FEEDING PRACTICES AND NUTRITIONAL STATUS OF CHILDREN (AGED 0 TO 3 YEARS) IN TWO CLINICS IN THE MORETELE DISTRICT

by

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Rozanne Kruger

ABSTRACT

The research was undertaken to obtain baseline data on the nutritional status and feeding practices of two rural communities. Two health care clinics (Makapanstad and Mathibestad) in the Moretele District north of Pretoria were identified. Children (0-36 months) visiting the baby clinic with their mothers / caregivers were targeted. The exploratory investigation can be described as cross sectional, prospective and descriptive in the qualitative and quantitative research domains. This study aimed to examine, explore and describe the nutritional status (anthropometry, dietary intake) and feeding practices (food intake / security, knowledge, attitude) of the studied children and to determine if malnutrition existed in these communities.

The technique of convenience sampling was used to draw the sample. The sample was compiled from mothers / caregivers with children (six age categories) that visited the baby clinic on a Tuesday morning in both areas. The research was conducted from September 1995 to March 1996. Two interviewers (one per clinic) of the same ethnic group were used to overcome cultural, literacy and language problems associated with cross-cultural research. Individual interviews, using structured questionnaires (biographic questionnaire, hunger scale (48) and a 24h-recall) and anthropometry were done in the quantitative research domain and structured focus group interviews in the qualitative research domain. Descriptive and inferential statistics were used on the quantitative data and content analysis and ethnography on the qualitative data. Systematic coding of data as part of the content analysis produced numerical descriptions. Ethnography provided descriptive data / results.

Quantitative results revealed that the children in both areas grew according to their birth percentiles, but all showed an abnormal growth pattern between the ages of 12-24 months. The nutritional evaluation, using two sets of standards [WHO and RDA (⅔ cut off) reference values], revealed that iron, calcium and zinc intakes were low. Though the protein and kilojoule intakes were sufficient, it was only marginally so. The hunger scale measurements revealed that the subjects from the Makapanstad and Mathibestad areas perceived themselves as food insecure (58% and 25% respectively).

Qualitative results revealed that breast feeding was the choice feeding for newborn babies. Bottle feeding was only given where breast feeding was physiologically / clinically impossible. Solid food was introduced very early (at two-three months). The reasoning behind the specific sequence for the introduction of solid foods could not successfully be uncovered. The children's diets were nutritionally poorly balanced due to the foods chosen and the limited variety offered in their diets. The mother's / caregiver's nutrition knowledge with regard to specific foods, their functions and recommended quantities, was poor. The women adhered to their cultural beliefs regarding food choices and preparation practices for babies / young weaning-age children. Certain misconceptions were revealed in the discussion on attitudes.

The results provided insight regarding the feeding practices, nutrition knowledge and attitudes, and were used to substantiate recommendations aimed at the improvement of the feeding practices / nutritional status of the children. Education on health care practices and nutrition might positively influence the attitudes and consequently the feeding practices.

KEY WORDS: nutritional status, dietary adequacy, anthropometry, feeding practices, breast feeding, bottle feeding, weaning, nutrition knowledge, attitudes, food security, content analysis, ethnography

SAMEVATTING

Hierdie navorsing is onderneem om basislyndata oor die voedingstatus en die voedingpraktyke van twee landelike gemeenskappe te bekom. Twee gesondheidsorgklinieke (Makapanstad en Mathibestad) in die Moretele Distrik, noord van Pretoria, is geidentifiseer. Die teikengroep was kinders (0-36 maande) wat die babakliniek met hul moeders / versorgers besoek het. Hierdie verkennende ondersoek kan beskryf word as 'n dwarssnee, prospektiewe, beskrywende ondersoek in die kwantitatiewe- en kwalitatiewe navorsingsdomeine. Die studie het ten doel gehad om die voedingstatus (antropometrie, dieetinname) en die voedingpraktyke (voedselinname /-sekuriteit, voedingkennis en houding) van die bestudeerde kinders te ondersoek, te verken te beskryf, asook om te bepaal of wanvoeding in hierdie gemeenskappe voorkom.

Die tegniek van geriefsteekproeftrekking is gebruik om die steekproef saam te stel. Die steekproef is saamgestel uit moeders / versorgers met kinders (ses ouderdomsgroepe) wat die babakliniek op Dinsdagoggende in beide areas besoek het. Die navorsing is uitgevoer vanaf September 1995 tot Maart 1996. Twee onderhoudvoerders (een per kliniek) van dieselfde etniese groep is gebruik om die kulturele-, taal- en geletterdheidsprobleme, wat met kruis-kulturele navorsing geassosieer word, te oorkom. Individuele onderhoude wat gestruktureerde vraelyste (biografiese vraelys, hongerskaal (48), 24h-herroep) en antropometrie ingesluit het, is in die kwantitatiewe navorsingdomein gedoen en 'n gestruktureerde fokusgroeponderhoud in die kwalitatiewe navorsingsdomein. Beskrywende en inferensiële statistiek is op die kwantitatiewe data gebruik en inhoudsanalise en etnografie op die kwalitatiewe data. Sistematiese kodering van die data as deel van die inhoudsanalise het numeriese beskrywings gelewer. Etnografie het beskrywende data / resultate gelewer.

Die kwantitatiewe resultate het getoon dat die kinders in beide areas volgens hul geboortepersentiele gegroei het, maar almal het 'n abnormale groeipatroon tussen die ouderdomme van 12-24 maande getoon. Die nutrisionele evaluasie, gedoen met twee stelle standaarde [WHO en RDA (⅔ afsnypunt) verwysingswaardes], het getoon dat die yster-, kalsium- en sinkinnames laag was. Alhoewel die proteïen- en kilojouleinnames voldoende was, was dit marginaal. Die hongerskaalmetings het getoon dat die proefpersone van die Makapanstad- en Mathibestadareas hulself as voedselonseker beskou het (58% en 25% respektiewelik).

Die kwalitatiewe resultate het getoon dat borsvoeding as keusevoeding vir pasgebore babas beskou is. Bottelvoeding is alleenlik gegee waar borsvoeding fisiologies / klinies onmoontlik was. Vaste voedsel is baie vroeg reeds (teen twee tot drie maande) in die dieet ingesluit. Die redes vir die bepaalde volgorde van insluiting van vaste voedsel kon nie suksesvol vasgestel word nie. Die voedingkennis van die moeders / versorgers met betrekking tot spesifieke voedsels, hul funksies en aanbevole hoeveelhede, was swak. Die kinders se diëte was nutrisioneel ongebalanseerd weens die swak voedselkeuses en beperkte verskeidenheid. Die vroue het steeds hul kulturele gewoontes met betrekking tot voedselkeuses en voorbereidingspraktyke vir babas / jong speningsouderdom kinders beoefen. Bepaalde wanopvattings is in die besprekings oor houding geïdentifiseer.

Die resultate het insig gebied oor die praktyke, kennis en houdings aangaande voeding- en voedingpraktyke en is gebruik om voorstelle gemik op die verbetering van die voedingpraktyke / voedingstatus van die kinders te bewerkstellig. Onderrig oor gesondheidsorgpraktyke en voeding mag die houdings en gevolglik die voedingpraktyke positief beïnvloed.

SLEUTELTERME: voedingstatus, dieettoereikendheid, antropometrie, voedingpraktyke, borsvoeding, bottelvoeding, spening, voedingkennis, houding, voedselsekuriteit, inhoudsanalise, etnografie

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CHAPTER 1

BACKGROUND TO THE INVESTIGATION

CHAPTER 1 BACKGROUND TO THE INVESTIGATION

1.1 THE EFFECTS OF CHRONIC MALNUTRITION IN COMMUNITIES

The concept of a balanced diet is based on the consumption of a variety of nourishing foods in proportion to essential nutrients and kilojoules to support body growth and function. Malnutrition is a state of disease which results when either deficiencies or excesses lead to imbalances of nutrients and energy that are available for use in the body. Under nutrition and over nutrition are manifestations of malnutrition because both result in an imbalance of nutrients and energy (1).

There seems to be a widespread occurrence of chronic malnutrition in developing countries such as South Africa (2,3). The younger children (under the age of five years) in any community are the worst victims of protein-energy malnutrition (PEM), because of their vulnerability by being in the growth phase (4, 3).

The research of Steyn et al (5) clearly shows that the problem found in black preschool children is one of chronic malnutrition, caused by a diet low in kilojoules over a long period of time (2). Many interrelated factors contribute to this state, including the health status, socioeconomic and education levels, housing status of a population, and political climate (see Chapter 3) (1). The main causes appear to be the food shortage and imbalances in the diets of these children (3). Secondary malnutrition results from inadequate absorption, impaired utilization of nutrients or from increased metabolic demands or losses and may thus reflect other underlying disorders (6). No age group is totally free of PEM, but the older the person, the less frequently this disease occurs and the less critical the manifestations thereof (4). The quality and quantity of food consumed by any group of people are indicative of that group's welfare (3).

According to Steyn et al (7) it is clear that the patterns of infant feeding (or childhood feeding practices) affect the nutritional status, health and growth of children. Research on infant feeding (2, 7, 8) indicates that nutrition problems occur when breastfeeding declines with the onset of weaning, or when breastfeeding is totally stopped, or if the mother returns to the workplace, or if the weaning period lasts too long and the child's main nutrient intake consists of an inadequate volume of breast milk without adequate weaning (solid) foods (8, 9). Poor weaning practices can lead to stunted growth, delayed motor and mental development, immune incompetence, frequent attacks of diarrhoeal disease, PEM, micronutrient deficiencies, and lastly but most importantly, interfering with the realization of full human potential (6, 10, 11).

1.2 SUBSTANTIATION OF THE RESEARCH

Knowledge of and insight in the health and/or malnutrition situation of the baby and/or child in a specific community is essential before any problems can be addressed (7). As there were no research results on the health / malnutrition situation available on the Moretele district in the Hammanskraal community, it was

decided that baseline data should be gathered in order to describe this community. This data could serve as a basis for any recommendations and practical solutions to improve and / or sustain the current situation, as well as for the planning of nutritional intervention programmes (2, 5, 7).

When planning a research project in order to gather baseline data, it would be sensible to first gather information about the nutritional status and nutritional practices of the child, because the intervention to stop stunting of growth should take place at this level. Secondly, information should be gathered about the nutritional knowledge and the attitudes of the mother/caregiver of the child on food and nutrition, because this could be used to explain the food intake of the children (2, 7).

According to Steyn et al (7) there is very little data available on the dietary practices of young black children in the rural areas in South Africa . Research that has been done was on breast feeding or on breast feeding and infant feeding (children aged three to five years old). There is a paucity in the literature regarding data on breast feeding and weaning practices, as well as the eating habits of the child shortly after weaning (children between the ages of six to 36 months) (7). This period is probably the most critical in the physical development of any individual, since nutritional practices in this early stage of life have a great influence on especially brain development and subsequent intellectual performance at school (7). These side-effects clearly have great implications for the future manpower pool and socio-economical developments in developing countries such as South Africa (3).

The problems associated with chronic malnutrition and the wider social implications thereof are thus clear. The young growing child is more susceptible to the nutritional defects that accompanies malnutrition. National food supplementation programmes located within a broader primary health care approach, and the improvement of nutritional practices, could therefore be of more value to this group of children than the older child or adult. Firstly, because of the direct and more immediate effects of the growth and development of the child as such, and secondly because of the indirect and more long term beneficial effects on the future adult population (2, 3).

1.3 INVESTIGATION

The research had been requested by a private company in order to obtain baseline data on communities and their nutritional practices in areas where there is no such information available. The Moretele District in the Hammanskraal area north of Pretoria is the non-urban community that was identified for the investigation. Children between the ages of naught to 36 months were targeted. The mothers / caregivers of these children were included in the research group to obtain data regarding the nutritional status of the children, as well as on the feeding practices of the mothers / caregivers regarding the studied children.

The research question put forward was: What are the nutritional status and feeding practices of children aged naught to three years in two clinics in the Moretele district in the Hammanskraal area? To answer this question in a meaningful and scientific justifiable way, baseline data were gathered from the target group in order to make recommendations regarding the factors that affect the nutritional status and feeding practices of the children negatively.

The study is presented in three parts :

PART 1 : LITERATURE REVIEW

The literature review will be presented in two chapters.
Chapter 2 deals with chronic under nutrition in deprived communities in developing countries. In Chapter 3 all the factors that influence the nutritional status of young children are discussed.

PART 2 : EMPIRICAL INVESTIGATION

The empirical investigation is discussed in three chapters.
In Chapter 4 the research aim, objectives, and design are discussed. In Chapter 5 the quantitative research strategy is discussed and in Chapter 6 the qualitative research strategy is discussed.

PART 3 : RESULTS AND RECOMMENDATIONS

In this part the research results, the discussion thereof and the recommendations are presented. Three chapters deal with the results. The results obtained from quantitative research methods are discussed in Chapter 7. The results obtained from qualitative research methods are discussed in Chapters 8 and 9. The executive summary and recommendations for this research study are presented in Chapter 10.

PART 1

LITERATURE REVIEW

CHAPTER 2

CHRONIC UNDER NUTRITION AND THE YOUNG IN DEPRIVED COMMUNITIES IN DEVELOPING COUNTRIES

PART 1 LITERATURE REVIEW

CHAPTER 2 CHRONIC UNDER NUTRITION AND THE YOUNG IN DEPRIVED COMMUNITIES IN DEVELOPING COUNTRIES

"Children are our most precious asset, and their well-being reflects the future of the nation. Children differ from adults in two important respects: they are growing and developing, and they are dependent on others for sustenance and protection. In order to grow, develop and thrive, children require adequate nutrition, protection from the environment, essential health care and an emotionally nurturing family setting. Deficiencies in one or more of these components are why millions of children around the world still die unnecessarily every year, and why untold millions fail to reach their genetically endowed potential" (6).

2.1 INTRODUCTION

Health problems, especially that of chronic under nutrition, has been causing concern worldwide (1, 2, 3, 6, 12). In any given population there have always been subgroups (vulnerable groups)(see Table 1), who are considered at high risk for a range of health and nutrition problems. New subgroups are emerging constantly due to the evolvement of new / current problems in an environment. Possible reasons are:

- they are consuming an inadequate diet because they are poor or lack consistent access to the food supply,
- they are unable to eat because of a handicapping condition,
- infants, young children, the elderly, and the mentally retarded are dependent on others for food,
- they are unable to meet their needs for increased nutrients and energy to support pregnancy, lactation, growth and development, and other physical conditions (1).

TABLE 1 : GROUPS WITH SPECIAL NEEDS (1)

VULNERABLE GROUPS	EMERGING GROUPS
Pregnant and lactating women	Poor (low socioeconomic status)
Infants	Hungry
Young children (toddlers)	Homeless
Older persons	AIDS / HIV positive
Chronically ill or handicapping condition	Lead poisoning
Migrants	Tuberculosis (new drug resistant strain)
Minorities	

Any group could be vulnerable for one or more reasons (1). If global efforts to reduce chronic under nutrition and mortality rates are to succeed, the focus should be directed to infants and toddlers (12). Infants and toddlers are considered the worst victims of chronic under nutrition because of their vulnerability (1, 2, 3, 12, 13). Kibel and Wagstaff (1995:3)(6) summarize children's wellbeing as containing four

elements (see Table 2).

TABLE 2 : ESSENCE OF THE WELLBEING OF CHILDREN

1. ADEQUATE NUTRITION	2. PROTECTION FROM THE ENVIRONMENT
3. ESSENTIAL HEALTH CARE	4. EMOTIONALLY NURTURING FAMILY

(Adapted from Kibel & Wagstaff, 1995:3 (6))

The first and most important element is adequate nutrition (3, 12). A nutritionally adequate diet in any part of the world should contain ample quantities of all the essential nutrients and energy by means of eating a variety of nourishing foods in order to comply to all the functions of nutrition in the human body. These include in the first place the provision of energy, secondly the maintenance of body tissue and the promotion of growth, and thirdly the regulation of body processes to protect the body against disease (1, 3, 14). Growing children require an additional amount of certain essential nutrients, including protein, energy, calcium, iron, zinc, vitamin A and vitamin D to meet the needs of the growth spurts in these years (3, 4, 10). If the child receives poor nourishment, it will not meet his needs and consequently will make him more prone to becoming malnourished (11).

PEM is no longer regarded as a disease caused by low intakes of protein and energy only. It is now known that PEM is a manifestation of deficiency of many nutrients (13). According to Walker (1990) (13) there is a relationship between reduced antioxidant nutrient status and the development of kwashiorkor. The focus is particularly on β-carotene, vitamins C, E, and also on dietary selenium, manganese, copper and zinc. These nutrients are all essential components of key enzymes involved in antioxidant pathways responsible for reducing free-radical attack. In the development of kwashiorkor, free radicals are formed as part of the body's immune response to infection (13, 15). They are superoxides that can also damage body tissues (especially the kidneys), causing oedema, fatty enlargement of the liver, pale skin and hair, and possibly diarrhoea (15). Children with low antioxidant status are more prone to infection and consequently the production of large numbers of free radicals (6, 13, 15).

2.1.1 MALNUTRITION DEFINED

PEM encompasses a range of clinical disorders, including the underweight child, the stunted child, the syndromes of kwashiorkor, marasmic kwashiorkor and marasmus (13, 16). PEM may be hidden or very obvious, and additional stresses such as infections (measles) and diarrhoea may lead to a rapid transformation from a mild to a serious case of malnutrition (6). On the one end of the range marasmus occurs. This is caused by a lack of protein, energy and other nutrients such as vitamins A, C, thiamin, riboflavin, niacin and minerals such as iron and zinc, i.e. when the total food intake is low. On the opposite end kwashiorkor occurs, which is caused by a lack of protein quality and quantity in the diet (4, 14, 16, 17). The name "Kwashiorkor" was given by Cicely Williams in 1933 when she described "a disease the deposed

baby gets when the next one is born", and it is also the local name in the Gold Coast for a nutritional disease of children, associated with a maize (corn) diet. (13, 16, 17). Marasmus typically occurs in the child under the age of one year, while kwashiorkor more typically occurs in the child between the ages of one and two years(4, 14, 16, 17).

2.1.2 NATURE OF THE PROBLEM: THE VICIOUS CIRCLE OF MALNUTRITION

Malnutrition quite often starts in utero. After birth it may be precipitated by inadequate amounts of breast milk from malnourished mothers or thirdly, because of inappropriate weaning practices. Whatever the cause might be, the result would probably be stunting in the later years of childhood (2, 7, 13). According to Steyn et al (7) it is clear that the patterns of infant feeding (or childhood feeding practices) affect the nutritional status, health and growth of children.

To understand the vicious circle of chronic malnutrition, it is essential to understand the way in which malnutrition would probably develop in an individual, from conception onwards, in a poor underdeveloped community (also see Chapter 3). Ocloo (1993:11-12)(3) explains the different phases clearly. Women are responsible for bearing children, rearing children, working in the home as well as working outside the home to earn a living. All these pressures lead to a decreased work capacity in the mother, resulting in a low income with inadequate food consumption. The mother is often already malnourished with the onset of pregnancy, resulting in premature births, babies with low birth weight, birth defects and infant deaths. These babies are often too weak to fight against poor living conditions and may therefore die sooner than expected. Unfortunately this could then lead to an early return to pregnancy and another birth of a weak child (1, 3, 6).

When such a weak child is born, he continues to be malnourished for several reasons. His undernourished mother produces inadequate amounts of breast milk to meet his nutritional needs. Weaning / complementary foods are of low quality and consumed infrequently, and the diet of the weaned child is totally inadequate. This then leads to the stunting of growth and eventually to the development of PEM, which in turn may increase the risk for acute and chronic infections. These children do not always survive, and if they do, they continue to be malnourished because of the low income of which approximately three-quarters is spent on food (1, 3, 6). Families often cannot afford adequate amounts of food to feed everyone. High quality foods such as animal proteins are rarely purchased because they are so expensive. The foods usually purchased are those that provide bulk - to fill the tummies - but are often not of high quality; the nett effect is a nutritionally inadequate diet (3). Therefore any fall in income due to crop failures, unemployment and so forth, will enhance the risk of malnutrition. The result often is irregular and inadequate food intake which means less than the required amount of energy intakes for the children in these communities. Additionally the poor living conditions, poor personal hygiene, poor food preparation practices and poor storage of food contribute to the development of infectious diseases in this vulnerable group, giving rise to the vicious circle of malnutrition (3)(Figure 1).

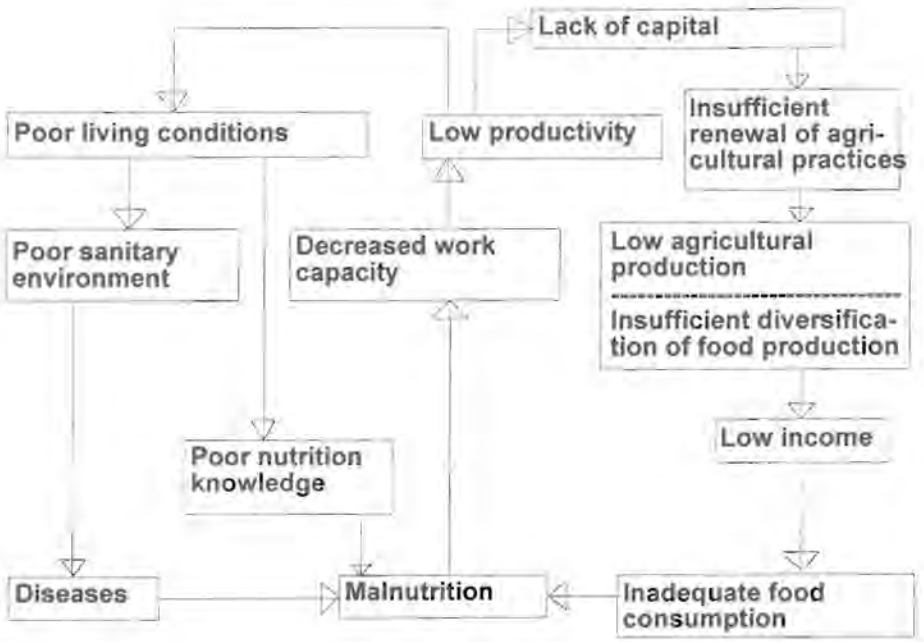


FIGURE 1 : VICIOUS CIRCLE OF MALNUTRITION (3)

Furthermore, the mothers are so exhausted by work or frequent childbearing, that they cannot provide a nurturing, stimulating environment for their children. These children sometimes also lack parental attention because they are often left in the care of other children, caregivers or the elderly (also see Chapter 3). The cycle of malnutrition thus continues up to school age where it continues in the same fashion as described previously. The older children usually have to help with activities involved in the upkeep of the family, leaving them little time for rest and recreation. Their food intake does not relate to their energy expenditure. Since much less energy is consumed than is required, malnutrition results (2, 3, 4, 6, 10, 14, 18). Physical weakness, reduced resistance to infections, stunting of growth, lack of stamina for continuous activities, lack of initiative, general sluggishness and an increased susceptibility to diseases which make them perform poorly at school, complete the final picture in these children(3)

The child in a low socioeconomic community thus grows up with the same problems that his parents have to cope with in order to survive. The survivors now become poor achievers and consequently they remain impoverished. In this way the vicious circle of malnutrition maintains itself (3, 6, 14).

2.2 PREVALENCE

Under nutrition continues to cause enormous worldwide human suffering. As indicated previously, young children are at much greater risk of dying from hunger than adults and smaller children (3, 12, 13). More than one-fourth of all deaths occur among young children (under five years of age) in developing countries - most of which is three years and younger (12). According to Dennill et al (19) the World Health

Organisation(WHO) estimates that more than 25% of these deaths result from malnutrition. In developing countries about 184 million children are defined as having malnutrition with weight-for-age less than -2SD. of the reference. This represents one third of the under-five child population (12). Africa's children account for only 10% of the world's children, but one third of the 40 000 children who die every day worldwide are African (19). This accentuates the fact that the problem in Africa is much more extensive than that in other developing countries. In Figure 2 the under-five mortality rate (U5MR) of Africa is compared with that of other developing countries.

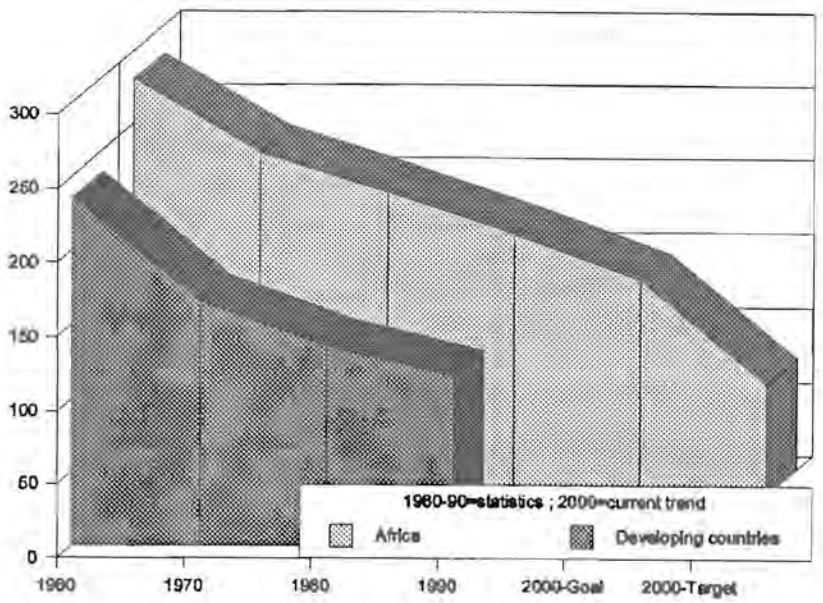


FIGURE 2 : AFRICA'S CHILDREN: UNDER-FIVE MORTALITY DECLINES (19)

For the whole of Africa, the U5MR has up till the mid-1990's been halved since that of 1960 (285%). But an increased acceleration is needed if the year 2000 goal of 75% is to be achieved. The current 2000 trend for Africa is 145% (19). According to the United Nations Children's Fund (UNICEF)(1998)(20), South Africa is ranked 69th (of 191 countries) with 66% on the list of countries ranked in descending order of their estimated 1996 U5MR. In 1960 South Africa's UMP was 126%. Currently 62 countries are still above the 75% goal.

The United Nations (1987) published the *First Report on the World Nutrition Situation*, which states that in most parts of the world nutrition has improved over the last 25 years, as the infant and child mortality rates reflect (13). Malnutrition is indicated by low birth weights, children underweight for age and by infant and child mortality. These indicators have shown that malnutrition remained stable in South America, decreased in Asia and Central America, but it is still rising in Sub-Saharan Africa (13, 21). The data on the percentage of infants with low birth weights, as presented in Table 3, verify this trend.

TABLE 3: PROPORTION OF INFANTS WITH LOW BIRTH WEIGHTS (BELOW 2.5kg)
(Adapted from 21)

REGIONAL SUMMARIES	1980	1990
Sub-Saharan Africa	16	17
South Asia	35	33
Middle America	15	13
South America	12	12
United States	-	15(blacks) 7(whites)

Maternal health and nutrition are clearly very important if the low birth weight problem is recognised. It affects some 20 million newborn babies annually, mainly in developing countries, but not excluding industrialised countries (21, 22). The data in Table 3 on the proportion of infants with low birth weights clearly show that this is still a huge public health problem.

Food deprivation may either lead to low weight-for-height (wasting), an indicator for acute or short term malnutrition; or to low height-for-age (stunting), an indicator for chronic malnutrition (21). Table 4 presents data on food deprivation in children world wide.

TABLE 4 : PROPORTION OF CHILDREN WASTED AND STUNTED, 1980-1990 (21)

COUNTRIES / REGIONS	WASTING (12 - 23 MONTHS)	STUNTING (24 - 59 MONTHS)
Sub-Saharan Africa	10	39
Asia (without India and China)	11	53
India	27	65
China	8	41
Latin America	5	26
North Africa	2.5	25
Overall figure of countries mentioned	13	46

According to UNICEF (1998) (20) the percentage under-fives (1990-1997) suffering from stunting is 42% for Sub-Saharan Africa and 23% for South Africa. For wasting it is 8% for Sub-Saharan Africa and 3% for South Africa and for moderate and severe underweight 30% and 9% respectively (Refer to Table 5 for the South African values). Wasted children could catch up growth, provided they receive sufficient nutrients, but stunting is largely irreparable and these children never regain their full height or cognitive potential. Therefore the figure indicating that 46% (Table 4) of the world's children are "too short" due to malnutrition is worrisome (21).

Health and related socio-economic indicators put Africa among the least developed regions of the world (19). Examples of these according to UNICEF(1998) (20) include:

- Infant mortality rate: 105 per thousand in Sub-Saharan Africa compared to 6 per thousand in industrialised countries.
- Life expectancy at birth: 51 years in Sub-Saharan Africa compared to 77 years in industrialised countries.
- Safe water supply: 49% in Sub-Saharan Africa compared to nearly 100% in industrialised countries.

The infant mortality rate (IMR) is defined by Kibel & Wagstaff (1995)(6) as an index that reflects not only the health status of children under one year of age, but also reflects the overall environmental and health service inputs in a community. It is a key indicator for comparing the health status of countries or regions. Dennill et al (19) compare the IMR's of several countries world wide as published by the Department of Health and Population Development in 1992 (Figure 3).

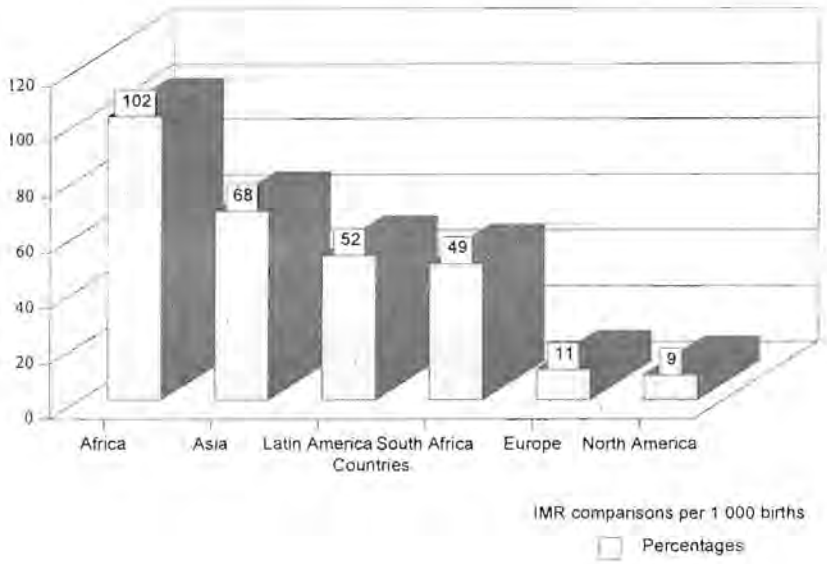


FIGURE 3 : INFANT MORTALITY RATES (15)

According to UNICEF (1998) (20) the percentage IMR's (1996) is 105% for Sub-Saharan Africa, 50% for South Africa and 60% for the World.

The first step in addressing the problem of chronic under nutrition would be to accurately assess the type, severity, prevalence and distribution of the disease in vulnerable groups (23, 24). In South Africa the crudest idea of the trends in the prevalence of chronic under nutrition is perceived as there are no regular, accurate and satisfactory nutritional data available (23, 25). Walker (1995)(17) states that chronic under nutrition has affected 30-50 million children under five years in Africa. In 1989 1200 African children died in South Africa as a result of nutrition-related diseases. The report of the Committee for the development of a Food and Nutrition Strategy for Southern Africa estimated in 1990 that 2,3 million people in South Africa and the TBVC countries previously needed nutritional assistance (23).

Regardless of the sparse data, several researchers agree that chronic under nutrition is a major health problem in South Africa amongst black, coloured and Indian pre-school children (23, 25). The trends in prevalence suggest the following :

- Stunting occurs frequently among rural black pre-school children with a prevalence of between 25 and 41% in contrast with 12% in urban blacks, 20% in coloured and 6% in Indian children (25).

- Approximately 31% of rural black pre-school children are underweight, while the figure for peri-urban blacks varies between 10-15%, for coloureds 48% and for Indian children 35% (25).

The research of Steyn et al (5) shows that a fairly large percentage of Pedi preschool children in two rural communities in Lebowa were stunted (36% of boys and 22% of girls) and only a small percentage wasted (5% of boys and 2% of girls), which indicates that these children experienced malnutrition from a very early age. Steyn et al (5) also state that the most recent studies of black preschool children in South Africa (in among other, the Umtata district, Transkei, Khayelitsha and in Lebowa) have two findings in common. Firstly, that the percentage prevalence of stunting in children is greater than the percentage underweight in children and secondly, that most studies show less than three percent wasting in these age groups. The percentage stunting in general is greater than 30% and the percentage underweight less than 15% in these groups. These findings suggest that the problem that is found in black preschool children be one of chronic malnutrition. The cause is a diet low in kilojoules over an extended period (1, 4). The following basic indicators for demographics and nutrition in South Africa emphasise the problems as stated previously (see Table 5). The overall stunting rate is 13% for the total South African population, with the wasting rate low at 2.6%, and the underweight rate higher again at 9.0% (17,26,27,28).

TABLE 5 : CHILDREN IN SOUTH AFRICA : BASIC INDICATORS FOR DEMOGRAPHICS AND NUTRITION

BASIC INDICATORS		STATISTICS (Specified by year)		
		1995	1996	
DEMOGRAPHICS	Crude birth rate: → South Africa average	23.4	21.3	
	→ White	13.7	12.2	
	→ Coloured	21.7	21.2	
	→ Indian	18.1	16.1	
	→ African	25.3	22.4	
	Low birth weight prevalence	16%		
		1990	1994	1991-1996
	IMR: → South Africa average	40.2	48.9	56.1
	→ White	7.4	7.3	19.3
	→ Coloured	28.6	36.0	60.5
	→ Indian	15.9	9.9	34.1
	→ African	48.3	54.0	59.0
		1960	1990	1997
	Under-5 mortality rate: → South Africa average	126%	73%	65%
	→ White		12	
	→ Coloured		19	
	→ Indian		13	
	→ African		20	
		1995		
NUTRITION (nutrients)	Children - marginal vitamin A status	30.0%		
	Children - iron deficient	10.0%		
	Children - visible goitre	1.0%		
		Wasting %	Underweight%	Stunting%
NUTRITION (anthropometry)	Population groups: → South Africa average (1994*) (1990-97◊)	2.6* 3.0◊	9.0* 9.0◊	13.2* 23.0◊
	→ White	0.9*	1.1*	1.8*
	→ Coloured	4.1*	16.9*	18.2*
	→ Indian	5.2*	6.2*	4.1*
	→ African	2.4*	8.7*	14.6*

Crude birth rate: annual number of births per 1000 population expressed per 1000 live births

IMR: probability of dying between birth and exactly 1 year of age expressed per 1000 live births

Low birth weight: less than 2500g

Wasting: below minus two standard deviations from median weight for height of reference population

Stunting rate: below minus two standard deviations from median height for age of reference population

Underweight: below minus two standard deviations from median weight for age of reference population

*SA Health Review - 1994 (26)

◊UNICEF statistics - 1990-97(28) (SAVACG - 1994(111) values are similar)

(Compiled from 17, 26, 27 and 28)

2.3 GROWTH AS AN INDICATOR OF CHILDREN'S HEALTH

2.3.1 GENERAL IMPACT OF GROWTH ON CHILDREN'S HEALTH STATUS

Physical growth is a characteristic that is unique to childhood. Thus normal growth patterns and factors influencing them are quite important to be able to assess child health. A normal rate and pattern of growth are indicators of child wellbeing and nutritional status (6). Frankle & Owen (1993)(1) define "the nutritional status of an individual as the condition of his or her health as influenced by the intake and utilization of nutrients". Nutritional status cannot be measured directly by any single measurement or test. Assessment of nutritional status is therefore dependent on the interpretation of relevant food and nutrient intake data, as well as evaluation of nutrition-related health indicators (1, 29). The U.S. Department of Health and Human Services defines nutritional assessment as " the measurement of indicators of dietary status and nutrition-related health status to identify the possible occurrence, nature, and extent of impaired nutritional status", which can range from deficiency to toxicity (29).

An overall linear relationship exists between nutritional status and mortality, indicating a gradual increase in mortality as nutritional status decreases (2, 3). According to Taylor (1988)(30) the faltering of growth in children seems to be the best single general indicator of incipient problems in child health and development. The monitoring of child growth can therefore be used to identify children with early problems in order to apply corrective measures in time (6, 17, 30, 31). Abnormal size and growth are commonly associated with malnutrition or disease (1). The vicious circle of malnutrition is best broken at an early stage by identifying children as they start the insidious, silent downward progression towards ill health. Children who are not growing are probably sick children ! (1, 30).

Physical growth and development in children can be divided into various stages, which each has typical characteristics relating to child growth and development. Infancy is the period where the greatest growth spurt occurs. Thereafter growth is slow but steady while coordination and intellectual skills are developed (6). The effect of nutrition on human growth and development is therefore clear and the measurement of physical growth parameters or anthropometry, as well as dietary analysis forms the basis for preventive health care programmes worldwide (6, 29).

2.3.2 FACTORS THAT INFLUENCE GROWTH

Growth is influenced by many factors of which the negatively influencing ones are mentioned mostly (see the vicious circle of malnutrition as discussed in 2.1.2.). Zeitlin (1991)(32) looks at it from another viewpoint. He uses the term "positive deviance" to describe the children who grow and develop normally in low-income families where most children normally suffer from nutritional growth retardation and poor health. Another term used for this occurrence is nutritional resilience or invulnerability to the classic high risk situation. This is in other words a form of adaption to nutritional stress — positive adjustment to a limited food supply. It is in contrast to the more common phenomenon of negative adaption, where stunting of growth in early malnutrition benefits group survival at the expense of the individual by producing people with reduced food requirements and less nutrient deficiency symptoms (32).

According to Zeitlin (1991)(32) "positive deviance research highlights the fact that the best growing children do not necessarily mirror the clinically malnourished, and that the diet quality in addition to energy consumed and frequent feedings distinguish good from poor growers". Zeitlin (1991)(32) concludes that a positive environment (see Chapter 3) that predicts a good nutritional outcome, also predicts good cognitive development, health, and long-term development of the individual into a stable, productive member of society. More than only the nutritional factors concerning families and communities should be considered when evaluating child growth, namely the psychological and social health factors (32) (see Chapter 3).

2.3.3 GROWTH MONITORING

Growth faltering in a child is the best single general indicator of problems in child health and development (30). An extensive method of breaking the vicious circle of malnutrition is to identify children at the earliest possible time when they enter this process, and to make their parents aware of the fact that a child who is not growing, does have a problem (30, 31). Growth monitoring is what the first letter of the acronym, GOBI, which was devised by UNICEF to describe the means for effecting the "child survival revolution", stands for (6, 17, 31). Taylor (1988)(30) defines growth monitoring as being the regular assessment of growth and development in individual children in order to apply appropriate interventions. In the broader sense growth surveillance has to do with assessment of groups of children in various populations in order to determine causes for nutritional problems affecting nutritional status and to serve as a guideline to policy makers. Both these approaches are concerned with growth and development of children between the ages of birth to three years (31).

2.4 CLASSIFICATION OF MALNUTRITION

To distinguish between the various syndromes as mentioned in 2.1.1, research has shown that many biochemical indices may aid in the diagnosis between these syndromes, but few have proved of practical value. Therefore, to distinguish between the syndromes of PEM, anthropometric measures are compared with international reference standards. Those generally applied are that of the National Centre for Health Statistics, U.S. (NCHS). Tables indicating various cut-off points are available. Most commonly used cut-off points are -2 and -1 standard deviations below the median — roughly equivalent to the 3rd and 15th centiles (6). Three classifications are used most commonly. Firstly the two-way Wellcome classification of PEM (Wellcome Trust Working Party, 1970), where weight for age and oedema are the main criteria, can be used for international comparisons (6, 16, 33, 34). The Wellcome Classification is shown in Table 6.

TABLE 6: WELLCOME CLASSIFICATION OF INFANTILE NUTRITION (33)

	60-80%of standard* weight	Less than 60% of standard* weight
No oedema	Underweight: - nutritional dwarfing - growth retardation	Marasmus
Oedema	Kwashiorkor	Marasmic kwashiorkor

* Standard refers to the 50th centile and the term is used in preference to 'expected' weight (children should be 'expected' to have a range of normal weights for age, and only those with height-for-age on the 50th centile are expected to be on the 50th weight-for-age centile). 80% of standard approximates the 3rd weight-for-age centile.

Secondly, the Waterlow Classification defines stunting as being less than 90% height-for-age, and wasting as being less than 80% weight-for-height (Table 7)(6). Waterlow also distinguishes between marasmus and kwashiorkor with regard to the degree of fatty liver, oedema, wasting and serum albumin concentration (16, 34).

TABLE 7: WATERLOW CLASSIFICATION OF MALNUTRITION (6)

	NORMAL	MILD	MODERATE	SEVERE
wt-for-ht(%)	90-120	80-90	70-90	<70
Z-score (wasting)	+2Z to -1Z	-1Z to -2Z	-2Z to -3Z	>-3Z
ht-for-age (%)	95-11	90-94	85-89	<85
Z-score (stunting)	+2Z to -1Z	-Z to -2Z	-2Z to -3Z	>-3Z

wt-for-ht : Weight-for-height
ht-for-age : Height-for-age
Z-score : For weight for age and weight for height one Z-score unit is approximately equal to 10% of the median except in children less than 6 months. For height for age, one Z-score unit is equivalent to 5% of the median.

Thirdly, the Gomez classification takes weight and age into consideration. The child's percentage of standard weight-for-age forms the basis for the Gomez classification (35) (Table 8).

TABLE 8: GOMEZ CLASSIFICATION OF MALNUTRITION BASED ON WEIGHT-FOR-AGE STANDARDS (35)

Percentage of standard weight -for-age	Classification
>90	Normal
75-89.9	Grade I (mild malnutrition)
60-74.9	Grade II (moderate malnutrition)
<60	Grade III (severe malnutrition)

Scrimshaw (1990:57)(36) indicates that severe PEM has become relatively uncommon globally. In certain situations drought, civil war and other political factors will cause kwashiorkor to recur and whenever early weaning and insufficient knowledge and resources result in insufficient quantities of breast milk, marasmus will recur. Although the severe forms of PEM are gradually disappearing, retarded physical growth and development with mild to moderate PEM continue to affect a majority of young children in developing countries, and should thus be addressed accordingly (36). According to Latham (1997:131)(35) a number

of nutrition workers in the early 1970's suggested that judging malnutrition only on the basis of weight-for-age has many disadvantages. Therefore a method was suggested that distinguishes between the three categories of mild to moderate PEM based on weight and height measurements of children. These are:

- *wasting*: acute, current, short-duration malnutrition, where weight-for-age and weight-for-height are low, but height-for-age is normal;
- *stunting*: past chronic malnutrition, where weight-for-age and height-for-age are low, but weight-for-height is normal;
- *wasting and stunting*: acute and chronic or current long-duration malnutrition, where weight-for-age, height-for-age and weight-for-height are all low (35).

This classification distinguishes between current and past influences on nutritional status. It will also help the examiner to assess the child's history of malnutrition and will aid in the decision to provide supplementary feeding for the improvement of nutritional status. It is also very useful in nutritional surveys and in nutritional surveillance. In general, worldwide stunting is more prevalent than wasting (35).

2.5 CLINICAL SIGNS AND SYMPTOMS OF MALNUTRITION

The clinical presentation of PEM depends on the type, severity and duration of dietary deficiencies. The five forms, as mentioned previously, will be described separately, but each forms part of the PEM spectrum (4).

2.5.1 MARASMUS AND KWASHIORKOR

Marasmus and kwashiorkor are the major health problems of infants and young children as described previously. Marasmus (see Figure 4) is a chronic condition of semi-starvation, to which the child adjusts to some extent by reduced growth. Significant loss of body weight, skeletal muscle, and subcutaneous fat is apparent. Serum protein concentrations remain relatively intact (29).

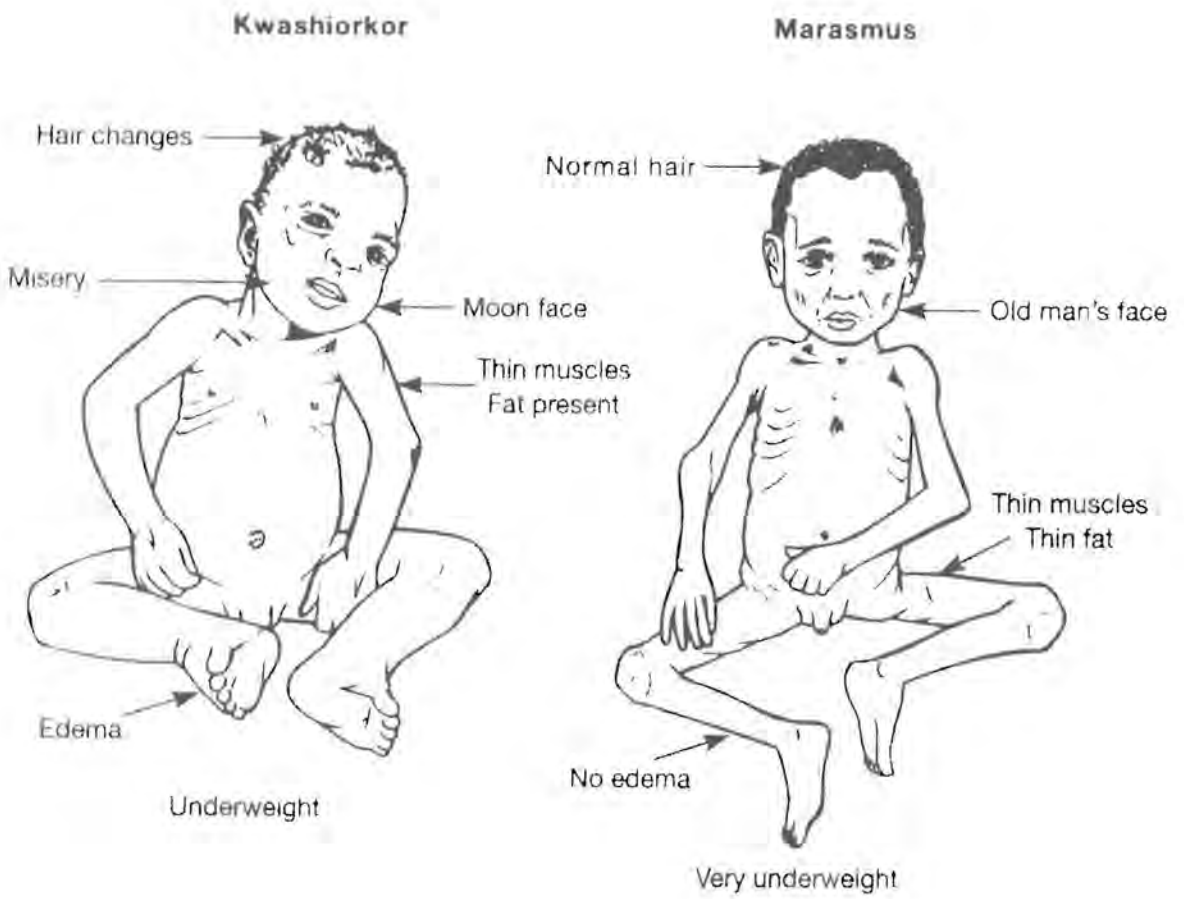


FIGURE 4: DIFFERENCES IN CLINICAL SIGNS BETWEEN KWASHIORKOR AND MARASMUS (29)

Kwashiorkor, in contrast, is associated with extreme protein deficiency, which leads to hypoalbuminaemia, pitting oedema, and enlarged fatty liver. Subcutaneous fat is usually not wasted, but muscle is. The muscle wasting is not clearly visible since it usually is masked by oedema (14, 29). The general characteristics of these two forms of malnutrition are outlined in Table 9.

TABLE 9: CHARACTERISTICS OF KWASHIORKOR AND MARASMUS (29)

VARIABLE	KWASHIORKOR	MARASMUS
Skeletal muscle	No major losses	Significant losses
Serum proteins	Significantly decreased	Relatively normal
Adipose tissue	Preserved	Significant loss
Body weight	Relatively normal	Significant loss
Oedema	Pitting oedema common	Absent
Predisposing factors	Ample energy with little or no protein	Starvation, lack of both protein and total energy

Stimulation and bonding to the mother in the first weeks of life are also critical for normal growth. Maternal deprivation leads to apathetic children with pale skins and cold extremities, and pronounced anorexia: the child rejects food in response to rejection by its mother ("the disease of the displaced child")(34).

2.5.2 MARASMIC KWASHIORKOR

In areas where PEM is endemic, children show a mixture of some of the features of both marasmus and kwashiorkor and they are referred to as having marasmic kwashiorkor or simply, protein-energy malnutrition (4, 15). The child's weight is extremely low and he/she appears thin and wasted. The weight-for-height is also very low. Mild oedema of the legs is typical, sometimes of the arms and face as well. Any other typical symptoms of kwashiorkor / marasmus may be present: thin or moon face; weak hair; skin changes; and misery (15).

2.5.3 NUTRITIONAL DWARFING

Sometimes when children are chronically exposed to insufficient food intake, they adapt by means of reduced / retarded growth. Their weight and height are proportionally reduced in such a way that they appear superficially normal. When weights and heights are compared to standards for normal children, they resemble children of a year or more younger (4).

2.5.4 THE UNDERWEIGHT CHILD

Usually there are more cases of invisible malnutrition than the visible kwashiorkor and marasmus. For each serious case of PEM there are several children with mild to moderate, subclinical PEM. These children suffer from growth retardation which can be detected by their weight-for-age or their weight-for-height that would be significantly below normal. They might also have reduced plasma albumin or other biochemical protein deficiencies. The result of this undetected problem is that these children grow up smaller than their genetic potential and they are usually at greater risk of infections, specifically gastroenteritis or respiratory tract infections, which may then lead to the precipitation of malnutrition (4, 15).

CHAPTER 3

FACTORS THAT INFLUENCE THE NUTRITIONAL STATUS OF YOUNG CHILDREN

CHAPTER 3 FACTORS THAT INFLUENCE THE NUTRITIONAL STATUS OF YOUNG CHILDREN

"An understanding of the complex and subtle causes of malnutrition is important to appreciate the scale and depth of the problem, the progress achieved to date and the possibilities for further progress that exist" (20).

3.1 INTRODUCTION

To solve problems, causes must be discovered! Before a community nutrition problem, like chronic malnutrition, can be alleviated or solved, it must be ascertained which factors in the community are causing the nutrition problem (37). According to Naidoo et al (1993)(38) there is an universal awareness that under nutrition is largely the result of poverty, which arises from:

- underemployment and unemployment
- the pressure of a growing population on land which may be maldistributed
- low productivity of agriculture
- uneven distribution of income and consumption
- poor environmental sanitation
- illiteracy
- cultural deprivation (38).

Nutrition problems found among groups are usually determined not by one factor only, but by a variety of interrelated factors that play a role to influence the nutritional status of the individual, or in this case the child, negatively (37, 38, 39, 40). Actual food behaviour is the result of the synergistic relationships among ecological, socio-cultural, economic and political environments. Multiple and interrelated determinants are involved in why malnutrition develops, and a similar series of approaches, multifaceted and multi sectoral, are needed to deal with it (see Figure 5). The model illustrates the important factors that affect the nutritional status of children in a community, ultimately leading to malnutrition, disability and/or death on the negative side, and survival, growth and development on the positive side (20,41).

The model will be discussed with the focus on the child, highlighting the immediate and underlying causes influencing the nutrition of the child, as well as the relevant factors underlying the basic causes. In each instance the global situation will be discussed, followed by the South African scenario in italic print.

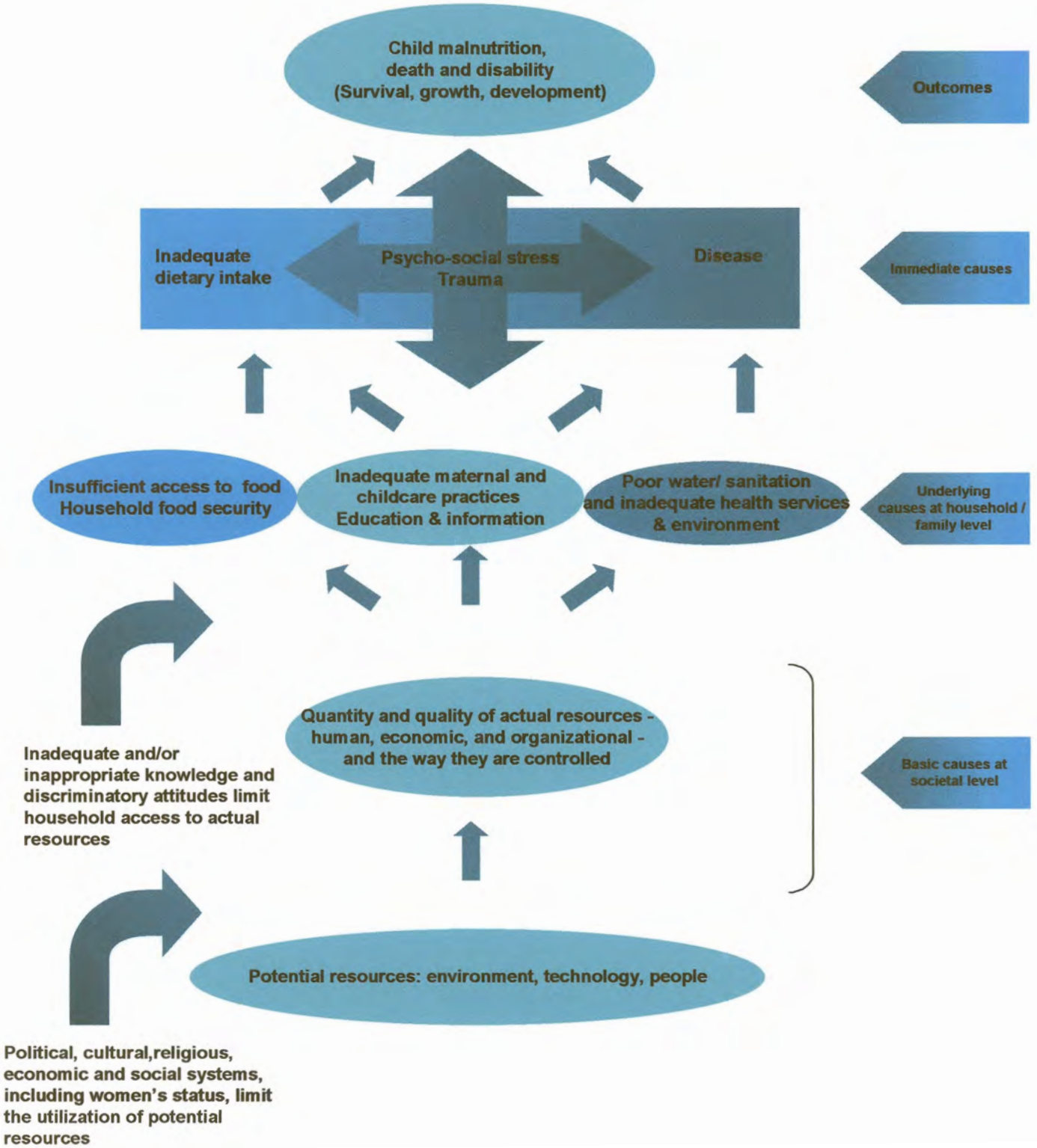


FIGURE 5 : CAUSES OF CHILD MALNUTRITION / SURVIVAL AND DEVELOPMENT (Adapted from 20 and 36)

3.2 IMMEDIATE CAUSES

The model clearly reiterates the creation of the vicious circle of malnutrition as explained in Chapter 2. The two most significant causes of malnutrition are **inadequate dietary intake** and the **incidence and prevalence of specific diseases**, and they are known to be interactive (20, 41). Children who enter this malnutrition-infection cycle can quickly fall into the downwards and fatal spiral since one condition feeds off the previous one (see Figure 6).

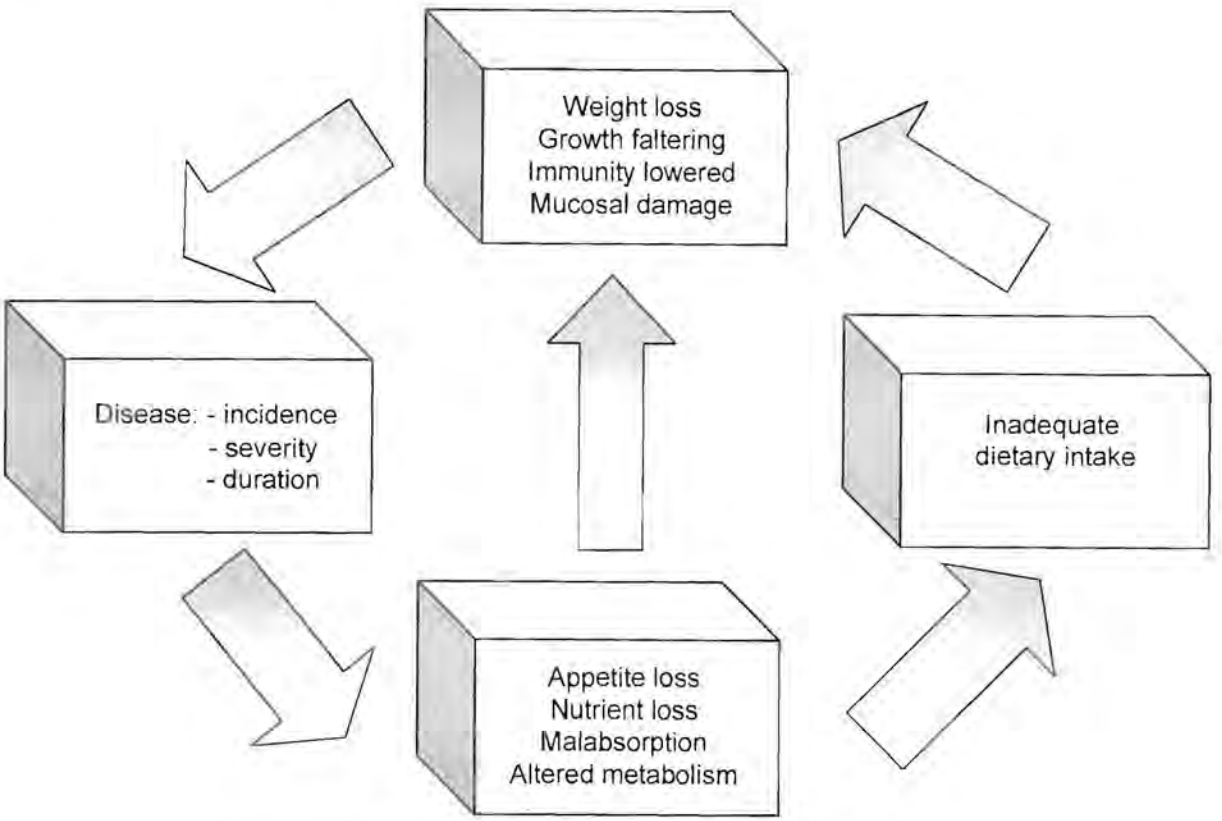


FIGURE 6: INADEQUATE DIETARY INTAKE / DISEASE CYCLE (20)

3.2.1 INADEQUATE DIETARY INTAKE

The nutrient intake per se of the individual will determine his nutritional status (3, 14, 18, 21,37). PEM results as a visible sign / disease of poor nutritional status or under nutrition, but less visible deficiencies of micronutrients also occur frequently. Micronutrient deficiencies such as that of vitamin A, iron and iodine, put a burden on children. It can have lasting effects including eye damage, anaemia, impaired growth and brain development, learning deficits, and decreasing long-term learning and work capacities (21). Research has shown that stunting in children may also be the result of micronutrient deficiencies, particularly that of vitamin A and iron. Retardation in psychosocial, motor, and cognitive development is also the result of micronutrient deficiencies (21).

Walker (1995)(17) describes the then current South Africa situation regarding dietary intake as follows: the diet in rural areas varies, but the traditional diet with a few local modifications, is usually still followed. The

staple food is still very refined maize, which is supplemented partly with "Kaffir corn" (Sorghum vulgare) and wheat products like brown bread (17, 38). Other foods consumed mostly, included dried peas, beans, ground nuts, pumpkin, tomatoes, melons, onions, wild greens and other available fruits and vegetables. Meat is consumed irregularly, once or twice a week and milk only in small quantities. Varying amounts of sugar, tea, coffee, soft drinks, condensed milk, margarine and tinned fish are bought (17). This type of diet is probably adequate in energy and gross protein — one would not go hungry, but the animal protein and fats are low and the carbohydrate is high, fibre is moderately high, calcium and iron are low and most other vitamins, especially vitamin A is borderline low (17). Carbohydrate contributes approximately 65-80%, protein 10-14% and fat 10-25% of the energy content of this type of diet. When nutrient intakes were accessed against the Recommended Dietary Allowances (RDA)(1989), about half of rural children fell below 75% RDA and 38-62% fell under the 5th centile of NCHS Reference Standards — indicating nutritional problems which implicate nutritional status (17).

3.2.1.1 Food Behaviour

The food behaviour of the individuals in a community will directly influence first the nutrient intake and consequently the nutritional status of community members (17, 37, 39, 40). Terry (1993)(37) states that food behaviour in a group refers to patterns of food selection, procurement, distribution, manipulation, consumption, storage, and disposal.

Food selection is defined by Terry (1993)(37) as those items chosen as food by a group. What is important in this instance is not only which foods are most commonly selected but also who makes these food selection decisions; usually the adult female, although this is changing in many communities (37). Food preference refers to the like or dislike for a food, and will obviously play an important role in the selection of foods for consumption (39). Peers and adults can exert a powerful influence on the development of food preferences in children. Children's preferences will shift to emulate the food choices of peers. Very young children, under two years of age, clearly prefer foods that they know and therefore choosing foods for them should be done with great care (40). According to research, the statement "I don't like it; I've never tried it," may be a truism about children's food preferences because repeated exposure to unfamiliar foods is likely to result in acceptance of that food (40).

Food procurement refers to how food is obtained (37). There are basically four ways of obtaining food: firstly by purchasing food, secondly through producing your own meat, vegetables, fruit, milk or fat, thirdly through preserving food by means of canning, freezing, drying, or other techniques, and fourthly depending on the situation, through generosity or refuge of others (37).

Food distribution refers to the way in which food is divided between community members. For individuals or families the amount of food available is determined by income or participation in food programmes. The access to, the amount and type of food received, and the priority for what is available in each household will also influence the nutritional status of family members (37).

Food preparation techniques are indicated by **food manipulation**. Direct control over food manipulation implies self preparation from raw ingredients at home, while indirect control implies purchasing of food in restaurants, ready-to-eat foods or food items requiring minimal preparation. In each instance the food preparation equipment and skills are also important because in some households the equipment is not functioning or unavailable, while others do not have the skills or knowledge required (37).

Terry (1993)(37) defines **food consumption** as the foods eaten, how much, when, with whom, and where. Knowledge of the context in which eating occurs, is necessary before realistic suggestions can be made about dietary change. Foods that a group eats most often are called core foods. They are eaten daily or at least every other day and thus have the greatest nutritional impact on the group, and should thus receive the most attention in assessment and intervention. Secondary foods are those that complement the core foods and are usually eaten at least weekly. Since they are also a consistent source of nutrients, they are also important to the nutritional wellbeing of the group. Foods used least, are often the peripheral foods and consist of those used on special occasions and ceremonies. They have the least nutritional impact but usually have intense emotional and symbolic meaning (37).

Food storage refers to the way in which food is put away for future use and therefore has implications for food safety. This concerns storage temperatures, storage periods, hygiene and sanitation practised, storage equipment used and storage space available (37). **Food disposal** refers to which food is disposed of, how, and why. Health hazards should be looked into, especially spoilage of food (37).

It can be concluded that food behaviour as such plays a very important role in the development of malnutrition in infants and small children. The selection of a feeding practice by the mother / caregiver will clearly have an influence on the outcome of the different nutritional phases that a child goes through in the early years of life, until such time as eating a full family diet. Food selection for the infant via the mother / caregiver is therefore an important factor to consider.

3.2.2 DISEASE

When a child does not eat enough or well enough, his immune system defences are lowered, resulting in greater prevalence, severity and duration of disease. Infections cause loss of appetite, malabsorption and metabolic and behavioural changes. These in turn increase the nutrient requirements of the body. Disease also accelerates nutrient loss. Sick children also do not eat as they should due to appetite loss, again compromising their immune systems (6, 12, 20, 41).
The four most likely infections causing PEM in South Africa, according to Coovadia (1993)(25), are diarrhoeal diseases, respiratory infections, tuberculosis and measles.

An additional cause of poor physical and mental health in children relates to their poor psychosocial development. *The RDP-report (1996:42)(41) states that: "in South Africa, as in other countries which have experienced sustained periods of social disorder, many children have been severely traumatised through exposure to violence and brutality, as witnesses and as victims. Under such circumstances, their normal*

development as human beings is encumbered by post-traumatic stress and other forms of emotional and psychological scarring. Such trauma has a direct impact on young children's health, feeding and appetite and consequently increases their vulnerability to malnutrition and illness."

3.3 THE UNDERLYING CAUSES

Having identified the immediate causes of malnutrition and death, the focus shifts to the multidimensional underlying causes of malnutrition. These causes relate to a failure to meet the basic needs of children and women (41). Three primary clusters of underlying causes may individually or collectively contribute to inadequate dietary intake, infectious disease or poor psychosocial development: inadequate access to food in a household (household food security); insufficient health services and an unhealthful environment; and inadequate care for women and children (20, 41). In general the prevalence of any one of these clusters is likely to contribute to malnutrition or death (41).

3.3.1 HOUSEHOLD FOOD SECURITY

Food security for households and individuals has long been a concern in the international nutrition community (42). Food security was defined in 1989 by an American Institute for Nutrition (AIN) Expert Panel as "access by all people at all times to enough food for an active, healthy life and includes at a minimum:

- the ready availability of nutritionally adequate and safe foods, and
- the assured ability to acquire personally acceptable foods in socially acceptable ways (1, 43, 42, 44).

Food availability implies the types of nutritious food available from the direct environment to the specific community, as well as the amount of food and money available (37, 45). Household characteristics such as income, type and size influence the kind and quantity of food used. When families have a low income, they immediately decrease their consumption of fresh vegetables, as these are expensive items to use. Larger households also tend to supply less food per person than do smaller households, except for those foods prevalent in children's diets such as fresh milk, flour, cereals, and sugars (40).

Food acceptability according to Terry (1993)(37) refers to those items recognised as food and under what conditions. Lots of food items are available from the environment, but groups differ according to which ones are acceptable for human consumption, for example animal blood, seaweed, yeast paste, raw fish are both acceptable and unacceptable to different groups (37, 45). Other foods are associated with specific sex and age groups, for example large portions of red meat are associated with masculinity, and cottage cheese with femininity (37); fathers and older sons having the first right to protein-rich food; no eggs eaten by some unmarried women (38) or by children (46); women and girls receiving less food than men and boys (3, 43); food is primarily prepared for the father / male, women and children eating what is left over (47); children compete with their elders for food and must mostly be satisfied with the leftovers of the staple food and almost never get meat, fruit or other side dishes to eat (46)(also see 3.4.2.2.5 and Table 17).

According to Crockett (1995)(40) experts in food safety rank foodborne disease as the greatest health risk from the food supply. This includes short-term **food safety** (food-borne illnesses), and long-term food safety (contributions to cancer, hypertension or coronary heart disease)(37). Most of the short-term risks can be controlled by proper food handling techniques (food storage and food preparation) by the person who prepares the food (40). Children are more susceptible to contaminants and pathogens in foods resulting mostly in gastroenteritis and PEM as the commonest reason for very young African children being admitted to rural hospitals. Special attention should therefore be given to the handling of their particular foods (17, 40).

According to Terry (1993)(37) the **nutritive quality** of food implies the nutrients generally provided by the total diet of the group. To make realistic suggestions for the improvement of the nutritional status via changed food intake, the nutrient contribution of individual foods / items consumed should also be known.

To summarize, Cohen (1990:24)(45) defines food security as all people obtaining a culturally acceptable, nutritionally adequate diet, through non-emergency (or conventional) food sources at all times. Abundant food may be available, though it may not be affordable to poor families (12, 20, 45). In different areas there may also be a prerequisite for household food security; in rural areas access to land and/or agricultural resources for food production; in urban areas a range of foods available at attainable prices (20). In infants and young children their biological absorptive capacity (which is influenced by disease), the quality of food (its nutrient density, palatability, etc.) and the frequency of access (feeding patterns) is also crucial to their nutritional health (41).

The potential consequences of food insecurity include hunger, malnutrition, and negative effects on health and quality of life, achieved either directly or indirectly by the lack of adequate food (1, 44). The AIN defines hunger as: "a recurrent, involuntary lack of access to food which may produce malnutrition over time" (45). Hunger is also defined as a condition in which people lack the basic food intake to provide them with the energy and nutrients for fully productive, active lives (43), and therefore hunger may also be defined as a lack of "food security" (1). Food insecurity is a process with a general sequence as the problem worsens (44). Household food insecurity (food anxiety) is experienced first, followed by adult (women's) hunger where the quality and quantity of food eaten by adults are decreased (in favour of children), and lastly, child hunger, which is characterized by decreased quantities of food eaten. Child hunger is the last and most fundamentally, severe stage, representing the most problems with household food insecurity (40, 44, 48). Childhood hunger can have a permanent, negative impact on the health, growth, vitality, cognitive development and learning ability of the young child. Therefore hunger eradication is in the world community's interest (40, 43).

3.3.2 HEALTH SERVICES, SAFE WATER AND SANITATION

The number and availability of health-care services in a community determine the maintenance of an individual's health and nutritional status (37). Access to curative and preventive health services (clinics, hospitals and primary health care services) that are affordable and of good quality (human and physical resources) is an essential element of good health; especially for children (20, 43). Without these services

they have a high risk for contracting the most preventable diseases. If the parents have limited access to information, it directly influences the wellbeing of the children, for example lifesaving oral rehydration therapy (ORT) or knowledge on standards of hygiene (41).
In South Africa there exists a substantial inequality regarding this aspect, which can be substantiated by means of black-white and urban-rural divisions by comparing health-care expenditure, the distribution of nurses and doctors, and the availability of hospital beds and access to clinics (38).

As for environmental health, unclean water and the absence of latrines and refuse pits usually make a population prone to infectious diseases (3, 20, 41). Most infectious diseases are water borne. Weaning foods and formula feeds are easily contaminated with unclean water, especially with faecal pathogens, which are responsible for many diseases and deaths among children. Unhygienic food handling, and unhygienic conditions in and around homes (littered with human and animal wastes among others) add to the risk of spreading infectious diseases. Intestinal parasites infect children easily under these conditions, aggravating poor growth and malnutrition (20, 41). Inadequate access to water also affects the productive capacity of poor households, resulting in deaths of livestock, failure of crops, and spending considerable time and energy in fetching and carrying supplies for the household. Poor housing conditions in informal settlements also affect children negatively (41).

Clean drinking water supplies are still not widely available throughout the rural areas in South Africa. The family water supply is mostly untreated and has to be transported for long distances to the family home - a considerable expenditure of time and energy, with effects on the mother's nutritional status and consequently the baby's as well. Sewage disposal is nonexistent and therefore pollution of natural water supplies occurs readily. The result is continuous episodes of water-borne and food-borne infections (cholera, typhoid, dysentery and intestinal parasites) leading to diarrhoea and death in infancy. Improving water quality and increasing its accessibility and quantity may prevent these hazardous effects (6). Corrugated shacks predominate in most urban settlements. These are too hot in summer, too cold in winter, poorly ventilated and mostly damp inside, leading to respiratory problems in children. This situation is usually aggravated by overcrowding (41).

3.3.3 CARING PRACTICES

It is well established that malnutrition may still occur in a situation where adequate food is available in a safe and healthful environment with adequate access to health services. Adequate care for the children is thus the key element in the prevention of malnutrition (20, 41). Care for children is manifested in the ways a child is fed, nurtured, taught and guided. Nutritionally it entails all the measures and behaviours that translate available food and health resources into good child growth and development. UNICEF (1998:28)(20) states that " exclusive breast feeding for about six months, and then continued breast feeding with the addition of safe, high-quality complementary foods into the second year of life, provides the best nourishment and protects children from infection." Only feeding practices (as part of care) will be discussed

3.3.3.1 Breast feeding

Breast feeding is confirmed to be the primary means of nourishing an infant and of preventing infant morbidity and mortality in developing countries. Breast milk is also confirmed to have universal superiority above any other milk for infants → *BREAST IS BEST!* (6, 8, 9, 13, 22, 49, 50). Currently, recommendations for infant feeding include periods of 3-4 months (6, 9, 13, 50, 51), 3-5 months (52) and six months (49) of exclusive breast feeding. Prentice (1991:78)(9) indicates a world wide variation in breast feeding patterns (Table 10).

TABLE 10 : WORLD WIDE VARIATIONS IN BREAST FEEDING PATTERNS (9)

TYPE OF SOCIETY	% BREAST FED	DURATION OF BREAST FEEDING	GROUP WITH HIGHEST INCIDENCE	REASONS FOR PRACTICES
Industrialised countries	Small percentage	A few weeks only	Highly educated mothers, upper socio-economic groups	1. Aware of potential benefits 2. Desire for a "natural" way of life
Traditional societies	Universal breast feeding in early infancy - formula use is rare	Continued into 2nd and 3rd years of life	Poor mothers, living in rural areas in the developing world	1. Breast milk is a valuable economic resource. Only discarded for another pregnancy
Other urban communities of the developing world	Intermediate percentage	Intermediate duration. Consumption of formula alone/combined with breast milk	Educated, middle and high class mothers	1. Move away from traditional practices 2. Desire for a "modern" lifestyle 3. Pressures on the mother to return to work

There seems to be a declining prevalence in breast feeding in industrialised countries, as well as in urban areas of the developing world (Table 10) (22, 52). Different researchers determined that breast feeding is supplemented from early on (even in the first month) with milk and/or water, fruit juice, tea, gruels, cereals, fruits, vegetables (12, 13, 51, 53, 62, 63). This problem is also increasing, being especially associated with over-rapid, unprepared urban migration (22). *A South African study showed that the proportion of infants being breast fed ranged from 73% to 94% for mean periods of 9-16 months, while rural black children had the most consistent breast feeding habits (53).*

The choice for breast feeding an infant is usually made because of its benefits, while the choice to discontinue breast feeding or to start bottle feeding is often due to the disadvantages of breast feeding, breast feeding problems or personal reasons rather than the positive aspects of bottle feeding (54) (see Table 11).

TABLE 11: BREAST FEEDING: BENEFITS, DISADVANTAGES AND REASONS FOR NOT BREAST FEEDING

	BENEFITS
1.	Ideal nutritional composition
2.	High bioavailability and high nutritional quality of breast milk constituents: vitamins, whey protein, fatty acids, cholesterol, iron
3.	Lower mineral and electrolyte content
4.	Contains digestive enzymes which contribute to the immature or compromised (due to malnutrition) digestive system
5.	Contains antimicrobial factors which reinforce the immature immune system: lysozyme, lactoperoxidases, secretory-IgA, lactoferrin,
6.	Reducing morbidity and mortality from infectious diseases - diarrhoea, xerophthalmia, eye disorders
7.	Improved cognitive development in the pre-term infant
8.	Contains hormones and other factors which have growth modulating properties - epidermal growth factor, prostaglandins, insulin, thyroid hormones
9.	Contraceptive effect via high prolactin levels which suppress ovulation, especially in poorly nourished mothers. Thus it is a determinant of child-spacing
10.	Hygienically safe
11	Suckling stimulates uterine contractions
12.	Suckling stimulates milk production
13.	Correct temperature
14.	Prevention of allergy/atopy - delaying introduction of foreign proteins
15.	Counteracts constipation
16.	Counteracts obesity
17.	Economical
18.	The demands consequent on lactation tend to mobilize fat stores laid down during pregnancy - improved figure
19.	Convenient for the mother
20.	Breast feeding leads to interaction between the mother and child which is important for emotional development - enhances bonding
21.	Reduced risk of breast and ovarian cancer
22.	Prevents subsequent development of coronary heart disease and hypertension
23.	Breast fed babies tend to be lighter, shorter, with smaller fat-folds than bottle fed babies
	DISADVANTAGES
1.	Large volumes of low energy-dense breast milk leads to appetite suppression - child does not demand enough food to meet his requirements
2.	Drugs taken by the mother may reach her infant through the milk she produces
3.	Breast milk is low in some nutrients - thiamin, iron, vitamin B_{12}, D, K
4.	Contains antigens which can sensitize infants
	NEGATIVE PERCEPTIONS
1.	Maternal or infant illness
2.	Impossible to achieve if the mother has to go back to work
3.	Embarrassment for mother
4.	Breast milk can be tainted by emotional states, heavy exercise, exposure to the sun - express and discard
5.	General community opinion

NEGATIVE PERCEPTIONS	
6.	Colostrum should not be given to the baby
7.	Perceived breast milk insufficiency
8.	Fears that breast feeding will permanently alter breast size or shape
9.	The mother prefers not to continue breast feeding too long -low frequency and duration
10.	Next pregnancy
11.	The baby rejects the breast
12.	Nipple / breast problems
13.	Doctor's orders

(Adapted from 1, 6, 8, 9, 22, 49, 50, 52, 54, 55, 56, 57, 58, 59, 60, 61)

3.3.3.2 Bottle feeding

Bottle feeding is generally used in situations where the infant cannot be breast fed, for early supplementation of breast feeding or where misconceptions are formed and breast feeding is discontinued (49). Traditionally babies were always given human milk, although the status of the mother influenced the situation: a rich woman could afford to pay a wet nurse to feed her baby. It then became a status symbol not to feed your own baby. This pattern has now been established in developing countries where breast milk substitutes have undermined breast feeding (instead of the wet nurse) (50). Furthermore, urbanization has favoured the nuclear rather than the extended family, resulting in young mothers having limited support and encouragement from their mothers and families. The tradition of breast feeding is therefore disappearing. In urban areas the physical and financial environments are less favourable, pressuring mothers to go back to work. Those who are less well off could now afford the status symbol of not feeding their children themselves (50, 54, 58).

There are a wide variety of breast milk substitutes available to mothers/caregivers, which provide the infant's nutritional requirements if given in recommended strengths and quantities. These products meet the infant's nutritional needs during the first six months of life (1, 6). However, bottle feeding can be hazardous for the child's health if not administered properly (Table 12) (6, 49, 50, 52, 54, 57).

TABLE 12: RISKS OF BOTTLE FEEDING WHICH CAN LEAD TO DISADVANTAGES FOR CHILDREN'S HEALTH

RISKS OF BOTTLE FEEDING	
1.	Formula diluted improperly
2.	Use of contaminated water supplies
3.	Inadequate sterilization techniques
4.	Inadequate or lacking refrigeration
5.	Lack of sanitation
6.	Expense leading to fewer feeds given / improper dilution
7.	Feeds contaminated with different pathogens if kept for later use
8.	Lack of adequate knowledge of the mothers concerning its use
9.	Casual and haphazardous 'topping up' of bottles throughout the day
10	Obsessive fanaticism whereby the infant is required to take exact and carefully measured feeds at strictly controlled intervals
DISADVANTAGES OF BOTTLE FEEDING TO THE CHILD'S HEALTH	
1.	Decreased intelligence
2.	Poorer cognitive development
3.	Increased weight gain
4.	Increased incidence of atopic diseases and reduced visual acuity due to nutritional/compositional differences
5.	Increased incidence of gastrointestinal illness, otitis media, respiratory and urinary tract infections, diabetes, and necrotizing enterocolitis due to the absence of the immunological components which occur in breast milk
6.	Increased morbidity and mortality
7.	Over dilution → undernutrition and under dilution → hypernatremia or obesity
8.	Oral thrush

(Adapted from 6, 49, 50, 52, 54, 57)

3.3.3.3 Complementary feeding

Complementary feeding usually comprises a combination of breast feeding, bottle feeding and solid or semi-solid foods (62). The introduction of complementary foods is a critical stage. Poor practices may lead to PEM, especially in deprived communities (63). If done too early, it may increase the risk of malnutrition and/or illness or illness due to unhygienic food preparation or storage. With introduction too late, breast milk will not meet all the nutritional needs (20, 41). In deprived environments predominant breast feeding protects the infant's health and allows time for the maturation of his own immune system. After the neonatal period the greatest threats to survival and development come during the weaning process (63). Nutrition problems occur when breast feeding declines with the onset of weaning or when breast feeding is totally stopped, or if the mother returns to the workplace or if the weaning period lasts too long and the child's main nutrient intake consists of an inadequate volume of breast milk without adequate weaning (solid) foods (see Figure 7) (8, 9).

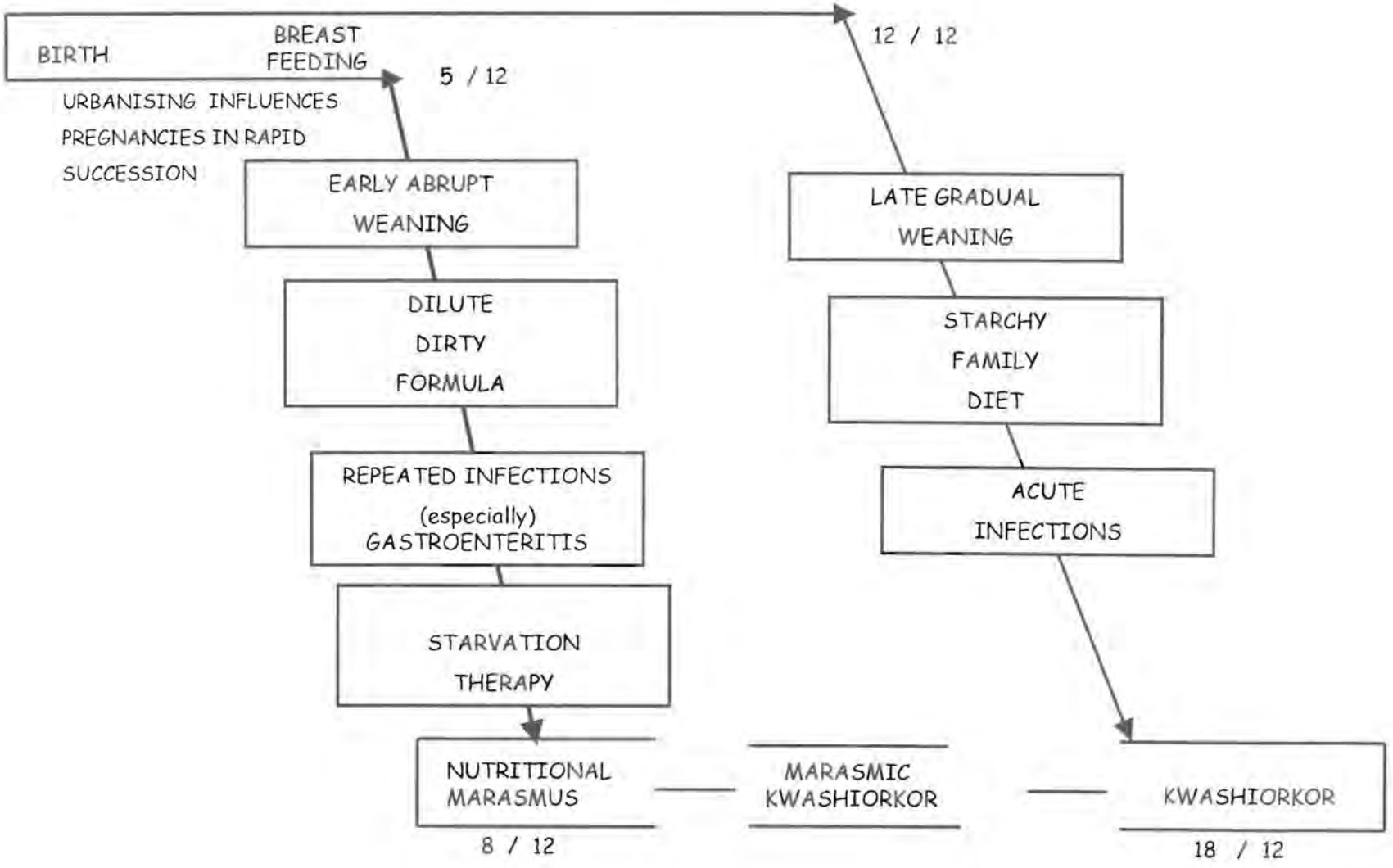


FIGURE 7: PATHS LEADING FROM EARLY WEANING TO NUTRITIONAL MARASMUS AND FROM PROTRACTED BREAST FEEDING TO KWASHIORKOR(4)

Weaning The word "wean" is derived from the Anglo-Saxon *"wenian"* meaning "to accustom (as a child) to take food otherwise than by nursing (10). The WHO defines the weaning process as the "progressive transfer of the infant from breast milk as the sole source of nourishment to the usual family diet (12). During this transition period:

- the exposure to environmental pathogens is most intense,
- the likelihood of inadequate nutrient intake most probable,
- the emotional trauma of less intimate maternal-infant contact most stressful (12, 63).

If all of these factors are present, the infant may not be able to adapt physiologically and emotionally, leading to high morbidity and mortality (63).

The weanling's dilemma Rowland et al in Walker (1990:31)(13) describe the term "weanling's dilemma" as the difficult choice to be made in the interest of the health of the weanling in the Third World. Human milk does not provide enough energy to meet the requirements of the infant of about 4-6 months of age. Therefore there is risk of malnutrition, unless weaning foods are introduced, but this puts the infant at a high risk of infection, including diarrhoea.

Increased infant morbidity is related to poverty, maternal illiteracy, poor hygiene, contaminated food and poor practices (12, 13, 63). Repeated morbid episodes affect the growth of the child. The child has an increased need for food during such episodes in order to counteract the decreased efficiency in absorption and the increased metabolism related to disease. A sick child unfortunately has no appetite for food, breast milk or solid food alike. With frequent or prolonged episodes no catching-up on food intake is achieved and consequently growth is affected (63). Underweight (low weight-for-age), wasting (low weight-for-height) and stunting (low height-for-age) are most prevalent in this period.

The prevalence of malnutrition, as illustrated in Table 13, shows an increase between the age of six months and two years of age. By two to three years of age the nutritional status usually stabilizes. The percentage of wasting drops off sharply, but children are often unable to compensate for the early poor feeding and continue to be underweight and stunted (8, 12).

TABLE 13: MALNUTRITION PREVALENCE BY SINGLE YEAR OF AGE (12)

Average Prevalence %			
Year of age	**Underweight**	**Stunting**	**Wasting**
0-0.99 years	14.7	18.0	4.8
1-1.99 years	30.4	35.3	9.4
2-2.99 years	26.6	33.5	5.1
3-3.99 years	24.1	34.5	3.4
4-4.99 years	23.2	35.3	3.6
Number of countries	39	39	39

Problems experienced during the weaning process, which may add to the weanling's dilemma, may be broadly categorized as those concerning poor diets and poor feeding practices (12).

Poor diets Energy and protein inadequacy and deficiencies of iron, zinc, vitamin D and A are the most common nutrient deficiencies during infancy (10, 12, 64). The vitamin, mineral and trace element requirements throughout the lifespan are shown in Table 14.

TABLE 14: AVERAGE DAILY VITAMIN, MINERAL AND TRACE ELEMENT REQUIREMENTS (ALL AGE GROUPS) (6)

VITAMINS			MINERALS	TRACE ELEMENTS	
Vitamin A	Vitamin C	Vitamin D	Calcium	Iron	Fluoride
300-750μg (1200-1500 IU)	30mg	400IU	500mg	5-10mg	0,25mg

The daily nutrient requirements for protein and energy are reflected in Table 15, illustrating the relatively greater food requirements of the young child and infant.

TABLE 15: PROTEIN AND ENERGY REQUIREMENTS (WHO, 1985)(6)

AGE	ENERGY	PROTEIN
	kJ/kg/day	g/kg/day
0-1 year	418	1.85
1-3 years	418	1.2
4-6 years	365	1.0
7-9 years	326	1.0
Adult man	192	0.6
Adult woman	167	0.5

Too little variety, leading to too few micronutrients, is a common characteristic of weaning diets. Vitamin A, Vitamin C, iodine, iron and zinc deficiencies over an extended period may lead to blindness, stunted growth, mental and physical handicaps, reduced immunity to infections, anaemia, apathy, anorexia, poor absorption, decreased total food intake and death (12, 65, 64). A varied diet and fortified foods (salt with iodine; margarine with vitamin A; cereals with iron and B vitamins, milk with vitamin A and D) may prevent deficiencies. In developing countries weaning diets lack the variety and availability of fortified foods. These children have to rely on breast milk alone for vitamin A, on vegetable sources for low bioavailable iron and on small quantities of animal products for vitamin A and B_{12}, iron and zinc (12).

Children in developing countries have low kilojoule (kJ) intakes, due to low energy density of the complementary foods rather than smaller volumes consumed (12, 13, 64). Traditional weaning foods in developing countries are starchy staple porridges. They are diluted with large quantities of water to serve as a weaning porridge with an appropriate consistency. However, the energy and nutrient concentrations

are greatly reduced. Children cannot consume sufficient quantities to satisfy their needs because of their small stomach capacities (12, 13).

Both the quantity and quality of protein affect their digestibility and ability to support growth. Animal protein (from milk, meat, eggs) has a high protein quality, while cereal proteins (maize, rice, bread) in general lack in the essential amino acid, lysine, with maize (corn) being deficient in tryptophan as well. Some of the vegetable protein is more difficult to digest (beans, 82%; leafy vegetables, 86%; maize, 89%; wheat, 90%; and rice, 93%) and can therefore not be utilized by the body. A mixture of cereal with animal protein or high vegetable protein (beans, peas, lentils, peanuts) will ensure an improvement in the quality of the protein (6, 10, 12). Protein intake will usually be adequate if energy intake is sufficient. With a high intake of starchy tubers, additional sources of protein should however be added to the diet. The solution is to promote breast feeding, since it is a high quality, easily digestible animal protein, which can provide at least one-third of the protein needs of older infants (12).

Poor feeding practices Various behaviours, traditional beliefs about food and feeding practices affect childhood nutrition, especially during the weaning phase. The effect of these practices is worse when the child is sick (12). First, improper timing of weaning may affect childhood nutrition. The consequences of inappropriate weaning are listed in Table 16.

TABLE 16: CONSEQUENCES OF WEANING ONSET

ONSET	CONSEQUENCES
Too early	Increased diarrhoeal and allergic disease: due to intestinal immaturity; limited breast milk anti-infective factors Decreased breast milk production: due to displaced weaning foods Malnutrition: due to decreased milk production Diarrhoeal disease: due to contamination or unhygienic conditions
Ideal	Appropriately timed: starting at 4-6 months Nutritionally adequate: emphasizing kilojoules, protein, iron, zinc, vitamin A, vitamin D Hygienically prepared: cool, covered, clean, cooked Culturally appropriate: available, acceptable to the population
Too late	Growth failure: breast milk alone becomes energy-wise inadequate Depressed immunity: due to inadequate energy and protein intake Increased diarrhoeal disease: due to depressed immunity Malnutrition: due to inadequate kilojoules, diarrhoeal disease Micronutrient deficiencies: due to inadequate dietary intake; increased needs with infection Difficulty in accepting and chewing food: due to not learning to eat in the period of development; unaccustomed to food Lack of interest in / acceptance of food: due to monotony of taste and texture; no varied diet given

(Adapted from 8, 10, 12, 63, 66, 67)

Too early weaning may cause diarrhoea and food allergies due to an immature digestive tract or unhygienic conditions. Infant malnutrition may result from a decrease in maternal milk production as the baby is withdrawn from the breast, or from limited quantities of weaning foods eaten. Weaning too late can decrease growth and immune protection and increase diarrhoeal disease, malnutrition and a lack of interest

in food.

Secondly, sub-optimal breast feeding practices may contribute to weaning problems. The absence of exclusive breast feeding may affect the infant's health and nutritional status. Delayed introduction of breast feeding may also have negative effects. This practice may be due to hospital policies of separating mothers and infants, or from the cultural belief that colostrum is bad for the baby. The result is a loss of the nutritive and protective benefits of colostrum to the baby (12, 49). A limited period (short duration) breast feeding may lead to a loss of nutrients for the baby which in turn will affect his/her growth and health. (9, 12).

Thirdly, infrequent feedings during the weaning phase may influence the nutritional outcome of the child. In order to meet their energy requirements, infants should have frequent meals because of a small stomach capacity and the low energy-density of weaning foods. In many developing countries traditional weaning foods are neither kilojoule-dense nor given three times per day (12, 13, 66).

Fourthly, inappropriate feeding methods and child care practices may also affect nutritional outcome. More physical interaction, affirmation, verbal stimulation together with high quality foods given will result in a positive outcome. Mothers/caregivers with more self-confidence will practice what they believe is right for the child instead of non-persistence when a child refuses food. The active (separate feeding times, encouragement, praise) rather than passive (child expected to help himself, no new foods) role of the mother/caregiver is therefore very important in successful child feeding practices (10, 12). Guldan et al (1993:174)(66) state that poor child care practices among mothers are more indicative of ignorance than any other reason, including economic hardship. Parents and child caregivers have a crucial role in the emotional, psychological and social development of children. Children need emotional support and cognitive and verbal stimulation for optimal development. Breast feeding is the first means to provide such support and stimulation to the child (20, 41).

3.3.3.4 Essential health care

Another important aspect of caring is ensuring that children receive essential health care at the right time. Early treatment can prevent serious diseases which are far cheaper than therapeutic treatment in a hospital. Children should receive their immunizations according to a specific schedule. Detrimental practices, such as inappropriate feeding methods/practices and unhygienic ways of food handling, as well as poor sanitation may lead to parasite infestation and need to be addressed. Sound health information need to be available to the family and they should be supported to seek appropriate and timely health care for each member of the family. A positive nutritional impact may be achieved by means of timely immunizations, primary health care such as deworming and mineral and vitamin supplementation and health education (12, 20).

3.3.3.5 Education and information

An important cause of poverty, disease and malnutrition that link in closely with maternal and child care, is the lack of education and information. This forms a part of the underlying causes. Limited education greatly reduces life chances, irrespective of gender or culture. But low educational levels among women correlate strongly with the incidence of malnutrition among children. Illiterate women do not have the

means to secure a job or to improve their productive skills and therefore cannot generate resources to improve their family's nutrition. They also have limited knowledge on the nutritional and hygienic needs of a healthy family (41). Poverty rates are usually directly proportional to the years of education attained by the parents. If a household is headed by a female who has not completed high school, the amount of money spent on food per person per month is less than where the female has completed school. The education attained therefore not only affects the income and wage potential of the parents, but also the attention and response given to educational materials and information exchanged in a family (40). According to Naidoo et al (1993)(38) traditional eating patterns / wisdom with food choices become less valid when the rural black cultures come into contact with Western cultures with urbanisation. Their chances of eating incorrectly now become very high especially when coupled with low levels of literacy and a low income.

In South Africa the 1980 census revealed that 30% of blacks older than 20 had not achieved an educational level as high as standard four and were thus "functionally illiterate". Research in the Cape Peninsula has shown that the level of education clearly influenced the knowledge people had about healthy eating habits (38). In South Africa the total literacy rate (persons older than 15 who can read and write) was 77% for males and 75% for females in 1980 and has improved to 82% for both males and females in 1995 (28).

To conclude, poverty and social problems including those concerned with nutrition, exist even in families where the average living standard of the community is high. Although a nutritionally adequate diet can be inexpensive, it is necessary to know how to compose it. Poverty is however often combined with a low level of education which always has a concurrent effect (51). Illiteracy additionally influences the level of unemployment negatively; the demand for unskilled labour decreases all the time (38).

3.4 BASIC CAUSES

Although it is true that a lack of resources (poverty) and malnutrition often go hand in hand, the broader explanation lies within a fuller understanding of the different types of resources necessary for good nutrition, and of the factors that affect families' ability to access and control these resources. The three components of nutrition (food, health, care) interact closely in their influence on family life. Efforts to fulfill one component undermine the achievement of another as the same resources are often required for all the components (20).

3.4.1 CONTROL AND MANAGEMENT OF HUMAN, ECONOMIC AND ORGANIZATIONAL RESOURCES

At the basis of the causal chain are economic and political factors that set the parameters within which a society could develop. The dominant political ideology and economic system, together with the prevailing technical and social conditions of production, influence the way in which natural resources are exploited (41).

The ecological environment, among which natural resources like water, soil fertility and seasonal changes

play a large role in the determination of nutritional status. These factors determine the productive capacity of the society and have an indirect influence on the food availability and food consumption (3, 14, 39, 41). Geography, climate, topography, soil and water are all determinants of the agricultural potential of a certain area and therefore influences the food environment and food behaviour of individuals in that area (6, 39, 41). The way in which these resources are utilised, the technology and skills applied, will influence productive output and the sustainability of the natural resource base (41).

3.4.2 POTENTIAL RESOURCES: ENVIRONMENT, TECHNOLOGY, PEOPLE

Prevailing ideologies, which emanate from religion, tradition and culture, serve to legitimise societal practices in both positive and negative ways (41). Through the family the child receives nutrition and protection from the external physical environment, and through the family the wider issues of the community and society will determine the life experiences of the child; culture will mould his/her habits, and the beliefs and values of the community will become part of the child's makeup (6).

3.4.2.1 Physical environment

In some living environments, especially inner city neighbourhoods and rural areas, individuals / children have limited access to food and to both health and nutrition services. The few grocery stores located in these areas stock only selected food items and their food prices are extremely high, which automatically restrict the type and amount of food that can be bought (37, 38, 40, 68). Ever increasing food prices influence especially the low-income consumers in these areas (38). People with a low income spend proportionally more of their income on food. Food expenditure is the most pliable part of the household budget, and meals are easily skipped or stretched when little money is available, thus influencing the food security of the household (40, 68). A lack of storage and cooking facilities will also limit the chances of a family to have a healthy and varied diet (68).

3.4.2.2 Culture

Terry (1993)(37) describes culture as the learned behaviour patterns of a group that may also affect the nutrition problems in the group. Cultural variables like what, where, when and why people eat is linked to the emotional, social, and mythical meanings of food. All aspects of cultural practices (beliefs, customs, techniques and attitudes) interact, therefore a deep and profound knowledge of a culture is needed to understand their practices (69). People demonstrate / communicate deep-rooted sentiments through food, and once a certain food has achieved symbolic status, its nutritional value is lost from mind or becomes secondary (39). Culture is made up from five systems (37).

3.4.2.2.1 *The economic system*

This consists of the production, distribution and consumption of goods and services and it therefore determines the group's access to food and to health and nutrition services (37). As urbanisation follows industrialisation, a move from a food-growing situation to a food-buying situation inevitably

occurs. For the small child this implies in most situations no breast feeding, as the mother often has to work to assist in the support of the family (69). Keane & Willetts (1994)(68) state that when money is tight in a family situation, skipping meals becomes a common coping strategy where the parents would frequently go without food (becoming food insecure) to ensure that their children are fed. Women will more likely than men go without food for the sake of their families.

In South Africa poverty results due to low wages and a lack of social payments. The migrant labour system furthermore leads to the breakdown of the family unit, resulting in a decrease in subsistence farming with rural people also becoming dependent on bought foods (23, 25, 38).

3.4.2.2.2 ***The political system***

This refers to the way in which a group governs themselves. Decisions of local and state governments in the form of laws and regulations have an influence on the nutritional problems of any community (37).

Vorster & Labadarios (1993)(23) emphasize the fact that political factors probably played a unique role in the variations of under nutrition among different South Africa population groups by affecting employment, low agricultural productivity, uneven distribution of income, poor sanitation, substandard education, illiteracy, cultural deprivation and socioeconomic inequalities (23, 25).

3.4.2.2.3 ***The social system***

The way people organise themselves into groups and the interactions between these groups encourage certain dietary, health-care and other lifestyle patterns among group members. The social groups and institutions that are important to a community include family, religious and ethnic groups, as well as educational institutions. Their nutritional status is influenced in a formal way by means of education or informally by means of shared food, nutrition knowledge, attitudes and behaviour (37).

In South Africa people are increasingly moving from rural to urban areas in order to find work. This leads to a lack of social support systems for mothers with babies with a subsequent lower quality of care for the baby. A dysfunctional mother-child interaction develops as well as failure to bond properly. This have serious developmental implications for children, affecting language, cognition, social development and adjustment. Undernourished babies therefore have poor recovery and outcome with less opportunity for compensatory experiences (23, 25, 70).

3.4.2.2.4 ***The technological system***

This refers to the application of science to the development of foods, tools and other goods. It can cause rapid changes in food supply, nutrition, health-care and in a group's lifestyle (37). According to Abrahamsson (1977:103)(51) food habits and feeding principles are bound to culture and traditions and therefore learnt from a very early age in developing countries. In industrialised countries, traditions are lacking and therefore have a negative effect on food choice. Food habits

are being based not on experiences, but rather on marketing of new food items. With westernisation this is becoming a more serious problem to consider in rural communities.
In South Africa this was demonstrated clearly by the irresponsible advertising of inappropriate, expensive foodstuffs like infant formulae feeds during the 1950's. Black consumers buying these items are:

- *living under poor circumstances with an inadequate supply of clean water for sterile bottle feeding,*
- *illiterate, thus not able to follow written instructions on tins,*
- *poor, thus unable to afford proper dilution of feeds, resulting in under nutrition and gastro-enteritis (38).*

3.4.2.2.5 ***The belief system***

This system refers to the beliefs held by a group about their world. Especially important are the nutrition, food and health related beliefs in a community, since they influence nutritional status (38).

Values determine what is desirable and undesirable as food and which foods are held in high esteem. Values are not the result of the individuals' own input, but are rather social products imposed on and slowly internalized by the individual. In the African culture for instance, insects are choice foods while they are totally rejected by western cultures. A feeling of security (household food security) is associated with a lack of anxiety over whether food will be forthcoming. Certain foods, like milk, are also associated with a feeling of security (39).

Beliefs about food represent an interpretation of the food values and serve as cognitive elements of attitude. Motivations related to health are common, although they are not always practised. Most women believe that breast feeding is best for the baby, but not all practice breast feeding (39). With respect to food habits certain beliefs and taboos restrict the intake of nutritious foods. One example is the belief in some communities that the head of the family, usually the male, should have the best portion of the meal. Children, instead, are often given very small amounts of meat or fish for fear that giving them more will encourage them to steal (3, 38).
In South Africa there is a widespread belief that blacks only want to eat maize meal as it is part of their culture, and this will not change. Research however indicated that change is taking place - especially over the past 300 years, and that black people have willingly accepted new cultural elements like Coca-Cola and bottle feeding, whereas they actually ate balanced and varied diets before colonisation (38).

Customs are the standards or norms of behaviour that one acquires as a member of a social group. Individuals respond to this by selecting among the available foods those that are acceptable. Food patterns (classification of foods as meals or snacks and suitable foods for each) are passed on through the training of children. Food consumption is therefore a product of a group's food lore and its present environment (39, 51). Customs may prevent families from

adopting balanced and nutritious dietary habits, early introduction and quality of supplementary food for infants, or accepting modern methods of food preparation, processing and preservation (3). *In South Africa food customs often affect women more than men. Certain foodstuffs are tabooed in pregnancy and afterwards for both women and children (38). For example the prohibition of colostrum for the newborn or the restriction of the mother's diet in the puerperium (69).*

Symbolism refers to the nonrational expressions that are accepted parts of food and eating. Every food has a particular meaning and these meanings are part of the cultural heritage. This symbolism is often of primary importance and food may be refused because of its unacceptability to the eater. For example meat is masculine (39), or snails and meat are forbidden in certain societies (3).
Naidoo et al (1993)(38) conclude that the listed food customs and/or cultural taboos (Table 17) have been observed in South Africa and that they may have an effect on nutrition.

TABLE 17: FOOD CUSTOMS AND/OR CULTURAL TABOOS IN SOUTH AFRICA THAT MAY HAVE AN EFFECT ON NUTRITION (38)

	FOOD CUSTOMS / CULTURAL TABOOS IN SOUTH AFRICA
1.	*A taboo on the eating of eggs by unmarried black women*
2.	*A taboo on breast feeding when black mothers are ill or pregnant*
3.	*Often the child who has just been weaned has to compete for his / her share of food within the family as the father and older sons have the first right to protein-rich food because of their age and status*
4.	*The custom to throw the colostrum away and to offer sugar water to the newborn infant*
5.	*A misconception that breast milk is too thin because of its blueish colour*
6.	*The belief that if an infant is sick or a previous sibling has died the mother's milk is "poisoned"*
7.	*The belief that a mother's milk will become sour or the baby will not gain weight when she has intercourse with her husband*
8.	*No eggs, meat and milk in the first 10 days after birth*
9.	*The abstention by Zulu women from sour milk, fresh milk and meat for a variable period of time after childbirth and menstruation*

3.4.2.3 Social systems

Biographic and demographic patterns among which age, sex, race, ethnic and religious affiliation, education, employment, income and household composition also influence nutritional status indirectly (37, 40). This type of information describes the individuals belonging to a specific group and is usually an indication of the nutrition problems and practices that are likely to be found in a group (37).

Racial and ethnic differences account for differences in nutrient intake by children. Crockett & Simms (1995)(40) indicate that black children showed the highest nutritional risk since they have lower vitamin A intakes and higher total fat, saturated fat, cholesterol and sodium intakes than children from other racial / ethnic groups studied in America. In South Africa, however, numerous studies have shown that the diets

of black pre-school children were high in carbohydrate-rich foods and low in fats (5, 7).

The biologic environment has to do with aspects of an individual's life that he has no or very little control over, like his nutrient requirements according to his own special needs. Some life cycle stages, for example infants at weaning age, have a higher nutritional risk than others (39). The individual's health status may also pose some risk. For young African children, gastroenteritis with PEM is the most common cause of hospitalisation (17). Food choice is influenced by certain genetic limitations and an individual's taste physiology (17, 39).

Socialization is a learning period influenced by family characteristics as soon as the child begins to consume adult foods from their culture (39, 40). Family characteristics in turn affect the quality and quantity of food available in the home, the way it is prepared and distributed as well as the time spent by the mother feeding her children (39). Children also learn the rules about what to eat and how to eat it, a sense of portion control, table manners, and timing of eating. This social interaction at meal and snack times is essential for teaching the rituals of eating, sharing food, cultural meanings of food and food intake, as well as for transferring family knowledge on their religious and ethnic heritage (40).

Nutrition knowledge is a tool only if individuals are ready to make changes. Food preferences and attitudes seem to be stronger predictors of food consumption than nutrition knowledge (39). Two to five year old children are cognitively ready to learn about nutritious food choices. At this age children are usually eager to learn and participate in food preparation tasks that will aid in the learning about nutrition and in refining the fine motor skills. It is also important to introduce new foods at this time as learning to enjoy a large variety of nutritious foods at this age will help in the formation of a sound foundation for a lifetime of healthy eating (40, 51).

Attitudes about food have to do with feelings and emotion and they are predispositions to beliefs. In many instances attitude is the most important factor in food acceptance (39). Children prefer foods presented to them with a positive attitude and attention from their parents; like when the parents join in the meal, establish a positive and enjoyable eating atmosphere and model positive attitudes and behaviours towards food intake. These children usually have improved dietary quality and would eat health-promoting foods when they are offered (40). Such influences should be demonstrated from a very early age, as children will show persistence in eating behaviours from as early as two years of age (40). Food intake is also guided by the prevailing attitude toward body image and physical appearance — in western cultures model-like thinness is desired while other traditional societies regard robustness as a sign of prosperity (39).

PART 2

EMPIRICAL INVESTIGATION

CHAPTER 4

RESEARCH METHODOLOGY

PART 2 EMPIRICAL INVESTIGATION

CHAPTER 4 RESEARCH METHODOLOGY

"How can our intellectual life and institutions be arranged so as to expose our beliefs, conjectures, policies, positions, sources of ideas, traditions, and the like — whether or not they are justifiable — to maximum criticism, in order to counteract and eliminate as much intellectual error as possible?" (Bartley in Dane, 1990:3)(71).

4.1 RESEARCH PROBLEM

4.1.1 AIM OF RESEARCH

The aim of this research study can be put as an investigation into the breast feeding and weaning practices of mothers/caregivers in the Moretele district / Hammanskraal area, as well as an investigation into the nutritional status and nutritional practices of the children from birth and during and after weaning up to the age of three years (refer to section 4.3.2 for the definition of concepts).

This exploratory investigation can primarily be described as prospective and descriptive in the quantitative and qualitative research domains. Exploratory studies attempt to determine whether or not a phenomenon exists; in this case, malnutrition. Descriptive studies attempt to examine a phenomenon to more fully define it, or differentiate it from others; in this case, feeding practices (71). The results of the investigation could be used to substantiate recommendations aimed at the improvement of the feeding practices and the nutritional status of the children if malnutrition would have been identified.

4.1.2 RESEARCH OBJECTIVES

4.1.2.1 What is the nutrition knowledge regarding infant feeding of the mothers / caregivers of (children 0-36 months old) in the Moretele district ?

4.1.2.2 What are the attitudes towards nutrition of the mothers / caregivers of (children 0-36 months old) in the Moretele district?

4.1.2.3 What is the nutritional status of (children 0-36 months old) in the Moretele district with reference to :

4.1.2.3.1 the weight for height ?

4.1.2.3.2 the weight for age ?

4.1.2.3.3 the height for age ?

4.1.2.4 What are the feeding practices of children (0-36 months old) in the Moretele district ?

4.1.2.4.1 What are the breast feeding practices of mothers in the Moretele district?

4.1.2.4.2 What are the formula feeding practices of mothers / caregivers in the Moretele district ?

4.1.2.4.3 What are the weaning practices of mothers / caregivers in the Moretele district ?

4.1.2.4.4 How nutritionally adequate is the diet of children (0-36 months old) in the Moretele district?

4.1.2.4.5 What are the mothers / caregivers perceptions of hunger and food security with reference to the household, themselves and their children?

The research objective number 4.1.2.3 was addressed within the quantitative research perspective, and numbers 4.1.2.1, 4.1.2.2, 4.1.2.4. were addressed within the qualitative research perspective. (See Chapters 5 and 6 for discussion of the research perspectives.)

4.2. RESEARCH PERSPECTIVE

The two most important general classifications of research are those of quantitative and qualitative studies (72). The two types of research differ in various aspects, but are complementary in others (73). One of the biggest differences is the nature of the data itself. For quantitative research observation methods are designed to produce data in the form of numbers, appropriate for statistical (quantitative) analysis. For qualitative research methods are designed to produce data in the form of words, sentences and paragraphs which can not easily be reduced to numbers (74, 73). The second difference lies in the orientation of qualitative research. It makes assumptions about social life, objectives for research, and ways to deal with data that conflict with the quantitative approach. Quantitative standards cannot be used to judge qualitative research. Qualitative reports are rich in description, have colourful detail and unusual characters instead of the formal, neutral tone with statistics found in quantitative reports (73). To explain these methodologies the differences in the key aspects are compared in Table 18.

TABLE 18: DIFFERENCES BETWEEN QUANTITATIVE AND QUALITATIVE RESEARCH (73)

QUANTITATIVE	QUALITATIVE
- Test hypothesis that the researcher begins with	- Capture and discover meaning once the researcher becomes immersed in the data
- Concepts are in the form of distinct variables	- Concepts are in the form of themes, motifs, generalizations, taxonomies
- Measures are systematically created before data collection and are standardized	- Measures are created in an ad hoc manner and are often specific to the individual setting or researcher
- Data are in the form of numbers from precise measurement	- Data are in the form of words from documents, observations, transcripts
- Theory is largely causal and is deductive	- Theory can be causal or non-causal and is often inductive
- Procedures are standard, and replication is assumed	- Research procedures are particular, and replication is very rare
- Analysis proceeds by using statistics, tables, or charts and discussing how what they show relates to hypothesis	- Analysis proceeds by extracting themes or generalizations from evidence and organizing data to present a coherent, consistent picture

Decisions on the type of research domain to use is not always clear-cut. According to Denzin & Lincoln (1994:343)(75) "a fundamental tenet of the proposed vision of clinical research is that *the question and*

clinical context are primary; methods must adjust to the clinical setting and the clinical questions". Researchers should be free to mix and match methods as driven by particular clinically based questions. Terry (1993:17) (37) confirms this view by stating that community assessment requires both quantitative and qualitative information.

Denzin & Lincoln (1994)(75) clarify the choice of method as follows: when research questions are formulated about one's body, life or power, survey methods should be used that start with questions such as "how many", "how much", "how often", or numerically measurable associations among phenomena. Experimental methods should be used with questions such as "if _, then_" or "is _ more effective than _". Qualitative methods should be used with questions concerning experience, meaning, patterns, relationships and values, since these questions referred to knowledge as story. Denzin & Lincoln (1994:343) (75) further state that "in attempting to evaluate the physical /behavioural, conceptual/historical, social/emotional, and spiritual features relevant to a particular clinical question, multiple paradigms and methods are necessary". According to Neuman (1997:336)(73) the logic of qualitative research does not forbid the use of numbers, statistics, and precise quantitative measurement; such quantitative data can be a source of information, which supplements or complements qualitative data. Sometimes a single method design is appropriate, being either qualitative or quantitative, but some other times a research design requires both qualitative and quantitative approaches. There are at least four different formats in which qualitative and quantitative methods are integrated within a multi method approach (Table 19).

TABLE 19 : DIFFERENT FORMATS OF A MULTI METHOD APPROACH (75)

TYPE	DESCRIPTION	EXAMPLE
Concurrent design	Two independent studies are conducted concurrently on the same study population and the results are then converged	Enhancing clinical trial results with simultaneously conducted interpretive studies to help explain why an intervention does/does not work
Nested design	The two methods are directly integrated into one research study. Quantitative studies incorporating qualitative methods to help identify and operationalize key variables	Simultaneously collecting and analysing data on a concept to measure key independent variables within the context of a prospective epidemiological study design
Sequential design	The results of one study is used to inform another	Using field methods for identifying and describing key variables before developing measurement instruments for hypothesis testing
Combination design	Combining some of the above design options	Using a sequential design of field methods to identify patterns followed by survey techniques to confirm the findings

The type of study population will also determine the appropriate research style within each of the above-mentioned broad research domains.

This research study was a cross-cultural study where the research population belonged to a different culture than the researcher, thus certain problems were expected, including:

- illiteracy (in a section) of the target population,
- lack of standardized measuring instruments for a group with this particular cultural background,

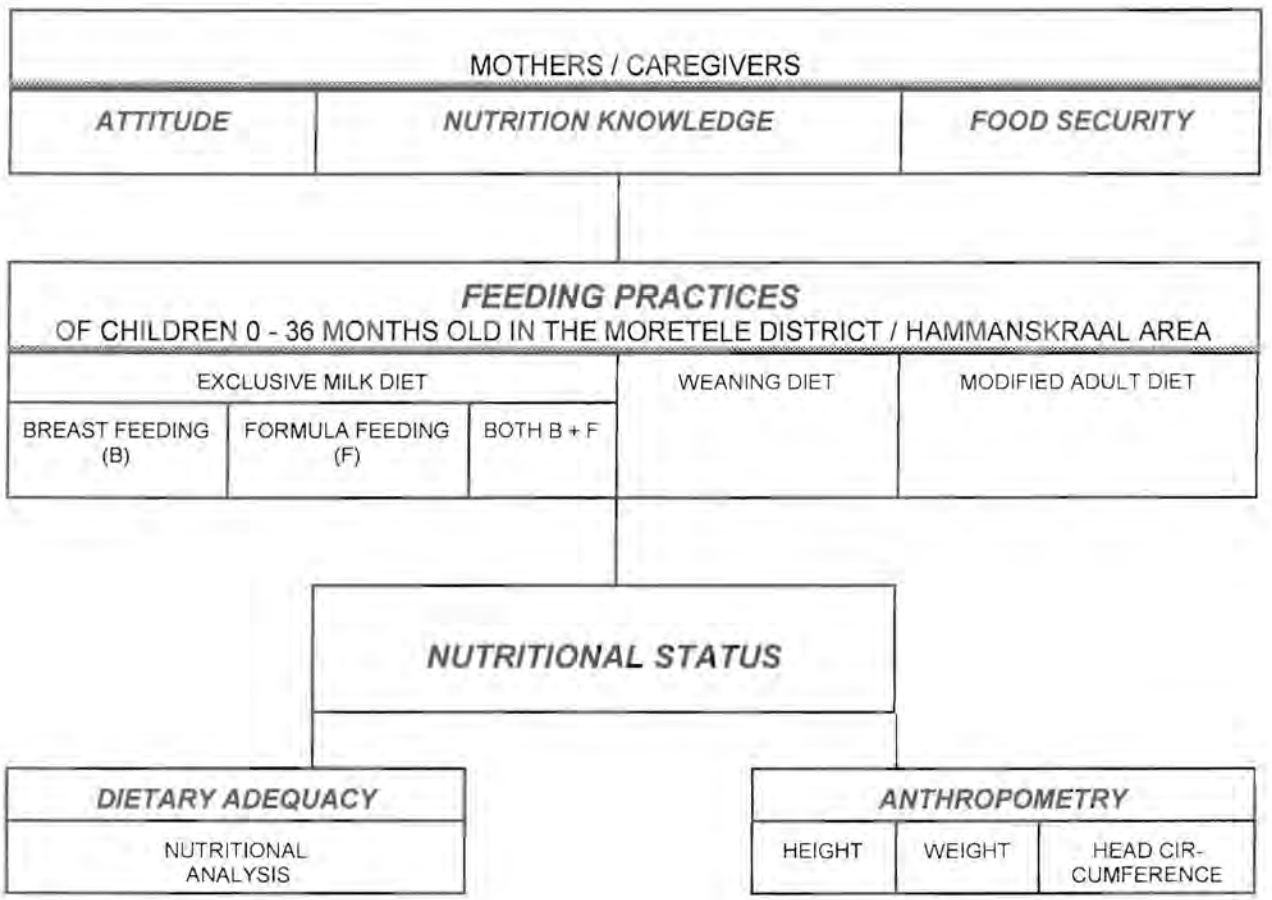
- language problems; the researcher conversing in a second language and the mother/caregivers conversing in a second or third language,
- acceptance of the researcher due to belonging to a different culture and background, therefore influencing honesty and completeness of data gathered (76).

According to Schoeman (1988:2) (77) to identify with the research mothers/caregivers from a different culture is not a prerequisite to obtain scientific knowledge. It is rather the methodology that is important. A research strategy that involves observation or dialogue of some kind, which will reduce the differences between the researcher and the mothers/caregivers is thus recommended. Biesheuvel (1987:24)(78) also favours a multi method strategy for cross-cultural research including methods such as group discussions, interviews with small groups, participant observation, interaction between informants and interviewers and feedback discussions / debriefing.

To achieve the aims of the research as stipulated previously, the combination design (see Table 19) was chosen on the premise of appropriateness. Within this design an exploratory and descriptive survey in both the quantitative and qualitative research domains was implemented. Quantitative or numerical information included data from existing documentation / clinic reports as well as information gathered by means of an empirical survey. However, little information about the physical environment, culture, nutritional practices and food environment of the community would be gathered in this way (see model in Figure 5, Chapter 3). Quantitative or numerical data were therefore complemented with qualitative or descriptive information, gathered by means of techniques such as observation and interviewing (37).

4.3 RESEARCH DESIGN

4.3.1 CONCEPTUAL FRAMEWORK



4.3.2 DEFINITION OF CONCEPTS

- Attitudes: an attitude is a relative stable and lasting learned inclination to appear or react to certain persons, objects, institutions or matters in a certain manner (79). In this investigation it implied the attitudes of mothers / caregivers about the different feeding practices or feeding techniques that were being used, or not used, as well as the attitude towards the types of food given.

- Nutrition knowledge: this implied the knowledge of the mothers / caregivers about infant feeding (14, 38, 41).

- Feeding practices: this included the types of food, amounts and frequency of food-intake and the technique of administering (14, 20, 41) used for:

- exclusive milk diet, which suggests the exclusive intake of milk as the only food source (14)
- breast feeding, which suggests the exclusive intake of breast milk as the only food source (6, 9, 13, 14, 20, 50, 51)
- formula feeding, which suggests the exclusive intake of formula milk as the only food source (1, 6, 14)
- both breast and formula feeding which suggest a combination of breast milk and formula milk as the only food source (14, 53)
- weaning diet, which suggests the intake of a form of solid food in combination with either breast milk or formula milk (12, 14, 62)
- modified adult diet, which suggests that the child would eat a variety of solid foods from all the food groups in the family diet. Milk alone would no longer be the main source of nutrients (12, 14).

☞ Nutritional status: a measurement of the extent to which the physiological needs for nutrients of the individual is met. In this investigation only the anthropometric measurements for height, weight and head circumference, as well as dietary intake, were used in order to evaluate the nutritional status of the children (1, 29).

☞ Dietary adequacy: the nutrient analysis of the 24h-recall was compared to dietary standards to evaluate the dietary adequacy (29).

☞ Anthropometry: the measurement of the physical dimensions and gross composition of the body. Height, weight and head circumference of the children were measured (1, 6, 29).

4.4 OPERASIONALIZATION

4.4.1 BIOGRAPHIC INFORMATION

A questionnaire (see Addendum A), specifically designed to gather information regarding each child individually, was used. Information regarding demographics, environmental factors and health factors was gathered in this way. This information was used to describe the community in terms of frequency distributions.

4.4.2 ATTITUDES AND NUTRITION KNOWLEDGE

Focus group interviews were used to explore these concepts. A trained interviewer conducted each focus group interview based on a structured, tested, interview schedule. (See Addendum B.) The content of each interview was analysed and interpreted by means of content analysis and presented by means of frequency distributions and ethnography.

4.4.3 FEEDING PRACTICES

Data on breast feeding and / or formula feeding, as well as the weaning practices, were gathered in focus group interviews by means of the mentioned interview schedule. (See Addendum B.) Content analysis was used to analyse the data which were presented by means of frequency distributions and ethnography

4.4.4 FOOD SECURITY

A hunger scale was implemented to evaluate the perceptions of the mothers / caregivers of household food insecurity. The Hunger scale developed by Radimer (1990)(48) from the Radimer/Cornell Measures of Hunger and Food Insecurity was used. (See Addendum A.) Radimer (48) indicates that there is no scale score equal to hunger. Any consistent score above a "never" response was considered as indicative of hunger. The results were presented by means of frequency distributions.

4.4.5 NUTRITIONAL STATUS

4.4.5.1 Dietary adequacy

Dietary related data were gathered by means of a 24-hour recall method of habitual food intake. (See Addendum A.) The data were evaluated by means of a nutrient analysis computer programme (Foodfinder) (129) based on the South African food tables. The data were compared to the WHO recommendations, as well as the RDA(1989) to evaluate the nutritional adequacy of the individual intake. The results were presented by means of frequency distributions.

4.4.5.2 Anthropometry

The height, weight and head circumference values were classified according to the percentiles of the NCHS, as well as the Reference data for the weight and height of children (WHO)(1, 29, 35).

4.5 MEASURING INSTRUMENTS

Due to the exploratory and descriptive nature of the research design, various measuring instruments were used for the data collection. In the quantitative research strategy individual interviews with structured questionnaires and anthropometry were applied. (See Addendum A.) In the qualitative research strategy

focus group interviews were executed. (See Addendum B.) The selection, development, methodology, reliability and validity of the measuring instruments are discussed in Chapters 5 and 6.

4.6 POPULATION AND SAMPLING

The population consisted of mothers / caregivers with children between the ages naught to 36 months old living in the Moretele district / Hammanskraal area situated approximately 90 km from Pretoria (180 km return journey). Two non-urban areas approximately 30 kilometres outside the Hammanskraal-proper town area were identified as suitable for the purpose of this study. These areas were known as Mathibestad and Makapanstad in the Moretele district. The Mathibestad area clinic was approximately 30 kilometres outside the Hammanskraal-proper town area and the Makapanstad area clinic was situated approximately ten kilometres further away (deeper rural).

Convenience sampling was used as sampling technique. The sample was taken from mothers / caregivers and their children that visited the baby / child or immunisation clinic on a Tuesday morning. Six groups of mother/caregivers were included in the sample according to age based on the classification of Hendricks and Badruddin (1992:125) (10). According to this classification there are three overlapping periods in the nutrition of the infant, namely:

- exclusively breast fed (0-12 months)
- weaning period (3 and/or 4-24 months)
- period of modified adult diet (24-36 months).

Six phases where diet changes occur can be identified, namely :

0 - 3 months	: exclusive breast feeding (0-3 months)
3 - 6 months	: breast feeding and grains (4-6 months)
6 - 9 months	: breast feeding, grains, soft fruits and vegetables (7-9 months)
9-12 months	: breast feeding, grains, soft fruits and vegetables and meat (10-12 months)
12-24 months	: breast feeding (supplement) and regular solid food (13-24 months)
24-36 months	: no breast feeding, only solid food (25-36 months) (10).

Mothers / caregivers were allocated to a particular group according to the age of the child. Four focus group interviews (two per clinic) with approximately 6 mothers/caregivers per group were conducted for each age group (i.e. 24 focus groups); resulting in a total sample of 144 children. Due to a number of mothers / caregivers not pitching up for the scheduled focus group interviews, the sample size increased to 174 children and 26 focus groups. A letter of informed consent (in English and Tswana) was signed by each mother / caregiver who agreed to participate. (See Addendum A.)

4.7 COLLECTION OF DATA

The protocol was approved by the Ethics and Protocol Committee of the Faculty of Medicine, University of Pretoria (UP).

To overcome the cultural, literacy and language problems, it was decided to make use of two field workers/interviewers of the same ethnic group. One field worker / interviewer was included in the study for each clinic. The field workers were living close to the health clinics involved in the study, and were therefore able to recruit new children on a continual basis for inclusion in the research study (74). An interviewer was exclusively used per clinic, with no contact whatsoever between the interviewers. The techniques for the data collection were taught by the researcher beforehand. The researcher monitored the process on regular intervals (i.e. visiting the clinics alternatively during each research session).

Data collection started in September 1995. This was preceded by a pilot study (see Addendum C) and a training session for the field workers. (See Addenda D and E.) It was decided to start with the individual interviews only, and to leave the focus group interviews until a number of children had been identified. This entailed completion of the biographic questionnaire, doing the anthropometric measurements, and the 24h-recall, as well as completing the hunger scale for each child individually. (See Chapter 5 for the selection and development of measuring instruments.) Each mother/caregiver was booked back for the focus group interview on his / her next scheduled visit to the clinic. The field workers conducted interviews from approximately 08:00 until 12:00 or 13:00 on every Tuesday for the duration of the study.

The focus group interviews were started a few weeks later once enough mothers/caregivers had been recruited and the field workers had been trained. (See Addendum E.) The first focus group took place on 7 November 1995 at Mathibestad. Problems concerning the starting time, arrival of the recruited mothers/caregivers, recruiting new mothers/caregivers to make up the correct group numbers, and difficult environmental circumstances hampered the group sessions. It became clear that to have participatory mothers / caregivers the interviews as well as the focus groups had to take place as early as possible in the morning. The last focus group interview was done on the 26th of March 1996.

All the focus group interviews were preplanned for specific dates (usually the return date specified by the clinic). Mothers / caregivers were asked to come back on that day and time. A food parcel as an incentive was handed out once the individual interview and focus group interview had been completed. If mothers/caregivers did not arrive on the appropriate date or time, substitutes had to be found. Their interviews were done either before the group or just after the group interview. The researcher travelled between clinics to deliver equipment, check on the number of people in the focus groups, to control all the growth chart information of the children and to generally oversee the research process. (See Chapter 6 for the development of the interview guide.)

4.8 DATA ANALYSIS

4.8.1 QUANTITATIVE RESEARCH DOMAIN

Descriptive statistics were done and the data were presented as frequencies, means, standard deviations and percentages. Results were presented on a comparative basis between the age groups in the two clinics. Inferential statistics (Student's t-test, Chi-square and the Mann-Whitney u-test) were done. (Refer to Chapter 5.)

4.8.2 QUALITATIVE RESEARCH DOMAIN

Content analysis and ethnography were used to analyse the qualitative data. Content analysis typically produces numerical descriptions of the data, or rather the systematic coding of data, while ethnography provides descriptive data (80). Content analysis was used for the objective, systematic and quantitative description of the manifest content of the interviews. Tables were used to summarise the basic information that were relevant to the research study (80, 81). Ethnography was used to make the summaries from the group discussions or to give a description of what happened in the focus group discussion, complemented with direct quotations to verify the data (80). Results were presented on a comparative basis between the age groups in the two clinics. (Refer to Chapter 6.)

4.9 ASSUMPTIONS

The following assumptions were made regarding the research:

- the mothers/caregivers gave their full cooperation to complete all the individual questionnaires and measuring instruments honestly,
- the mothers/caregivers participated openly and honestly in the focus groups,
- the mothers/caregivers understood what was expected of them concerning each of the measuring instruments,
- the mothers/caregivers did not in any way try to please the researcher with the answers that they provided,
- the mother's / caregiver's recall of the baby's/child's food intake was not hampered by memory loss and the recall provided was representative of habitual food intake,
- the interviewers followed the instructions for the interview process correctly in both the individual and group interviews,
- the interviewers followed the correct procedures for the anthropometric measuring of the children,
- the interviewers did not influence the mothers/caregivers in any way,
- the interpretation by the interviewers of the responses provided by the mothers/caregivers in the focus group interviews was as exact as possible, and they gave a true reflection of the discussion in the transcription.

CHAPTER 5

QUANTITATIVE RESEARCH STRATEGY

CHAPTER 5 QUANTITATIVE RESEARCH STRATEGY

"The known is finite, the unknown infinite; intellectually we stand upon an islet in the midst of an illimitable ocean of inexplicability. Our business . . . is to reclaim a little more land" (T.H.Huxley in Dane, 1990:61)(71).

5.1 INTRODUCTION

Babbie (1992:G6)(74) defines quantitative analysis as "the numerical representation and manipulation of observations for the purpose of describing and explaining the phenomena that those observations reflect". According to Greenbaum (1988:6) (72) quantitative research consists of research conducted for the purpose of obtaining empirical evaluations of attitudes, behaviour or performance. This is mostly done to provide data with information developed from a relatively small group that is representative of a larger universe. Subsequently results can be projected to the universe from which the sample is drawn.

For this research study, quantitative research methods / techniques were required for the description and / or evaluation of:

- the biographical profile of selected families in the community,
- the nutritional status of the children in terms of:
  - anthropometry, and
  - dietary adequacy,
- the food security of selected families in the community.

The chosen measuring instruments and appropriate evaluation techniques will subsequently be discussed.

5.2 MEASURING INSTRUMENTS: SELECTION, DEVELOPMENT AND METHODOLOGY

5.2.1 BIOGRAPHICAL PROFILE

5.2.1.1 Biographic indicators

Socio - demographic information were gathered by means of a structured, pretested questionnaire. The questionnaire was compiled from the relevant literature in order to identify certain aspects pertaining to the research group; specifically those aspects that might influence the nutritional status of the members of a community. Questions pertaining to demographic information, environmental and health factors were included. (See Addendum A.)

5.2.1.2 Methodology as implemented for this research study

The structured questionnaire (Addendum A) was used during an individual interview with the mother /

caregiver of each child in the study group. The data attained from the questionnaire were coded, processed and analysed by means of descriptive statistics.

5.2.2 NUTRITIONAL STATUS

When different nutritional assessment methods are combined, a nutritional profile can be compiled of either an individual or a population (18). Nutritional assessment methods can be classified in five categories, namely anthropometric, biochemical, clinical, dietary and functional methods (1, 18, 29). For the purpose of this research study only two of these methods were incorporated into the quantitative methodology, namely anthropometric and dietary methods (see Table 20).

TABLE 20 : NUTRITIONAL ASSESSMENT METHODS

	CATEGORY	MEASURES CHOSEN	JUSTIFICATION
1.	***ANTHROPOMETRIC METHODS*** Measurement of the physical dimensions and gross body composition	- height - weight - head circumference	These 3 measures are the most sensitive indicators for infants and children
2.	***DIETARY METHODS*** Assessment of nutrient intakes including quantity, food supply, practices, preparation and storage	- 24-hour dietary recall - analysis of dietary intakes via a nutrient analysis software programme	This method is relatively easy to implement and affordable while it produces high quality data. Nutritional analysis via a computer programme is easily achieved

(Adapted from 1 and 29)

5.2.2.1 Anthropometry

Lee & Nieman (1993:122)(29) define anthropometry as "the measurement of body size, weight and proportions". These are sensitive indicators of health development and growth in infants and children (1, 6, 29).

5.2.2.1.1 Anthropometric indicators and applicable methodology

Weight One of the most important parameters used in nutritional assessment is body weight, since it can be used effectively to predict energy intake/expenditure and body composition. Infants should be weighed undressed and children should be weighed with minimal clothing, using an accurate calibrated scale, eg electronic or pan-type balance-beam scale. Any cushion or diaper should be in place before the zero adjustments are made and the child should be placed in the centre of the weighing surface. Body weight should be measured to the nearest 10g for infants and 100g for children (6, 29).

Height or length The measurement of length or height is important for use in parameters such as height-for-weight, weight divided by height, creatinine-height-index and estimations of the basal

energy expenditure (29). Length (also known as recumbent length) is generally used for children less than 24 months of age or for children between 24 and 36 months who cannot stand without assistance (1, 18, 29). Normally after the age of three years, height (also known as stature) is measured in a standing position. The NCHS reference data for persons birth to 36 months are based on recumbent length, while those for 2 to 18 years are based on stature (6, 1, 29). The measurement of length for infants require a special length-measuring device where the child lies on his/her back on a backboard, with the head against a stationary headboard while the moveable footboard is adjusted to press firmly against the foot soles. The zero end is at the edge of the headboard and allow the length to be read from the footboard. The length is recorded to the nearest 0.1cm (1, 29).

Head circumference Measurements of the circumference of the head is important to detect abnormalities of the head and of brain growth. This is especially important as brain growth peaks during the first year of life, but is completed after 36 months. Therefore head circumference should be measured routinely on infants and young children up to the age of 36 months (6, 29). An insertion tape proves the best positioning and fixation for measuring the cranium - just above the eyebrows, the ears and around the back of the head. Objects such as pins or ribbons should be removed from the hair. The tape should be pulled snug to compress the hair and the measurement is read to the nearest 0.1cm (1, 29).

The ideal with any anthropometric measurement on infants and young children is to follow the technique decided on uniformly each time the infant/child is measured and to record regular measurements in order to assess trends rather than evaluating only individual measurements (6,29).

5.2.2.1.2 Standards for assessment of anthropometric measurements

Standards for assessing these parameters are presented in the form of centile charts or growth charts that express the range of normal values for age from birth to 18 years for males and females. The values on which these growth charts are based are the NCHS centiles which are most widely used (1, 6, 18, 29). Although these values are based on those of normal North American children, it is generally accepted that these values represent international references standards, and therefore growth charts used in South Africa reflect the NCHS centiles (6).

Kibel & Wagstaff (1995)(6) describe these growth charts as having a bell-shaped normal distribution curve that is represented graphically over a spectrum of ages. Two standard deviations above the mean include all but 5% of the "normal" values and are represented by the 95th and 5th centiles. Any value falling outside either limit is likely to be abnormal (6). A centile is a sequence of values under which that percentage of a normal population falls. Seven percentile curves are presented on the growth chart : 5, 10, 25, 50, 75, 90, 95 (29).

Charts have been developed for both males and females for two age intervals: birth to 36 months, and two to 18 years. For the charts for birth to 36 months percentiles are provided for body weight for age, length for age , body weight for length and head circumference for age (recumbent length is used). The charts for two to 18 years provide centile curves for body weight for age, and stature for age (stature is used)(29).

5.2.2.1.3 Evaluation of anthropometric data

Weight-for-age This measurement reflects the immediate nutritional status of the infant / small child but is a poor indicator of general growth in the older child. One weight value indicates whether a child's weight falls within the normal range. The 5th percentile is used as a cut-off point below which under nutrition is diagnosed. Of all the indicators of nutritional status, weight is considered to be the most sensitive and therefore reflects acute and chronic changes. A low weight-for-age indicates altered body composition for example low serum albumin and increased total body water(6). The weights of infants weighed monthly are valuable indicators of growth in this period of rapid growth, whereas the older child gains weight at a slower rate and also less regularly. In the older child, weight gain may wrongly be ascribed to physical growth where in actual fact it may really only indicate an increase in body fat (6).

Height-for-age Deviations in height become obvious more slowly than that of weight. Reduced values indicate a chronic or longstanding problem such as malnutrition, other chronic diseases as well as chronic growth faltering, also known as stunting (1, 6). Failure to thrive can also be identified with height-for-age values < 5th percentile (1). Contrary to weight, height is a valuable growth indicator in the older child. There is a slow, linear increase in height during childhood with a growth spurt occurring in late childhood and adolescence (6).

Weight-for-height This measurement can be used when age is unknown or uncertain. This indicator evaluates the proportions of the body and it may confirm thinness or fatness. Normal weight-for-height values indicate either normal or stunted growth, with the latter indicating chronic growth failure. A low weight-for-height indicates wasting. The weight-to-height ratio may be an useful indicator of acute malnutrition in the older child (6).

Head circumference A measurement below the fifth centile (microcephaly) often reflects a cerebral insult that occurred prenatally or in infancy. It may also be due to general growth failure especially if the other parameters are also below the lowest centile. The opposite is a large head circumference above the 95th centile (macrocephaly). This is usually not due to growth abnormalities, but rather the abnormal accumulation of cerebrospinal fluid. Only rarely does macrocephaly occur as a result of macrosomia or excessive physical growth of the whole body (6).

5.2.2.1.4 Methodology as implemented for this research study

For each respondent a range of weight, length and head circumference data were obtained during the individual interview and recorded on the structured data record sheet. (See Addendum A.) The birth-measurements were collected either from the mother or from the growth chart. The previous information (after birth) as recorded on previous visits to the clinic was obtained from the growth chart. For each visit the date and age of the child were also recorded.

Weight was determined with an electronic Massakot scale. The mother stood on the scale, after which it was zeroed. The undressed baby was handed to her and the weight recorded. A table model measuring device, with a stationary headboard and a moveable footboard that are perpendicular to the backboard, was used to determine **recumbent length** of the children while lying down. The **head circumference** was measured with a flexible, non-stretchable measuring tape.

The data processing was done by the researcher. For each respondent a history of anthropometry was compiled. The birth information served as the starting point of the history and the current measurements (at the time of the research) served as the end point of the history. For each measurement the age of the child was computed in weeks of age, and the relevant percentile was read from the charts and recorded per age.

5.2.2.2 Dietary assessment

Lee & Nieman (1993:50) (29) define assessment of dietary status as the "consideration of the types and amounts of foods consumed as well as intake of the nutrients and other components contained in foods. When food consumption data are combined with information on the composition of food, estimates may be made of the intake of particular nutrients and other food components".

5.2.2.2.1 Diet measuring techniques

Various methods exist for the collection of food intake data, although no method can be singled out as being the best (29, 82). Each of the existing methods have strengths and weaknesses which should be considered when choosing a method to use (14, 29). The purpose or aim of the research should be well defined and will consequently determine the most appropriate techniques (82). Although dietary intake data for individuals are often criticized for accuracy, such accuracy is often not essential to draw valid conclusions on the universal relationship of diet and health. Broad rankings can also be achieved in terms of intake (29). There are mainly three purposes for determining individual dietary intakes:

- to compare average nutrient intakes of different groups,
- to rank individuals within a group, and

- to assess an individual's usual intake

Lee & Nieman (1993:51)(29) categorise data collection methods for individuals as follows:

- **quantitative daily consumption methods:** measuring the nature and quantity of individual foods consumed in a defined period of time, and
- **semi-quantitative food frequency methods:** measuring the patterns of food use and implied nutrient intake across longer and often less precisely defined periods.

Five techniques are available to determine individual food intakes. They are the:

- 24-hour recall,
- food record or diary,
- food frequency questionnaire,
- diet history, and
- duplicate food collections.

For the purpose of this research study the 24-hour recall (i.e. a quantitative daily consumption method) was chosen as the most appropriate instrument for measuring the quantity of individual foods consumed in a defined period of time (see Table 21).

TABLE 21 : DESCRIPTION OF THE 24-HOUR RECALL METHOD

TECHNIQUE AND DESCRIPTION	STRENGTHS	WEAKNESSES	APPLICABILITY
24-hour Recall recall in detail all the food and drink intake during a period of time in the past ; assist with memory of items consumed and estimating portion sizes	♦ Requires less than 20 minutes to administer ♦ Relatively inexpensive ♦ Can provide detailed information on food ♦ Only short-term memory required ♦ Low respondent burden ♦ Probability sampling possible ♦ Can be used to estimate nutrient intakes of groups ♦ More objective than dietary history ♦ Does not alter usual diet ♦ Give qualitative rather than quantitative data ♦ Validity increases when used with another technique ♦ Can be used with illiterate respondents ♦ Usually no problems with cooperation of subjects	♦ Seldom representative of usual intake ♦ Under / over-reporting sometimes occurs ♦ Information can be withheld or altered ♦ Omissions of sauces, dressings and beverages can lead to low estimates of energy intake ♦ Inappropriate for those with irregular eating habits when determining usual food intake	♦ Best choice due to time constraints ♦ Involve the respondent for the shortest possible time ♦ Small budget required ♦ Personal contact ensures high quality information ♦ For children <8yr data are best obtained from the person preparing meals (the mother / caregiver) ♦ Easy to implement in a community where the literacy level is unknown ♦ Could use the previous day's recall or a recall of usual intake ♦ Useful to compare intakes from the different age groups involved ♦ Good validity to determine average group intakes

(Adapted from 14, 18, 29, 82, 83)

5.2.2.2.2 Evaluation of food intake data

Gathered information is usually evaluated by comparing it to some standard. Various methods exist to evaluate the nutritional adequacy of the food intake of individuals or groups.

Food group method This method is used to make a less exact evaluation of the adequacy of the diet. It is the quickest and most elementary method, but also most inaccurate. The amount of servings consumed from each of the food groups for the intake period is determined and compared to the recommended amount of servings (83). This method is impractical when no standard portion sizes are available, eg for babies. This method becomes restrictive when too many mixed items or unfamiliar cultural foods that do not fit into a food group, are eaten (14, 18, 83).

Nutrient analysis This method is used when more detailed and accurate calculations of nutrients are desired. Either food composition tables or computer software with nutrient data bases are used. The nutrient calculations are compared to the RDA values or WHO dietary standards for the reference person of the same gender and age category (14, 18, 83). Nutrient requirements vary considerably among individuals, therefore the RDA's include a safety margin and are set high to meet the needs of nearly all healthy people. This implicates that the RDA'S are probably higher than the nutrient needs of the average individual (except energy). In order to prevent overestimation of inadequate nutrient intakes, researchers often use a fixed cutoff point, such as two-thirds (67%) or three-fourths (75%) of the RDA in determining inadequate nutrient intake for specific nutrients (14, 29, 83). The FAO-WHO Recommended Intakes of Nutrients is probably a better choice of standard to use as it is intended for use in developing countries like South Africa. The recommended levels of nutrients tend to be lower than the RDA's (84).

5.2.2.2.3 Methodology as implemented for this research study

During each individual interview with the child's mother / caregiver a 24-hour recall of usual food intake was done for the child. A structured format was used for this purpose. (See Addendum A.) Preparation methods and household portion sizes were noted as completely as possible. Visual aids were used to aid in the process of recall to ensure the accuracy of the data. (See Addendum F.)

The coding of the data was done by the researcher to ensure consistency (29). The household portion sizes were converted to weights with the aid of the MRC Food Quantities Manual (1991)(85). Standard conversions and food codes were used throughout. (See Addendum G.) The recorded food intake was analyzed by means of a software program (Foodfinder)(129). The WHO dietary standards as well as the RDA's were used to evaluate dietary intakes.

5.2.2.3 Food security

Food insecurity usually leads to hunger and malnutrition (see Chapter 3). Childhood hunger has the most

detrimental effects on the health profile of the young child. In 1989 the AIN identified hunger and food security as being the most important indicators of an individual's nutritional status (42). In South Africa there is a need for the measurement of these phenomena in order to be able to address the problem sufficiently in future nutrition intervention programmes.

5.2.2.3.1 Evaluation of hunger

For the purpose of this study the Radimer/Cornell Measures of Hunger and Food Insecurity were used. According to Kendall et al (1995:2794)(42) Radimer identified two dimensions from her research on hunger. The narrow dimension of hunger refers to an insufficient intake of food and going without food, resulting in a physical sensation of hunger pangs, i.e. on the individual level. The broader dimension of hunger involves problems with household food supply, quality of diets, feelings about the situation and what has been done to maintain household food supplies; thus food insecurity (42, 48).

5.2.2.3.2 Development of the Hunger Scale

Conceptually the two dimensions of hunger each consists of four major components, concerning quantitative and qualitative aspects of the food available / consumed, and the psychological and social components experienced by households or individuals:

☞ **household hunger**

- food depletion (running out of one's usual food supply)
- food unsuitability (not being able to buy the quality and kinds of foods considered appropriate)
- food anxiety (uncertainty about whether one's food supply would last)
- food acquisition (whether household food is acquired in socially acceptable ways, such as with income or food stamps but not with charity)

☞ **individual hunger**

- intake insufficiency (a problem of intake quantity)
- diet inadequacy (a problem of intake quality)
- disrupted eating patterns (not eating the socially prescribed three meals a day)
- feeling deprived (without choice about eating this way)(see Table 22) (48).

TABLE 22 : DIMENSIONS AND COMPONENTS OF A CONCEPTUAL DEFINITION OF HUNGER (48)

COMPONENT	DIMENSION	
	HOUSEHOLD	INDIVIDUAL
Quantity	Food depletion	Insufficient intake
Quality	Unsuitable food	Inadequate diet
Psychological	Food anxiety	Feeling deprived, lack of choice
Social	Unacceptable means of food acquisition	Disrupted eating pattern

Radimer (1990:1546)(48) designed survey items to measure both household and individual hunger. These items had been taken directly from the words of women interviewed in an in-depth qualitative study, and therefore were considered to have face validity. The content and construct validity were also assessed. After factor analysis and assessment of internal consistency of the items within measures, food insecurity measures were developed that included four items directed at the household, four directed at adults and four directed at children. The reliability of the scale was assessed with a coefficient alpha and the correlation of the item with the scale. The former should be at least 0.90 for applied research and the latter should be at least 0.50. The items selected for each scale are listed in Table 23. The reliability was 0.91 for the household hunger scale, 0.92 for the women's hunger scale, and 0.89 for the children's hunger scale. All item-to-scale correlations were >0.5 (1990:1546)(48).

TABLE 23 : ITEMS TAKEN UP IN RADIMER'S HUNGER SCALES (60)

HUNGER SCALES	
HOUSEHOLD HUNGER	
1.	Do you worry whether your food will run out before you get money to buy more?
2.	The food that I bought just didn't last, and I didn't have money to get more.
3.	I ran out of the foods that I needed to put together a meal and I didn't have money to get more food.
4.	I worry about where the next day's food is going to come from.
WOMEN'S HUNGER	
1.	I can't afford to eat the way I should.
2.	Can you afford to eat properly?
3.	How often are you hungry, but you don't eat because you can't afford enough food?
4.	Do you eat less than you think you should because you don't have enough money for food?
CHILDREN'S HUNGER	
1.	I cannot give my child(ren) a balanced meal because I can't afford that.
2.	I cannot afford to feed my child(ren) the way I think I should.
3.	My child(ren) is/are not eating enough because I just can't afford enough food.
4.	I know my child(ren) is/are hungry sometimes, but I just can't afford more food.

Radimer (1990:1547)(48) suggested the following modifications to improve the scales for future implementation:

- use three response categories "never, sometimes, often" for questions and " not true, sometimes true, often true" for statements, rather than the five used in their research,
- respondents indicated that statements were easier to understand than questions. Thus transforming items phrased as questions into statements may improve them,
- the issue of food quality at household level was not addressed directly. A statement such as " I can't afford to buy the foods that I think I should to feed my household", based on

one of the coping tactics, would be a worthwhile addition to the household scale,

- the "negative loading" of some items caused a problem of double negatives, for example replying "never" to "How often would you say you don't eat balanced meals". Using items in a statement format and a response choice of "not true" rather than "never" would minimize this problem,
- frequency distributions of scale scores are probably the easiest and most useful forms of data. Also monitor each component separately. There is no objective guideline for determining what scale score to equate with hunger. Radimer (1990:1548)(48) recommends to use any scale score above the minimum value (i.e. any score above a consistent "never" or "not true" response) as indicative of hunger (48). These changes were made to the hungerscale (see Table 24).

TABLE 24 : RADIMER'S MODIFIED HUNGER SCALE

		NOT TRUE	SOMETIMES TRUE	OFTEN TRUE
A.	**HOUSEHOLD HUNGER**			
1.	I am worried about the family's food running out before I get money to buy more.			
2.	The food that I bought just didn't last, and I didn't have money to get more.			
3.	I ran out of foods that I needed to put together a meal and I didn't have money to get more food.			
4.	I worry about where the next day's food is going to come from.			
5.	I can't afford to buy the foods that I think I should to feed my household.			
B.	**WOMEN'S HUNGER**			
1.	I can't afford to eat the way I should.			
2.	I can afford it to eat properly.			
3.	I am hungry very often, but I don't eat because I can't afford enough food.			
4.	I eat less than I think I should, because I don't have enough money for food.			
C.	**CHILDREN'S HUNGER**			
1.	I cannot give my child(ren) a balanced meal because I can't afford that.			
2.	I cannot afford to feed my child(ren) the way I think I should.			
3.	My child(ren) is/are not eating enough because I just can't afford enough food.			
4.	I know my child(ren) is/are hungry sometimes, but I just can't afford more food.			

(Compiled from 42, 48)

5.2.2.3.3 Methodology as implemented for this research study

The adapted scale was pre-tested in a pilot study in the Hammanskraal community at the Temba clinic. Some problems relating to this specific cultural group were experienced in the pilot study and the following adaptions were made(according to Radimer's suggestions):

- Statements were poorly understood in English or even in the translated form in the respondent's mother language. The statements were thus all changed back into question format.
- The response "often" was not well understood, and could not be explained well enough. This was changed to "most times" thus indicating that this situation happens three or more times a week.

The final draft of the hunger scale as implemented in this research study can be found in Addendum A. The hunger scale questionnaire (Addendum A) was used to evaluate the food security of the respondents. Three response categories were used, namely never (indicating that this situation never happens, not even once), sometimes (indicating that this situation happens 1-2 times a week) and most times (indicating that this situation happens 3 or more times a week).

5.2.3 PILOT STUDY

A pilot study was done during May 1995. Two postgraduate students in Dietetics did the pilot study after having been trained on the quantitative data collection techniques. (See Addendum C.) The two field workers that were to be used for the actual research study worked with the two students for the benefit of their own training and to act as translators for the students. The researcher also used the two field workers to establish if the general level of difficulty as well as the comprehensibility of the questions in the measuring instrument were suitable to use for the group. During July and August(1995) the questionnaires and information attained during the pilot study were analysed and incorporated in the questionnaires to be used in the final study.

5.3 VALIDITY AND RELIABILITY OF MEASURING INSTRUMENTS

Reliability and validity are central issues in all scientific measurements. Perfect reliability and validity are the ideals to strive for, but virtually impossible to achieve. Reliability deals with the dependability and consistency of an indicator while validity is concerned with the actual meaning of an indicator (73)(see Table 25).

TABLE 25: SUMMARY OF MEASUREMENT RELIABILITY AND VALIDITY TYPES (73)

RELIABILITY It is a dependable measure	**VALIDITY** It is a true measure
Stability reliability (over time)	Face validity : in the judgement of others
Representative reliability (across subgroups)	Content validity : captures the entire meaning
Equivalence reliability (across indicators)	Criterion validity : agrees with an external source ✦ Concurrent validity : agrees with a pre-existing measure ✦ Predictive validity : agrees with future behaviour
	Construct validity : multiple indicators are consistent ✦ Convergent validity : alike ones are similar ✦ Discriminant validity : different ones differ

5.3.1 RELIABILITY

Reliability or reproducibility may be defined as "the ability of a method to produce the same estimate on two or more different occasions, assuming that nothing has changed in the interim" (29). Reliability is therefore concerned with whether a method is capable of providing the same answer repeatedly when applied to the same object, and does not indicate the correctness of the answer (29, 73, 74). According to Neuman (1997:138)(73) reliability means that the information provided by measuring instruments does not vary because of characteristics of the instrument itself. But it is also true that a method cannot give a correct answer every time unless it gives approximately the same answer each time. Reliability and validity therefore complement each other (29). Three types of reliability need to be considered.

Stability reliability concerns comparisons / reliability over time. It refers to the consistency of measures on repeated applications in different time periods. The test-retest method is used for pretesting instruments. With observations, numerous observations may be made, but with instruments such as questionnaires or interviews, only two are made, but always to the same group of people. With high stability reliability you will get the same results each time (73, 74). This was not tested.

Representative reliability is reliability across subpopulations or groups of people. An instrument will have high representative reliability if it yields the same result for a construct when applied to different subpopulations like different races, ethnic groups, age groups, etc. A subpopulation analysis determines this type of reliability. The indicator must be compared over different subpopulations and independent knowledge about the populations is used to verify the outcome (73). This type of reliability was not applicable for this research study.

Equivalence reliability applies when researchers use multiple instruments for one construct. Equivalence involves arriving at consistent results from two parallel measurements used with the same individuals at approximately the same time. A reliable measure will yield the same result with all instruments (73). There are two methods to examine equivalence reliability:

- The **split-half method** involves dividing the same test randomly in two halves and determining

whether both halves give the same results. The correlation between the scores is used to estimate the reliability that would result from a full length test. Special statistical measures can also determine this type of reliability (e.g., Cronbach's alpha, Kuder-Richardson technique) (73, 74). This type of reliability was not applicable in this research study.

- **Intercoder / interrater reliability** arises when there are several observers or raters or coders of information. A measure is reliable when these observers agree with each other. This can be tested by having several coders measure the exact same thing, then comparing the measures. With high reliability, they would observe or code the same (73, 74). Since two field workers / interviewers were used for the two research sites, both were involved in the pretesting and training in order to establish that both use the same methodologies and interview techniques. The researcher was involved continuously in the process of training the interviewers to improve this type of reliability. This was not tested.

Perfect reliability is difficult to achieve (73), but four principles could be followed to increase the reliability of measures, namely:

- Clearly conceptualize all constructs: higher reliability is achieved when a single construct is measured. This requires developing clear, unambiguous theoretical definitions.

- Increase the level of measurement: indicators at higher more precise levels are likely to be more reliable. The more specific the information required, the less likely it is that anything other than the construct would be measured.

- Use multiple indicators of a variable: two or more indicators of the same construct are better than one. This allows researchers to take measurements from a wider range of content of a conceptual definition and it tend to give stability, ruling out systematic errors.

- Use pilot studies, pretests, and replication: trying out one or more drafts / versions of the measure before applying the final version in the actual research situation. This extends to replicating the measures other researchers have used. Building on previous measures by adding new indicators can only improve the quality of the measure over time (73).

In this research study the following measures, based on the fore-mentioned principles, were implemented to improve the stability and intercoder / interrater reliability of the measures used:

- clear, well defined conceptual definitions were used (refer to 4.3.2 in Chapter 4),
- specific and standardized measuring instruments for anthropometric measurements as well as for the hunger scale evaluations were used (refer to 4.4.5.2 and 4.4.4 in Chapter 4, 5.2.2.1 and 5.2.2.3 in Chapter 5),
- all the measuring instruments were pretested for understandability, applicability and clarity (refer to 5.2.3 in Chapter 5),

- a pilot study was launched to refine the instruments for the quantitative methodology (biographic questionnaire, anthropometric data sheet and measurements, 24h-recall of food intake, hunger scale) (refer to 5.2.3 in Chapter 5)
- each of the individual interview instruments were tested twice before the actual research study took place — once in the pilot study and once with the training session (refer to 5.2.3 in Chapter 5),
- the physical measurement techniques were practised to ensure a consistent and reliable application (refer to 5.2.3 in Chapter 5),
- multiple indicators were introduced for evaluating the nutritional status by means of the 24-hour recall dietary analysis and the anthropometric evaluations (refer to 4.4.5 in Chapter 4 and 5.2.2 in Chapter 5),
- only one specific interviewer from the same ethnic group, who was living in the same area, was used per research area together with the researcher in order to achieve a high level of confidence with the respondents,
- an interviewer was exclusively used per clinic, with no contact whatsoever between the interviewers. Data were thus more reliable since there was less chance for misinterpretations and prejudice,
- confidentiality was ensured by means of a formal consent form (refer to Addendum A),
- the researcher never conveyed her own opinion, attitudes or beliefs to the respondents or to the interviewers,
- leading questions were avoided as far as possible (73, 74, 86).

5.3.2 VALIDITY

Validity can be defined as "the ability of an instrument to measure what it is intended to measure" (29). Validity is concerned with what the test measures and how well it is measured. Data are valid when the correctness can be confirmed (6, 29, 74). The term validity has multiple uses which need to be distinguished from one another.

5.3.2.1 Nonmeasurement validity

External validity concerns the generalisation of research findings to the defined population and is used primarily in experimental research. High external validity means that the results can be generalized to many situations and many groups of people (73, 86). Results obtained from a representative sample can only be projected to the universe from which the sample was drawn. To ensure that external validity is achieved, random sampling is applied during the sampling phase. Additionally measurements are repeated several times in different situations (72, 86, 87). For the purpose of this research study these types of measures were unpractical and external validity could thus not be claimed for.

Internal validity concerns the internal design of the research study and means that no errors are present. It is mainly used in experimental research where errors might occur despite attempts to institute controls to prevent them (73). Internal validity was also not applicable in this research study.

Inferential validity in a study means that the correct statistical procedure is chosen and its assumptions are fully met. Misuse of a statistical procedure, even if the computation is correct, means invalid results. For high statistical validity, the major statistical assumptions should not be violated (73).

In this research study the following measures were implemented to improve the inferential validity:

- descriptive statistical procedures were use to evaluate the data and to describe the results. Descriptive statistics included the determination of frequencies, means, standard deviations and ranges,
- inferential statistics for the comparison of the data (the Student t-test, Chi-square and Mann-Whitney u-test)($P< 0.05$),
- guidance by a qualified statistician.

5.3.2.2 Measurement validity

Measurement validity usually refers to a particular purpose or definition and will therefore be unique in each research situation in order to obtain valid data. It refers to how well the conceptual and operational definitions integrate with each other (73). For high measurement validity it is important that all the concepts should be defined and explained logically and systematically for each research theme. There should be no misconceptions or misinterpretations concerning them. Any research study should thus be based on a conceptual framework constructed from a sound theoretical background (73, 86). Four types of measurement validity are identified (see Table 25).

Face validity is the easiest and most basic type of validity to achieve. According to Neuman (1997:142)(73) it is a judgement by the scientific community that the indicator really measures the construct, and that the indicators that are measured really are representative of the construct. "On the face of it, does the definition and method of measurement fit?" It is thus based on the subjective evaluation of the researcher (73).

Content validity refers to the degree to which a measure covers the range of meanings included within the concept. Measures should represent all the ideas identified in the defined concept (73, 74).

Criterion validity uses a standard or criterion that is known to indicate a construct accurately. The purpose being to use a measure to estimate some important form of behaviour that is external to the instrument itself (73, 74, 86). There are two subtypes of criterion validity:

- **Concurrent validity** for which an measure must be associated with a pre-existing measure that is judged to be valid. The two measures may not be perfectly associated, but if they measure the same construct, they would logically yield similar results (73, 86). Concurrent validity was not measured in this research study.

- **Predictive validity** is used to estimate success or future behaviour from the results of a present measurement. The criterion which is employed to determine whether the measurement is valid is situated in the future (73, 86). Predictive validity was not applicable in this research study.

Construct validity is for measures with multiple indicators. It refers to the accuracy with which the constructs are measured. Does the items in the scale or questionnaire therefore measure the construct which the items are supposed to represent? (73, 86). The following two types are identified:

- **Convergent validity** applies when a few measures converge or are associated with one another. The various measures of the same construct operate in similar ways. Convergent validity was not measured in this research study.

- **Discriminant validity** or divergent validity means that indicators can converge or hang together, but can also diverge or be negatively associated with opposing constructs at the same time (73). This type of validity was not applicable for this research study.

In this research study the following measures were implemented to improve the non-measurement and measurement validity of the measures used:

- a thorough review of literature concerning the causes and effects of malnutrition, the feeding practices and nutritional status of infants and small children, was done (refer to Chapter 2 and 3),
- concepts were defined explicitly in terms of their meaning for this research study in order to prevent any misinterpretations (refer to 4.3.2 in Chapter 4),
- all the measurements used, as well as their content, were evaluated and approved by specialists in the field of nutrition,
- instruments were chosen to incorporate each applicable aspect of each concept for this study group (nutritional status, feeding practices, nutrition knowledge and attitudes)(refer to Chapter 5),
- the two interviewers evaluated the measuring instruments with reference to the level of difficulty and the understandability (refer to 5.2.3 in Chapter 5),
- a standardized hunger scale (48) was used for each individual respondent,
- nutritional status was evaluated by means of more than one accepted measuring instrument (dietary intake and anthropometry). Different indicators were also used for anthropometry (weight, stature and head circumference)(73, 86).

CHAPTER 6

QUALITATIVE RESEARCH STRATEGY

CHAPTER 6 QUALITATIVE RESEARCH STRATEGY

"Content analysis remains an underutilised research method with great potential for studying beliefs, organizations, attitudes, and human relations. The limited application and development of content analysis is due more to unfamiliarity with the method and to its historic isolation from mainstream social science than to its inherent limitations" (Woodrum in Neuman 1997: 274)(73).

6.1 INTRODUCTION

Babbie (1992:G6)(74) defines qualitative analysis as "the nonnumerical examination and interpretation of observations, for the purpose of discovering underlying meanings and patterns of relationships". The purpose of any qualitative research action is to produce findings. The data collection as such, is not the main aim. It rather is the culmination of activities, including analysis, interpretation and the presentation of findings. The challenge of qualitative research lies in the following:

- making sense of the masses of data,
- reducing the volume of information,
- identifying significant patterns,
- constructing a framework for communicating the essence of what the data reveal (88).

According to Greenbaum (1988:6)(72) qualitative research is characterized by the absence of empirical measurements with the focus on more subjective evaluations. It is implemented with smaller samples since it is not intended to be projectable to a larger universe, and as these interviews tend to be longer, smaller groups are less expensive. For this research study subjective evaluations were required for the description of:

- the feeding practices implemented by the mothers/caregivers of the children,
- the nutrition knowledge of the mothers/caregivers of the children, and
- the attitudes of the mothers/caregivers of the children towards nutrition.

The chosen qualitative methodology and appropriate analysis techniques will subsequently be discussed.

6.2 MEASURING INSTRUMENTS: SELECTION, DEVELOPMENT AND METHODOLOGY

6.2.1 SELECTION

In the qualitative research domain there are a number of data collection strategies, some of which include ethnography, life history, case studies, focus groups, motivation research, in-depth interviews, participant observation, field research, naturalistic studies, phenomenological studies, descriptive studies, symbolic interactionism studies, interpretive research, action research, narrative research, etc (72, 75). An

appropriate method should be chosen to suit the research aim, for example individual in-depth interviews for addressing questions on individual matters; participant observation for exploring processes and behaviour occurring in a certain setting; focus groups for addressing questions regarding group behaviour, etc. The method chosen should also be a culturally and developmentally appropriate communication tool (75). A graphic overview of all the qualitative research types is presented in Figure 8 (89).

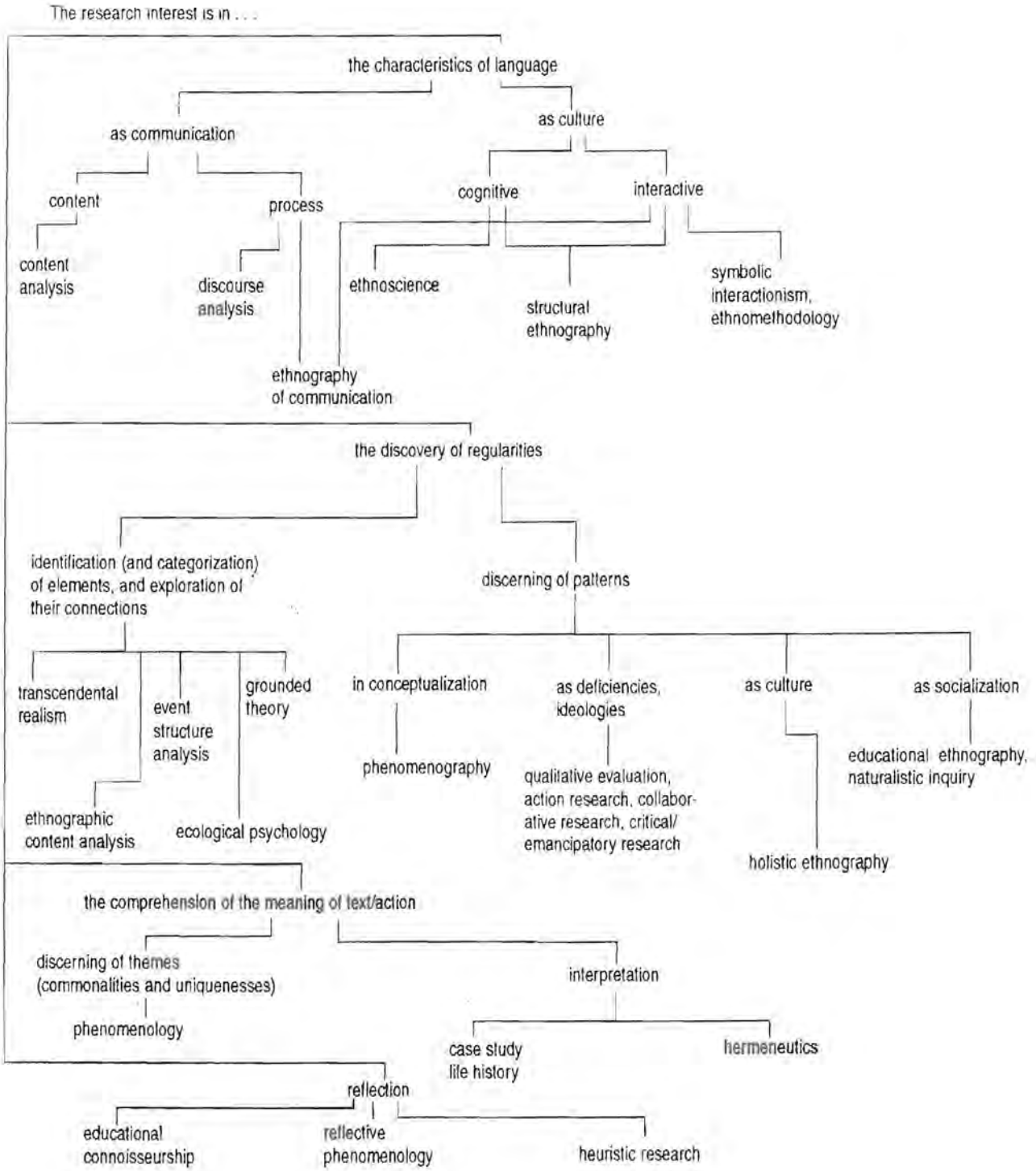


FIGURE 8 : GRAPHIC OVERVIEW OF QUALITATIVE RESEARCH TYPES (89)

The research interest (within the given nutrition context) lied in the discovery of regularities and the identification (and categorization) of elements, and the exploration of their connections. Ethnographic content analysis and grounded theory seemed to be the most appropriate of the five techniques mentioned (see Figure 8). The grounded theory approach is a method that uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon. It is exclusively concerned with the generation rather than the testing of a theory, and the research is used to develop theory systematically. The research begins with an area of study and what is relevant to that area is allowed to emerge (90). However, for this research study ethnographic content analysis was the more suitable approach for analysis due to the focus group technique used for the collection of data and the development of analysis categories from a science-based background (80, 89).

For this research study group participation (focus groups) was favoured because nutritional practices, knowledge and attitudes are sensitive issues. Sharing their ideas and knowledge as group members could be more acceptable than being individually questioned on these sensitive issues as they might be exposed as having little knowledge, or had shame for certain practices if asked directly. Within the group social and cultural resources and support were readily available, therefore it was expected to encounter a more spontaneous and honest participation (72, 75).

For this type of qualitative analysis the researcher should have theoretical sensitivity. This refers to the attribute of having insight, the ability to give meaning to data, the capacity to understand and the capability to separate the pertinent from that which is not pertinent. Theoretical sensitivity comes from:

- literature (wide reading),
- professional experience (professional expertise in the field of nutrition),
- personal experience (having had children and being responsible for their feeding, nutritional state and ultimately their growth, health and wellbeing),
- analytic process →
  - collecting the data (asking questions)
  - interacting with the data
  - making comparisons
  - thinking about what one sees and hears
  - making hypothesis
  - developing small theoretical frameworks about concepts and their relationships (90).

6.2.2 FOCUS GROUPS

Focus group interviewing is one of the best methods for discovery and exploratory research, where very little is known about the phenomenon of interest, such as in this particular research study (91). Topics on attitudes and cognitions are most suitable for focus groups. The hallmark of focus group interviewing, according to Morgan (1988:12) (80), is *the explicit use of the group interaction to produce data and insights that would be less accessible without the interaction found in a group.* The philosophy behind the group interaction is that more useful data are cost-efficiently generated in this manner, than would be otherwise available (72, 80). Greenbaum (1988:18-19) (72) provides the following explanation:

- most people feel more comfortable talking about almost any subject when they are involved in a discussion as part of a group,
- the interaction among the members of a group will result in the participants' being more talkative due to the stimulation generated by the feelings of others in the group,
- the group dynamics provide insights into how peer pressure plays a role in the degree of overall acceptance of a concept, product, or idea being presented.

The focus group strategy as such is thus very useful as a self-contained means of data collection, but can serve especially well as a supplement to both quantitative and other qualitative methods, facilitating the interpretation of results and adding depth to responses (80, 91).

6.2.2.1 Advantages and disadvantages of focus group research

The advantages / strengths and limitations / weaknesses of group interviewing relative to other types of research are compared in Table 26.

TABLE 26: ADVANTAGES / STRENGTHS AND LIMITATIONS / WEAKNESSES OF FOCUS GROUP RESEARCH

	ADVANTAGES		LIMITATIONS
1.	Provide data from a group of people more quickly	1.	Small numbers of participants limit generalization to a larger population
2.	Usually costs less in terms of time and transcription costs	2.	Interaction leads to responses of group members not being independent of one another - thus restricting generalization
3.	It is one of the few research tools available to obtain data from children or other illiterate individuals	3.	Results obtained may be biased by a very dominant or opinionated member, while reserved members may be hesitant to talk
4.	Allows the researcher to interact directly with subjects - clarify answers, observe non-verbal responses, ask contingent questions	4.	The "live" nature of the interviews may lead to the researcher placing greater faith in the findings than is warranted
5.	Open response formats lead to obtaining large amounts of data in the subject's own words	5.	Open-ended nature of responses obtained makes summarization and interpretation difficult
6.	It allows subjects to react and build on responses of others	6.	The moderator (interviewer) may bias results by knowingly /unknowingly providing cues about desirable answers.
7.	Are very flexible in terms of topics and settings	7.	Groups result in less data gathered (70% of individual interviews)
8.	Focus groups can be assembled on very short notice		
9.	Results are easy to understand		
	STRENGTHS		**WEAKNESSES**
1.	Easy to conduct	1.	Not based in natural settings — leads to uncertainty about the accuracy of subject responses
2.	Ability to explore topics and generate hypotheses — especially on new topics	2.	Researcher has less control over the data generated
3.	Provide an opportunity to collect data from group interaction on a specified topic	3.	When relying on interaction in groups, there is always uncertainty whether or not it would mirror individual behaviour

(Adapted from 80, 91)

The simplest test to determine whether focus groups are appropriate for a research study is to ask how actively and easily participants would discuss the topic of interest. The topics of interest for the qualitative methodology in this research study were the feeding practices of children, as well as the nutrition knowledge and attitudes of the mothers/caregivers towards nutrition. Mothers/caregivers usually discuss their children freely among themselves, thus it was argued an appropriate technique for this project (80).

6.2.2.2 Design of focus groups

Kirk and Miller in Morgan (1988:38) (80) describe qualitative research as generally having four phases, namely planning, observation, analysis, and reporting. Figure 9 lists the sequence of steps in the design of focus group interviews (91).

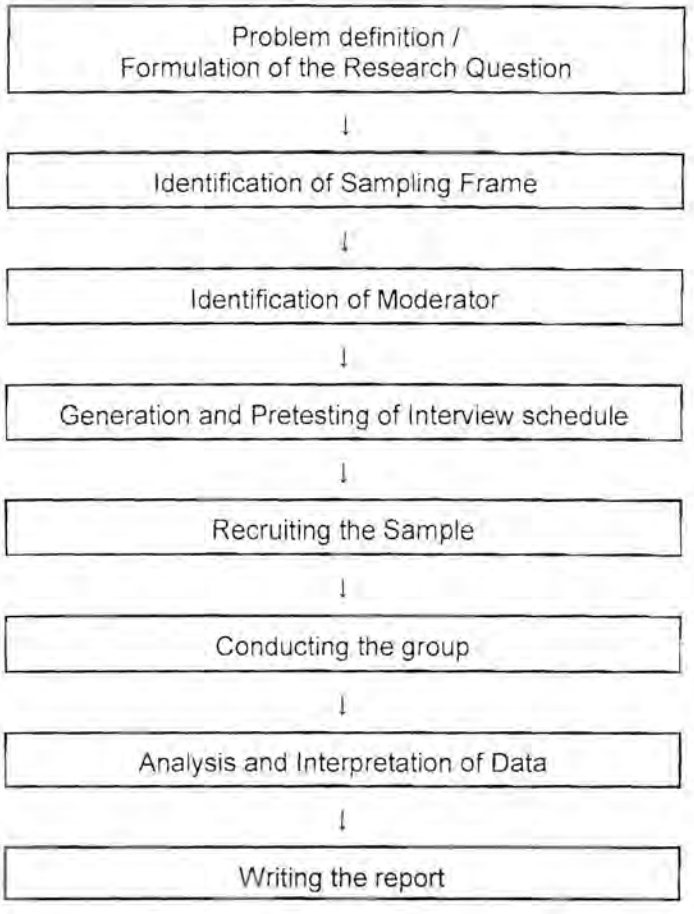


FIGURE 9: STEPS IN THE DESIGN AND USE OF FOCUS GROUPS (76)

In the planning stages of focus group research various factors must be considered to achieve the best results possible. These factors, and the application thereof in this research study, are summarized in Table 27.

TABLE 27 : FOCUS GROUP INTERVIEW CONSIDERATIONS (Adapted from 72, 80, 91)

FACTORS	CONSIDERATIONS	APPLICATION IN THIS RESEARCH
Ethics	- Invasion of privacy, due to taping of interviews - Inherently all participants are sharing their views or perceptions with each other, thus restricting the suitable topics	- Mothers/caregivers were properly informed of the research procedure and signed a form of consent as approved by the Ethics & Protocol Committee of the Faculty of Medicine (UP) - Participation was voluntary
Budget	- Salaries to moderators (interviewers) - Travel to research sites - Payments to participants - Tape production and transcription	- Salaries were paid to the two moderators for the individual and group interviews and for the transcription sessions - The researcher travelled once a week on the specific clinic day to the research site, as well as between the two clinics to monitor the research procedures and process as such - Participants received an incentive (food hamper) to participate in the research. Each mother/caregiver had to be present twice and the group interview was a long session - Tape-recording equipment was hired daily as required from the Media Department of UP. Recording quality had to be checked beforehand. Tapes were separately marked for each session - Transcription required a second step where a specialist from the same ethnical group as the moderators was required to listen randomly to tapes and check transcriptions for correctness and thoroughness of the transcription of the interviews
Time constraints	Time consuming tasks include: - Recruitment - Transcription - Transcription analysis	- Recruitment was a time consuming process as children were needed in very specific age categories for each focus group - Transcription of any one interview took longer than the initial interview in order to be sure that no data were lost. This was done immediately after completion of the day's research - Transcription analysis was the most time consuming task of all: * transcriptions (all the focus group data) were entered into a spreadsheet format of the interview schedule * all the age categories were grouped together per response category * categories (sampling and recording units) were made to sort the data * individual coders coded the data * the data were presented

FACTORS	CONSIDERATIONS	APPLICATION IN THIS RESEARCH
Number of groups	- Increasing the number of groups will lead to an increased research time period - For exploratory research (aimed at getting perspectives) 3-4 groups are sufficient - For detailed content analysis 6-8 groups are required - An important determinant of the number of groups is the number of population subgroups required. With several distinct population segments separate groups should be run in each with a minimum of 2 groups / segment. - Determine a target number of groups in the planning stage, but have flexible alternatives available	- Two focus groups per age group (six age groups) were planned per clinic This meant 24 focus groups in total, which automatically increased the research period - However, content analysis, as the choice method of analysis, requires only 6-8 groups - With the two recommended groups per segment the target was 24 groups. However, to achieve the required number of children per age category more groups were needed. Finally the data of 26 focus groups were used
Size of groups	- Use moderate sized groups: 6-8, 8-10, 6-12. - Recommendation: not <4 and not >12 - Groups with less than 6 members produce dull discussions and more than 12 members are difficult to manage - Recruit more than the required number; at least 2 usually do not show up. Rather have too many participants than to cancel the focus group due to inadequate numbers - Small groups are used where a clear sense of each subject's responses is required (less productive, more costly) - Large groups are used for exploratory research. It can lead to "social loafing"; individuals participate less; the group carry the discussions (more difficult to manage, require more moderator involvement)	- An average number of 6 members per focus group was strived for in recruitment. It was difficult to recruit more than 6 members in advance due to practical reasons. If the mothers/caregivers did not show up as expected, new recruitment was done at the clinic - The medium sized groups (n=5-6) seemed to produce the best results. In smaller groups mothers/caregivers were more reluctant to talk and in bigger groups one or two mothers/caregivers did most of the talking
Layout of the group	- Seating arrangements should be in a circular or ⊔ - shaped format with the moderator at the head of the table - Seat subjects around a table - it provides comfort, security and personal space - Maximize eye contact - Increase the balance of responses from all the subjects Seat the least talkative members directly across from the moderator, and the most talkative off to either side - Facilities must be chosen with the quality of audio-taping in mind	- A semi-circular arrangement around a table was strived for with the moderator at the head of the table - Seating was arranged around a table: - for the comfort and ease of the mothers/caregivers - to accommodate the tape recording equipment - to put the moderator at ease - to generally improve the discussion - Maximum eye contact was achieved due to this arrangement - Due to practical reasons, seating was arranged randomly. The moderator was instructed to involve all the members in answering questions or giving responses - Only clinic facilities were available for the research which were prone to much noise, heat and stuffiness; however the best was made of the less ideal circumstances

FACTORS	CONSIDERATIONS	APPLICATION IN THIS RESEARCH
Source of subjects	- Randomly sampled groups hold no guarantee for shared perspectives - Choose samples theoretically from population segments that will provide the most meaningful information. Focus groups should be selected systematically with convenience sampling - Always match the sample with the objectives of the research - If specific categories of subjects are needed, put in a real effort to locate them - Avoid mixed categories of subjects - If separate groups (different categories) are run, about 4 groups per type is indicated - Rather use strangers than friends in one group to produce more variance in opinion in group discussions	- Convenience sampling was used. Mothers/caregivers with babies / toddlers in the appropriate age groups were required as they could give the most meaningful information on feeding practices of children - Effort went into getting children in the appropriate age categories. Due to this the data collection period was prolonged in order to find suitable children especially in the older age groups, as these children did not visit the clinic regularly anymore - Categories of children were never mixed and four groups per category was completed. This favoured the analysis between categories and subpopulation groups - It was not always possible to exclude friends in a group. The moderator always tried to involve each individual in the group to overcome the problem of shared opinion
Level of moderator involve-ment	Treated as a continuum: *low level* ➜ - play small role in group discussion, subjects should speak for themselves - have minimum of comments - for exploratory research and full-scale content analysis - advantage: it has the ability to access the subject's interests - disadvantage: it supplies a disorganized content which is difficult to analyze, and some topics may never come up *high level* ➜ - control the set of topics and the group dynamics - best method to get the most useful information from the group - for an externally generated agenda, like comparison of data or answers to particular questions - advantage: the moderator could cut off unproductive discussions; probe where necessary; ensure coverage of desired topics; allow for changes in discussions - disadvantage: the incorporation of moderator bias - Choose moderator involvement according to the type of information needed - Ideally only one moderator should be involved in all the focus groups, although it is not always easy to implement	- High level of moderator involvement was chosen due to the research aim and the specific research population - an externally generated agenda (to ensure coverage of topics) was used to achieve the research aim (high moderator involvement) - moderator bias was countered by: - training the moderators thoroughly, - using an moderator / interviewer guide with specified questions and probes as a guideline - one moderator for all the focus groups was impractical as both clinics operated simultaneously. Two moderators were used; one per clinic exclusively

FACTORS	CONSIDERATIONS	APPLICATION IN THIS RESEARCH
Location	- Participation is more likely if the location is close to home/work - Travel time is more critical than distance - Locations in well-travelled, familiar areas are likely to be perceived as more attractive - Use a "neutral site" like a church, or meeting room	- People attending the local clinics were recruited - Care was taken to finish interviews on time as some people travelled a fair distance and wanted to be home at lunch time. This ensured cooperation and prevented restlessness - The "neutral site" was the health clinic, which is well accepted in the community and frequented by the community members required for the research
Inter-viewing styles	- Directive and non-directive styles are the two extremes styles; rather use a style on the continuum - The purpose of the research determines the style used: * unstructured: for new ideas * structured: for hypothesis generation or diagnosis of problems - The two types of questions used: *open-ended:* - broader in nature - allows any information - increases the amount of data - less reliability and validity *closed-ended:* - for polarizing opinions for further discussion - where reliability/replicability is essential - Primary questions: to introduce new topics, secondary questions: to probe and give detail - Start with general questions and move on to more specific questions. Other techniques can also be applied - Supportive leadership style is the most successful. The leader shows concern for the subject's wellbeing and personal needs, is approachable, considerate, friendly, and treats others as equals - A high compatibility between group members and moderator leads to greater interaction and more open communication - Aids are useful to help stimulate discussions, e.g. storytelling, demonstrations, samples, displays	- The style used for this research was mainly directive with a few open-ended questions - Nutrition-related issues needed to be uncovered, thus a structured interview style was used - Both open-ended and closed-ended types of questions were included in the interview schedule. This ensured answers of a broader nature but also indicated opinions or responses where needed - Primary questions were used for the introduction of a new topic. Thereafter secondary questions were used to provide more specified data on a topic and to serve as probes - Six interview topics were included in the interview schedule. The first was the most general / easy and the last the more difficult and sensitive - The supportive leadership style was used. The wellbeing and personal needs of the mothers/caregivers were always of primary concern. Treating others as equals and overall friendliness were some of the main values nurturing human relations - Both moderators initially were care group leaders and thus very sensitive and considerate towards the group members. This produced a lot of goodwill and cooperation in getting the research done - Visual aids were used to stimulate the discussions. Samples of food products and household eating utensils and demonstrations by group members were used

6.2.2.3 Design of the interview schedule

Morgan (1988:54) (80) presents four broad criteria for focus group observation:

- it should cover a maximum range of topics,
- it should provide data as specific as possible,
- it should encourage interaction that explores participants' feelings in some depth,
- it should take into account the personal context that participants use in generating their responses to a topic.

The interview schedule is central to the observation process. The typical length of a session should be no more than one to two hours during which the focus should be maintained; not exploring too many topics. Morgan (80) advises that four to five major topics with preplanned probes under each, are probably ideal. Stewart (91) states that most interview schedules consist of 12 or less major topics. With high moderator / interviewer involvement, it is useful to construct an interview schedule that can be followed in the same order with each of the groups. A good guide will create a natural flow of discussion on the topics and even some overlap between topics. The last option was chosen for this research study.

The first step in creating a schedule is to list all the questions that need to be answered and then organising them into a set of topics rather than questions, since this would improve the discussion flow (80). Although it may appear that less structure is favoured for focus group interviews, this may not always be the case. Certain people need help in expressing a response, therefore a key word or cue in the interview schedule may be useful. Sometimes more specific cues are needed to ensure that aspects easily forgotten are discussed. It is important however for the moderator / interviewer not to "lead" the mothers/caregivers answers. Structured questions are also useful when mothers/caregivers are uncertain or embarrassed about particular responses and would therefore not respond unless asked directly for fear of being wrong. Questions that include probes like *how, why, when, under what conditions* are useful in the group interview. Additionally, questions should be phrased simply in language that the mothers/caregivers understand (91).

Development of the interview schedule for this research study An interview schedule (see Addendum B) was developed taking into consideration all the fore-mentioned aspects. Due to the fact that transcultural research was undertaken and that the moderator / interviewer would be continuously working from a first to a second language, it was decided to go for a fairly structured interview schedule. When the pilot study was conducted, it was found that the mothers / caregivers did not understand or interact well if a statement or a topic was put forward as a statement; a topic put in the form of a question was better understood. As sensitive issues were discussed, structured questions with suitable probes were more useful. Very simple language was used for the setting of the questions and this was checked by the moderators / interviewers beforehand.

Six major topics on nutrition of the child were identified to be included in the interview schedule. Four topics covered the feeding practices and two topics the nutrition knowledge and attitudes towards nutrition. Aspects that were discussed, included eating patterns, types of food necessary for healthy eating, foods linked to important body functions, the concept of healthy food and healthy eating, money and food,

traditional food preparation techniques and other customs. Aspects concerning feeding practices that among others received attention, included the duration of breast feeding, the time when weaning / complementary foods were included for the first time, what the first and following weaning foods were, the type of milk products that were given when breast feeding was stopped, the type of formula used, and so forth. All the questions / probes included in the interview schedule were identified from the literature as being those that might identify the feeding practices, nutrition knowledge and attitudes towards nutrition of the members of the study group. The interview schedule was checked / tested for content and feasibility twice. First the broad outline of identified topics and sub-sections thereof were verified with the moderators / interviewers and the care group manager of these communities to determine if the topics were suitable, and whether the mothers/caregivers would be able to answer questions/probes appropriately. After the initial approval of the draft, the interview schedule was further developed and finalised. The moderators / interviewer again pretested the interview schedule, after which it was finalised for implementation.

6.2.2.4 Conducting the focus group interview

An atmosphere of trust and openness should be achieved from the start of the discussion by stressing anonymity, empathy, and the value of opinions. The general list of topics to be discussed, as well as the ground rules should be stated clearly. During the discussion all members of the group should be encouraged to participate; if not voluntarily, they should be asked questions or opinions directly. Moderators / interviewers should be sensitive to the reactions of the group members and act accordingly. The moderator / interviewer should also manage the time allocated to discussions of the various topics in order to achieve coverage of all the topics in the available time. It is also important for the moderator / interviewer to probe the mothers/caregivers for more information as they do not always say all they think or know. The group may also be asked their opinion on any one mother's/caregiver's explanation (80, 91).

Conducting of the focus group interview as implemented for this research study Before commencement of the focus group interviews, the moderators / interviewers were intensively trained by the researcher with regard to all the forementioned aspects concerning the conducting of focus group interviews. (See Addendum E.)

During the execution of the focus group research, the following procedure was implemented (also refer to Table 27):

- Anonymity, value of opinions, and voluntary participation were explained during the first interview when the mothers/caregivers were recruited and the form of consent was signed.
- The group was gathered and seated around the table in an area in the clinic allocated to the researcher for the duration of the study.
- Introductions were done between the researcher, moderator / interviewer and all the mothers/caregivers.
- It was stressed that the researcher did not form part of the interview process and might only be present part of the time. This was well accepted since the researcher clearly did not understand the language used for the interviews.
- The general list of topics was explained.

- The ground rules were established, e.g. that every individual's responses were needed to ensure high quality information; that this was not a test in terms of correct or wrong answers; rather that answers given would be viewed as opinions; that honest answers and opinions should be given and that refreshments would be served throughout the session by the researcher without interrupting the interview.
- The moderator / interviewer encouraged each mother/caregiver constantly to participate and if they were not responding spontaneously, she directly asked their opinions.
- When it was obvious that the group had problems with a question, the probes on the interview schedule were used by the moderator / interviewer.

Moderators / interviewers should make field notes during each session. With an inexperienced moderator / interviewer this is not always possible due to time constraints, language problems and the inability to write down important additional information. This type of data can also be collected by means of a debriefing interview directly after the session. Since these notes involve some interpretation it can be considered part of the evaluation / analysis rather than data collection (80).

The moderators/interviewers used for this research study were inexperienced and thus not able to make notes during the interview. Space was provided with each question/probe on the interview schedule for the purpose of transcription and for taking relevant notes during the interview by the moderator/interviewer, e.g. the measuring/preparation techniques for formula feeds. Each moderator/interviewer was instructed to record any useful information on the interview schedule as the interview progressed. A debriefing interview was done together with the transcription of focus group data directly after each interview. In this way it was ensured that all the valuable information that the moderator/interviewer could contribute, was recorded.

6.2.2.5 Analysis of focus group data

Although the purpose of qualitative research is an in-depth exploration of a topic, the amount of analysis required largely depends on the aim of the research (91). The first step in any kind of qualitative analysis would be to transcribe all the interviews completely. Transcription will facilitate further analysis and will also provide a permanent record of the interviews. These transcriptions can then be supplemented with the notes from the researcher and / or moderator / interviewer, as well as a summary of the events as they were observed by the researcher (91).

The data gathered in qualitative research usually comprise two types of content which need to be analysed, namely manifest and latent content.

- **Manifest content:** the visible, surface content. In other words, that which is obvious, like counting certain words to see if the subjects know anything about a subject. The words serve as indicators. The ease of coding and the reliability are the advantages of this method. The disadvantage however is that there is little validity in terms of the *meaning* of the words as such (73, 74).
- **Latent content:** the underlying meaning. Make an overall assessment after reading the complete answer. The advantage of this method is that the underlying meaning can be determined, but at the disadvantage of low reliability and specificity (73, 74).

Due to the apparent weaknesses of each type of content, it is recommended that both types of content should be analysed. If the results from both types of content are in agreement, the final result is strengthened (73, 74).

Morgan (1988:64) (80) states that the two basic approaches to analysing focus group data are a strictly qualitative or **ethnographic summary** and a systematic coding via **content analysis**. This is supported by Miles & Huberman (1994:7)(89) where it is indicated that an ethnographic content analysis approach is implemented with categorization of elements and exploration of their connections. Ethnography can be defined as the description of information, or rather it is qualitative information which relies more on direct quotation of the group discussions. Content analysis typically produces numerical descriptions of the data, or rather the systematic coding of data (80). Although these methods can be used individually, there is an additional strength in the combination of the two methods. According to Morgan (1988:64) (80) " a largely ethnographic approach may benefit from a systematic tallying of one or two key topics, while a basically quantitative summary of the data is improved immensely by including quotes that demonstrate the points being made."

The analysis should be done with a group-for-group approach, since the group is the actual unit of analysis (80, 88). The cut-and-paste technique is often used for analysis (80, 91). However, when an interview schedule is used in the group discussion, the topics in the guide will serve as the structure for organizing the analysis of topics. The guide organizes the discussions of each group around the same set of topics and in the same order, which is a very favourable aspect during the analysis of more structured group discussions as this allows for comparisons between the groups (80). Patton (1980) (88) corroborates the fact that if a standardized open-ended interview is used, it will be easy to do cross-case or cross-interview analysis for each question in the interview schedule.

Methodology for analysis of qualitative data as implemented for this research study The focus group discussions were recorded on tape. A transcription of the interview, together with a debriefing interview with the moderators / interviewers was done directly after each focus group had been completed. This was necessary due to the inexperience of the moderators / interviewers, the distance to be travelled by the researcher on each research day and the availability of the moderators / interviewers. Everything for each focus group had to be completed on that particular research day to prevent data being lost due to lapses in memory. The researcher listened again to the whole tape recording and wrote down every response that was made with the aid of the moderator / interviewer who acted as translator. All the information was checked and double checked as soon as possible after completion of an interview so that the least information was lost. If an answer came across vaguely, the researcher verified it with the moderator / interviewer. After completion of all the interviews and transcription of all the tape recordings an independent specialist (a dietitian from the same cultural group who was fluent in the language used during the interviews) was used to verify the translations and quality of the data produced.

The final transcription of the data (all 26 focus groups) resulted in a voluminous data transcription document consisting of data in six parts that covered 121 pages (document available on request). The transcribed data were compiled in a format that would ease the comparison of the results in the various categories and

between the age groups (cross-interview analysis). Both ethnography and content analysis were used in the analysis of data. Ethnography by means of direct quotations was used to impact on the content analysis and to verify the data (80). For the content analysis, two coders were used to categorise the data. The final results from the content analysis were presented in table format in an effort to communicate the huge volumes of data and to describe significant patterns in the data that were relevant to the research study (80).(Refer to Chapter 8.)

Content included in this research study was analysed in terms of manifest as well as latent content. Many responses to questions/probes could be classified as manifest content. These included countable objects or concepts like the ages of the children, types of teachers or informants, types of actions, frequencies, volumes, utensils, foods, etc. The latent content concerns the underlying meaning. As such it consisted of the reasons given by the mothers/caregivers for the practices or actions they performed, their beliefs concerning nutritional knowledge, their reasons for the nutrition related attitudes that they had and how these might have influenced their practices.

As ethnography is only a description of what was said in the focus group discussions complemented with direct quotations, the content analysis technique will be discussed in more detail as this entails a specialized procedure for processing the transcribed data.

Content analysis Krippendorf (1980:21) (81) defines content analysis as "a research technique for making replicable and valid inferences from data to their context". Any effort to interpret a focus group interview represents analysis of content. Content analysis therefore includes the analysis of both manifest and latent content of the data in order to discover the meaning or the symbolic meaning of messages and the specific implications for the research question (81, 91). Meaning is always relative to the communicator. Any message usually has more than one meaning, depending on the background or angle of interpretation used. Content analysis should therefore be predictive of something that is observable in principle, aid in decision making, help to conceptualize that portion of reality that gave rise to the analysed text (81). The meaning of any message may be interpreted in relation to the intentions of the sender, the receiver's cognitive / behaviour effects, the institution within which it has been exchanged, or to the culture within which it plays a role (81). In this research study the meaning of the data was interpreted in terms of the behaviour identified and the culture within which it occurred.

Berelson (1952) in Krippendorf (1980:33-34)(81) lists several (17) uses for content analysis. Within the context of this research study the following three uses were regarded applicable:

- "to reflect attitudes, interests, and values ("cultural patterns") of population groups" (e.g. in terms of nutrition practices)
- "to reveal the focus of attention" (e.g. concerning child feeding and nutrition)
- "to describe attitudinal and behavioural responses to communications" (e.g. in terms of nutrition related questions).

The definition of content analysis delineates the object of inquiry and places the researcher into a particular position vis-à-vis his reality. Krippendorf (1980:25-28)(81) provides a conceptual framework (refer to Figure

10) within which the role of the researcher can be summarized. It is simple and general, and consists of a few basic concepts:

- ☞ the data as communicated to the analyst (which data are analyzed, defining the data, population it is drawn from, etc.)
- ☞ the context of the data (clarity of the context relative to the data, define natural boundaries)
- ☞ how the analyst's knowledge partitions his reality (interest, knowledge will determine the construction of the context)
- ☞ the target of a content analysis (clearly stated)
- ☞ inference as the basic intellectual task (from data to context, justify in terms of stable factors, formulate data-context relationships: data appear as its independent variable and the target its dependent variable)
- ☞ validity as ultimate criteria of success (evidence for validation is needed: repetition, comparison with similar information from quantitative methods)(80).

The framework is summarized in Figure 10. According to Krippendorf (1980:28)(80) the framework suggests that data become dissociated from their source or from their surrounding conditions and are communicated one way to the analyst. The analyst places these data in a context that he constructs based on his knowledge of the surrounding conditions of the data including what he wishes to know about the target of the content analysis. Knowledge about the stable dependencies within the system of interest is formulated as analytical constructs which allow him to make inferences that are sensitive to the context of the data. Content analysis results should always represent a characteristic of reality and the nature of this representation must be verifiable in principle.

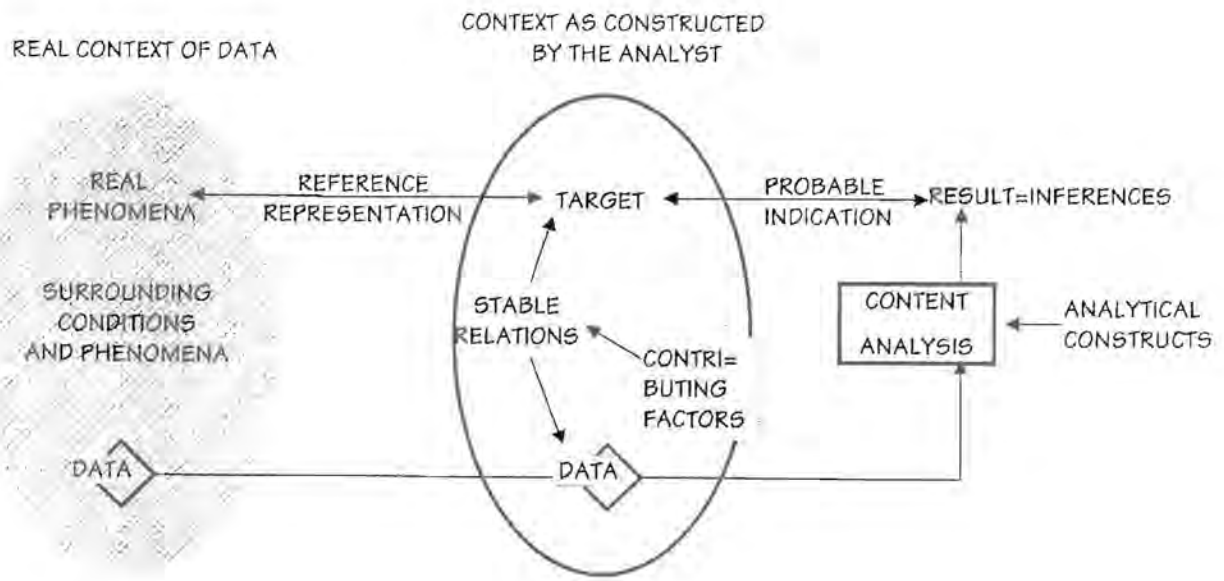


FIGURE 10 : THE FRAMEWORK FOR CONTENT ANALYSIS (81)

The framework serves three purposes:

- prescriptive (guiding the conceptualization and design of practical content analysis)
- analytical (facilitating the examination of content analysis results), and
- methodological (directing growth and systematic improvement of methods for content analysis).

Janis (1965) in Krippendorf (1980:33)(81) and Stewart (1990:107)(91) provide a classification of the three different types of content analyses, based on the purpose of the investigation:

Pragmatical content analysis (PCA): This deals with procedures that classify signs according to their probable causes and effects. The emphasis being on why something is said. This type of analysis is used when trying to understand the characteristics or the attitudes of a group of people.

Semantical content analysis (SCA): This deals with the procedures that classify signs according to their meanings. This type of analysis is used when trying to describe the positive and negative characteristics of people.

Sign-vehicle content analysis (SVCA): This deals with the procedures that classify content according to the psychophysical properties of signs. Counting the number of times specific words or types of words are used. This type of analysis is used to evaluate emotion-laden words referring to something.

For the purpose of this research study the pragmatical type of content analysis (PCA) was the most suitable type of analysis to use within the context of the aim of the research.

During the process of content analysis, several steps need to be followed. The procedure entails the following:

① data making
①-1 unitizing
①-2 sampling
①-3 recording
② data reduction
③ inference
④ analysis
⑤ validation
⑥ testing for correspondence with other methods
⑦ testing hypotheses regarding other data.

The content analysis procedure and methodology as implemented in this research study

① **DATA MAKING** (Also refer to Table 67 in Chapter 8 for a summary of the data making for this research study)

①-1 Unitizing Defining the appropriate unit or level of analysis. This could be words, sentences, sequences of sentences or dialogue about a particular subject (81, 91). In content analysis there are three kinds of units to consider:

①-1.1 *Sampling units* (SU's)

SU's are parts of the larger whole that can be regarded as independent of each other. It usually has physically identifiable boundaries (91). SU's represent the way the information in the discussion is divided and therefore the SU's provide a way of organizing information that is related (91). SU's are also important in sampling and provides a basis for statistical considerations (81).

For this research study the six main topics for discussion, as identified in the interview schedule, served as the SU's:

- General knowledge on infant feeding and health
- Breast feeding
- Bottle feeding
- Weaning
- Nutrition knowledge
- Attitude towards nutrition

①-1.2 *Recording units* (RU's)

RU's grow from the descriptive system that is employed (81, 91). RU's are subsets of SU's and represent specific statements (91). RU's are the analyzable part of a SU's. Therefore the RU's collectively carry the information within the SU's and provide the basis for the analysis of information (81, 91). Each specific segment of content is characterized by placing it in a given category (81).

For this research study the interview schedule was constructed with regard to the SU's. The RU's were accordingly identified beforehand, with all the questions / probes relevant to a topic (SU) grouped together under that heading. (See Interview schedule, Addendum B.)

It is very important to define the RU's appropriately, because this may influence the interpretation of the content of a particular focus group discussion. Five approaches to defining RU's are distinguished (81, 91):

①-1.2.1 *PHYSICAL UNITS (PU's)* This type of units are used to divide the content of a medium by physical properties such as time, length, size, or volume rather than by the information it carries (81, 91). Stewart (1990:110)(91) states that the boundaries of this type of units are determined by time and space. PU's require essentially only mechanical counting with minimal cognitive input for their identification therefore increasing their reliability and efficiency. However, unless the boundaries of physical units coincide with those of the content to be described, they can cause unreliabilities in recording and uninteresting findings (81) (see Table 67, Chapter 8 for application).

①-1.2.2 *SYNTACTICAL UNITS (STU's)* These units are based on the natural grammar of a medium. No judgements on meaning are required. The researcher must be familiar with the grammar, medium or format of the material used. Context is often explained in this way. Words are the smallest and safest recording unit in a written document, as is a news item in a broadcast or an act in a show. The source of the communication thus specifies the type of unit used (81, 91). The reliability and efficiency are high but not always productive in subsequent analysis. Context units are often defined in this way (81). Not applicable for this research study.

①-1.2.3 *REFERENTIAL UNITS (RFU's)* These units may be defined by particular objects, events, persons, ideas, etc. to which an expression refers. The reference may be made in one or more words, directly or indirectly, about a specific topic; in other words, any expression that refers to the same person / object / event (81, 91). RFU's are the units of choice to define SU's and RU's. They are indispensable when it is the task to determine how something happens or what the values, attitudes, attributes and beliefs are. The researcher should be familiar with the semantics, symbols and the referential meaning of elements. The efficiency is high, but the reliability is questionable, because all the references made are not always clear (81) (see Table 67, Chapter 8 for application).

①-1.2.4 *PROPOSITIONAL UNITS (PPU's)* These units recognise objects and their attributes, thus offering particular thoughts about the referent object or person. It is the basis for evaluation of assertion analysis (81, 91). PPU's require considerable familiarity with the syntax, semantics, and logic of the source language, with linguistic transformations such as rephrasing, completion and kernelization. Often the whole document needs to be rewritten, therefore the process can be inefficient and only moderately reliable (81). Not applicable for this research study.

①-1.2.5 *THEMATIC UNITS (TU's)* These are more global interpretative or explanatory sets of statements. Recurring systems of beliefs or explanations of events represent TU's (81, 91). It requires a deep understanding of the source language with all of its shades and nuances of meaning and content. It may be relatively easy to identify themes, but it is more difficult to identify them reliably. It is the most unreliable and ineffective units that can be used, and are more commonly avoided in content analysis, or at best used to circumscribe the fuzzy universe from which the sample or PPU's are drawn (81) (see Table 67, Chapter 8 for application). The aim for the choice of units would be to choose those that are empirically the most meaningful and productive units that are both efficiently and reliably identifiable and that satisfy the requirements of the available techniques (81).

①-1.3 CONTEXT UNITS (CU's)

CU's provide a basis for the interpretation of a RU. It may be identical to a RU or it may be totally independent. It is often defined in terms of the syntax or structure in which a RU occurs. The CU's may overlap and contain many RU's (91). The CU's represent the environments or context in which the statements occur. CU's are thus of importance in the process of describing the RU's (see Table 67, Chapter 8 for application).

①-2 *Sampling* Sampling of the available data is necessary to provide a representative subset of the larger population. This is unnecessary if the whole set of data is used (81, 91).

For this research study the sampling was done beforehand, and the focus groups were compiled from mothers/caregivers of children in six specified age categories. A structured interview schedule was used due to the characteristics of the specific community and the whole interview was used for analysis (refer to Table 37). (See Addendum B.)

①-3 *Recording* Data must be recorded in such a way as to ensure the reliability and meaningfulness. Recording does not only involve rewriting the statements. It implies using the defined units of analysis to classify the content of the discussion into meaningful categories which will aid in the explication of data (91). Under ideal circumstances, recording will involve more than one judge, so that the coding of each specific unit can be examined for reliability, and sources of disagreement can be identified and corrected. There is a difference between inter-rater reliability and assuring that an individual element is coded reliably (91). Stewart (1990:111)(91) concludes that in most focus group projects general rater reliability is more important because the emphasis is on general themes rather than specific units. Data making tends to be the most time consuming stage of content analysis; the reason being that data making occurs after the observation, in contrast to survey research where data making occurs prior to observation.

For this research study a tested structured interview schedule (Addendum B) was used. The data were transcribed, using the structured interview schedule as outline. For both clinics all the responses of all the groups within an age category were grouped together. Each response given was coded in order to relate it to the specific group within which it had been generated. All six age categories were listed in table format next to each other. With this method of transcription all the similar and different responses could easily be identified between age groups and between clinics to aid in the description and discussion of the data. Response categories were created in order to assemble the data. Two independent specialists in the field of nutrition (registered dietitians) were asked to code the data according to the specified categories. The coding was checked by the researcher, and the outcome was very similar to that done by the two specialists. It can be concluded that the inter-rater reliability seemed to be high. Where differences in opinion occurred (in a very few cases), the researcher and study leader (both specialists in the field of nutrition) made a final decision on the allocation of the data to a particular unit.

② **DATA REDUCTION**

Miles & Huberman (1994:10) (89) refer to data reduction as " the process of selecting, focusing, simplifying, abstracting, and transforming data that appear in written-up field notes or transcriptions". Data reduction is not a once-only step, and should rather happen throughout the research process. It starts with the researcher making choices on the conceptual framework, the research questions, the methods and making summaries. It can be regarded as part of the analysis (81, 89). "It is a form of analysis that sharpens, sorts, focuses, discards and organizes data in such a way that "final conclusions" can be drawn and verified." Methods involved in data reduction include selection, summary, paraphrasing, subsuming under a larger pattern, etc. (89).

In this research study data reduction was partly achieved by the detailed documentation of all the transcribed interviews, and secondly by the creation of the categories for coding (see Figure 15 in Chapter 8).

③ **INFERENCE**

To justify any inferences from the data, some knowledge or empirical evidence about the connections between data and what is to be inferred from them, is essential. This knowledge serves to place data in a suitable context (81). In order to effectively draw conclusions and take action, it is necessary to have a data display, which is an organized, compressed assembly of information (89). According to Miles & Huberman (1994:11)(89) better data displays (graphs, matrixes, charts, etc.) are a major avenue to valid qualitative analysis.

In this research study tables were used to display the data in the reduced form. The tables used showed the different units of analysis in relation to the age-category samples. The responses from the two clinics (Makapanstad and Mathibestad) were simultaneously compared by means of frequencies per clinic.

④ **ANALYSIS**

Analysis concerns the identification and representation of patterns that are noteworthy, statistically significant, accounting for or descriptive of the content analysis results (81). The specific types of analysis that might be used will depend on the purpose of the research. Basically any analytical tool may be used; from simple descriptive analysis to multivariate associative techniques. Much of the content analysis that occurs in the context of focus group data tends to be descriptive. Focus group data are usually amenable to the most sophisticated quantitative analysis (91). It is common for focus group data to be used for the purpose of developing hypotheses that then are tested or validated with other types of research. Focus group results also need to be validated, usually with additional focus group data or other methods such as survey research or formal experiments (91).

For this research study the analysis of data was done within the units as identified when data making took place. The analysis was organized in terms of the six sampling units. The identified topics / themes delineated the context within which the data reduction was done for each of the six sampling units. For each of the identified topics/themes all the relevant RU's were identified and discussed, themes and context were identified and explored, and the essences revealed within these data sets were strengthened by means of ethnographic descriptions (see Table 67, Chapter 8). The data were simultaneously displayed and discussed.

⑤ **VALIDATION**

The meanings from the data have to be tested for validity. The whole process also needs to be well documented to refine the methods used and to make them generally more usable by others (89).

⑥ **TESTING FOR CORRESPONDENCE WITH OTHER METHODS**

During the discussion and exploration of the topics/themes, findings were substantiated from the literature, as well as from the qualitative results on the study group.

⑦ **TESTING HYPOTHESES REGARDING OTHER DATA**

Not applicable for this research (81).

6.3 VALIDITY AND RELIABILITY OF MEASURING INSTRUMENTS

Within the qualitative research paradigm the same reliability and validity issues are of importance as in all scientific measurement. Perfect reliability and validity are the ideal, but difficult to accomplish. As stated previously, reliability deals with the dependability and consistency of an indicator, while validity is concerned with the actual meaning of an indicator (73) (see Chapter 5 for the discussion on reliability and validity).

6.3.1 RELIABILITY

In this research study the following measures were implemented to improve the reliability of the measures used:

- clear, well defined conceptual definitions were used,
- all the measuring instruments were pretested for understandability, applicability and clarity,
- the two moderators / interviewers evaluated the measuring instruments with reference to the level of difficulty and the understandability,
- the focus group interview schedule was tested twice before the actual research study took place — once in the development phase of the interview schedule and once during the training,
- multiple indicators were introduced for evaluating the different practices by means of different questions / probes concerning similar content in the different SU's,
- only one specific moderator / interviewer from the same ethnical group, and who was living in the same area, was used per clinics in order to achieve a high level of confidence with the mothers/caregivers,
- an moderator / interviewer was exclusively used per clinic, with no contact whatsoever between them. There was thus less chance for misinterpretations and prejudice,
- the moderators / interviewers were trained thoroughly on the research procedures,
- confidentiality was ensured by means of a formal consent form,
- the researcher never conveyed her own opinion, attitudes or beliefs to the mothers/caregivers or to the moderators / interviewers,
- leading questions were as far as possible avoided,
- an independent specialist was used to verify the translations and quality of the data produced by the two moderators / interviewers,
- during the content analysis phase, two independent coders were used to record data into the relevant data categories,
- the data categories created for the recording of the data were clearly specified with clear instructions as to the specific information required in order to ensure the correct construct being coded (73, 74, 86).

6.3.2 VALIDITY

In this research study the following measures were implemented to improve the content validity

- a thorough review of the literature was done concerning the causes and effects malnutrition, the feeding practices of infants and small children, as well as the knowledge component involved and the attitudes towards these issues,
- concepts were defined explicitly in terms of their meaning for this research study in order to prevent any misinterpretations,
- all the measuring instruments were approved by specialists in the field of nutrition,
- instruments were chosen to incorporate each aspect of all the studied concepts (73, 74, 86).

PART 3

RESULTS AND DISCUSSION

CHAPTER 7

QUANTITATIVE RESEARCH RESULTS

PART 3 RESULTS AND DISCUSSION

Chapter 7 will deal with the quantitative results and Chapter 8 and 9 will deal with the qualitative results. The recommendations and conclusions will be presented in Chapter 10. The quantitative and qualitative results on the two clinics will be presented and discussed comparatively. Due to assumed socio-economic differences the two clinics (Makapanstad and Mathibestad) were chosen. Both were non-urban areas situated in the Moretele district in the Hammanskraal area outside Pretoria. The Mathibestad area clinic was approximately 30 kilometres outside the Hammanskraal town area and the Makapanstad area clinic was situated approximately 10 kilometres further in the more rural area of the same district.

CHAPTER 7 QUANTITATIVE RESEARCH RESULTS

"We have to interpret our data in order to analyse it. But analysis can go beyond interpretation. We can try to create conceptual tools to classify and compare the important or essential features of the phenomena we are studying. This involves a process of abstracting from the immense detail and complexity of our data those features which are most salient for our purpose" (Dey, 1993:94)(92).

7.1 DESCRIPTION OF THE STUDY GROUP

The study group consisted of two groups of children (N=174), aged naught to 36 months of age , from two different clinics in the Moretele district / Hammanskraal area. The chosen clinics were the Makapanstad clinic (n = 85) and the Mathibestad clinic (n = 89) respectively. The children were allocated to different study subgroups according to their ages. Six age categories were identified according to the set phases (10) where diet changes typically occur, namely:

Group 1: 0-3 months (exclusive breast feeding)
Group 2: 3-6 months (breast feeding and grains)
Group 3: 6-9 months (breast feeding, grains, soft fruits and vegetables)
Group 4: 9-12 months (breast feeding, grains, soft fruits and vegetables and meat)
Group 5: 12-24 months (breast feeding (supplement) and regular solid food)
Group 6: 24-36 months (no breast feeding, only solid food)

7.1.1 AGE, GENDER AND ETHNICITY

The age, ethnicity and sex of children in the study group are compared in Tables 28 - 33. In all the age groups (in both clinics) the most common ethnic group was the Tswana's, with a representation of at least 58.3% in each of the age categories and 71.3% (n = 124) of the total group. In most of the age groups there were more girls than boys; in the total study group 42% (n=73) were boys and 58% (n=101) were girls.

TABLE 28: ETHNICITY AND GENDER OF CHILDREN (n=30) IN THE AGE GROUP 0-3 MONTHS

AGE CATEGORY: 0-3 MONTHS							
		CLINICS					
		MAKAPANSTAD (n=13)		MATHIBESTAD (n=17)		TOTAL (n=30)	
		n	%	n	%	n	%
ETHNICITY	Tswana	10	76.9	10	58.8	20	66.7
	Northern-Sotho	0	0	0	0	0	0
	Venda	0	0	0	0	0	0
	Southern-Sotho	0	0	0	0	0	0
	Pedi	1	7.7	0	0	1	3.3
	Xhosa	1	7.7	0	0	1	3.3
	Shangaan	1	7.7	6	35.3	7	23.3
	Zulu	0	0	0	0	0	0
	Ndebele	0	0	1	5.9	1	3.3
GENDER	Boys	7	53.8	7	41.2	14	46.7
	Girls	6	46.2	10	58.8	16	53.3

TABLE 29: ETHNICITY AND GENDER OF CHILDREN (n=25) IN THE AGE GROUP 3.1 - 6 MONTHS

AGE CATEGORY: 3.1-6 MONTHS							
		CLINICS					
		MAKAPANSTAD (n=13)		MATHIBESTAD (n=12)		TOTAL (n=25)	
		n	%	n	%	n	%
ETHNICITY	Tswana	9	69.2	7	58.3	16	64.0
	Northern-Sotho	1	7.7	0	0	1	4.0
	Venda	1	7.7	0	0	1	4.0
	Southern-Sotho	0	0	0	0	0	0
	Pedi	1	7.7	3	25.0	4	16.0
	Xhosa	0	0	0	0	0	0
	Shangaan	0	0	1	8.3	1	4.0
	Zulu	0	0	1	8.3	1	4.0
	Ndebele	1	7.7	0	0	1	4.0
GENDER	Boys	5	38.5	7	58.3	12	48.0
	Girls	8	61.5	5	41.7	13	52.0

TABLE 30: ETHNICITY AND GENDER OF CHILDREN (n=30) IN THE AGE GROUP 6.1 - 9 MONTHS

AGE CATEGORY: 6.1-9 MONTHS							
		CLINICS					
		MAKAPANSTAD (n=16)		MATHIBESTAD (n=14)		TOTAL (n=30)	
		n	%	n	%	n	%
ETHNICITY	Tswana	12	75.0	12	85.7	24	80.0
	Northern-Sotho	0	0	1	7.1	1	3.3
	Venda	0	0	0	0	0	0
	Southern-Sotho	0	0	0	0	0	0
	Pedi	1	6.3	1	7.1	2	6.7
	Xhosa	0	0	0	0	0	0
	Shangaan	2	12.5	0	0	2	6.7
	Zulu	0	0	0	0	0	0
	Ndebele	1	6.3	0	0	1	3.3
GENDER	Boys	9	56.3	6	42.9	15	50.0
	Girls	7	43.7	8	57.1	15	50.0

TABLE 31: ETHNICITY AND GENDER OF CHILDREN (n=27) IN THE AGE GROUP 9.1 - 12 MONTHS

AGE CATEGORY: 9.1-12 MONTHS							
		CLINICS					
		MAKAPANSTAD (n=11)		MATHIBESTAD (n=16)		TOTAL (n=27)	
		n	%	n	%	n	%
ETHNICITY	Tswana	8	72.7	10	62.5	18	66.7
	Northern-Sotho	0	0	1	6.3	1	3.7
	Venda	0	0	0	0	0	0
	Southern-Sotho	0	0	1	6.3	1	3.7
	Pedi	0	0	1	6.3	1	3.7
	Xhosa	0	0	0	0	0	0
	Shangaan	2	18.2	2	12.5	4	14.8
	Zulu	0	0	1	6.3	1	3.7
	Ndebele	1	9.1	0	0	1	3.7
GENDER	Boys	4	36.4	6	37.5	10	37.0
	Girls	7	63.6	10	62.5	17	63.0

TABLE 32: ETHNICITY AND GENDER OF CHILDREN (n=37) IN THE AGE GROUP 12.1 - 24 MONTHS

AGE CATEGORY: 12.1-24 MONTHS							
		CLINICS					
		MAKAPANSTAD (n=20)		MATHIBESTAD (n=17)		TOTAL (n=37)	
		n	%	n	%	n	%
ETHNICITY	Tswana	18	90.0	13	76.5	31	83.8
	Northern-Sotho	2	10.0	2	11.8	4	10.8
	Venda	0	0	0	0	0	0
	Southern-Sotho	0	0	0	0	0	0
	Pedi	0	0	0	0	0	0
	Xhosa	0	0	0	0	0	0
	Shangaan	0	0	2	11.8	2	5.4
	Zulu	0	0	0	0	0	0
	Ndebele	0	0	0	0	0	0
GENDER	Boys	10	50.0	3	17.6	13	35.1
	Girls	10	50.0	14	82.4	24	64.9

TABLE 33: ETHNICITY AND GENDER OF CHILDREN (n=25) IN THE AGE GROUP 24.1 - 36 MONTHS

AGE CATEGORY: 24.1-36 MONTHS							
		CLINICS					
		MAKAPANSTAD (n=12)		MATHIBESTAD (n=13)		TOTAL (n=25)	
		n	%	n	%	n	%
ETHNICITY	Tswana	7	58.3	8	61.5	7	60.0
	Northern-Sotho	3	25.0	1	7.7	4	16.0
	Venda	0	0	0	0	0	0
	Southern-Sotho	0	0	0	0	0	0
	Pedi	2	16.7	0	0	2	8.0
	Xhosa	0	0	0	0	0	0
	Shangaan	0	0	4	30.8	4	16.0
	Zulu	0	0	0	0	0	0
	Ndebele	0	0	0	0	0	0
GENDER	Boys	5	41.7	4	30.8	9	36.0
	Girls	7	58.3	9	69.2	16	64.0

7.1.2 ADULT RESPONSIBLE FOR THE CHILD

The children in the study group were most often accompanied by their own mothers (see Table 34).

TABLE 34: COMPARISON OF THE DIFFERENT ESCORTS OF THE CHILDREN IN THE VARIOUS AGE GROUPS (N=174) IN THE TWO CLINICS

AGE CATEGORIES OF CHILDREN (MONTHS)		ESCORT OF THE CHILD (N=174)							
		MOTHERS		TOTAL MOTHERS		CAREGIVERS		TOTAL CAREGIVERS	
		n	%	n	%	n	%	n	%
0 - 3	✳n=13 #n=17	13 16	100.0 94.1	29	96.7	0 1	0.0 5.9	1	3.3
3.1 - 6	n=13 n=12	13 10	100.0 83.3	23	92.0	0 2	0 16.7	2	8.0
6.1 - 9	n=16 n=14	14 12	87.5 85.7	26	86.7	2 2	12.5 14.3	4	13.3
9.1 - 12	n=11 n=16	9 13	81.8 81.3	22	81.5	2 3	18.2 18.7	5	18.5
12.1 - 24	n=20 n=17	18 12	90.0 70.6	30	81.1	2 5	10.0 29.4	7	18.9
24.1 - 36	n=12 n=13	8 10	66.7 76.9	18	72.0	4 3	33.3 23.1	7	28.0
TOTAL				148	85.1			26	14.9

DIFFERENTIATED BY CLINIC: ✳MAKAPANSTAD #MATHIBESTAD

The results showed that most mothers (85.1%,n=148) took their own children to the clinic. Most of the children (73.1%, n=19) who went with caregivers were from the older age groups (from nine months to three years), and few of the young babies (26.9%, n=7) (from naught to nine months) went with caregivers.

TABLE 35: COMPARISON OF THE DIFFERENT PERSONS RESPONSIBLE FOR CARING OF THE CHILDREN IN THE VARIOUS AGE GROUPS (N=174) IN THE TWO CLINICS

AGE CATEGORIES OF CHILDREN (MONTHS)		PERSONS INVOLVED IN CHILD CARE (N=174)					
		MOTHER	FAMILY MEMBERS				INDEPENDENT CAREGIVERS
			GRANDMOTHER	BROTHER	SISTER	OTHER ADULT	
0 - 3	✳n=13 #n=17	11 16	1 0	0 0	0 0	1 0	0 1
3.1 - 6	n=13 n=12	12 9	0 2	0 0	0 1	1 0	0 0
6.1 - 9	n=16 n=14	13 11	2 2	0 0	0 0	1 0	0 1
9.1 - 12	n=11 n=16	10 12	0 1	0 1	0 1	1 1	0 0
12.1 - 24	n=20 n=17	16 11	2 4	0 0	0 0	2 1	0 1
24.1 - 36	n=12 n=13	8 9	3 3	0 0	0 0	0 1	1 0
TOTAL PER CLINIC	n=85 n=89	70 68	8 12	0 1	0 2	6 3	1 3
TOTAL GROUP	N=174 %	138 79.3	20 11.5	1 0.6	2 1.1	9 5.2	4 2.3

DIFFERENTIATED BY CLINIC : ✳MAKAPANSTAD #MATHIBESTAD

The person responsible for taking care (feeds, dresses, baths, etc.) of the child, is shown in Table 35. Similar to the escort of the children, the persons taking care of the children were mostly their own mothers (79.3%, n=138). No fathers were involved in the caring of children. Caregivers usually were other family members, mostly grandmothers (n=20, 11.5%). Very few independent caregivers (2.3%, n=4) were involved in child care.

7.1.3 FEEDING PRACTICES

The types of feeds that each child received at the time of the research are reported in Table 36.

TABLE 36: COMPARISON OF THE DIFFERENT FEEDS IN THE VARIOUS AGE GROUPS (N=174) IN THE TWO CLINICS

TYPE OF FEED	CLINICS AND AGE CATEGORIES (months)												
	MAKAPANSTAD (n = 85)						MATHIBESTAD (n = 89)						TOT (N = 174)
	0-3 n=13	3.1-6 n=13	6.1-9 n=16	9.1-12 n=11	12.1-24 n=20	24+ n=12	0-3 n=17	3.1-6 n=12	6.1-9 n=14	9.1-12 n=16	12.1-24 n=17	24+ n=13	
EXCLUSIVE BF	7	0	1	0	0	0	10	0	0	0	0	0	18 *10.4%*
BF + BT	2	0	0	0	0	0	0	1	0	0	0	0	3 *1.7%*
EXCLUSIVE BT	0	0	0	0	0	0	0	0	0	0	0	0	0 *0%*
BF + SF	4	5	12	8	13	0	6	8	7	14	5	0	82 *47.1%*
BT + SF	0	1	0	1	4	0	0	1	1	1	5	0	14 *8.1%*
BF + BT+ SF	0	7	3	2	2	0	1	2	6	1	3	0	27 *15.5%*
SF + CM	0	0	0	0	0	9	0	0	0	0	2	0	11 *6.3%*
SF	0	0	0	0	1	3	0	0	0	0	2	13	19 *10.9%*

BF = breast feeding BT = bottle feeding SF = solid food CM = cow's milk in a mug

The type of feed reported most frequently in both clinics was breast feeding with solid food (49.4%, n=42 in Makapanstad and 44.9%, n=40 in Mathibestad). Feeding practices least reported in both clinics was that of exclusive bottle feeding (0%, n=174). In the study as a whole (74.7%, n=130) of all the children were still being breast fed at the time of the research and 25.3% (n=44) received bottle feeding in some form. Exclusive breast feeding was only reported in the 0-3/12 age category and by one group in the 7-9/12 category. If exclusive breast feeding was not practised in the 0-3/12 age group, breast feeding was usually combined with solid food (n=10) and only one group reported combining it with bottle feeding. A combination of breast feeding and bottle feeding was seldomly used (n=3, 1.7%) and only in the 0-3/12 and 4-6/12 age groups. Bottle feeding, combined with solid food, was also not very commonly used, and if at all, only in the children older than three months. The combination of breast feeding, bottle feeding and solid food was the second most popular feeding regime used in these communities, occurring in all the age categories, except the 25-36/12 group who obviously did not need bottle feeding any more. Solid food alone

or combined with cow's milk was only given in the older age groups; mainly in the 25-36/12 groups (n=25).

The types of milk used as part of bottle feeding is presented in Table 37. Formula feeds were most popular among mothers practising bottle feeding (74.4%; n=32).

TABLE 37: COMPARISON OF THE DIFFERENT BOTTLE FEEDING PRACTICES OF THE CHILDREN IN THE VARIOUS AGE GROUPS (N=174) IN THE TWO CLINICS

AGE CATEGORIES OF CHILDREN (MONTHS)		TYPE OF BOTTLE MILK		
		FORMULA n=15* n=17#	OTHER POWDER MILK n=6* n=4#	FRESH COW'S MILK n=1* n=0#
0 - 3	*n=13 *#n=17*	2 *1*	0 *0*	0 *0*
3.1 - 6	n=13 *n=12*	8 *4*	0 *0*	0 *0*
6.1 - 9	n=16 *n=14*	2 *6*	1 *1*	0 *0*
9.1 - 12	n=11 *n=16*	2 *1*	1 *0*	0 *0*
12.1 - 24	n=20 *n=17*	1 *5*	4 *3*	1 *0*
24.1 - 36	n=12 *n=13*	0 *0*	0 *0*	0 *0*
TOTAL: %	n=85 *n=89*	68.2 *81.0*	27.3 *19.0*	4.5 *0*

DIFFERENTIATED BY CLINIC: *MAKAPANSTAD *#MATHIBESTAD*

TABLE 38: COMPARISON OF THE DIFFERENT AGES FOR INTRODUCTION OF SOLID FOOD IN THE TWO CLINICS (N=154)

AGE FOR SOLID FOOD INTRODUCTION	CLINICS					
	MAKAPANSTAD (n=76)		MATHIBESTAD (n=78)		BOTH (n=154)	
	n	%	n	%	n	%
1 - 2 months	22	29.0	11	14.1	33	21.4
3 months	41	54.0	60	76.9	101	65.6
4 months	13	17.0	4	5.1	17	11.0
5 months	0	0	1	1.3	1	0.7
6 months	0	0	2	2.6	2	1.3

The introduction of solid food in the diets of the children occurred at a fairly early age (Table 38). Solid foods were introduced to the largest part of the study group (87%, n=134) before the recommended age of four to six months. Only 13% (n=20) started on solid foods at the recommended age. By four months of age most of the children in this study group (98.1%, n=151) were already eating solid food. The reasons mentioned most frequently for the introduction of solid foods were that the mother did not have enough milk to satisfy the baby (45.8%, n=70), that the baby was crying (22.9%, n=35), and that the mother did not cope

well with breast feeding (13.1%, n=20). Crying as such is not a reason for solid food introduction, but it could be interpreted as the mother not having enough milk. When asked to explain the mothers replied that the baby cried a lot when breast fed. They assumed that the breast milk alone appeared not to satisfy the hunger and therefore they introduced solid food into the child's diet to complement the breast feeding. When this was done, the child usually cried less and the problem was solved. If this line of thought is pursued, the number of mothers / caregivers indicating the reason of not having enough milk, increased to 68.6% (n=105). Other reasons mentioned less often included that the child was old enough (2.0%); the child refused the breast (0.7%); the mother had to go back to school (5.9%); a sick mother (5.2%); the mother had to go back to work (5.2%); cultural reasons (0.7%); the mother was working with sick people that contaminated her milk (0.7%); and no specific reason (1.7%).

7.1.4 BIOGRAPHIC PROFILE OF THE MOTHER

The age distribution of the mothers of the children in the study group is presented in Table 39.

TABLE 39: COMPARISON OF THE AGE DISTRIBUTION OF MOTHERS AND THEIR CHILDREN IN THE VARIOUS AGE GROUPS (N=173) IN THE TWO CLINICS

AGE CATEGORIES OF MOTHERS (YEARS)	AGE CATEGORIES OF CHILDREN (MONTHS)													
	0-3		3.1-6		6.1-9		9.1-12		12.1-24		24.1-36		TOTAL	
	n	%	n	%	n	%	n	%	n	%	n	%	N=173	%
< 20	*8 #1	61.5 5.9	5 0	38.4 0	3 3	18.8 21.4	0 2	0 12.5	7 3	35.0 17.6	0 0	0 0	23 9	13.29 5.20
20-24	2 8	15.4 47.1	2 4	15.4 33.3	2 3	12.5 21.4	4 6	36.4 37.5	4 6	20.0 35.3	2 7	16.7 53.8	16 34	9.25 19.65
25-29	1 3	7.7 17.7	3 5	23.1 41.7	5 2	31.2 14.3	4 3	36.4 18.8	4 5	20.0 29.4	2 4	16.7 30.8	19 22	10.98 12.72
30-34	1 1	7.7 5.9	1 2	7.7 16.7	2 1	12.5 7.1	1 2	9.1 12.5	3 0	15.0 0	2 1	16.7 7.7	10 7	5.78 4.05
> 34	1 4	7.7 23.5	2 1	15.4 8.3	4 5	25.0 35.7	2 3	18.2 18.8	2 2	10.0 11.8	6 1	50.0 7.7	17 16	9.83 9.25

DIFFERENTIATED BY CLINIC : * MAKAPANSTAD # *MATHIBESTAD*

Most of the very young mothers (<20 years) were from the Makapanstad area and most of the mothers aged 20-24 years were from the Mathibestad area. If these two age categories are considered together, the number of mothers involved from each of the two clinics were approximately the same (Makapanstad area: 22.54%,n=39 versus Mathibestad area: 24.85%, n=43). In each of the older age categories of mothers (25-29, 30-34, >34 years) an equal number of mothers were involved from each of the two clinics (see Table 39). Most of the mothers of the children in the study group were younger than 30 years (71.1%, n=123). None of the mothers that were younger than 20 years (n=32) had any children in the 24 - 36 month age category. Quite a number of them (31.3%, n=10) though had children between 12 - 24 months, indicating that some were pregnant as young as 18 years of age. The parity of the mothers is compared between clinics in Table 40.

TABLE 40: COMPARISON BETWEEN THE TWO CLINICS OF THE POSITION OF THE STUDIED CHILD (N=174) RELATIVE TO SIBLING AGES

	CLINICS					
	MAKAPAN-STAD		MATHIBE-STAD		TOTAL	
	n	%	n	%	N	%
STUDIED CHILD'S POSITION	**n=85**		**n=89**		**n=174**	
First	36	42.35	38	42.70	74	42.53
Second	22	25.88	31	34.83	53	30.46
Third	11	12.94	8	8.99	19	10.92
Fourth	6	7.06	9	10.11	15	8.62
Fifth	3	3.53	1	1.12	4	2.30
Sixth	7	8.24	2	2.25	9	5.17
THE OLDER CHILD'S AGE	**n=85**		**n=88**		**n=173**	
No older child	36	42.35	39	44.32	75	43.35
9-12 months	3	3.53	1	1.14	4	2.31
12-24 months	1	1.18		0	1	0.58
24-36 months	3	3.53	7	7.95	10	5.78
36-48 months	9	10.59	4	4.55	13	7.51
48-60 months	7	8.24	9	10.23	16	9.25
60+ months	26	30.59	27	30.68	53	30.64
Don't know		0	1	1.14	1	0.58
THE YOUNGER CHILD'S AGE	**n=85**		**n=89**		**n=174**	
No younger child		96.47		97.75	169	97.13
0-6 months		1.18		2.25	3	1.78
6-12 months		2.35		0	2	1.15

The results indicated that most of the children (43.35%, n=75) in the study group were the youngest in the family. Of these only 2.93% (n=5) did have a younger sibling as well. Most of the children (n=146, 83.91%) were the first, second or third child in the family, and only 16.09% (n=28) of the children were the fourth, fifth or sixth child. It can be concluded that in this study group there were fewer large families, with most families having only one (n=74, 42.53%) or two (n=53, 30.46%) children. This might indicate that better child spacing was occurring (with reference to the number of children per mother).

The educational level of the mothers is summarized in Table 41. This research study was conducted before the new grade system was introduced into schools. The results will therefore be presented according to the previous system.

TABLE 41: COMPARISON OF THE QUALIFICATIONS OF THE MOTHERS OF THE CHILDREN IN THE TWO CLINICS (N=174).

HIGHEST QUALIFICATION ACHIEVED	CLINICS					
	MAKAPANSTAD (n=85)		MATHIBESTAD (n=89)		TOTAL (N=174)	
	n	%	n	%	n	%
Post matric qualification	0	0	1	1.12	1	0.6
Standard 10 (matric)	21	24.71	35	39.33	56	32.2
Standard 9	14	16.47	6	6.74	20	11.5
Standard 8	19	22.35	9	10.11	28	16.1
Standard 7	8	9.41	10	11.24	18	10.3
Standard 6	11	12.94	11	12.36	22	12.6
Standard 5	6	7.06	6	6.74	12	6.9
Standard 4	2	2.35	2	2.25	4	2.3
Standard 3	3	3.53	0	0	3	1.7
Standard 2	1	1.18	1	1.12	2	1.2
Standard 1	0	0	1	1.12	1	0.6
Grade 1	0	0	1	1.12	1	0.6
No schooling	0	0	5	5.62	5	2.9
Don't know (unknown)	0	0	1	1.12	1	0.6

Although only one mother had a post matric qualification, a large number of the mothers (32.2%, n=56) had matriculated. The occupations of the mothers according to their own perceptions are summarized in Table 42.

TABLE 42: COMPARISON OF THE OCCUPATIONS OF THE MOTHERS OF THE CHILDREN IN THE TWO CLINICS (N=174).

OCCUPATIONS	CLINICS					
	MAKAPANSTAD (n=85)		MATHIBESTAD (n=89)		TOTAL (N=174)	
	n	%	n	%	n	%
Housewife	69	81.18	1	1.12	70	40.2
Going to school	9	10.59	11	12.36	20	11.5
Teacher	0	0	4	4.49	4	2.3
Shop assistant	0	0	1	1.12	1	0.6
Cashier	1	1.18	1	1.12	2	1.1
Domestic worker	2	2.35	3	3.37	5	2.9
Going to school next year	0	0	1	1.12	1	0.6
Factory worker	2	2.35	5	5.62	7	4
Soldier	0	0	1	1.12	1	0.6
Day care	1	1.18	0	0	1	0.6
Garage - petrol pump assistant	1	1.18	0	0	1	0.6
Looking for work	0	0	11	12.36	11	6.3
Unemployed	0	0	50	56.18	50	28.7

Few of the mothers were working; as a whole only 12.6% (n=22) of the study group was working. Some mothers were still at school (12.1%, n=21) and therefore not able to work.

7.1.5 PROFILE OF THE FAMILY

Mothers who visited the Makapanstad clinic were mostly (87.1%, n=74) living in one area, namely the Makapanstad area. Maseding (3.5%, n=3), Mothlabaneng (2.4%, n=2) and Maropeng (2.4%, n=2) were the other residential areas mentioned most frequently. Mothers who visited the Mathibestad clinic were coming from various areas. The areas mentioned mostly were Machidi (30.3%, n=27), Ramogoga (14.6%, n=13), Lefatlheng (14.6%, n=13), Lesoaneng (9.0%, n=8) and Bochabelo (7.9%, n=7).

The size of the family that lived together is reported in Table 43. The results did not reveal any particular pattern between the ages of the children and the family size.

TABLE 43: COMPARISON OF THE FAMILY SIZE OF THE STUDIED CHILDREN IN THE VARIOUS AGE GROUPS (N=174) IN THE TWO CLINICS

AGE CATEGORIES OF CHILDREN (MONTHS)		FAMILY SIZE - NUMBER OF MEMBERS				
		2	3 - 5	6 - 10	11 - 15	>15
0 - 3	*n=13 *#n=17*	0 *1*	6 *5*	6 *10*	1 *1*	0 *0*
3.1 - 6	n=13 *n=12*	0 *0*	3 *1*	10 *11*	0 *0*	0 *0*
6.1 - 9	n=16 *n=14*	0 *0*	4 *4*	11 *10*	1 0	0 *0*
9.1 - 12	n=11 *n=16*	0 *0*	4 *3*	6 *11*	1 *1*	0 *1*
12.1 - 24	n=20 *n=17*	0 *0*	8 *4*	10 *10*	2 *3*	0 *0*
24.1 - 36	n=12 *n=13*	0 *0*	6 *5*	5 *7*	1 *0*	0 *1*
TOTAL / CLINIC	n=85 *n=89*	0 *1*	31 *22*	48 *59*	6 *5*	0 *2*
TOTAL / GROUP	N=174 %	1 0.6	53 30.5	107 61.5	11 6.3	2 1.1

DIFFERENTIATED BY CLINIC: *MAKAPANSTAD *#MATHIBESTAD*

The family size of six to ten people living together was found most commonly in both the clinics: 56.5% (n=48) in Makapanstad, 66.3% (n=59) in Mathibestad, and 61.5% (n=107) in the total study group. The total number of people living together was reported as 1209 people for the 174 households in the study group; an average of 6.9 people per family living together. The composition of the people living together was mostly that of the closest family members, including husbands, own children, parents, grandparents, other siblings and their children. The number of own children of the mothers involved in the study group was 373. This amounted to an average of 2.14 own children per mother.

TABLE 44: COMPARISON OF THE FATHERS' INVOLVEMENT (FINANCIAL CONTRIBUTION) WITH THE CHILDREN IN THE VARIOUS AGE GROUPS (N=173) IN THE TWO CLINICS

AGE CATEGORIES OF CHILDREN (MONTHS)		INVOLVEMENT OF FATHERS (N=173)			
		CLINICS		TOTAL	
		CONTRIBUTE (n)	DID NOT CONTRIBUTE (n)	CONTRIBUTE (%)	DID NOT CONTRIBUTE (%)
0 - 3	*n=13 #*n=17*	11 *16*	2 *1*	90.0	10.0
3.1 - 6	n=13 *n=12*	12 *11*	1 *1*	92.0	8.0
6.1 - 9	n=16 *n=14*	13 *12*	3 2	83.3	16.7
9.1 - 12	n=11 *n=16*	6 *14*	5 *1*	76.9	23.1
12.1 - 24	n=20 *n=17*	15 *13*	5 *4*	75.7	24.3
24.1 - 36	n=12 *n=13*	9 *9*	3 *4*	72.0	28.0
TOTAL / CLINIC	N=173 (%)	66 (77.7) *75 (85.2)*	19 (22.4) *13 (14.8)*	81.5	18.5

DIFFERENTIATED BY CLINIC: *MAKAPANSTAD *#MATHIBESTAD*

Very few of the fathers of the children were actually living with the family. Only 32.9% (n=28) of the fathers in the Makapanstad group (n=85), and 36.0% (n=32) of the fathers in the Mathibestad group (n=89) were living with their children. For the study group as a whole (N=173) only 34.5% (n=60) of the fathers lived with their families. Although most of the fathers were not living with their children, many of them were contributing financially to the family (see Table 44). Of the total group 81.5% (n=141) of the fathers were contributing money to the family. It is also evident from Table 44 that more fathers were contributing money to the younger children than to the older children.

7.1.6 DESCRIPTION OF THE MICRO ENVIRONMENT OF THE FAMILY

Individual interaction takes place within the family; leading to interrelationships with the various dimensions of the environment, including the micro, meso and macro environments (73, 93). The family exists within the micro environment. The micro environment of the family thus involves regular personal contact, objects available to them to enhance the environment, the living unit and surroundings, and lastly the physical products needed to make a living (73, 93, 94).

The housing of the study group is described in Table 45. In both areas most people (68.4%, n=119) were living in houses with five or more rooms. Bricks (81.6%, n=142) and zinc (12.1%, n=21) were used most often as building material for the houses.

TABLE 45: COMPARISON OF THE NUMBER OF ROOMS AND BUILDING MATERIALS USED FOR HOUSES, THE SOURCES OF DRINKING WATER AND AVAILABILITY OF ELECTRICITY IN THE TWO CLINICS (N=174)

DESCRIPTION OF THE HOUSE	CLINICS					
	MAKAPANSTAD (n=85)		MATHIBESTAD (n=89)		TOTAL (N=174)	
	n	%	n	%	n	%
NUMBER OF ROOMS						
Two	5	5.88	2	2.25	7	4
Three	11	12.94	8	8.99	19	10.9
Four	16	18.82	13	14.61	29	6.7
Five	53	62.35	66	74.16	119	68.4
BUILDING MATERIAL USED						
Bricks	67	78.82	75	84.27	142	81.6
Zinc	13	15.29	8	8.99	21	12.1
Clay	2	2.35	5	5.62	7	4
Mud	3	3.53	0	0	3	1.7
Bricks and clay	0	0	1	1.12	1	0.6
SOURCE OF DRINKING WATER						
Tap in the house	4	4.71	1	1.12	5	2.9
Tap outside	23	27.06	0	0	23	13.2
Borehole and pump	56	65.88	74	83.15	130	74.7
River / stream	2	2.35	2	2.25	4	2.3
Pit	0	0	1	1.12	1	0.6
Buy from tankers	0	0	11	12.36	11	6.3
ELECTRICITY						
Available in the house	29	34.12	22	24.72	51	29.5
Not available	56	65.88	66	74.16	122	70.5

Very few houses had taps available in the house for the water supply (2.9%, n=5). Most people (74.7%, n=130) got their drinking water from a borehole with a pump in close proximity of their houses. If the water source was any other than tap water, as most of the mothers / caregivers indicated, only 5.7% (n=10) said that they boiled it before using it. All the other mothers / caregivers (94.3%, n=164) said that they used the water as such.

The availability of electricity in this area was at the time of the research very low (29.5%, n=51), but during this period electricity and water were installed in the studied communities. Though some people had electricity available to them, not all of them used it for food preparation. Only 21.3% (n=37) used electricity as a fuel. The most frequently used fuel was paraffin (70.1%, n=122), and coal stoves (6.3%, n=11).

TABLE 46: COMPARISON OF THE SOURCES OF FOOD FOR THE CHILDREN IN THE TWO CLINICS (N=174)

DESCRIPTION OF THE FOOD SOURCES	CLINICS					
	MAKAPANSTAD (n=85)		MATHIBESTAD (n=89)		TOTAL (n=174)	
	n	%	n	%	n	%
Plant their own foods	0	0	1	1.12	1	0.6
Buy from a shop	74	87.06	85	95.51	159	91.4
Plant their own foods and buy from a shop	3	3.53	3	3.37	6	3.4
Buy from a shop and from a market (vendor)	8	9.41	0	0	8	4.6

The sources of food that the family used were fairly restricted (see Table 46). Food was mostly bought from the shops nearby (91.4%, n=159). Few people (4.0%, n=7) were producing some of their own food by planting vegetables, and only a few people used the vendors (4.6%, n=8).

The people responsible for the purchasing and the preparation of the food for the family varied between the caregivers and people contributing money to the family (see Table 47).

TABLE 47: COMPARISON OF THE PEOPLE RESPONSIBLE FOR FOOD PURCHASING AND PREPARATION FOR THE FAMILY IN THE TWO CLINICS (N=174).

FOOD PURCHASING AND PREPARATION	CLINICS					
	MAKAPANSTAD (n=85)		MATHIBESTAD (n=89)		TOTAL (n=174)	
	n	%	n	%	n	%
FOOD BUYER Mother	9	10.59	8	8.99	17	9.8
Caregiver	0	0	3	3.37	3	1.7
Father	23	27.06	27	30.34	50	28.7
Family member	53	74.12	50	56.18	103	59.2
Caregiver and family member	0	0	1	1.12	1	0.6
PERSON PREPARING FOOD Mother	71	83.53	68	76.40	139	79.9
Caregiver	0	0	5	5.62	5	2.9
Family member	14	16.47	16	17.98	30	17.2

The person who bought the food was usually not the same person who prepared the food for the family or who was caring for the child (see also Table 35). The mother (79.9%, n=139) was the person who most frequently prepared the food for the family. Usually the mother was also the person who was most frequently taking care of the baby (79.3%, n=138) (see Table 35). If the father was living with the family (32.9% and 36.0% in Makapanstad and Mathibestad respectively) he bought the food for the family (27.1% and 30.3% in Makapanstad and Mathibestad respectively) (see also Table 44). If the father did not buy the food, another family member usually did (29.2%, n=103). This was most likely to be the person bringing the money into the household.

7.1.7 CLINIC INVOLVEMENT

All the children attending the clinic came for a particular reason and all had a "Road to Health" chart. The frequency of visits varied according to the age of the baby/child. Babies just born, visited weekly or every second week until their six-week visit after which they were booked monthly for immunizations or weight checks. Most children attended the clinic once per month (90.6%, n=77) in Makapanstad and (89.9%,n=80) in Mathibestad. However, children additionally came to the clinic when they were sick in Makapanstad (4.7%, n=4) and (7.9%, n=7) in Mathibestad. The reasons for the clinic visit on the day of the research are summarized in Table 48.

TABLE 48: COMPARISON OF THE DIFFERENT REASONS FOR CLINIC ATTENDANCE OF THE CHILDREN IN THE VARIOUS AGE GROUPS (N=173) IN THE TWO CLINICS

AGE CATEGORIES OF CHILDREN (MONTHS)		REASONS FOR ATTENDANCE								
		IMMUNI-ZATION	SIX-WEEK VISIT	WEIGH	ADVICE	SICK CHILD	SEVEN DAY VISIT	WEIGH + ADVICE	WITH OTHER CHILD	IMMUNIZATIO N + WEIGH
0 - 3	*n=13	2	5	3	1	0	-	0	0	2
	#n=17	*4*	*3*	*5*	-	*0*	*1*	*0*	*0*	*4*
3.1 - 6	n=13	2	0	7	0	1	-	0	0	3
	n=12	*3*	*0*	*7*	-	*1*	*0*	*0*	*0*	*1*
6.1 - 9	n=16	1	0	8	0	1	-	1	0	5
	n=14	*0*	*0*	*8*	-	*2*	*0*	*1*	*0*	*3*
9.1 - 12	n=11	0	0	8	0	0	-	1	0	1
	n=16	*0*	*0*	*11*	-	*1*	*0*	*0*	*0*	*4*
12.1 - 24	n=20	3	0	10	1	3	-	2	0	1
	=17	*0*	*0*	*15*	-	*2*	*0*	*0*	*0*	*0*
24.1 - 36	n=12	2	1	0	0	3	-	0	6	0
	n=13	*0*	*0*	*0*	-	*5*	*0*	*0*	*4*	*4*
TOTAL/ GROUP	n	17	9	82	2	19	1	5	10	28
	%	9.8	5.2	47.4	1.2	11.0	0.6	2.9	5.8	16.2

DIFFERENTIATED BY CLINIC: *MAKAPANSTAD *#MATHIBESTAD*

The children were brought to the clinic mainly to be weighed (47.4%, n=82). The second most frequent reason for clinic visits was a combination of immunization and weighing (16.2%, n=28). The third most frequent reason for visits was bringing sick children for medical advice (11.0%, n=19), and fourthly for immunization only (9.8%, n=17).

7.2 ANTHROPOMETRIC EVALUATION

Standardized anthropometric techniques (see Chapter 5) were used for determining the weight, recumbent length (height) and head circumference of the children in the study group. The three most frequently used anthropometric indices were weight-for-height, height-for-age and weight-for-age (95, 96).

Gorstein et al (1994:281)(95) recommend that when the anthropometric status of a population is described, the results should always be given by age group (if the age information is accurate). Children under the age of five years are considered to be a homogenous group and generally referred to as preschool children. This may lead to major errors in the interpretation of results because the pattern of malnutrition changes as children grow older. A deficit in weight-for-height usually occurs in one to two year old children. However by the age of three to four years this deficit has often been made up but the child may remain with a deficit in height-for-age and weight-for-age (96). Also at ages less than one year, at a given height, the older child tends to be heavier (95, 96). This source of error is minimized if children are classified in fairly narrow age ranges in the first year of life (96). It is therefore recommended that data be presented in the age groups shown in Table 49.

TABLE 49: RECOMMENDED AGE GROUPS FOR THE PRESENTATION OF ANTHROPOMETRIC DATA (96)

A Highly recommended	B Recommended	C Permissible
0 - 2.99 months		
3.0 - 5.99 months	0 - 5.99 months	
6.0 - 8.99 months		
9.0 - 11.99 months	6.0 - 11.99 months	0 - 11.99 months
1.0 - 1.99 years	1.0 - 1.99 years	1.0 - 1.99 years
2.0 - 2.99 years		
3.0 - 3.99 years	2.0 - 3.99 years	
4.0 - 4.99 years		
5.0 - 5.99 years	4.0 - 5.99years	2.0 - 5.99 years
6.0 - 6.99 years		
7.0 - 7.99 years	6.0 - 7.99 years	
8.0 - 8.99 years		
9.0 - 9.99 years	8.0 - 9.99 years	6.0 - 9.99 years

The categories in column A are recommended for large groups of children (>100), but the categories in column B will be the most useful in many circumstances and the categories in column C should only be used with very small groups (96).

In this research study the age information could be regarded as accurate as the birth data was extracted from the child's "Road to Health" chart and confirmed by the mother/caregiver. The children were grouped according to a combined approach referring to the age categories mentioned in column A and B for the

assessment as such, as well as for the presentation of the results. These age groups were chosen according to the recommendations of Waterlow (1977)(96). The age categories used, with the number of children from each clinic, are shown in Table 50.

TABLE 50: AGE GROUPS FOR THE PRESENTATION OF ANTHROPOMETRIC RESEARCH RESULTS

GROUP	AGE GROUP	NUMBER OF CHILDREN INVOLVED		TOTAL
		Makapanstad area	Mathibestad area	
Group 1	0.0 - 2.99 months	13	16	29
Group 2	3.0 - 5.99 months	13	10	23
Group 3	6.0 - 11.99 months	26	27	53
Group 4	12.0 - 23.99 months	14	17	31
Group 5	24.0 - 36.00 months	10	11	21

Gorstein et al (1994:281)(95) indicate that "for the purpose of comparing the prevalence of low anthropometry data (such as "mild", "moderate", or "severe" malnutrition; "wasted" or "stunted") between different geographical areas, it is sometimes preferable to have a summary measure. One way to address this issue would be to standardize the age-specific information using a standard age distribution, which would permit reasonable comparisons to be made between populations". The anthropometric results will therefore be presented according to a "summary birth measure" which will be compared with a "summary measurement value" in the different age categories as indicated in Table 50. In order to determine a "summary birth measure" all the birth data from all the children were used. However, only children with all the birth measurements including birth age, birth weight, length and head circumference (n=157) were included in the determination of the summary measures. The reason being to include as many anthropometric measurements (length, weight and head circumference) as possible in order to characterize an infant's current status and to make inferences regarding previous and future states of wellbeing (97). Variability in the initial size of the child (e.g. birth weight) strongly affects the interpretation of attained status (97). In order to minimize the effects of different initial sizes it was statistically determined whether the initial sizes (birth data) of all the children in both clinics were similar by means of the General Linear Models Procedure. No significant difference ($P<0.05$) was found between the birth measurements of the children from the two clinics for all the age groups. Therefore the birth data were considered to be comparable for all the children in all of the age groups in both areas and subsequently their growth velocity could be expected to be on a similar growth curve. The "summary birth measure" or mean was determined separately for girls and boys for each of the clinics (see Tables 52 and 53).

In order to determine the growth curve of the children the "summary measurement value" was determined and then compared to the "summary birth measure". The "summary measurement value" or mean was determined according to the actual "current age " measurements (weight, length and head circumference) done during the data collection stage of the research. These values were used to calculate the average measurement values for each of the age groups (see Tables 52 and 53). Both the "summary birth measure" and the "summary measurement value" were used to determine the percentiles on which the

children were at birth and at the subsequent ages of growth up to 36 months of age. The height, weight and head circumference values, as well as the weight-for-height values are presented according to the percentiles of the NCHS (98), as well as the Reference data for the weight and height of children (WHO)(99). The smoothed percentile tables and the percentile graphs were used to present the data graphically. The following average ages were used to plot the data on the graph to ensure a summary value (see Table 51).

TABLE 51: AVERAGE AGES USED FOR PERCENTILE GRAPHS

GROUP	AGE GROUP	NCHS-PERCENTILE	WHO-PERCENTILE
Group 1	0.0 - 2.99 months	1.5 months	2 months
Group 2	3.0 - 5.99 months	4.5 months	4 months
Group 3	6.0 - 11.99 months	9 months	9 months
Group 4	12.0 - 23.99 months	18 months	18 months
Group 5	24.0 - 36.00 months	30 months	30 months

The results are shown in Table 52 and 53 and in Figures 38-41 for girls and boys respectively.

TABLE 52: ANTHROPOMETRIC RESULTS AND INDICATORS: GIRLS

GIRLS AGE CATEGORIES	ANTHROPOMETRIC MEASUREMENTS							
	LENGTH-Recumbent (cm) [Height-for-age]		WEIGHT (kg) [Weight-for-age]		HEAD-CIRCUMFERENCE (cm) [Head-circumference-for-age]		HEIGHT-FOR-WEIGHT	
	Makapanstad	Mathibestad	Makapanstad	Mathibestad	Makapanstad	Mathibestad	Makapanstad	Mathibestad
AGE GROUP 0: BIRTH **MEAN**	47.83	47.72	3.06	2.88	33.56	33.98	-	-
NCHS-PERCENTILE (0/12)	25	25	25	25	25	50	50	25
WHO-PERCENTILE (0/12)	20	20	40	20	-	-	30	20
AGE GROUP 1: 0-2.99 MONTHS MEAN	56.25	55.61	4.60	5.77	37.55	39.28	-	-
NCHS - PERCENTILE (graph - 1½ /12)	75	75	75	95	50	95	50	95
WHO - PERCENTILE (2/12)	40	30	50	95	-	-	50	97
AGE GROUP 2: 3.0-5.99 MONTHS MEAN	64.19	62.02	6.78	7.24	41.76	42.83	-	-
NCHS - PERCENTILE (graph - 4½ / 12)	75	50	75	90	75	90	50	90
WHO - PERCENTILE (4/12)	80	50	80	90	-	-	50	95
AGE GROUP 3: 6.0-11.99 MONTHS MEAN	70.71	62.74	8.88	8.42	45.05	42.65	-	-
NCHS - PERCENTILE (9/12)	50	<5	50	50	75	10	50	>95
WHO - PERCENTILE (9/12)	50	<3	60	40	-	-	60	>97
AGE GROUP 4: 12.0-23.99 MONTHS MEAN	73.71	70.86	9.60	10.22	46.31	44.50	-	-
NCHS - PERCENTILE (18/12)	<5	<<5	10	25	25	5	75	95
WHO - PERCENTILE (18/12)	<3	<<3	20	30	-	-	70	97
AGE GROUP 5: 24.0-36.00 MONTHS MEAN	89.63	87.56	12.92	12.10	48.88	45.63	-	-
NCHS - PERCENTILE (30/12)	25	10	50	25	50	<5	75	50
WHO - PERCENTILE (30/12)	30	10	50	30	-	-	70	50

- = no percentiles available
< = below the percentile
<< = far below the percentile

TABLE 53: ANTHROPOMETRIC RESULTS AND INDICATORS: BOYS

BOYS AGE CATEGORIES	ANTHROPOMETRIC MEASUREMENTS							
	LENGTH-Recumbent (cm) [Height-for-age]		WEIGHT (kg) [Weight-for-age]		HEAD-CIRCUMFERENCE (cm) [Head-circumference-for-age]		HEIGHT-FOR-WEIGHT	
	Makapanstad	Mathibestad	Makapanstad	Mathibestad	Makapanstad	Mathibestad	Makapanstad	Mathibestad
AGE GROUP 0: BIRTH								
MEAN	**48.20**	**47.57**	**2.99**	**2.89**	**34.30**	**34.57**	-	-
NCHS-PERCENTILE (0/12)	**25**	**10**	**25**	**25**	**25**	**50**	**25**	**50**
WHO-PERCENTILE (0/12)	**20**	**10**	**20**	**20**	-	-	**30**	**20**
AGE GROUP 1: 0-2.99 MONTHS								
MEAN	54.75	51.57	4.17	5.17	38.23	37.79	-	-
NCHS - PERCENTILE (graph - 1½ /12)	25	5	25	75	50	50	50	>95
WHO - PERCENTILE (2/12)	10	<3	10	50	-	-	50	>97
AGE GROUP 2: 3.0-5.99 MONTHS								
MEAN	66.60	57.13	7.39	7.56	42.70	42.75	-	-
NCHS - PERCENTILE (graph - 4½ / 12)	75	<5	75	75	50	50	25	>95
WHO - PERCENTILE (4/12)	90	<3	80	80	-	-	30	>97
AGE GROUP 3: 6.0-11.99 MONTHS								
MEAN	70.04	66.85	7.92	9.29	45.01	43.15	-	-
NCHS - PERCENTILE (9/12)	25	5	10	50	25	5	25	95
WHO - PERCENTILE (9/12)	20	<3	10	50	-	-	20	97
AGE GROUP 4: 12.0-23.99 MONTHS								
MEAN	75.71	65.33	8.74	10.40	46.40	43.17	-	-
NCHS - PERCENTILE (18/12)	5	<<5	<<5	25	5	<<5	10	>>95
WHO - PERCENTILE (18/12)	<3	<<3	<3	20	-	-	5	97
AGE GROUP 5: 24.0-36.0 MONTHS								
MEAN	87.20	85.67	12.42	13.00	52.00	49.33	-	-
NCHS - PERCENTILE (30/12)	5	5	25	25	95	25	50	90
WHO - PERCENTILE (30/12)	5	3	20	30	-	-	50	80

- = no percentiles available
< = below the percentile
<< = far below the percentile

GIRLS: BIRTH TO 36 MONTHS
PHYSICAL GROWTH
NCHS PERCENTILES

NAME _____ RECORD # _____

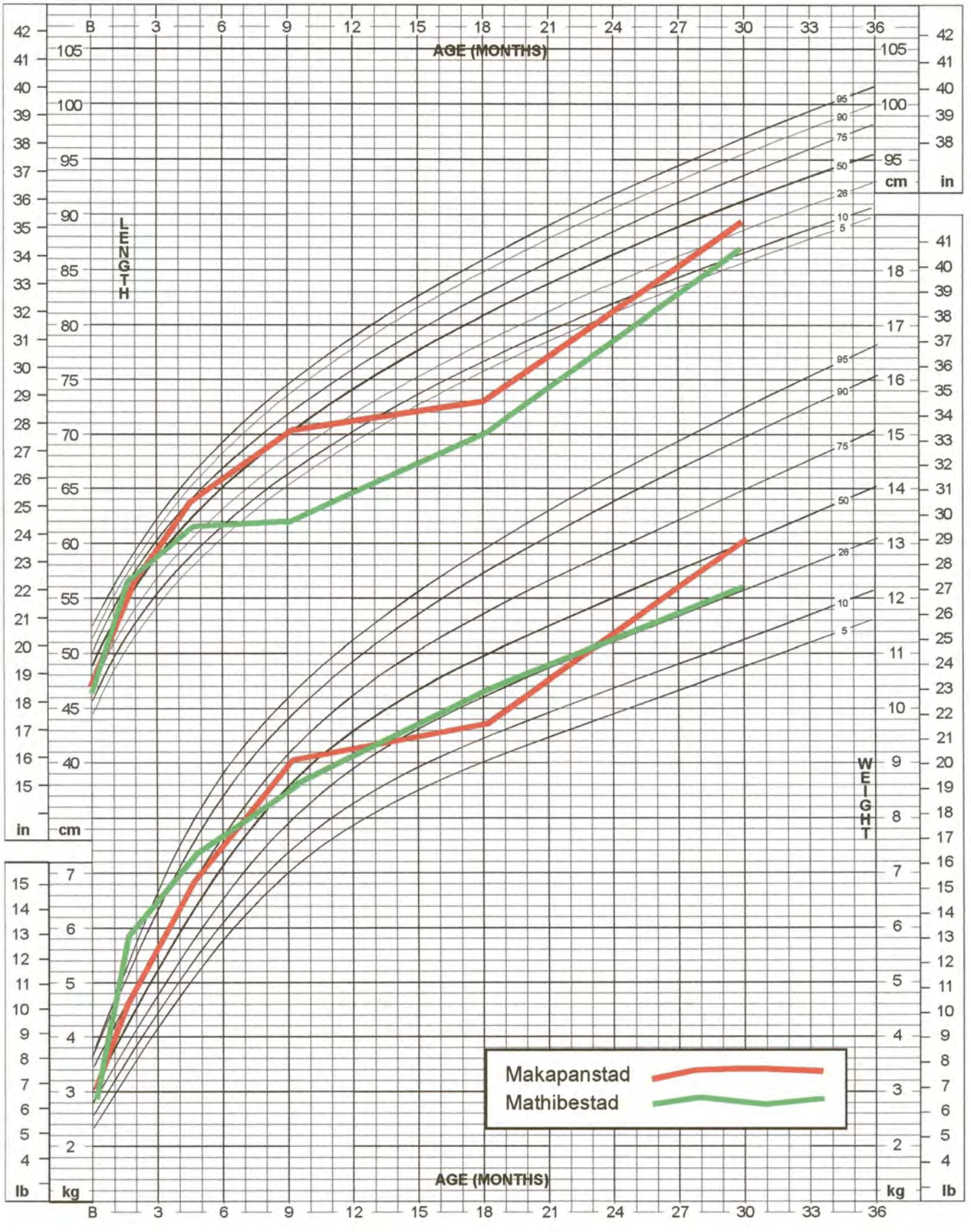


FIGURE 11: ANTHROPOMETRIC RESULTS - NCHS PERCENTILE GRAPHS FOR GIRLS BIRTH TO 36 MONTHS FOR HEIGHT-FOR-AGE AND WEIGHT-FOR-AGE

GIRLS: BIRTH TO 36 MONTHS
PHYSICAL GROWTH
NCHS PERCENTILES

NAME _____ RECORD # _____

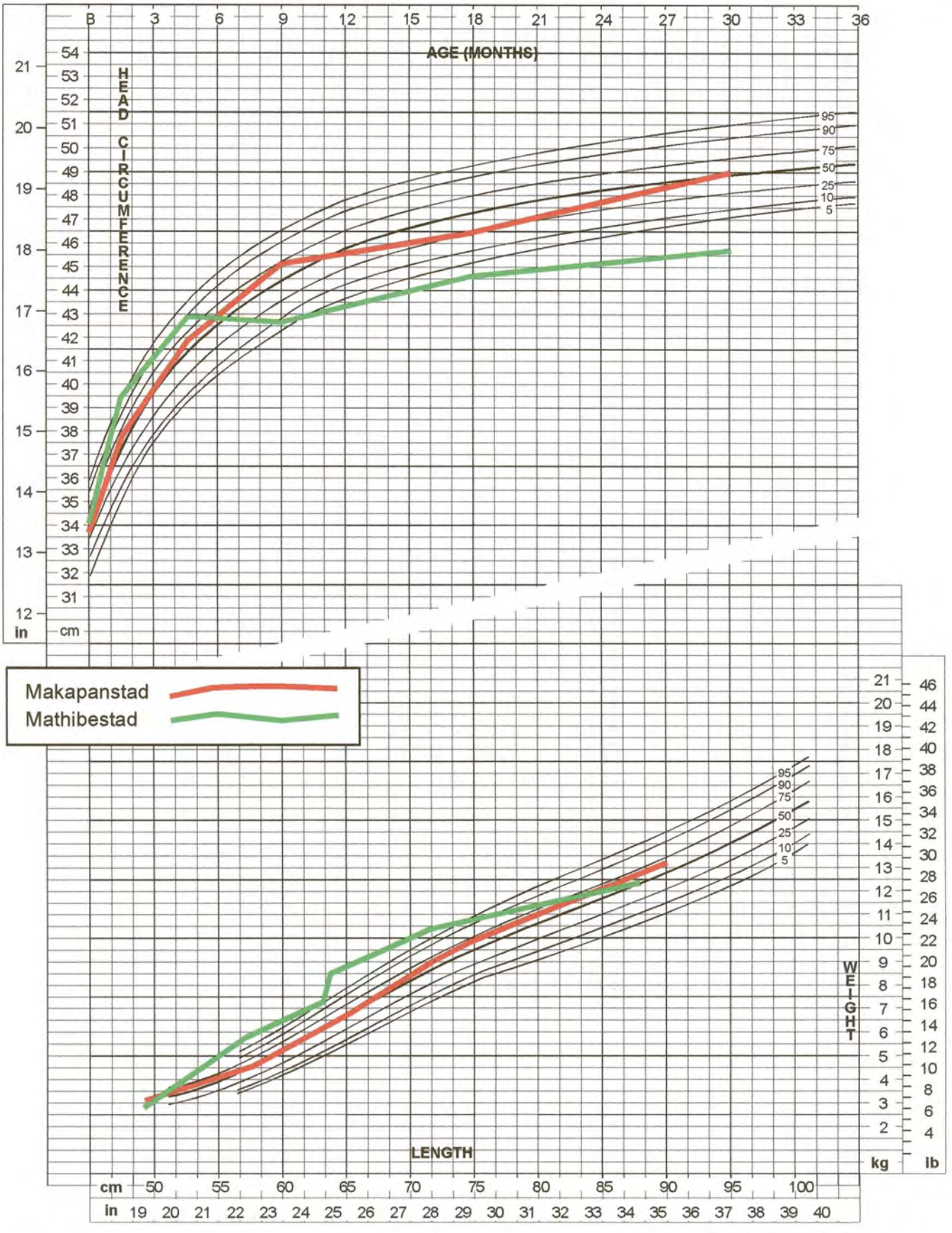


FIGURE 12: ANTHROPOMETRIC RESULTS - NCHS PERCENTILE GRAPHS FOR GIRLS BIRTH TO 36 MONTHS FOR HEAD CIRCUMFERENCE AND WEIGHT-FOR-HEIGHT

BOYS: BIRTH TO 36 MONTHS
PHYSICAL GROWTH
NCHS PERCENTILES

NAME _____ RECORD # _____

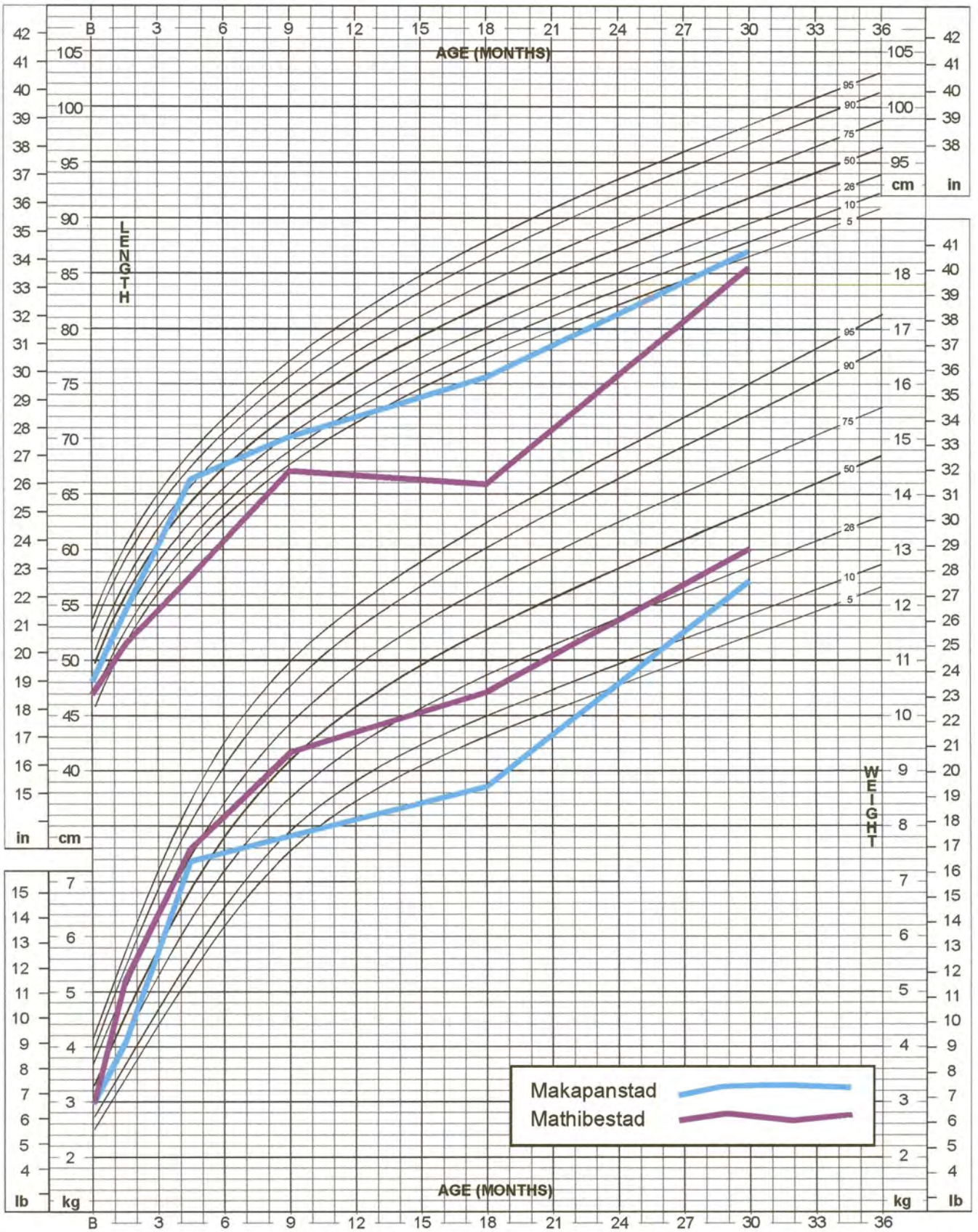


FIGURE 13: ANTHROPOMETRIC RESULTS - NCHS PERCENTILE GRAPHS FOR BOYS BIRTH TO 36 MONTHS FOR HEIGHT-FOR-AGE AND WEIGHT-FOR-AGE

BOYS: BIRTH TO 36 MONTHS
PHYSICAL GROWTH
NCHS PERCENTILES

NAME _____ RECORD # _____

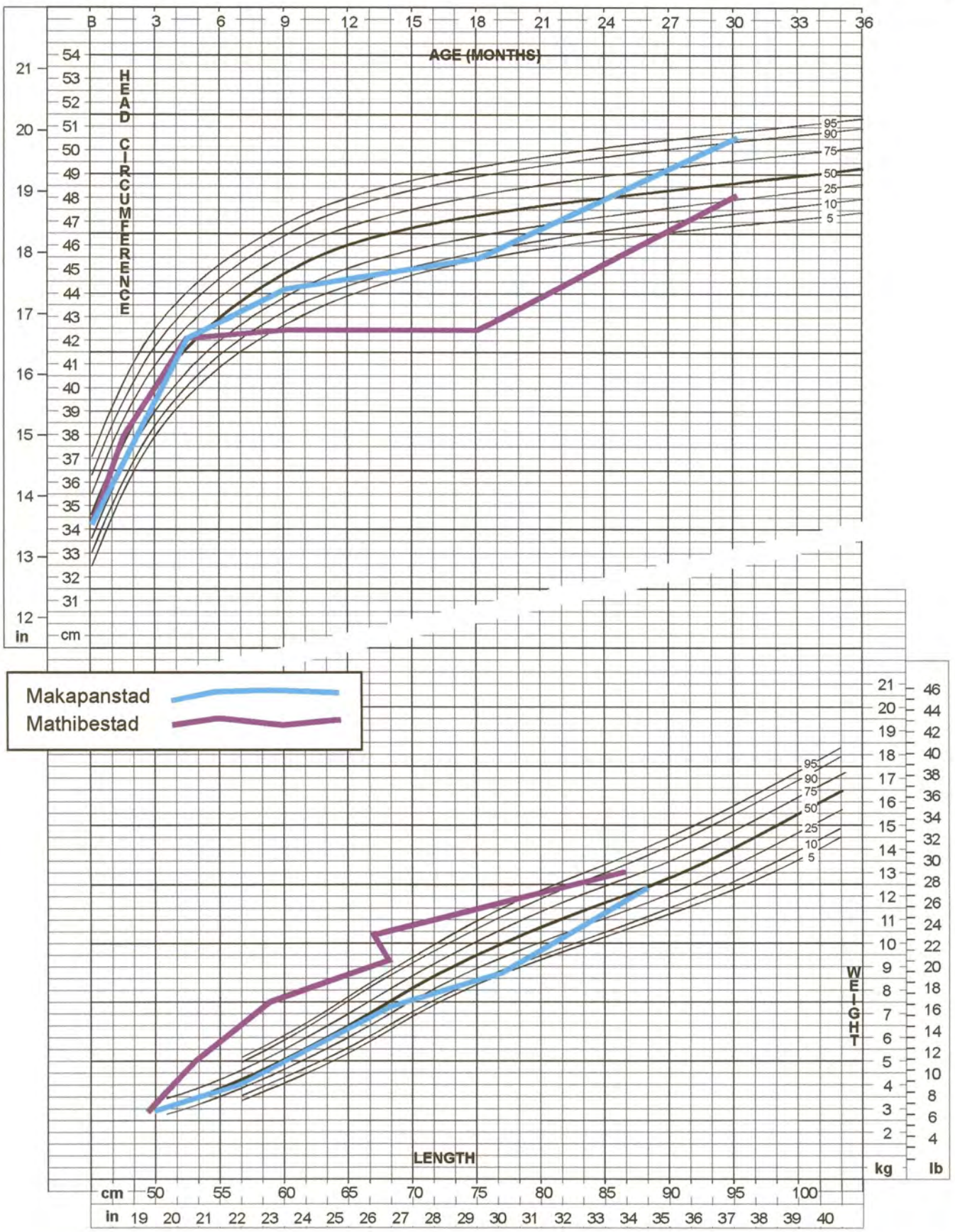


FIGURE 14: ANTHROPOMETRIC RESULTS - NCHS PERCENTILE GRAPHS FOR BOYS BIRTH TO 36 MONTHS FOR HEAD CIRCUMFERENCE AND WEIGHT-FOR-HEIGHT

7.2.1 RECUMBENT LENGTH

The length or height measurement is important to be used in accordance with age and weight. For the girls the mean birth length was very similar in both clinic areas, namely 47.83cm in the Makapanstad area versus 47.72cm in the Mathibestad area. The mean values were found to correspond with the 25th NCHS percentile and the 20th WHO percentile. For the boys similar results were found, namely a mean birth length of 48.20cm in the Makapanstad area versus 47.57cm in the Mathibestad area. The boys from the Mathibestad area however tended to be shorter than their Makapanstad area counterparts, indicating the 10th percentile versus the 25th NCHS and 20th WHO percentiles. This showed that these children were actually relatively short at birth, with the boys being a little shorter than the girls, and the Mathibestad area children being shorter than the Makapanstad area children.

Height-for-age deviations become obvious more slowly than that of weight. Reduced values indicate a chronic or longstanding problem such as malnutrition, other chronic diseases, as well as chronic growth faltering, also known as stunting, short stature or linear growth retardation (1, 6, 95). Failure to thrive can also be identified with height-for-age values < 5th percentile (1). In situations where wasting is not a big problem, a high prevalence of low height-for-age is frequently associated with poor overall economic conditions or repeated exposure to adverse conditions (95). From the results it was clear that the children grew well in the first few months of life. The percentiles increased rapidly up to the age of six months whereafter a significant decrease in growth became evident. This growth pattern was lower in the boys than in the girls. The children from the Mathibestad area clearly grew at a much slower rate than those in the Makapanstad area. The most prominent dip in the growth curve occurred at the age of 18/12. For both the girls and the boys in both areas the average measurement values indicated to be below the fifth NCHS-percentile and to be below the third WHO-percentile which indicated failure to thrive. At the age of 30/12 however, the growth curve recovered to the fifth percentile for boys and to the 25th or 10th percentile for girls (NCHS). This was thus not an indication of stunting, but rather of failure to thrive at a specific age. The girls from the Makapanstad area were the only children who ended on the same percentile as their birth percentile. All the others were fairly close to their birth percentile, except for the boys from the Makapanstad area who ended up two curve lines lower than their birth percentile.

7.2.2 WEIGHT

The measurement of weight is important for use with age and height. All the average birth measurement values were very similar for both the girls (3.06kg and 2.88kg for the Makapanstad and Mathibestad areas respectively) and the boys (2.99kg and 2.89kg for the Makapanstad and Mathibestad areas respectively). For all four groups the "summary measurement values" indicated the 25th NCHS percentile. For three of the groups the "summary measurement value" indicated the 20th WHO percentile and for the girls of the Makapanstad area the 40th WHO percentile; the Makapanstad area girls were the heavier of all the children. These results also showed that the weight of these children was in line with their length: approximately on the 20-25th percentile. These children were lighter in weight at birth than the expected 50th NCHS percentile of approximately 3.2kg; with the children from the Mathibestad area being lighter than the children from the Makapanstad area.

Weight per se is the most sensitive indicator of nutritional status and thus reflects acute and chronic changes (6). Weight-for-age however has the disadvantage that it does not distinguish between acute and chronic malnutrition (96). Weight-for-age reflects the immediate nutritional status of the infant / small child (under one year of age), but is a poor indicator of general growth in the older child. The reason being that increased weight may reflect the amount of body fat present rather than any increase in lean body mass or physical size (6, 96). For the girls the "summary measurement value" increased from birth to six months, after which it started to decline although it was still higher than the average birth measurement value. In the 12-24 month age group the percentiles levelled off to the 25th NCHS percentile for the Mathibestad area and to the tenth NCHS percentile and the 20th WHO percentile for the children from the Makapanstad area, which can be regarded close to the 25th percentile indicated by the "summary birth measure". For the Mathibestad area children the "summary measurement value" indicated to the same percentile, but for the Makapanstad area children it increased again to the 50th percentile by the age of 24-36 months. It was thus clear that the weight of the girls in this group did not go below the "summary birth measure" of the group. A very similar pattern was found in the weight of the boys from the Mathibestad area. The boys from the Makapanstad area however showed an initial increase in weight up to the age of six months, whereafter their weight went rapidly down to where the "summary measurement value" indicated the tenth percentile and then to below the fifth (NCHS) and the third (WHO) percentiles. Their weight however picked up again at the age of 24-36 months to the initial "summary birth measure" which indicated the 25th NCHS and the 20th WHO percentiles. The pattern of decrease was the same for both sexes and happened at exactly the same age.

A single weight value will only indicate whether a child's weight fall within the normal range, but with regular weighing and charting the trend can be assessed (6, 96). The third percentile is used as a cut-off point below which under nutrition is diagnosed (6). Only the Makapanstad area boys were at one stage below the fifth centile, indicating towards a period of possible poor food intake occurring at the age of total weaning from the breast.

7.2.2.1 Body Mass Index

The body mass index (BMI) of the children was evaluated with reference to the three age groups (0-6, 7-12 and 13-36 months) that were formed in order to correspond with the age groups used in the standard values (see Table 54).

TABLE 54: COMPARISON OF THE BODY MASS INDEX OF CHILDREN IN THREE AGE GROUPS IN THE TWO CLINICS

AGE CATEGORIES	BODY MASS INDEX				
	REFERENCE VALUE	MEAN	SD	RANGE	
				MIN	MAX
AGE 1: 0-6/12 *MP: n=26 # *MT: n=29*	19-24	15.20 *20.15*	2.80 *4.67*	9.45 *9.92*	19.61 *30.56*
AGE 2: 7-12/12 MP: n=27 *MT: n=30*	19-24	16.97 *22.21*	2.65 *5.71*	12.24 *14.68*	23.42 *38.83*
AGE 3: 13-36/12 MP: n=32 *MT: n=28*	19-24	16.13 *19.66*	1.84 *4.65*	13.14 *11.9*	21.97 *33.82*

DIFFERENTIATED BY CLINIC: *MAKAPANSTAD #*MATHIBESTAD*

TABLE 55: NUTRITIONAL STATUS INDICATED BY BODY MASS INDEX (BMI)(35)

BMI	NUTRITIONAL STATUS
<16	Undernourished
16-18.5	Possibly undernourished
18.5-25	Probably well-nourished
25-30	Possibly obese
>30	Obese

For the interpretation of the BMI, the levels summarized in Table 55 were used. The children from the Makapanstad area seemed to be possibly undernourished (BMI 16-18.5), while those from the Mathibestad area were probably well-nourished (BMI 18.5-25). Statistically the BMI of the children from the two clinics were significantly different from each other ($P<0.0001$).

7.2.3 HEAD-CIRCUMFERENCE

Head circumference measurements are important to detect abnormalities in head and brain growth. Brain growth peaks during the first year of life, but is completed after 36 months of age. Head circumference is thus only measured up to the age of 36 months (6, 29). The "summary birth measure" indicated a percentile which was very similar for both sexes. The average birth measurement value for the girls was 33.56cm and 33.98cm for the Makapanstad and Mathibestad areas respectively, which was lower than the measurement of the boys at 34.30cm and 34.57cm for the Makapanstad and Mathibestad areas respectively. For both sexes the children from the Mathibestad area had a slightly larger average head circumference measurement. The "summary birth measure" of the children from the Makapanstad area indicated towards the 25th percentile for head circumference and that of the children from the Makapanstad area towards the 50th percentile. (Only the NCHS percentiles were used for the evaluation of the head circumference as the WHO percentile tables do not provide head circumference values.)

The initial growth spurt of the girls from both areas were higher than the average birth measurement value,

but the girls from the Mathibestad area had a quicker and higher increase in head circumference in the early months, increasing until the measurement indicated the 95th percentile. From the age of 6-12 months however the head circumference values of the Mathibestad area girls decreased dramatically to indicate the 10th percentile, and thereafter decreased even further to the fifth percentile at 12-24 months and then to below the fifth percentile in the 24-36 month group. In contrast, the girls from the Makapanstad area had a less dramatic initial increase in head circumference; only indicating up to the 75th percentile in the 3-6 and 6-12 month age groups. Their measurements also decreased at the weaning age (12.00-23.99 months) in a similar pattern to the previous mentioned results. However, the measurements only corresponded with the 25th percentile at the age of 12-24 months, which was the same as their "summary birth measure", whereafter it again increased to correspond with the 50th percentile at the age of 24-36 months.

A very similar pattern was apparent for the boys between the two clinics. Their initial average measurement increase was even less dramatic and went up to correspond with the 50th percentile in both clinics. At the age of 6-12 months the same decrease started to happen, but more pronounced in the Mathibestad area, where the measurement values went down to correspond with levels below the fifth percentile. The Mathibestad area boys recovered to the 25th percentile, but the head circumference average measurements of the boys from the Makapanstad area increased to correspond with the 95th percentile. Head circumference measurements corresponding to values below the fifth percentile (microcephaly) often reflects a cerebral insult that occurred prenatally or in infancy. However, none of these children initially showed such a low percentile for head growth. The lower percentiles for average summary measurement values only appeared at the age of twelve months or more and may thus be due to general growth failure in the weaning period; more so since the other parameters also showed a decline in this age group. The opposite is a large head circumference above the 95th percentile (macrocephaly) which usually occurs due to abnormal accumulation of cerebrospinal fluid and not to growth abnormalities. In this research study macrocephaly seemed not to occur at birth but only in the older children. This would indicate that 'macrocephaly' might have occurred as a result of macrosomia or excessive physical growth of the body as a whole (6). This might have been the case with the Makapanstad area boys who achieved a value on the 95th percentile in the 24-36 month age group, which could be attributed to excessive growth in that phase.

7.2.4 WEIGHT-FOR-HEIGHT

Kibel & Wagstaff (1995:98)(6) state that weight-for-height indicates whether the body is proportional and that it may confirm thinness or fatness. Waterlow et al (96) state that, at a given height, both median weight and range of weight are independent of the age of the children concerned. Weight-for-height is also relatively independent of ethnicity, particularly in the age groups between one and five years. Weight-for-height values will indicate that the growth is either "normal" or stunted. If the child is stunted, it indicates chronic growth failure. A low weight-for-height indicates wasting (6).

The summary birth measures for height and for weight were used for the height-for-weight percentiles at birth. The girls from the Makapanstad area had a NCHS percentile of 50 and a WHO percentile of 30, and the girls from the Mathibestad area had a NCHS percentile of 25 and a WHO percentile of 20. For the boys

from the Makapanstad area the measures indicated towards the 25th NCHS percentile and the 30th WHO percentile, and for the boys from the Mathibestad area it indicated towards the 50th NCHS percentile and the 20th WHO percentile. These percentiles were in line with the previous anthropometric indicators (i.e. showed a similar tendency).

The summary measurement values for height and weight were used to determine the height-for-weight percentiles for the different age groups. The girls from the Mathibestad area showed a dramatic increase in weight-for-height already in the first 0-3 months of life, increasing from the 25th/20th percentile to the 95th and 97th percentile for the NCHS and the WHO standards respectively. The values stayed at this high level until the age of 24 months whereafter it fell to the 50th percentile for both the NCHS and the WHO standards. The Makapanstad area girls showed a similar pattern for weight-for-height, but less extreme. Initially the girls stayed on the 50th percentile up to the age of 12 months whereafter their summary measurement values indicated an increase to the 75th and 70th percentiles respectively for the NCHS and the WHO standards. This might indicate that the girls from the Makapanstad area were actually increasing both their weight and height simultaneously and were thus growing in a "more balanced" manner. It seemed that wasting was not a problem in the girls in these communities as no low weight-for-height percentile values were seen. The boys from the Mathibestad area showed the same pattern as the girls with an immediate increase in the summary measurement values indicating towards a height-for-weight percentile above the 95th and 97th percentiles for the NCHS and WHO standards respectively. The percentiles also fell in the last age category of 24-36 months to the 90th and 80th percentiles for the NCHS and WHO standards respectively. The summary measurement values for height and weight of the Makapanstad area boys indicated to an initial increase from the 25th/30th birth percentiles to the 50th percentile for the first 0-3 month age period. Thereafter the percentiles normalized to the 25th and 30th percentile similar to their birth percentiles. In the 12-24 month age period the percentile dipped to the 10th and the 5th for the NCHS and WHO standards respectively. They recovered well however and ended on the 50th percentile. Like their female counterparts, the boys from the Makapanstad area increased their birth value. However, the reported tendency showed that their growth was affected in some manner, especially at the age of 12-24 months.

7.3 DIETARY ADEQUACY

Food consumption was measured by means of a 24h-recall of usual food intake (see 5.2.2.2 in Chapter 5). The food intake data were evaluated by means of nutrient analysis in order to achieve a more detailed and accurate calculation of nutrient intake. For this purpose computer software with a nutrient data basis (the Foodfinder nutritional analysis computer program)(129) was used. As the ages of the children in the study group varied between naught and 36 months, breast feeding appeared frequently on the 24-hour recalls. For a complete analysis of food intake, it was therefore necessary to consider the breast milk intake as well. In each 24h-recall interview the mother / caregiver had to indicate the number of times the baby was breast fed during the day, referring to exclusive breast feeding or to breast feeding additional to the food intake. Breast milk values for the different feeding regimes were then added to the food intake data to complete the nutrient intake data set. The nutrient analysis for breast milk did not show all the nutrients that appeared on the RDA and WHO dietary standards. The data without any breast milk nutrient values added to it were

described as unadapted intake values, and the data with breast milk values added to it were described as adapted intake values (see Tables 56 and 57).

TABLE 56: ESTIMATES OF ENERGY CONSUMPTION FROM BREAST MILK (100)

NURSING FREQUENCY	kcal Contribution/day	kJ Contribution/day
Child nurses 6-8 times in 24 hours	400 kcal	1680 kJ
Child nurses 4-6 times in 24 hours	300 kcal	1260 kJ
Child nurses 3-4 times in 24 hours	200 kcal	840 kJ
Child nurses 1-3 times in 24 hours	100 kcal	420 kJ

TABLE 57: ESTIMATES OF NUTRIENTS PROVIDED WITH REGARD TO ENERGY CONTRIBUTION FROM BREAST MILK

NUTRIENTS	NUTRIENTS PROVIDED BY BREAST MILK			
	6-8+ feeds/day 400 kcal/day	5 feeds/day 300 kcal/day	3-4 feeds/day 200 kcal/day	1-2 feeds/day 100 kcal/day
Energy (kJ)	1680.00	1260.00	840.00	420.00
Protein (g)	5.60	4.20	2.80	1.40
Fat (g)	23.13	17.35	11.58	5.77
Carbohydrate (Lactose)(g)	45.00	33.77	22.54	11.23
Vitamin A (μg)	481.25	361.10	241.00	120.12
Vitamin D (μg)	0.78	0.59	0.39	0.195
Vitamin E (mg)	2.50	1.88	1.25	0.62
Vitamin C (mg)	37.50	28.10	18.78	9.36
Thiamin (mg)	0.13	0.098	0.065	0.03
Riboflavin (mg)	0.36	0.27	0.18	0.09
Niacin (mg)	1.25	0.94	0.63	0.31
Pyridoxine (Vitamin B_6)(mg)	0.125	0.094	0.063	0.03
Folate (μg)	62.5	46.90	31.30	15.60
Pantothenic acid (mg)	1.63	1.22	0.81	0.41
Calcium (mg)	187.5	140.70	93.90	46.80
Phosphorus(mg)	93.75	70.35	46.95	23.40
Magnesium (mg)	18.75	14.07	9.39	4.68
Iron (mg)	0.19	0.14	0.09	0.05
Zinc (mg)	1.0	0.75	0.50	0.25
Manganese (mg)	0.003	0.002	0.001	0.0006
Copper (mg)	0.15	0.11	0.08	0.04
Sodium (mg)	75.00	56.28	37.56	18.72
Potassium (mg)	281.25	211.05	140.85	70.20

(Adapted from 14 and 100)

The nutrient calculations were compared to both the RDA and WHO dietary standards for the reference persons of the same age and sex category (14, 83, 100). The suggested fixed cutoff point of two-thirds (67%) for the RDA's (1989) was applied in determining inadequate nutrient intake for specific nutrients (14, 29, 83)(see mean intake as a percentage of the reference value in Tables 58-60). The cutoff value was only calculated for those nutrients that appear on both the RDA(1989) and WHO dietary reference standards as well as for specific nutrients identified as being important in infant nutrition (see Chapters 2 and 3) as they may impact on the growth and health of the child. The results are presented in Tables 58-60, and 62-65. The mean intake for specific nutrients was also compared between the two clinics. The Student's t-test was used for the comparison. To improve the reliability of the results the Mann-Whitney u-test was also performed. The Mann-Whitney u-test is an alternative to the Student t-ratio when the measurements fail to achieve interval scaling (130). The Mann-Whitney P-value was reported and accepted when the conclusion differed from that of the Student's t-test.

TABLE 58: COMPARISON OF THE MEAN NUTRIENT INTAKES OF CHILDREN AGED 0-6 MONTHS(n=55) IN THE TWO CLINICS (RDA AS REFERENCE VALUE)

AGE 0-6 MONTHS		NUTRIENT INTAKES											
		MAKAPANSTAD (n=26)					MATHIBESTAD (n=29)					COMPARISON OF CLINICS (MP versus MT)	
NUTRIENT	RDA VALUE (1989)(14)	MEAN	SD	RANGE		MEAN INTAKE AS % OF RDA VALUE	MEAN	SD	RANGE		MEAN INTAKE AS % OF RDA VALUE	P-VALUE*	
				MIN	MAX				MIN	MAX		t-TEST	MANN-WHITNEY**
A. UNADAPTED INTAKE VALUES (WITHOUT BREAST MILK VALUES ADDED)													
PLANT PROTEIN (g)	-	4.77	5.14	0	19.20		4.38	5.04	0	19.20		0.78	
ANIMAL PROTEIN(g)	-	2.99	3.82	0	17.30		2.17	3.07	0	10.00		0.38	
CHOLES-TEROL(mg)	-	1.69	4.81	0	23.00		8.17	39.89	0	215.00		0.41	
FAT RATIO	-	0.43	0.83	0	3.20		0.52	0.98	0	3.20		0.70	
FIBRE(g)	-	2.08	2.10	0	7.70		2.34	2.56	0	8.40		0.68	
VITAMIN B12 (μg)	0.3μg	0.47	0.55	0	2.20	156.41	0.35	0.53	0	2.00	116.09	0.41	
BIOTIN(μg)	10μg	11.37	17.61	0	73.60		7.88	13.31	0	62.50		0.41	
B. ADAPTED INTAKE VALUES (WITH BREAST MILK VALUES ADDED)													
ENERGY (kJ)	2730kJ (kgx453.6)	2274.46	863.22	420.00	4327.00	88.85	2638.97	1142.97	1529.00	5215.00	90.83	0.19	
PROTEIN (g)	13g (kgx2.2g)	10.89	6.19	1.40	24.7	84.14	12.15	8.16	5.60	41.60	84.34	0.53	
TOTAL FAT(g)	30% of kJ	19.97	4.79	5.77	30.68		23.92	5.59	13.88	37.08		0.01*	
CARBOHY-DRATE(g)	50% of kJ	82.32	43.03	11.23	190.04		94.41	55.14	45.00	244.74		0.37	
VITAMIN A (μg RE)	375μg	420.89	116.85	120.12	754.00	112.24	471.86	146.50	241.00	991.00	125.83	0.16	
VITAMIN D(μg)	7.5μg	3.45	3.38	0.19	14.19	46.05	2.72	3.07	0.39	12.89	36.33	0.41	
VITAMIN E (mg =-TE)	3mg	3.27	1.59	0.62	8.62	109.01	3.34	1.42	1.92	7.05	111.38	0.86	

AGE 0-6 MONTHS		NUTRIENT INTAKES										
		MAKAPANSTAD (n=26)					MATHIBESTAD (n=29)					COMPARISON OF CLINICS (MP versus MT)
NUTRIENT	RDA VALUE (1989)(14)	MEAN	SD	RANGE		MEAN INTAKE AS % OF RDA VALUE	MEAN	SD	RANGE		MEAN INTAKE AS % OF RDA VALUE	P-VALUE*
				MIN	MAX				MIN	MAX		t-TEST	MANN-WHITNEY**
VITAMIN C(mg)	30mg	44.77	29.30	9.36	153.78	149.23	53.88	37.86	18.78	172.78	179.61	0.33	
THIAMIN(mg)	0.3mg	0.35	0.27	0.03	1.19	116.29	0.41	0.41	0.13	2.07	137.55	0.50	
RIBOFLAVIN(mg)	0.4mg	0.39	0.12	0.09	0.70	96.44	0.48	0.22	0.26	1.17	121.20	0.05	0.10**
NIACIN (mg NE)	5mg	3.48	3.73	0.31	16.93	69.60	2.87	2.51	1.24	10.63	57.38	0.48	
PYRIDOXINE (mg)	0.3mg	0.28	0.21	0.03	0.94	94.78	0.31	0.30	0.12	1.26	104.45	0.68	
FOLATE (μg)	25μg	54.26	11.85	15.60	78.30	217.05	72.17	26.24	38.60	150.30	288.69	0.002*	
PANTOTHENIC ACID (mg)	2mg	1.95	0.87	0.41	4.85		2.07	0.84	1.26	4.56		0.60	
CALCIUM (mg)	400mg	211.05	138.46	46.80	662.8	52.77	175.31	114.88	87.50	459.90	43.83	0.30	
PHOSPHORUS (mg)	300mg	195.74	122.76	23.40	591.4	65.25	226.74	183.48	93.75	981.95	75.58	0.47	
MAGNESIUM (mg)	40mg	61.73	44.90	4.68	180.39	154.33	60.55	48.07	9.39	169.39	151.37	0.93	
IRON(mg)	6mg	5.01	7.22	0.05	30.39	83.46	3.29	4.83	0.19	18.89	54.91	0.30	
ZINC(mg)	5mg	2.25	1.49	0.25	6.65	45.02	1.97	1.26	0.50	5.56	39.45	0.46	
MANGANESE (mg)	0.3-0.6mg	0.42	0.70	0.0006	2.93		0.22	0.29	0.001	1.14		0.15	
COPPER (mg)	0.4-0.6mg	0.31	0.24	0.04	1.13		0.27	0.18	0.08	0.79		0.43	
POTASSIUM (mg)	500mg(min)	440.98	200.12	70.20	951.20		130.54	150.87	37.56	675.56		0.13	
SODIUM(mg)	120mg(min)	110.58	80.30	18.72	401.56		564.57	360.74	281.25	1383.85		0.55	

- = no RDA value available
* P-values (significant when <0.05) are reported for Student's t-test
** Mann-Whitney p-value reported and accepted when conclusion differs from that of Student's t-test
MP = Makapanstad area
MT =Mathibestad area

TABLE 59: COMPARISON OF THE MEAN NUTRIENT INTAKES OF CHILDREN AGED 7-12 MONTHS(n=57) IN THE TWO CLINICS (RDA AS REFERENCE VALUE)

AGE 7-12 MONTHS		NUTRIENT INTAKES											
		MAKAPANSTAD (n=27)					MATHIBESTAD (n=30)					COMPARISON OF CLINICS (MP versus MT)	
NUTRIENT	RDA VALUE (1989)(14)	MEAN	SD	RANGE		MEAN INTAKE AS % OF RDA VALUE	MEAN	SD	RANGE		MEAN INTAKE AS % OF RDA VALUE	P-VALUE*	
				MIN	MAX				MIN	MAX		t-TEST	MANN-WHITNEY**
A. UNADAPTED INTAKE VALUES (WITHOUT BREAST MILK VALUES ADDED)													
PLANT PROTEIN g)	-	13.99	9.42	5.4	46		14.91	10.42	5.4	59.5		0.73	
ANIMAL PROTEIN(g)	-	5.84	5.31	0	22.3		5.48	3.69	0	19.6		0.76	
CHOLES-TEROL(mg)	-	24.81	43.59	0	210		15.63	41.1	0	216		0.42	
FAT RATIO	-	0.68	0.69	0.07	3.16		0.79	0.98	0.12	4.18		0.64	
FIBRE(g)	-	6.62	4.65	2.3	20.2		7.84	5.95	1.2	33.1		0.4	
VITAMIN B12 (µg)	0.5µg	0.59	0.6	0	2.5	119.23	0.57	0.39	0	1.5	113.33	0.83	
BIOTIN(µg)	15µg	11.61	10.42	0	53.4		11.45	6.09	3.8	31.8		0.94	
B. ADAPTED INTAKE VALUES (WITH BREAST MILK VALUES ADDED)													
ENERGY (kJ)	3570kJ (kgx411.6Kj)	3876.7	1612.8	1951	8182	114.75	4084.8	1127	2333	7882	113.67	0.57	
PROTEIN (g)	14g (kgx1.6g)	22.18	10.38	8.8	47.9	169.57	22.79	10.68	11.8	65.9	165.09	0.83	
TOTAL FAT(g)	-	25.69	15.57	9.37	93.97		28.92	8.76	13.88	46.43		0.33	0.03
CARBOHY-DRATE(g)	-	155.86	68.91	83.63	391.3		180.96	93.72	84.5	596.34		0.27	
VITAMIN A (µg RE)	375µg	440.02	273.79	129.12	1108	117.34	483.08	355.4	241	2305	128.82	0.62	
VITAMIN D(µg)	10µg	3.29	2.64	0.19	10.59	32.96	3.66	1.69	0.39	7.79	36.59	0.54	
VITAMIN E (mg α-TE)	4mg	3.26	1.55	1.2	6.61	81.38	4.68	2.35	1.89	13.73	117.03	0.01	
VITAMINC(mg)	35mg	53.04	60.45	9.36	288.4	151.54	79.29	41.28	18.78	180.78	226.53	0.06	0.003

AGE 7-12 MONTHS		NUTRIENT INTAKES											
		MAKAPANSTAD (n=27)					MATHIBESTAD (n=30)					COMPARISON OF CLINICS (MP versus MT)	
NUTRIENT	RDA VALUE (1989)(14)	MEAN	SD	RANGE		MEAN INTAKE AS % OF RDA VALUE	MEAN	SD	RANGE		MEAN INTAKE AS % OF RDA VALUE	P-VALUE*	
				MIN	MAX				MIN	MAX		t-TEST	MANN-WHITNEY**
THIAMIN(mg)	0.4mg	0.64	0.33	0.33	1.63	159.9	0.74	0.43	0.37	2.79	185.04	0.34	
RIBOFLAVIN (mg)	0.5mg	0.55	0.22	0.21	1.06	110	0.99	0.74	0.26	2.74	198.27	0.01	
NIACIN (mg NE)	6mg	4.38	3.35	1.21	12.71	72.94	4.47	1.93	1.43	10.43	74.51	0.90	
PYRIDOXINE (mg)	0.6mg	0.48	0.35	0.12	1.72	80.79	0.77	0.36	0.12	1.63	128.45	0.004	
FOLATE (μg)	35μg	77.28	38.05	34.6	183.6	220.81	107.95	41.15	27	226.3	308.44	0.01	
PANTOTHENIC ACID (mg)	3mg	2.14	0.74	1.12	3.78		2.54	0.84	1.26	4.76		0.06	0.04
CALCIUM (mg)	600mg	270.78	154.98	76.8	615.8	45.13	304.23	128	93.9	808.8	50.7	0.38	
PHOSPHORUS (mg)	500mg	440.98	194.62	140.4	904.4	88.19	448.18	237.5	227	1406	89.64	0.90	
MAGNESIUM (mg)	60mg	143.94	75.02	69.39	382.7	239.91	162.88	101.9	71.39	626.39	271.46	0.44	
IRON(mg)	10mg	4.66	4.24	0.79	21.95	46.59	5.34	2.32	0.99	10.75	53.42	0.45	0.04
ZINC(mg)	5mg	3.13	1.52	1.29	7.76	62.56	3.69	1.54	1.48	10.71	73.74	0.18	
MANGANESE (mg)	0.6-1.0mg	0.72	0.64	0.2	2.3		0.72	0.56	0.02	2.67		0.99	
COPPER (mg)	0.6-0.7mg	0.42	0.23	0.15	0.94		0.49	0.22	0.17	1.15		0.22	
POTASSIUM (mg)	700mg(min)	1001.7	493.66	403.85	2555		1175.7	511.5	405.9	2762.9		0.20	
SODIUM(mg)	200mg(min)	313.5	342.89	37.56	1569		273.24	179.6	38.56	690.72		0.58	

- = no RDA value available
* P-values (significant when <0.05) are reported for Student's t-test
** Mann-Whitney p-value reported and accepted when conclusion differs from that of Student's t-test.
MP = Makapanstad area
MT =Mathibestad area

TABLE 60: COMPARISON OF THE MEAN NUTRIENT INTAKES OF CHILDREN AGED 13-36 MONTHS(n=60) IN THE TWO CLINICS (RDA AS REFERENCE VALUE)

AGE 13-36 MONTHS		NUTRIENT INTAKES											
		MAKAPANSTAD (n=32)					MATHIBESTAD (n=28)					COMPARISON OF CLINICS (MP versus MT)	
NUTRIENT	RDA VALUE (1989)(14)	MEAN	SD	RANGE		MEAN INTAKE AS % OF RDA VALUE	MEAN	SD	RANGE		MEAN INTAKE AS %OF RDA VALUE	P-VALUE*	
				MIN	MAX				MIN	MAX		t-TEST	MANN-WHITNEY**
A. UNADAPTED INTAKE VALUES (WITHOUT BREAST MILK VALUES ADDED)													
PLANT PROTEIN g)	-	31.96	14.41	6.8	62.5		31.78	15.46	5.4	61.9		0.96	
ANIMAL PROTEIN(g)	-	10.69	8.98	0.2	34.6		9.41	6.56	0	23.3		0.54	
CHOLES-TEROL(mg)	-	38.72	35.48	0	127		36.39	48.09	0	236		0.83	
FAT RATIO	-	0.79	0.46	0.2	1.89		1.18	0.89	0.07	3.2		0.03	0.24
FIBRE(g)	-	14.55	6.29	3.7	28.4		16	6.72	2.3	32.3		0.39	
VITAMIN B12 (µg)	0.7µg	0.78	0.72	0	3.3	111.61	0.92	1.35	0	6.1	131.63	0.61	
BIOTIN(µg)	20µg	15.59	7.24	5	31.8		16.42	11.27	6	64.1		0.73	
B. ADAPTED INTAKE VALUES (WITH BREAST MILK VALUES ADDED)													
ENERGY (kJ)	5460kJ(kgx428 .4KJ)	6466.8	2100	2434	9917	145.62	5931.4	1995	1047	10544	127.57	0.32	
PROTEIN (g)	16g (kgx1.2g)	43.39	17.21	13.7	81.3	346.69	41.68	15.47	14.4	74.6	316.25	0.69	
TOTAL FAT(g)	-	36.41	18.45	15.7	88.1		35.51	17.09	3.6	86.38		0.85	
CARBOHY-DRATE(g)	-	289.17	103.71	101.84	510.3		260.58	86.21	108.8	497.8		0.25	
VITAMIN A (µg RE)	400µg	315.78	201.11	44	840	78.94	427.16	391.1	0	1499	106.79	0.16	
VITAMIN D(µg)	10µg	3.52	2.78	0.04	11.1	35.17	3.41	3.48	0	11.15	34.13	0.90	
VITAMIN E (mg =-TE)	6mg	4.26	2.85	1.69	13.54	70.95	6.15	5.19	0.69	19.95	102.49	0.08	
VITAMIN C(mg)	40mg	65.17	79.17	3	413	162.92	80.35	60.41	0	202	200.87	0.41	

AGE 13-36 MONTHS		NUTRIENT INTAKES											
		MAKAPANSTAD (n=32)					MATHIBESTAD (n=28)					COMPARISON OF CLINICS (MP versus MT)	
NUTRIENT	RDA VALUE (1989)(14)	MEAN	SD	RANGE		MEAN INTAKE AS % OF RDA VALUE	MEAN	SD	RANGE		MEAN INTAKE AS %OF RDA VALUE	P-VALUE*	
				MIN	MAX				MIN	MAX		t-TEST	MANN-WHITNEY**
THIAMIN(mg)	0.7mg	1.21	0.47	0.35	2.17	172.52	1.1	0.37	0.43	2.13	157.42	0.34	
RIBOFLAVIN(mg)	0.8mg	0.83	0.41	0.21	1.86	103.83	1.11	0.76	0.12	3.13	138.75	0.08	
NIACIN (mg NE)	9mg	5.71	2.45	1.63	12.1	63.48	6.23	3.42	1.2	15.5	69.18	0.50	
PYRIDOXINE (mg)	1.0mg	0.83	0.42	0.19	2.13	82.67	1.04	0.48	0.09	2.58	103.90	0.07	0.05
FOLATE (µg)	50µg	126.43	48.1	52	259	252.86	161.4	90.56	24	429	322.81	0.06	
PANTOTHENIC ACID (mg)	3mg	2.68	0.91	1.2	4.6		2.98	1.63	0.72	9.44		0.38	
CALCIUM (mg)	800mg	355.19	213.46	3	899	44.40	400.78	254.1	0	856	50.09	0.45	
PHOSPHORUS (mg)	800mg	903.42	361.01	302.95	1652	112.93	817.41	248.8	288	1213	102.18	0.29	
MAGNESIUM (mg)	80mg	310.58	119.43	95.39	548	388.23	299.17	106.6	85.68	523	373.97	0.70	
IRON(mg)	10mg	6.97	3.29	1.79	13.1	69.72	8.56	4.83	1.3	26.5	85.56	0.14	
ZINC(mg)	10mg	5.21	1.92	1.7	8.99	52.07	4.88	1.64	1.56	8.54	48.82	0.49	
MANGANESE (mg)	1.0-1.5mg	1.7	1.01	0.31	5.01		1.89	1.12	0.22	4.93		0.52	
COPPER (mg)	0.7-1.0mg	0.73	0.28	0.25	1.24		0.79	0.29	0.13	1.36		0.43	
POTASSIUM (mg)	1000-1400 mg(min)	1855.8	699.88	606.2	3766		1885.9	572.7	422	3172		0.86	
SODIUM(mg)	225-300 mg (min)	634.03	491.84	95.56	2036		439.38	322.6	1	1358		0.08	

- = no RDA value available
* P-values (significant when <0.05) are reported for Student's t-test
** Mann-Whitney p-value reported and accepted when conclusion differs from that of Student's t-test
MP = Makapanstad area
MT =Mathibestad area

In Table 58-60 the RDA(1989) values were used as the standard reference values. Three age groups had to be formed (0-6, 7-12 and 13-36 month old children) to correspond with the RDA age grouping.

The 0-6 month old babies in both groups had a higher plant protein intake than animal protein intake (without the contribution of breast milk intake). As expected, the cholesterol intakes were far below the recommended minimum intake. This might be due to the fact that not much additional food to the milk feeds were given to babies of this age. Although none of these values showed a significant difference between the clinics, it was clear from the results that more cholesterol-rich foods were consumed in the Mathibestad area. Even with the limited additional animal food intake, the babies from both groups had an adequate intake of both vitamin B_{12} (156.41%) and biotin. For all the other nutrients, the contribution of breast milk intake was included. The energy intake of both groups of children were just inadequate. As no safety margin has been included in the energy recommendations, the children should consume 100% of the energy reference value (14, 29, 83). In both the Makapanstad and Mathibestad areas the energy intake varied between 88-90% of the recommended value (there was no significant difference between the clinics, P=0.19). This is also similar to reports from a study in Cape Town where between 6-9% of the children had energy intakes <67%RDA (101). The total protein intake (84.14-84.34% of the reference value) compared well between the clinics; thus still considered to be adequate. In both clinics the total protein intake contributed only about 8% of the total energy consumed (calculated from the mean intake values). This was below the dietary recommendations of 12-15% (Dietary Goals and Diet and Health, NRC)(see Table 61)(14, 29).

TABLE 61: SUMMARY OF DIETARY RECOMMENDATIONS BY AMERICANS

NUTRIENT	U.S.DIETARY GOALS, 1977	DIET AND HEALTH (NRC) 1989
Protein	12%	12-15%
Carbohydrate	58%	≥ 55%
Fat	≤ 30%	≤ 30%

(Compiled from 14, 29)

Research reported indicated intakes of 13% of protein for both a reference group (RefG) and a failure to thrive group (FTTG) in Cape Town(101) and 10-14% of protein intakes for Africans generally(17). When considering the fat intake, there was a significant difference (P=0.01) in the mean fat intakes between the two clinics. The children from the Mathibestad area were consuming more fat. The fat intake contributed between 33-34% of the total energy intake. This was higher than the recommended intake of 30% and also higher than reported intakes of 10-25% for Africans generally (17). It was a little lower than the 39% reported for the RefG and 35% for the FTTG in Cape Town (101). The carbohydrate intake was 60% in both areas which compared well with the recommendations of 55-58% (see Table 61). It was however lower than intakes (65-80%) reported for Africans generally (17), and higher than the intakes reported in Cape Town where the RefG had intakes of 50% and the FTTG 54% (101).

Nutrients that should be of concern due to a low intake, were vitamin D, niacin, calcium and phosphorus.

The vitamin D intake seemed low at only 46.05% in the Makapanstad area and 36.33% in the Mathibestad area. It should however be taken into consideration that vitamin D is also produced from the UV-rays from sunlight, which is abundant in South Africa. Children may survive in good health even on a diet almost completely devoid of vitamin D (14, 35). In this study nearly half of the reference value was consumed via the diet. Therefore it seemed unlikely that the children in these communities would have a problem with vitamin D deficiency. The niacin intake of both groups was also on the borderline of a deficient intake. Although niacin is converted from tryptophan in the body, diets high in maize may not aid in this relationship due to the fact that the maize protein, zein, is deficient in tryptophan (35). The calcium and phosphorus intakes were very low. The calcium intake was 52.77% and 43.83% in the Makapanstad and Mathibestad areas respectively, and the phosphorus intake was 62.25% and 75.58% respectively. These values were below the 67% level of intake (except for the phosphorus intake in the Mathibestad area) and could thus be considered inadequate and of concern. The zinc intakes in both areas were quite low. Intakes varied between 45.02% in the Makapanstad area and 39.45% in the Mathibestad area. There is little evidence to suggest that zinc deficiency is an important public health problem (14, 35). However, Latham (1997:108)(35) suggests that current research may indicate that poor zinc status is responsible among others for poor growth and reduced appetite and would thus contribute to PEM. Young people during periods of active growth are at greatest risk of impaired body function and growth because growing tissues with their need for rapid cell division requires zinc (14). The role of mild zinc deficiency in growth and development still needs to be clarified (102). The anthropometrical results showed that the children in this study group showed a decreased growth from the age of six months (see 7.2). As height deviations manifest more slowly, the impact of low nutrient intakes might have started in the first few months after birth already. The vitamin A status of children's diets is almost always of concern when PEM is mentioned. In this study however, the vitamin A intake was adequate with intakes of 112.24% and 125.83% in the Makapanstad and Mathibestad areas respectively. All the other nutrients were consumed adequately. The only vitamin that showed an "excessive" intake, was folate, which was consumed up to 217.05% and 288.69% of the recommended intake (54.26μg and 72.17μg in the Makapanstad and Mathibestad areas respectively, versus 25μg recommended). There was a significant difference between the intakes of the children in the Makapanstad area and Mathibestad areas. The Mathibestad area children had a significantly higher intake of folate (P=0.002). This might be due to the high intake of milk (providing 6μg/100mL; thus an intake of 48μg if 800mL of milk was consumed) at this stage of their lives, as well as a high intake of orange juice, green leafy vegetables like merogo, legumes (soya products) and peanut butter (14, 35). According to Guthrie (1995:454)(14) most diets will provide 200-400μg of folate which would stabilize red cell folate levels for over 90% of the population.

The 7-12 month age group the older children had a higher energy intake of 113.67-114.75% which indicated an overconsumption of energy-rich food sources, which was also apparent in the anthropometric evaluation of this age group. These results differ from the research findings from a food consumption study done in Zambia where infants (aged 6-9 months) had median energy intakes ranged from 57-80% (103). The total protein intake was high, 169.57 versus 165.09% in the Makapanstad area and Mathibestad area respectively; it also compared well between the clinics. The infants in Zambia however had median protein intakes of 57-80%(103). In both clinics the total protein intake contributed only about 9% of the total energy intake (see Table 61)(14, 29), which was lower than the previously reported protein intakes of 10-14% for

Africans generally(17), 13% for both a reference group(RefG) and a failure to thrive group(FTTG) in Cape Town (101) and 11% for the infant group in Zambia (103). There was a significant difference (P=0.03) between the mean fat intakes of the two clinics (25.69g versus 28.92g in the Makapanstad and Mathibestad areas respectively). About 25% of the total energy intake was contributed by fat, which was below the recommended intake of 30%, but similar to previous research results where fat intakes varied between 10-25% for Africans generally (17), 12% for the infant group in Zambia (103) and a little lower than the 39% reported for the RefG and 35% for the FTTG in Cape Town (101). The carbohydrate content of the diet was high; 67% of the total energy intake in the Makapanstad area and 74% in the Mathibestad area, which also compared well with results on carbohydrate intakes that varied between 65-80% for Africans generally (17), 70% for the infant group in Zambia (103) and higher than the intakes reported in Cape Town where the RefG had intakes of 50% and the FTTG 54% (101). Biotin intakes were less than the reference values. Similar to the 0-6 month age group, the vitamin D levels were low; 32.96 versus 36.59% in the Makapanstad area and Mathibestad area respectively, but the niacin intakes were adequate. The calcium intake however was even lower than in the previous age group; 45.13% and 50.70% in the Makapanstad area and Mathibestad areas respectively. This is similar to the infant group in Zambia where the median calcium intakes was even lower at only 26%(103). In this age group the iron intake was lower than in the previous group. There was a significant difference (P=0.04) between the mean iron intakes of the two clinics (4.66mg in the Makapanstad area and 5.34mg in the Mathibestad area). The reference value is 10mg/day indicating that intakes varied between 47-53% compared to 10% median iron intake in the infant group in Zambia (103). Zinc intakes were also below the recommended levels, but to a lesser extent than in the previous group (62.56 and 73.74% in the Makapanstad area and Mathibestad areas respectively). All the other nutrients were consumed in adequate quantities in this age category. There were significant differences in the intakes of vitamins E (P=0.01), vitamin C (P=0.06), riboflavin (P=0.01), pyridoxine (P=0.00), folate (P=0.01) and pantothenic acid (P=0.06) between the two clinics. Intakes of all these nutrients, except pantothenic acid, were well above the reference values. The pantothenic acid intake (71% and 85% in the Makapanstad and Mathibestad areas respectively) was adequate (above the 67% cut-off point) even though it was below the reference intake value.

For the third age group (children between the ages of 13-36 months of age) similar results were found. With the increase in age, the quantity of food intake increased and thus the energy intake. These children had high energy intakes of 146-127% (mean energy intakes varied between 5931-6466kJ) which indicated a probable overconsumption of energy of up to 50%. This result compared well with findings reported in Cape Town where the RefG had a mean energy intake of 6646kJ and the FTTG had a mean intake of 5979kJ (101). The energy intake of the toddler group (14-20 months of age) in Zambia were much lower at 4850kJ or 70% of the recommended value (103). The total protein intake was above the reference value, varying between 346.69 versus 316.25% in the Makapanstad and Mathibestad areas respectively. The mean protein contribution to the diet in both clinics were equal, contributing about 10-11% of the total energy intake (43.39-41.68g/day) which was similar to the lower range of reported intakes of 10-14% in Africans generally (17), and less than the 13% for both a reference group(RefG) and a failure to thrive group(FTTG) in Cape Town (101) or the 15% (24g) intake of the toddler group in Zambia (103). The mean fat intake in the two clinics contributed about 20-22% of the total energy intake (35,51-36,41g/day), which was below the recommended fat intake of 30% and similar to the previously reported intakes of 10-25% for

Africans generally (17) or 13% (26g) for the toddler group in Zambia (103), and much lower than the 39% (68,6g) reported for the RefG and 35% (55,6g) for the FTTG in Cape Town (101). The mean carbohydrate content of the diet contributed 74-75% of the total energy intake (260-289g/day) which was also similar to the previous reports of 65-80% of intake for Africans generally (17), but lower than the 69% (114g) mean intakes of toddlers in Zambia (103), and higher than the intakes reported in Cape Town where the RefG had intakes of 50% (186g) and the FTTG 54% (182g)(101). Although the children in both groups had higher plant protein than animal protein intakes(31.96g plant and 10.69g animal proteins in the Makapanstad area versus 31.78g plant and 9.41g animal proteins in the Mathibestad area), the fibre content of their diets was still far below the acceptable level of more than 20g/day (14.55 and 16.00g/day in the Makapanstad and Mathibestad areas respectively). The Cape Town study reported intakes of 10.2g/day for the FTTG and 11.7g/day for the RefG (101). This compared well with the intakes reported for South African preschool children where it was found that the rural black children had the lowest fibre intake (12%) of all population groups(104). For the micronutrient intakes similar results occurred in this age group than in the younger age groups. The biotin intake was below the reference value but above the fixed cut-off point. The vitamin D intake levels were low; 35.17% versus 34.13% in the Makapanstad and Mathibestad areas respectively. The niacin intakes were bordering on low, with intakes of 63% and 69% respectively in the Makapanstad and Mathibestad areas. The Cape Town study also reported low niacin intakes where 13% of the RefG and 39% of the FTTG had intakes <67%RDA (101). The calcium intake was on the same low level than that of the previous age groups; 44.40% and 50.09% in the Makapanstad area and Mathibestad areas respectively. This compared well with the 40% intake in the toddler group in Zambia (103). The Cape Town study reported much higher mean calcium intakes of 777-836mg, but 48% of the RefG and 39% of the FTTG still had intakes <67%RDA (101). The iron intake improved from the previous low levels to safe intake levels above the fixed cutoff-point, namely 70-85% (6.97-8.56mg). The Cape Town study reported much lower iron intakes of 5.4-6.1mg/day where 71% of the RefG and 81% of the FTTG had intakes <67%RDA (101) and the toddler group in Zambia had intakes of 42%(103). Zinc intakes remained below the recommended levels; 52.07% and 48.82% in the Makapanstad and Mathibestad areas respectively. The Cape Town study also reported low zinc intakes where 58% of the RefG and 55% of the FTTG had intakes <67%RDA (101). All the other nutrients were consumed in adequate quantities. This could probably be explained in terms of the children eating a more varied diet than the babies and children in the weaning stage. There was for one nutrient only (pyridoxine) a significant difference (P=0.05) in the intakes between the two clinics. The intake of pyridoxine was however within the acceptable range varying between 82.67% and 103.90% in the Makapanstad and the Mathibestad areas respectively.

TABLE 62: COMPARISON OF THE MEAN NUTRIENT INTAKES OF CHILDREN AGED 0-6 MONTHS(n=55) IN THE TWO CLINICS (WHO AS REFERENCE VALUE)

AGE 0-6 MONTHS		NUTRIENT INTAKES											
		MAKAPANSTAD (n=26)					MATHIBESTAD (n=29)					COMPARISON OF CLINICS (MP versus MT)	
NUTRIENT	WHO VALUE (1996)(97)	MEAN	SD	RANGE		MEAN INTAKE AS % OF WHO VALUE	MEAN	SD	RANGE		MEAN INTAKE AS % OF WHO VALUE	P-VALUE*	
				MIN	MAX				MIN	MAX		t-TEST	MANN-WHITNEY**
A. ADAPTED INTAKE VALUES (WITH BREAST MILK VALUES ADDED)													
ENERGY (kJ)	1995kJ	2274.46	863.22	420.00	4327.00	114.01	2638.97	1142.97	1529.00	5215.00	132.28	0.19	
PROTEIN(g)	9.1g	10.89	6.19	1.40	24.70	119.69	12.15	8.16	5.60	41.60	133.49	0.53	
VITAMIN A (μg RE)	350μg	420.89	116.85	120.12	754.00	120.25	471.86	146.50	241.00	991.00	134.82	0.16	
IRON (low bio-available)(mg)	21mg	-	-	-	-	23.85	-	-	-	-	15.69	-	
IRON (medium bio-available) (mg)	11mg	-	-	-	-	45.52	-	-	-	-	29.95	-	
IRON (high bio-available) (mg)	7mg	5.01	7.22	0.05	30.39	71.53	3.29	4.83	0.19	18.89	47.06	0.30	
ZINC(mg)	4mg	2.25	1.49	0.25	6.65	56.27	1.97	1.26	0.50	5.56	49.31	0.46	

- = no RDA value available
* P-values (significant when <0.05) are reported for Student's t-test
** Mann-Whitney p-value reported and accepted when conclusion differs from that of Student's t-test.
MP = Makapanstad area
MT =Mathibestad area

TABLE 63: COMPARISON OF THE MEAN NUTRIENT INTAKES OF CHILDREN AGED 7-9 MONTHS(n=29) IN THE TWO CLINICS (WHO AS REFERENCE VALUE)

AGE 7-9 MONTHS		NUTRIENT INTAKES											
		MAKAPANSTAD (n=15)					MATHIBESTAD (n=14)					COMPARISON OF CLINICS (MP versus MT)	
NUTRIENT	WHO VALUE (1996)(97)	MEAN	SD	RANGE		MEAN INTAKE AS % OF WHO VALUE	MEAN	SD	RANGE		MEAN INTAKE AS % OF WHO VALUE	P-VALUE*	
				MIN	MAX				MIN	MAX		t-TEST	MANN-WHITNEY**
A. ADAPTED INTAKE VALUES (WITH BREAST MILK VALUES ADDED)													
ENERGY (kJ)	2856kJ	3177.93	645.49	1951.00	4547.00	111.27	4007.07	1303.40	2738.00	7882.00	140.30	0.04*	
PROTEIN (g)	9.1g	17.89	4.44	8 .80	25.30	196.63	19.69	6.92	11.80	35.40	216.33	0.41	
VITAMIN A (μg RE)	350μg	431.91	233.99	228.12	1089.00	123.40	439.63	98.36	241.00	597.25	125.61	0.91	
IRON (low bio-available)(mg)	21mg	-	-	-	-	22.35	-	-	-	-	25.94	-	
IRON (medium bio-available) (mg)	11mg	-	-	-	-	42.67	-	-	-	-	49.53	-	
IRON (high bio-available) (mg)	7mg	4.69	5.12	0.89	21.95	67.06	5.45	2.57	0.99	10.75	77.83	0.62	
ZINC(mg)	5mg	2.63	1.05	1.48	5.82	52.61	3.44	0.86	1.48	4.16	68.73	0.03*	

- = no RDA value available
* P-values (significant when <0.05) are reported for Student's t-test
** Mann-Whitney p-value reported and accepted when conclusion differs from that of Student's t-test.
MP = Makapanstad area
MT =Mathibestad area

TABLE 64: COMPARISON OF THE MEAN NUTRIENT INTAKES OF CHILDREN AGED 10-12 MONTHS(n=27) IN THE TWO CLINICS (WHO AS REFERENCE VALUE)

AGE 10-12 MONTHS		NUTRIENT INTAKES											
		MAKAPANSTAD (n=11)					MATHIBESTAD (n=16)					COMPARISON OF CLINICS (MP versus MT)	
NUTRIENT	WHO VALUE (1996)(97)	MEAN	SD	RANGE		MEAN INTAKE AS % OF WHO VALUE	MEAN	SD	RANGE		MEAN INTAKE AS % OF WHO VALUE	P-VALUE*	
				MIN	MAX				MIN	MAX		t-TEST	MANN-WHITNEY**
A. ADAPTED INTAKE VALUES (WITH BREAST MILK VALUES ADDED)													
ENERGY (kJ)	3486kJ	4892.64	2046.48	2465.00	8182.00	138.54	4152.75	987.08	2333.00	6023.00	119.13	0.26	
PROTEIN (g)	9.6g	28.04	13.28	9.30	47.90	292.04	25.51	12.73	14.10	65.90	265.69	0.62	
VITAMIN A (μg RE)	350μg	451.08	332.45	129.12	1108.12	128.88	521.09	482.19	252.12	2305.00	148.88	0.68	
IRON (low bio-available) (Mg)	21mg	-	-	-	-	21.96	-	-	-	-	24.99	-	
IRON (medium bio-available) (mg)	11mg	-	-	-	-	41.92	-	-	-	-	47.72	-	
IRON (high bio-available (mg)	7mg	4.61	2.86	0.79	11.10	65.87	5.25	2.15	2.59	10.09	74.98	0.51	
ZINC(mg)	5mg	3.81	1.83	1.29	7.76	76.13	3.91	1.95	2.23	10.71	78.14	0.89	

- = no RDA value available
* P-values (significant when <0.05) are reported for Student's t-test
** Mann-Whitney p-value reported and accepted when conclusion differs from that of Student's t-test.
MP = Makapanstad area
MT =Mathibestad area

TABLE 65: COMPARISON OF THE MEAN NUTRIENT INTAKES OF CHILDREN AGED 13-36 MONTHS(n=60) IN THE TWO CLINICS (WHO AS REFERENCE VALUE)

AGE 13-36 MONTHS		NUTRIENT INTAKES											
		MAKAPANSTAD (n=32)					MATHIBESTAD (n=28)					COMPARISON OF CLINICS (MP versus MT)	
NUTRIENT	WHO VALUE (1996)(97)	MEAN	SD	RANGE		MEAN INTAKE AS % OF WHO VALUE	MEAN	SD	RANGE		MEAN INTAKE AS % OF WHO VALUE	P-VALUE*	
				MIN	MAX				MIN	MAX		t-TEST	MANN-WHITNEY**
A. ADAPTED INTAKE VALUES (WITH BREAST MILK VALUES ADDED)													
ENERGY (kJ)	4620kJ	6466.81	2099.98	2432.00	9917.00	139.97	5931.36	1995.09	1047.00	10544.00	128.38	0.32	
PROTEIN (g)	10.9g	43.93	17.21	13.70	81.30	398.11	41.68	15.47	14.40	74.60	382.41	0.69	
VITAMIN A (μg RE)	400μg	315.77	201.11	44.00	840.00	78.94	427.16	391.11	0	1499.00	106.79	0.16	
IRON (low bio-available) (mg)	12mg	-	-	-	-	58.09	-	-	-	-	71.30	-	
IRON (medium bio-available) (Mg)	6mg	-	-	-	-	116.19	-	-	-	-	142.60	-	
IRON (high bio-available) (mg)	4mg	6.97	3.29	1.79	13.10	174.29	8.56	4.83	1.30	26.50	213.90	0.14	
ZINC(mg)	6.5mg	5.21	1.92	1.7	8.99	80.11	4.88	1.64	1.56	8.54	75.11	0.49	

- = no RDA value available
* P-values (significant when <0.05) are reported for Student's t-test
** Mann-Whitney p-value reported and accepted when conclusion differs from that of Student's t-test.
MP = Makapanstad area
MT =Mathibestad area

In Table 62-65 the WHO values were used as the standard reference for energy, protein, vitamin A, iron and zinc. These values allow for three groups of iron reference values. The nutrient analysis programme used does not differentiate between the different levels of iron bioavailability in foods. Only the high bioavailable iron as analyzed in the food composition tables were therefore compared to the reference values. For the purpose of this evaluation, four age groups were formed in order to correspond with the age groups used in the standard reference values. These age groups were 0-6, 7-9, 10-12 and 13-36 month old children. The results of each age group are presented separately, and compared between clinics.

In the first age group almost all the nutrients were consumed in adequate quantities, and most were consumed in excess of the reference values. The iron intake varied between 5.01mg (71.53%) in the Makapanstad area and 3.29mg (47.06%) in the Mathibestad area. The differences between the intakes were however not significant. The zinc intake was inadequate at levels of 56.27% and 49.31% of the reference value in the Makapanstad area and Mathibestad area respectively.

The pattern of nutrient intake was very similar for the second age group as well, with higher intakes of energy, protein and vitamin A. The intakes of iron and zinc were also higher than for the younger age group, but still below 100% of the reference value. The iron intakes varied between 67% and 78%. The zinc intakes were even lower and varied between 52% to 68%, which might be considered inadequate.

With the progressing age of the groups of children, the intakes also increased and the levels for energy, protein and vitamin A were above the reference intake values for both the third and fourth age groups. The vitamin A intake however decreased in the last age group to 78-106% of the reference intake. This may indicate a lower intake of fruit and vegetables as the child became fully weaned onto the family diet where a vitamin A rich food might not have been consumed on a daily basis. This compared well with the Cape Town study where vitamin A intakes were also high and only 10% of children in the FTTG and none of the children in the RefG had intakes <67%RDA. In contrast, the toddler group in Zambia had low intakes of vitamin A of only 70% of the reference value (103). In the 10 to 12 month age group, the iron intakes were questionable since the intakes ranged between 65% and 74%. This level of intake was inadequate in terms of the reference value. At this age the children still mainly consumed milk with very little solid food intake, thus contributing to the low iron value. For the 13 to 36 month age group however, the iron intake was above the probable 100% level of intake. This may be attributed to the fact that the children in this age group were consuming a full family diet with a bigger variety of foods that might have contributed to their iron intake. This result differed from the Cape Town study where 71-81% of children showed intakes <67%RDA (101). The zinc intakes of the last two groups were quite similar. The 10 to 12 month old children consumed approximately 76% and 78% of the reference value and the 13 to 36 month old children 80% and 75% in the Makapanstad and Mathibestad areas respectively. These intakes indicated an inadequate intake of zinc. None of the intakes differed significantly between the two clinics. This also compared well with the Cape Town study where 55-58% of the children showed intakes <67%RDA (101).

To summarize the results on the nutritional evaluation, it could be concluded that the children in these two communities consumed adequate quantities of energy and all the macronutrients compared to the dietary

recommendations. The protein intake (10-11% of total energy intake) compared well with the standard recommendation of 12-15% of total energy intake, the carbohydrates (67-75% of total energy intake) to the ≥55% recommendation, and the fat (21-25% of total energy intake) to the ≤30% recommendation (14, 29). It could be recommended to decrease the intake of starch rich foods to 60-65% and to increase the animal/ plant protein intake to 12-15%. The vitamin A intakes were adequate except for the 13-36 month age groups who had an intake lower than 100% of the reference values. The intake of iron-rich foods was fairly low, but still adequate if fixed cut-off points were implemented in the RDA-analysis. It may however be of value to consider the sources of iron (high bioavailable iron in animal sources and low bioavailable iron in plant sources) consumed in these communities as it may influence the iron availability and absorption (7, 14). The intake of zinc was also low in all the age groups according to both sets of standards. Zinc is an important nutrient involved in growth and a deficiency is associated with low protein and energy intakes leading to PEM (14, 35). The intakes of the other micronutrients were adequate (in terms of both sets of standards) except for vitamin B_3, vitamin D and calcium. Niacin intakes were either low or just above the fixed cut-off point of the reference standards. Niacin is essential in energy metabolism and is required in the synthesis of protein, fat and carbohydrates. Niacin intake is linked to the energy intake of the individual due to its role in energy release (14, 35). A minimum of 4.4mg NE of niacin is needed to prevent pellagra. This level was not achieved by the youngest two age groups (mean intakes of 3.48mg NE and 4.38mg NE for children aged 0-6/12 and 7-12/12 respectively), but was adequately achieved by the 13-36/12 age group (5.71mg NE). Niacin intakes should therefore receive attention in order to prevent pellagra. Vitamin D was consumed only to a level of about 35% of the reference value, which indicated a very low food intake. As both food and sunlight (which is abundant is SA) contribute to vitamin D status, it is generally not considered a problem (14). For infants and children vitamin D is an essential vitamin that ought to be present in the body to absorb and use calcium effectively (14). If both calcium and vitamin D are continuously deficient, rickets (reduced bone quality and normal bone quantity), reduced growth or osteomalacia may develop. In conjunction with the low vitamin D intakes, the calcium intakes hardly reached a level of 50% of the reference values in all age groups. It might therefore be of value to investigate both the vitamin D and calcium status of these children more closely to determine future problems like osteomalacia or rickets. In conclusion, dietary deficiencies in vitamin A, vitamin C, iodine, iron, zinc and calcium may lead to stunted growth, blindness, mental and physical handicaps, reduced immunity to infections, anaemia, apathy, anorexia, poor absorption and decreased total food intake and should be prevented (12, 64, 65). In these communities iron, calcium (and vitamin D) and zinc should be taken into consideration as critical nutrients when evaluating the growth of the children as they are all involved in/essential for growth and would thus affect the growth curves of children if all were inadequate in the diet.

In can be concluded that the nutritional evaluation revealed a tendency of low intakes of both the macro and micronutrients associated with growth and development especially during the weaning phase in the first two years of life; an increase in intakes of these nutrients seemed to occur with an increase in age.

The 24h-recall of dietary intake was used to determine the foods that were eaten most frequently in the three age groups (0-6, 7-12 and 13-36 month old children). Only 19 different food items were mentioned by all mothers / caregivers of the children in the 0-6/12 age group, 40 different food items were mentioned in the 7-12/12 age group, and 58 different food items were mentioned in the 13-36/12 age group. Some

of these were mentioned only once or twice. In the 0-6/12 age group the four most frequently mentioned foods comprised 63.5% of the total number of foods mentioned: soft maize meal porridge (26.9%), Nestum (13.9%), Purity: fruit/vegetables (11.3%) and Nan powder stirred into the soft porridge (11.3%). In the 7-12/12 age group the five most frequently mentioned foods comprised 47.3% of the total number of foods mentioned: soft maize meal porridge (18.6%), banana (11.1%), juice - commercial, sweetened (6.09%), Nan powder stirred into the soft porridge (5.7%) and orange (5.7%). In the 13-36/12 age group the five most frequently mentioned foods comprised 39.9% of the total number of foods mentioned: stiff maize meal porridge (9.5%), soft maize meal porridge (8.2%), sugar (7.9%), brown bread (7.3%) and Nespray powder stirred into the soft porridge or drunk as milk (11.3%). The ten most frequently mentioned foods consumed by the children in each of the three mentioned age groups, ranked from the most frequently mentioned to least frequently mentioned, are:

0 - 6 MONTHS	7 - 12 MONTHS	13 - 36 MONTHS
Soft maize meal porridge	Soft maize meal porridge	Stiff maize meal porridge
Nestum	Banana	Soft maize meal porridge
Purity - fruit / vegetables	Juice - artificial, sweetened	Sugar
Nan powder stirred into soft porridge	Nan powder stirred into soft porridge	Brown bread
Banana	Orange	Nespray - in food / as a drink
Lactogen powder stirred into soft porridge	Sugar	Banana
Orange	Nespray - in food / as a drink	Soya mince
S_{26} powder stirred into soft porridge	Brown bread	Juice - artificial, sweetened
Marie biscuits	Chips / cheese curls	Rooibos tea
Juice - artificial, sweetened	Stiff maize meal porridge	Margarine

All the other foods mentioned were consumed very infrequently, including fruits like apples, oranges; vegetables like spinach, tomato and onion, potato and cabbage; margarine, oil, peanut butter, soya mince, commercial instant soups, artificial fruit juice and tea. It can be concluded that the variety of food consumed was limited and that protein-rich food, vegetables and fruits were consumed very infrequently.

7.4 FOOD SECURITY

The measurement of the phenomena of hunger and food security was done by means of the the Radimer/Cornell Hunger Scale (42)(see Chapter 5). Each mother / caregiver completed a hunger scale questionnaire individually by means of a structured interview. The results are presented in Table 66 according to the different sections of the hunger scale.

TABLE 66: RESULTS FROM THE HUNGER SCALE (N=174)

CLINIC	TYPE OF RESPONSE	RESPONSES (%)						CLINIC COMPARISON FOR INDIVIDUALS CHI-SQUARE (P-VALUE*)
		NEVER		SOMETIMES		MOST TIMES		
HOUSEHOLD HUNGER								
1. Do you worry that your food will run out before you get money to buy more?								
MAKAPANSTAD	INDIVIDUAL (n=85)	24	(28.24)	21	(24.71)	40	(47.06)	
MATHIBESTAD	INDIVIDUAL (n=89)	28	(31.46)	56	(62.92)	5	(5.62)	
TOTAL (BOTH CLINICS)	INDIVIDUAL (n=174)	52	(29.89)	77	(44.25)	45	(25.86)	43.37 (0.001)*
2. Does the food that you buy last until you get money to buy more?								
MAKAPANSTAD	INDIVIDUAL (n=85)	45	(52.94)	18	(21.18)	22	(25.88)	
MATHIBESTAD	INDIVIDUAL (n=89)	25	(28.09)	50	(56.18)	14	(15.73)	
TOTAL (BOTH CLINICS)	INDIVIDUAL (n=174)	70	(40.23)	68	(39.08)	36	(20.69)	22.47 (0.001)*
3. Do you run out of foods to prepare a meal with, without having any money to buy more?								
MAKAPANSTAD	INDIVIDUAL (n=85)	19	(22.35)	39	(45.88)	27	(31.76)	
MATHIBESTAD	INDIVIDUAL (n=89)	55	(61.80)	29	(32.58)	5	(5.62)	
TOTAL (BOTH CLINICS)	INDIVIDUAL (n=174)	74	(42.53)	68	(39.08)	32	(18.39)	34.04 (0.001)*
4. Do you worry that you will have food to eat tomorrow?								
MAKAPANSTAD	INDIVIDUAL (n=85)	24	(28.24)	24	(28.24)	37	(43.53)	
MATHIBESTAD	INDIVIDUAL (n=89)	29	(32.58)	55	(61.80)	5	(5.62)	
TOTAL (BOTH CLINICS)	INDIVIDUAL (n=174)	53	(30.46)	79	(45.40)	42	(24.14)	36.95 (0.001)*
5. Can you afford to buy the kind of foods that you think your family should eat?								
MAKAPANSTAD	INDIVIDUAL (n=85)	49	(57.65)	23	(27.06)	13	(15.29)	
MATHIBESTAD	INDIVIDUAL (n=89)	31	(34.83)	51	(57.30)	7	(7.87)	
TOTAL (BOTH CLINICS)	INDIVIDUAL (n=174)	80	(45.98)	74	(42.53)	20	(11.49)	16.36 (0.001)*
WOMEN'S HUNGER								
6. Do you have enough money to eat the way you should?								
MAKAPANSTAD	INDIVIDUAL (n=85)	71	(83.53)	8	(9.414)	6	(7.06)	
MATHIBESTAD	INDIVIDUAL (n=89)	56	(62.92)	27	(30.34)	6	(6.74)	
TOTAL (BOTH CLINICS)	INDIVIDUAL (n=174)	127	(72.99)	35	(20.11)	12	(6.90)	12.00 (0.002)*
7. Are your money enough to buy enough food to keep you from getting hungry?								
MAKAPANSTAD	INDIVIDUAL (n=85)	60	(72.29)	15	(18.07)	8	(9.64)	
MATHIBESTAD	INDIVIDUAL (n=89)	22	(24.72)	62	(69.66)	5	(5.62)	
TOTAL (BOTH CLINICS)	INDIVIDUAL (n=174)	82	(47.67)	77	(44.77)	13	(7.56)	46.84 (0.001)*
8. Are you most of the times hungry, but you don't eat because you can't afford enough food?								
MAKAPANSTAD	INDIVIDUAL (n=85)	19	(22.62)	29	(34.52)	36	(42.86)	
MATHIBESTAD	INDIVIDUAL (n=89)	59	(66.29)	26	(29.21)	4	(4.49)	
TOTAL (BOTH CLINICS)	INDIVIDUAL (n=174)	78	(45.09)	55	(31.79)	40	(23.12)	46.17 (0.001)*

CLINIC	TYPE OF RESPONSE	RESPONSES (%)						CLINIC COMPARISON FOR INDIVIDUALS CHI-SQUARE (P-VALUE*)
		NEVER		SOMETIMES		MOST TIMES		
9. Do you eat less than you think you should, because you don't have enough money for food?								
MAKAPANSTAD	INDIVIDUAL (n=85)	21	(25.00)	26	(30.95)	37	(44.05)	
MATHIBESTAD	INDIVIDUAL (n=89)	37	(41.57)	46	(51.69)	6	(6.74)	
TOTAL (BOTH CLINICS)	INDIVIDUAL (n=174)	58	(33.53)	72	(41.62)	43	(24.86)	32.20 (0.001)*
CHILDREN'S HUNGER								
10. Do you have enough money to give your child(ren) a good meal?								
MAKAPANSTAD	INDIVIDUAL (n=85)	57	(67.86)	16	(19.05)	11	(13.10)	
MATHIBESTAD	INDIVIDUAL (n=89)	39	(43.82)	46	(51.69)	4	(4.49)	
TOTAL (BOTH CLINICS)	INDIVIDUAL (n=174)	96	(55.49)	62	(35.84)	15	(8.67)	21.03 (0.001)*
11. Do you have enough money to feed your child(ren) the way you think is right?								
MAKAPANSTAD	INDIVIDUAL (n=85)	64	(75.29)	11	(12.94)	10	(11.76)	
MATHIBESTAD	INDIVIDUAL (n=89)	38	(42.70)	45	(50.56)	6	(6.74)	
TOTAL (BOTH CLINICS)	INDIVIDUAL (n=174)	102	(58.62)	56	(32.18)	16	(9.20)	28.19 (0.001)*
12. Do you have enough money to give your child(ren) enough food?								
MAKAPANSTAD	INDIVIDUAL (n=85)	64	(75.29)	11	(12.94)	10	(11.76)	
MATHIBESTAD	INDIVIDUAL (n=89)	39	(43.82)	43	(48.31)	7	(7.87)	
TOTAL (BOTH CLINICS)	INDIVIDUAL (n=174)	103	(59.20)	54	(31.03)	17	(9.77)	25.48 (0.001)*
13. Is/are your child(ren) sometimes hungry because you don't have enough money to buy food?								
MAKAPANSTAD	INDIVIDUAL (n=85)	25	(29.41)	22	(25.88)	38	(44.71)	
MATHIBESTAD	INDIVIDUAL (n=89)	68	(76.40)	18	(20.22)	3	(3.37)	
TOTAL (BOTH CLINICS)	INDIVIDUAL (n=174)	93	(53.45)	40	(22.99)	41	(23.56)	50.09 (0.001)*

* P<0.05

7.4.1 HOUSEHOLD HUNGER

The items (five questions) directed at the household hunger included questions about food depletion, food unsuitability, food anxiety and food acquisition.

First the mother's worry concerning the fact that the food would run out before she had any more money to buy food again was evaluated. There was a significant difference (P=0.001) between the responses from the two clinics, especially concerning the positive and intermediate responses. However, the number of mothers / caregivers indicating that they were **never** concerned about not having any money to buy food, was the same in both clinics. The mothers / caregivers (n=77, 44.25%) indicated that they worried only **sometimes** about food running out without having any money to buy more food.

In the second question it was asked directly if the food ran out before the mother got money to buy food again. The majority of mothers / caregivers from the Makapanstad area (n=45, 52.94%) indicated that their food never lasted until they got more money, versus the Mathibestad area (n=25, 28.09%). There was a significant difference (P=0.001) between the responses from the two clinics. For the whole group the results were almost the same for the food **never** lasting (n=70, 40.23%) and the food **sometimes** lasting (n=68, 39.08%) and the least for food lasting **most times** (n=3, 11.54%).

Question three could be regarded as a cross-control question for question two where it was asked whether they ran out of foods to prepare a meal with. Most of the mothers / caregivers from the Makapanstad area (n=39, 45.88%) indicated that they only **sometimes** ran out of foods to prepare a meal with without having any money to buy more while the majority of the mothers / caregivers from the Mathibestad area (n=55, 61.80%) **never** ran out of food. There was a significant difference in the responses between the two clinics (P=0.001). For the total group of mothers / caregivers most of the responses showed that they **never** (n=74, 42.53%) or **sometimes** (n=68, 39.08%) ran out of food, with the least number of responses (n=32, 18.39%) indicating that they ran out of food **most times**.

The next question (fourth) was more specific and asked about worrying if they would have food to eat the next day (tomorrow). These results compared well with those of the previous question. The mothers / caregivers from the Makapanstad area gave most responses for worrying **most times** (n=37, 43.53%), and the mothers / caregivers from the Mathibestad area gave most responses for worrying **sometimes** (n=55, 61.80%). The totals for the individual responses tended to be towards the intermediate (n=79, 45.40%) and negative responses (n=53, 30.46%).

The last question in this category was about the buying power of the household. Most of the mothers / caregivers from the Makapanstad area (n=49, 57.65%) and some mothers / caregivers from the Mathibestad area (n=31, 34.83%) said that they **never** could afford to buy the kind of foods that they thought their family should eat. There was a significant difference (P=0.001) between the responses from the two clinics. The majority of the mothers / caregivers from the Mathibestad area (n=51, 57.30%) indicated that they **sometimes** could afford to buy the kinds of foods that they thought their family should eat. Only 27.06% (n=23) of the mothers / caregivers from the Makapanstad area responded in this way. Only about 11% of the total group of mothers / caregivers said that they could buy the foods that they thought was necessary for the family.

From these questions asked on household hunger, it could be concluded that about 30% of the answers indicated no worry about not being able to buy foods, and 21% of the responses indicated that the foods mostly lasted until they were able to buy more food. Only 18% of the mothers / caregivers actually ran out of food and 40% **never** ran out of food. Almost 60-70% (sum of scores for never and sometimes or for sometimes and most times) of the people perceived they were not food secure in their households. The mothers / caregivers **never** (n=53, 30.46%) or only **sometimes** (n=79, 45.40%) worried about the food for tomorrow. Only 12% of the mothers / caregivers indicated that they had enough money to buy what they thought was necessary, thus suggesting that at least 88% of the people had the perception that they could

not afford the kind of foods that the family should eat.

In conclusion: referring to the significant differences ($P<0.05$) between the responses of the two clinics, it could be concluded that there was a difference in their experience of household food security. The mothers / caregivers from the Makapanstad area responded to four out of the five questions mainly to the worst scenario offered. The mothers / caregivers from the Makapanstad area could therefore be classified as food insecure in terms of household hunger, as all their responses indicated towards always worrying about the availability of money and food, and actually running out of food to prepare meals with. The mothers / caregivers from the Mathibestad area on the other hand, responded to four out of the five questions mainly with the intermediate response indicating that running out of foods was not a real problem. This might indicate that the Mathibestad area could be classified as having only moderate food insecurity as most of their responses pointed towards the middle or least serious responses.

7.4.2 INDIVIDUAL HUNGER: WOMEN'S HUNGER

The items directed at individual hunger of both the mother and the mothers' perception of her child's hunger included questions about intake insufficiency, diet inadequacy, disrupted eating patterns and feeling deprived. This section was divided in that of women's hunger and children's hunger, with four questions each.

The first question on women's hunger dealt with the issue of having enough money to eat the way that the mothers / caregivers thought that they should. The majority of the mothers / caregivers from the Makapanstad area (n=71, 83.53%) indicated that they **never** had enough money. The majority of the responses from the Mathibestad area (n=56, 62.92%) were following the same trend, although less pronounced. The responses from the Mathibestad area were significantly different ($P=0.002$) to that of the Makapanstad area. The total responses from the mothers / caregivers followed the same pattern with the majority of responses (n=127, 72.99%) indicating that they **never** had enough money to eat the way they thought they should. Only 6.90% of the mothers / caregivers indicated that they had enough money to eat the way they should **most times**.

The second question focused more on the availability of money to obtain enough food to prevent hunger. Most of the mothers / caregivers from the Makapanstad area (n=60, 72.29%) again indicated that they **never** had enough money for food in order to prevent hunger. The mothers / caregivers from the Mathibestad area had a significantly different ($P=0.001$) response to this. They mostly chose the moderate answer of **sometimes** (n=62, 69.66%), with only a few indicating a high need (n=22, 24.72%). The total response rate for the mothers / caregivers favoured the negative answer more (n=82, 47.67%) with only 7.56% indicating that they mostly had enough money to prevent hunger.

The third question focused on the mothers / caregivers being hungry most of the time without being able to relieve this hunger due to little money available. The majority of the Makapanstad area mothers / caregivers (n=36, 42.86) reacted in the worst way by responding to being hungry **most times**. Fewer

mothers / caregivers reacted to the intermediate response of **sometimes** (n=29, 34.52%) and less to the positive response of **never** being hungry most of the time without being able to afford food (n=19, 22.62%). There was a significant difference (P=0.001) in the responses between the two clinics. The mothers / caregivers from the Mathibestad area reacted in the opposite way. Most of the mothers / caregivers (n=59, 66.29%) said that they **never** were hungry most of the time and least of the mothers / caregivers (n=4, 4.49%) said that they were hungry **most times**. Considering the total number of responses, the lack of money seemed less a problem with the majority of the mothers / caregivers indicating that they were **never** hungry (n=78, 45.09%) and only a few mothers / caregivers being hungry **most times** (n=40, 23.12%).

In conclusion: these responses were clearly showing that the mothers / caregivers from the Mathibestad area were less influenced by the lack of money and perceived themselves less food insecure than in the Makapanstad area. It seemed that hunger and a lack of money was apparent in both areas, but that the perception existed that not all the people were hungry and lacking money to buy food constantly. Most of the mothers / caregivers could afford food to prevent extreme hunger; more so in the Mathibestad area.

The last question was about the volume of food consumed with direct relation to the amount of money available to buy the food. The majority of the mothers / caregivers from the Makapanstad area (n=37, 44.05%) indicated an intake less than what they thought they should have. There was a significant difference (P=0.001) in the responses between the two clinics. The majority of the mothers / caregivers from the Mathibestad area perceived their situation more positively indicating that they **sometimes** (n=46, 51.69%) or **never** (n=37, 41.57%) ate less than they thought they should. The total responses of the group of mothers / caregivers pointed towards the intermediate response of **sometimes** (n=72, 41.62%) and **never** (n=58, 33.53%).

From these questions asked about women's hunger, it could be concluded that only about 7% of the responses showed that enough money was **most times** available to the mothers / caregivers to eat the way that they thought they should. Most of the mothers / caregivers considered themselves as **never** (73%) or only **sometimes** (20%) having enough money to buy the foods they wanted. Approximately 92%(sum of scores for never and sometimes) of all the mothers / caregivers indicated that they **never** or only **sometimes** had enough money to buy enough food to prevent hunger. Only 23% of the mothers / caregivers were hungry **most times**, and not able to eat enough due to a lack of money to buy food with. If the intermediate response was also taken into account almost 55% of these two communities were food insecure. About 25% of the group of mothers / caregivers said that they **most times** ate less than they thought they should due to a lack of money. If the intermediate responses were also taken into account, about 65% of all the mothers / caregivers were not taking in enough food. This however should be regarded as a perception only and not indicative of food insecurity.

In conclusion: referring to the significant differences (P<0.05) between the responses of the two clinics, women's hunger was experienced differently. For all the questions asked the majority of mothers / caregivers from the Makapanstad area always responded to the worst scenario offered. The mothers / caregivers from the Makapanstad area could therefore be classified as hungry / food insecure in terms of

women's hunger. The mothers / caregivers from the Mathibestad area on the other hand, responded only to the money-related question as **never** having enough money. For the other questions the majority of responses were for the intermediate response (**sometimes**) or the positive response (**most times**). This showed that the people probably had enough food for the prevention of hunger, but perceived not to have access to the high quality nutritious foods / luxury food items as they would have liked to buy and therefore considered themselves as not having enough money.

7.4.3 INDIVIDUAL HUNGER: CHILDREN'S HUNGER

This section on individual hunger (children's hunger) consisted of four items about intake insufficiency, diet inadequacy, disrupted eating patterns and feeling deprived.

The first question asked if the mothers / caregivers thought that they had enough money to give their children a good meal. The majority of the mothers / caregivers from the Makapanstad area (n=57, 67.86%) responded to the worst scenario of **never** having enough money to provide a good meal. The Mathibestad area mothers / caregivers (n=46, 51.69%) mostly responded to **sometimes** having enough money for a good meal. The least responses were constantly given for having enough money to give children a good meal **most times** (Makapanstad area: n=11, 13.10% and Mathibestad area: n=4, 4.49%). However, there still was a significant difference (P=0.001) in the responses between the two clinics. The total number of responses from all the mothers / caregivers in these communities showed the high value they put on having enough money to give children a good meal as they mostly felt that they **never** (n=96, 55.49%) had enough money for a good meal and hardly ever had enough money **most times** (n=15, 8.67%).

The second question asked if enough money was available to feed the children the way that the mothers / caregivers thought was right. The majority of the mothers / caregivers from the Makapanstad area (n=64, 75.29%) said that they **never** had enough money to feed the children the way that they thought was right. The most popular response in the Mathibestad area (n=45, 50.56%) was **sometimes** and then **never** (n=38, 42.70%). There was a significant difference (P=0.001) in the responses between the two clinics. The total responses of the mothers / caregivers for this question favoured the negative response (**never**) (n=102, 58.62%) with **most times** almost unmentioned (n=16, 9.20%).

The third question was about money and food on a different level. Where the first question queried if money was enough for a good meal, and the second question asked if the money was enough to feed the way they thought was right, the third question addressed the actual hunger issue and asked if the money was enough to give enough food to the child. The majority of the mothers / caregivers from the Makapanstad area (n=64, 75.29%) indicated the worst scenario where they **never** had enough money to give the children enough food. There again was a significant difference (P=0.001) in the responses between the two clinics. The majority of the mothers / caregivers from the Mathibestad area (n=43, 48.31%) perceived that they only **sometimes** did not have enough money to give their children enough food. The total of the individual responses showed that these mothers / caregivers clearly perceived that they **never** had enough money to buy enough food (n=103, 59.20%), or only had enough **sometimes**

(n=54, 31.03%) with only a few people (n=17, 9.77%) saying that they had enough food for their children **most times**.

The last question focused on the actual hunger felt by children. The mother / caregiver was asked whether her child / children was sometimes hungry because she did not have enough money to buy food. This thus focused directly on the availability of food in the household to fill the stomach and to prevent hunger. The majority of the mothers / caregivers from the Makapanstad area (n=38, 44.71%) responded to the worst answer, but to a much lesser degree than with the previous questions. Again there was a significant difference (P=0.001) in the responses between the two clinics. The mothers / caregivers from the Mathibestad responded in totally the opposite manner, indicating that most (n=68, 76.40%) of the children **never**went hungry and that very few (n=3, 3.37%) were **most times** hungry. The total responses indicated that the majority of the mothers / caregivers from both clinics (n=93, 53.45%) felt that their children were **never** hungry due to a lack of money to buy food with. Only 23.56% indicated that their children were hungry **most times** due to a lack of money.

To conclude: 91.33% (sum of scores for never and sometimes) of the mothers / caregivers from these two communities perceived that they did not have enough money to give a good meal to their children. Approximately 91% of all the mothers / caregivers felt that they did not have enough money to feed their children the way that they thought was right. Likewise 90% of the total number of mothers / caregivers felt that they **never** had enough money to give their children what they considered being enough food. These results therefore revealed a perception of food insecurity concerning their children. However, only 23.56% of all the mothers / caregivers indicated actual hunger in their children; 47% of all the mothers / caregivers perceived the children as being hungry **most times** or **sometimes** and could thus probably be regarded as food insecure.

In conclusion: referring to the significant differences (P<0.05) in the responses between the two clinics, there seemed to be a difference in their experience of children's hunger or food insecurity. The majority of the mothers / caregivers from the Makapanstad area responded to all four questions in terms of the worst picture of child feeding. The mothers / caregivers from the Makapanstad area could probably be classified as food insecure in terms of children's hunger, as all their responses indicated towards **never** having enough money to give their children a good meal, or enough food or to feed them the way that they thought was right, and the children being hungry due to a lack of money. The majority of the mothers / caregivers from the Mathibestad area responded to three out of the four questions in terms of the worst scenario, followed by the intermediate response and lastly the worst response. This might indicate that the mothers / caregivers from the Mathibestad area could probably be classified as only having moderate food insecurity since most of their responses were in terms of the middle or least serious scenarios, and as being less food insecure than the mothers / caregivers from the Makapanstad area. The results from the hunger scale should however be interpreted with caution due to the restrictions concerning the cultural and lingual differences between the standardization and research groups.

CHAPTER 8

RESULTS OBTAINED FROM QUALITATIVE RESEARCH METHODS:
GENERAL HEALTH AND FEEDING PRACTICES

CHAPTER 8 RESULTS OBTAINED FROM QUALITATIVE RESEARCH METHODS: GENERAL HEALTH AND FEEDING PRACTICES

" You can't make an omelette without breaking eggs. And — to extend the aphorism — you can't make an omelette without beating the eggs together. 'Analysis' too involves breaking data down into bits, and then 'beating' the bits together. The word derives from the prefix 'ana' meaning 'above', and the Greek root 'lysis' meaning 'to break up or dissolve' " (Bohm in Dey, 1993:30)(92).

In this chapter the data reduction process will be discussed, as well as findings on general health practices in the first sampling unit on general knowledge on infant feeding and health, and findings on feeding practices in the following sampling units on breast feeding, bottle feeding and weaning.

8.1 THE DATA REDUCTION PROCESS

Once the data transcription had been finalised, a method for data reduction was devised in order to work with / use the masses of data recovered from the research (data transcription document - see Chapter 6)(88). A summary of the data reduction process is presented in Figure 15.

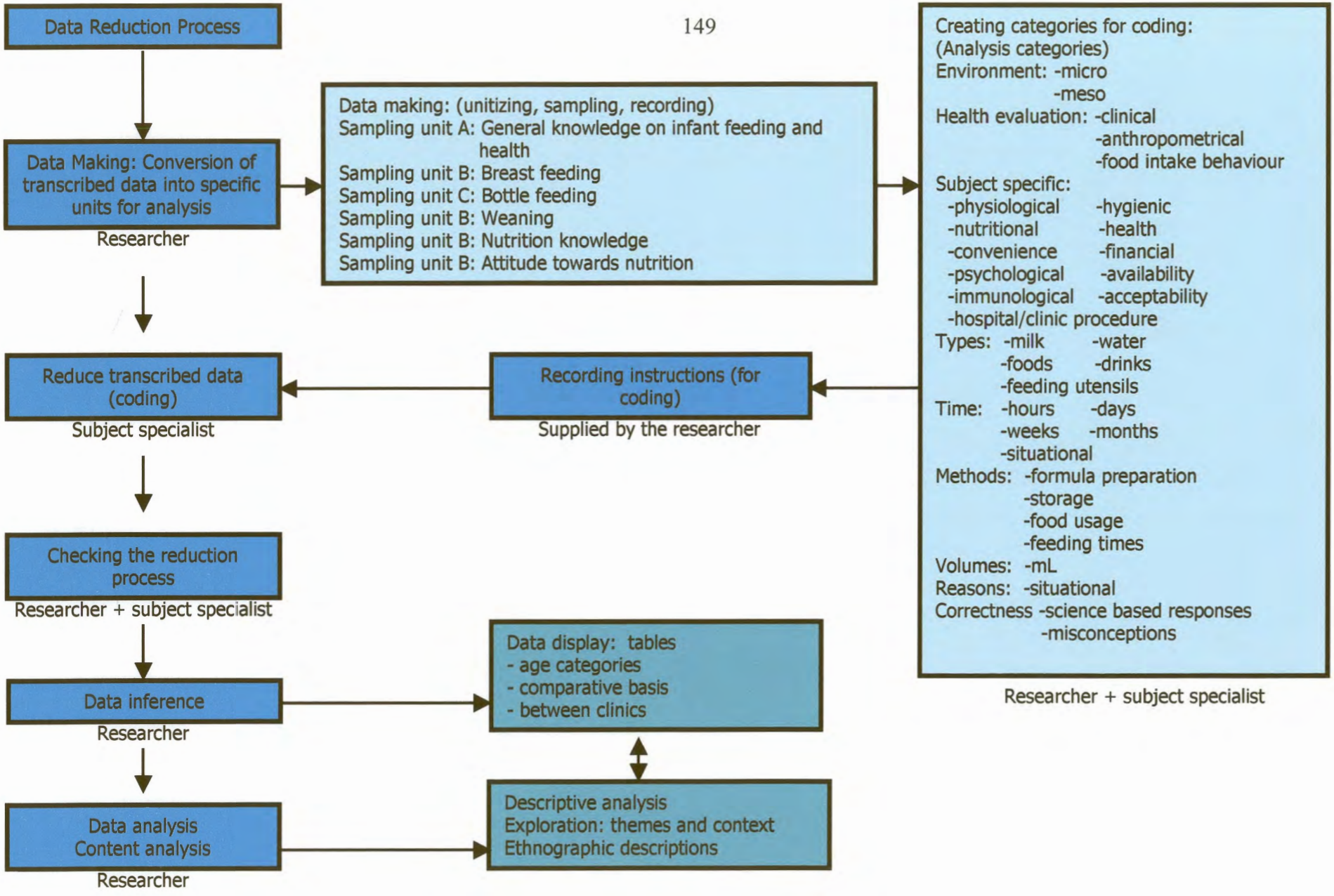


FIGURE 15: THE DATA REDUCTION PROCESS

The first step in the process was data making (unitizing, sampling, recording)(see Chapter 6). Categories were created for coding of data in the analysis process, using the structured interview schedule as outline in order to assemble the data. These data categories were created by the researcher and were derived from the theory as presented previously (see Chapters 5 and 6). For clarification, some of the category terminology used (refer to Figure 15) included the following:

For the purpose of this research, all the responses connected to any kind of **environment** were coded as either the micro or meso environments and were considered as being physical units of analysis. From an ecological perspective individuals and families in their living settings are identified as units with environmental relationships. These units interact interdependently with their environment (93). The **micro level** of reality refers to the individuals that interact on a daily basis (73). Usually the family is the centre of individual interaction and therefore the family has interrelationships with the various dimensions of the environment, including the micro, meso and macro environments (73, 93). The micro environment provides the immediate setting for the family system. It involves the area of regular personal contact within the living unit and surroundings with the objects, plants, animals and individual family members available to enhance the environment or promote the purpose of each member (93, 94). The family receives physical sustenance from the natural environment and is dependent upon the social environment for its affectional and socialization needs. The birth of each child affects some members more than others and the family's diversity will determine its ability to adapt to such changes (73). The **meso level** of reality attempts to link macro and micro levels or to operate at an intermediate level and includes organizations, social movements or communities (73). Permeating the boundaries of the family system is relatively easy, although much variation exists. A family's outer boundary for its micro environment is actually the result of environmental interchanges. These boundaries are non-physical and represent the meaningful interrelationships beyond the family unit (93). The macro environment surrounds the micro and meso environments through related socio-cultural, political, economic and technological systems and through the natural and structured surroundings for interchanges (93). The **macro level** of reality concerns the operation of larger aggregates such as social institutions, entire cultural systems and whole societies (73). For this research study, the micro and meso environments were applicable:

- micro environment — closest people to the respondent (individual) like her family, or members of the same household or very close friends with whom interaction took place on a daily basis,

- meso environment — people or objects in the community that could be seen as intermediary contacts. Interaction was less regular, like the clinic staff or neighbours.

Health evaluations included the subjective evaluation of the child's clinical appearance, his body measurements and eating behaviour:

- clinical evaluation — involved the subjective evaluation of physical appearance, good general health, no diseases present,

- anthropometrical evaluation — referred to the objective measurement of body size, weight and proportions at the clinic and included concepts like falling within applicable weight and height ranges,

- food intake behaviour — referred to eating or food consumed and included concepts like the mother's / caregiver's perception of a healthy appetite, or when a child is eating properly.

Subject specific categories were created for coding reasons given by the mothers / caregivers for their practices in terms of broad themes like physiological, nutritional, health, financial reasons, etc. Responses given as "good for you" / "good for the baby" were sometimes categorized in one or more of the subject specific categories because of the nonspecific nature of the response.

Physical items were classified according to the type of item, e.g. types of milk, water, food, drinks and utensils.

Time related responses were categorized in terms of hours, days, weeks, etc.

Methods for different actions were categorized separately according to type, e.g. formula preparation, food storage, etc.

Volumes of food or drink used or given to the child were given in mL.

Reasons for practices, knowledge or attitudes that did not fit into the subject specific categories were categorized separately in terms of the relevant situation / theme.

Correctness of reasons were categorized in terms of:

- science based responses — any response that was based on a well accepted scientific fact,

- misconceptions — any response that was based on some unknown or culturally based (scientific unsound) concept, or which was not based on a scientific fact or on wrong interpretations of scientific concepts.

The transcribed data (responses from the various focus groups) were reduced by means of coding according to the created categories and recording instructions which were supplied by the researcher (as described in 6.2.2.5 in Chapter 6). The document with the created analysis categories used by the two specialists to categorize the data is also a large document (56 pages) and therefore only the instructions to the coders and examples of the first six questions / probes will be included. (See Addendum H.)(The document is available on request.)

Data inference and analysis were done by the researcher by means of content analysis (i.e. exploration of the themes and context uncovered in the data) according to the methodology of Krippendorf (1980)(81) and

Stewart (1990)(91) as discussed in Chapter 6. Details on the data making categories are summarized in Table 67. Thirteen focus groups were conducted in each of the two clinics, with three groups in the 0-3/12 age category and two in the other five categories (i.e. 26 focus groups in total). On average six mothers/caregivers were included per focus group; resulting in a total sample of 144 children whose mothers / cargivers attended the focus group interviews. Due to a number of mothers / caregivers who were supposed to attend the scheduled focus group interviews but who did not pitch up and had to be replaced, the sample size for the quantitative data collection eventually increased to 174 children, while the mothers / caregivers attending the focus group interviews were only 144. The analysis was organized in terms of the six sampling units and the different topics / themes that were identified for communicating the essence of what the data revealed (88). These topics / themes delineated the context within which the data reduction was done. The data will be displayed on a comparative basis and discussed simultaneously with reference to each question / probe in the interview guide in terms of frequencies of responses from the two clinics. Descriptive analysis by means of ethnographic descriptions will be done simultaneously to the reporting of the content analysis.

TABLE 67: DATA MAKING FOR THIS RESEARCH STUDY

SAMPLING UNITS	RECORDING UNITS			CONTEXT UNITS	ETHNOGRAPHY
	PHYSICAL UNITS	REFERENTIAL UNITS	THEMATIC UNITS		
GENERAL KNOWLEDGE ON INFANT FEEDING AND HEALTH	- person teaching baby care - average age when taught baby care - person teaching baby feeding -duration of exclusive breast feeding -basis of knowledge concerning duration - number of months of exclusive breast feeding - number of months before discontinuing breast feeding -action taken with diarrhoea -action taken with vomiting - person teaching the appropriate actions - clinic informant	- reasons for visiting the clinic - health in terms of growth - type of milk best for a baby - reasons given for the type of milk chosen or not chosen - reasons for the duration of breast feeding - reasons for the action with vomiting - reasons for the action with diarrhoea - causes of vomiting - causes of diarrhoea - credibility of the clinic	- best kind of milk for a baby - reasons for exclusively breast feeding a baby for a number of months	- baby care - baby feeding - sick children - clinic involvement	- description of a healthy baby that grows well - perceptions of the causes of vomiting or diarrhoea
BREAST FEEDING	- appropriateness of breast feeding - soonest time to breast feed - breast feeding frequency - day versus night - timing per feed - age for exclusive breast feeding - age for discontinuing breast feeding - eating / drinking with breast feeding - additional feeds - frequency - age of first weaning food - age of eating family meals	- reasons for breast feeding - reasons for not breast feeding - timing of first feed and the reasons involved - reasons for the duration of exclusive breast feeding - reasons for discontinuing breast feeding - additional items with breast feeding: - time given - types given - reasons given	- the practice of breast feeding - introduction and duration of exclusive breast feeding - appropriate age for introducing solid foods - implementation of breast feeding: frequency and feeding time	- eating and drinking practices with breast feeding	- reasons for choosing or for avoiding breast feeding

SAMPLING UNITS	RECORDING UNITS			CONTEXT UNITS	ETHNOGRAPHY
	PHYSICAL UNITS	REFERENTIAL UNITS	THEMATIC UNITS		
BOTTLE FEEDING	- the attitude towards the practice of bottle feeding - person deciding on bottle feeding - type of milk used - brand of formula milk used - person teaching making bottle feeds - type of water used - cows' milk: usage boiling additions - making food/bottles in advance - places where it is kept	- reasons for giving bottle feeding or not - reasons for the type of water chosen - reasons for using cow's milk - reasons for boiling cow's milk - reasons given for preparing food/ bottles in advance	- preparation technique & general practice of bottle feeding	Bottle feeding: - type of feed - method/mixing procedures - hygiene	Bottle feeding: - brands with reasons used
WEANING	- age for discontinuation of breast feeding / milk feeds - milk drinking practices with weaning - type of milk used - utensils used for milk drinking - type of water used for mixing powder milk - temperature of water used for mixing powder milk - frequency of solid food meals - volumes of solid food given - volumes of milk drunk by a weaned child -separate preparation of food	- types of complementary foods - reasons for choices of complementary foods - reasons for stopping breast feeding / milk feeds - reasons for meal patterns - reasons for volumes of food given - reasons for volumes of milk given to weaned children - reasons for food prepared separately - additions made to the child's food - reasons for additions to the child's food	- milk mixing technique for cup drinking - temperature of the water used for milk mixing	- milk drinking practices - solid food intakes - explanations of preparation techniques for children's food and commercial products used	- traditional food preparation techniques for children - description of the reasons given for the choice of milk for a weaned child - volumes of food consumed by children in the different age categories

SAMPLING UNITS	RECORDING UNITS			CONTEXT UNITS	ETHNOGRAPHY
	PHYSICAL UNITS	REFERENTIAL UNITS	THEMATIC UNITS		
NUTRITION KNOWLEDGE	- meal frequency: adults - meal frequency: children - daily volume of milk for a child - daily volume of liquids for a child	- reasons for meal frequencies: adults - reasons for meal frequencies: children - reasons for keeping leftover food - reasons for checking leftover food - methods for checking leftover food - types of foods given to children - reasons for giving types of food to children - ways to use fat in the diet - the importance of daily intake of liquids by children -types of liquids / drinks given to children - reasons for the types of drinks / liquids given to children	- foods chosen and reasons given according to food group functions	- meal frequencies - hygiene control of meals - suitability of foods for children - suitability and variety of drinks used by children	- reasons for giving/withholding certain foods / groups for children
ATTITUDE TOWARDS NUTRITION	-	- the importance of food & health - importance of knowledge on healthy eating - fat children & health - food & illness - acceptability of new foods - availability of foods and health - money & health - reasons for following traditional cooking practices or not - father's food portions & reasons	- food & health - food availability & money - traditions relating to portion sizes	- health & eating - money influencing food choice / availability and thus health - traditions & culture affecting preparations and availability to the child	- attitudes towards food and health - trying new foods - traditional cooking methods - the father receiving largest portions

8.2 PRESENTATION AND DISCUSSION OF FOCUS GROUP DATA

8.2.1 SAMPLING UNIT: GENERAL KNOWLEDGE ON INFANT FEEDING AND HEALTH

The general knowledge on infant feeding and health was explored by asking questions and probing on baby care, baby feeding, sick children and clinic involvement. The four mentioned topics delineated the context within which the data reduction was done and the results will be presented.

8.2.1.1 Baby care

To describe the context of baby care by mothers / caregivers in this cultural group a few issues were considered, namely the age girls became mothers, by whom the baby care was taught and what a mother's own view was of baby care in terms of her evaluation of a healthy baby.

✦ How old were you when you were taught how to care for your baby?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
12 years	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1 0.9%
13 years	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1 0.9%
14 years	0	2	0	0	0	0	0	0	0	1	0	1	0	4	4 3.6%
15 years	0	2	0	0	0	1	1	2	0	1	0	1	1	7	8 7.2%
16 years	3	2	0	1	0	0	2	1	0	0	2	3	7	7	14 12.6%
17 years	0	1	3	2	2	1	0	0	0	2	0	0	5	6	11 9.9%
18 years	2	1	4	2	7	2	3	1	5	1	5	2	26	9	35 31.5%
19 years	2	0	4	1	1	0	1	1	0	1	2	1	10	4	14 12.6%
20 years	1	0	0	1	0	2	1	2	1	0	0	1	3	6	9 8.1%
21 years	0	0	0	0	0	1	1	3	1	0	0	0	2	4	6 5.4%
22 years	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 0.9%
23 years	1	0	0	1	0	0	0	2	0	0	0	0	1	3	4 3.6%
24 years	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 0.9%
25 years	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 0.9%
27 years	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 0.9%
TOTAL	12	8	11	8	11	8	9	12	7	7	9	9	59	52	111

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The mothers' / caregivers' ages varied between 15-21 years (n=97, 87.4%). The majority of the mothers / caregivers learnt baby care at the age of 18 years (n=35, 31.5%). In the children's age categories, the 0-3/12 babies had the biggest variation in the ages of the mothers — from 14 years to 27 years. Most of the 4-6/12 babies' mothers were between the ages of 17-19 years (n=16, 54.2%). Most mothers in the 7-9/12 group were 18 years old (n=9, 47.4%). The 9-12/12 group had a broad representation of ages with most mothers being between the ages of 15-21 years. On the whole it was clear that the mothers in this community were all very young when they were taught about baby care. The majority (n=97, 87.4%) were 20 years old and younger when the first child was born and they were subsequently taught baby care.

✦ Who taught you how to care for your baby ?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Micro environment	1	4	1	3	2	2	1	2	1	3	2	2	8	16	24 47.1%
Meso environment	2	2	6	2	0	3	1	2	1	5	0	3	10	17	27 52.9%
TOTAL	3	6	7	5	2	5	2	4	2	8	2	5	18	33	51

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The micro environment involved only parents and grandparents (mentioned twice only). From the responses it was clear that there was a fairly equal involvement from the micro environment (family members: 47.1%) and meso environment (clinic staff: 52.9%) in teaching baby care in this community.

✦ How do you do you know that your baby is healthy and growing well?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Clinical evaluation	2	4	2	2	0	3	1	1	2	4	1	4	8	18	26 49.1%
Anthropometrical evaluation	3	1	2	2	1	0	2	3	1	2	2	1	11	9	20 37.7%
Food intake behaviour	1	0	1	1	1	0	0	0	1	1	0	1	4	3	7 13.2%
TOTAL	6	5	5	5	2	3	3	4	4	7	3	6	23	30	53

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the responses made by the groups could be categorized according to the three categories for nutritional assessment methods (see Chapter 5)(1, 18, 29). Most of the responses (n=26, 49.1%) were for a subjective clinical evaluation of health and growth (healthy skin, activeness, happiness, absence of illness, absence of fever). Anthropometrical evaluation (growing well, weight increasing or not decreasing, using the growth chart) was mentioned second most (n=20, 37.7%). The least number of responses (n=7,13.2%) linked health with food intake (giving healthy food, eating all the food presented, healthy appetite).

In order to have a clear view of the mother's / caregiver's perception of a healthy baby that grew well, ethnographical descriptions of the data from the focus group interviews were done within a nutritional status framework. Clinical evaluation responses made by all or most of the groups were:

- "when the baby is happy and smiling"
- "when the baby is active and playing around"
- "when the baby is not getting ill easily"
- "when the baby has a healthy skin - no sores"
- "when the child has no temperature"
- "when the child's face is a picture of health"

Anthropometrical evaluation responses referred mostly to weight. Responses included:

- "when they see the baby's weight is increasing"
- "when the child does not weigh less than before"
- "when we take the child to the clinic to weigh, and they don't lose weight"
- "the weight is not going down, but up"
- "when we take the child to weigh, and they don't lose weight"
- "by looking at the growth chart"

Food intake behaviour responses were relatively unspecific and only three responses were made:

- "when they are giving the baby healthy food"
- "when the child eats all his food"
- "due to her appetite - if she eats well, it means she is healthy"

From these responses it could be concluded that mothers / caregivers decided themselves on their baby's health and growth. When the mothers / caregivers felt that they had a content, healthy (no illness present) and happy child, who did not seem to be affected by anything, the child was healthy. Mothers / caregivers made their own decisions on the foods children should get and the quantities were apparently based on the appetite of the child only. Weight and weight changes were mainly used as an indicator of growth in the health care clinics.

In summary: it could be said that new mothers / caregivers received their education on baby care and feeding from both the micro environment and the meso environment. More often both environments were simultaneously mentioned as a source of information. The micro environment referred to the mother or grandmother of the new mother, and the meso environment mainly referred to the nurses or nursing sisters at the local clinic that the new mothers / caregiver visited. Most girls became mothers between the ages of 15-20 years with an average age of 18 years. These mothers / caregivers evaluated the quality of the baby care they provided by means of their own evaluation of the health status and growth of their babies. This was done mainly by means of subjective clinical evaluations where the facial expression of the baby, the condition of the skin, the activity level and the ease of contracting illness were evaluated. In terms of

anthropometrical evaluation only the weight of the child on the growth chart was used as an indicator of health. The clinic staff assisted in the interpretation of the actual growth curves, whereas the mothers / caregivers were only concerned with the weight of the child, wanting it to increase which would automatically then indicate health. Evaluations in terms of food intake were seldom made. Their only concern was that the baby should receive food that they themselves considered healthy or that a child should have a healthy appetite and eat all the food presented to him / her.

Having contextualized "care", it is clear that education concerning general baby care, the growth progress, as well as nutritional needs and food intake behaviour of babies is necessary. It could therefore be appropriate to target clinic staff for training in baby care as to teach new mothers / caregivers. The female parents / grandparents of the new mother in the family should also be targeted, as these are the people giving advice to new mothers. It could also be appropriate to target adolescent girls in the education of baby care in a high school program, as they are the mothers to be.

8.2.1.2 Baby feeding

In order to describe the common baby feeding practices, a few issues were considered together, namely the person who taught the mother / caregiver of the child about feeding a baby, the views of the mothers / caregivers on the best kind of milk for a baby, the duration of exclusive breast feeding and the age when breast feeding was stopped altogether once weaning had been achieved.

✦ Who taught you how to feed your baby ?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Micro environment	2	5	0	2	1	3	2	2	0	2	3	2	8	16	24 58.5%
Meso environment	1	1	2	1	1	3	0	2	2	2	0	2	6	11	17 41.5%
TOTAL	3	6	2	3	2	6	2	4	2	4	3	4	14	27	41

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Close family members in the micro environment were mentioned more often (n=24,58.5%) as teachers of baby care than the clinic staff in the meso environment (n=17,41.5%). All the groups in the Makapanstad area mentioned the micro environment and some also indicated the meso environment. In the Mathibestad area a choice was always made between the two environments and no group indicated the involvement of both. No differentiation was apparent according to the age groupings.

✦ What is the best kind of milk for a baby ?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Breast feeding	3	3	2	2	2	2	2	2	1	2	2	2	12	13	25 44.6%
Formula milk	0	3	1	3	0	3	0	5	2	3	0	3	3	20	23 41.1%
Other powder milks	0	2	0	0	0	0	0	1	1	1	0	3	1	7	8 14.3%
TOTAL	3	8	3	5	2	5	2	8	4	6	2	8	16	40	56

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most of the groups mentioned breast feeding to be the best source of milk for the baby (n=25, 44.6%). In addition to breast milk, formula milk (n=23, 41.1%) was mentioned as well. The mothers / caregivers had to be prompted regarding the fundamental meaning of this question. Different terminology for milk was used in these communities (breast feeding = letswele ; breast milk = mekgatho ; other milk = milk). The question was put as " What is the best kind of **milk** for the baby". If the moderator did not clearly explain what was meant, many of the mothers / caregivers assumed that breast feeding should not be considered and that the question only concerned other milks, i.e. milk choices other than breast feeding, although breast feeding was obviously practised. Without a prompt, 16 of the 26 groups said that breast feeding was the milk of choice for a baby (61.5%). After having been prompted that breast feeding might be considered as well, 25 (96,15%) groups indicated breast feeding to be the choice milk. If other kinds of milk than breast feeding was used, it usually was formula milk (n=23, 41.1%), and not other powder milks (n=8,14.3%). Most of the responses concerning the use of formula or powder milks were made by mothers / caregivers in the Makapanstad area.

✦ Why is it the best?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Physiologically more suitable	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 1.7%
Nutritious	2	0	1	0	0	1	0	0	0	0	2	0	5	1	6 10.2%
Healthy	0	0	0	0	0	0	1	0	2	0	0	0	3	0	3 5.1%
Convenience	1	0	0	3	4	3	3	1	0	2	0	1	8	10	18 30.5%
Psychological reasons	1	2	0	1	0	2	0	2	0	1	0	2	1	10	11 18.6%
Immunological advantages	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1 1.7%
Financial reasons	0	3	0	2	0	2	0	2	1	2	1	1	2	12	14 23.7%
Hygienic reasons	1	0	0	1	0	0	0	1	0	1	0	0	1	3	4 6.8%
Other: No answer given	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1 1.7%
TOTAL	5	5	2	7	5	8	4	6	3	7	3	4	22	37	59

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The reasons given for breast feeding as being the choice of milk for a baby were categorized into eight categories. However, three categories were mentioned more often. Convenience was mentioned most often (n=18, 30.5%). The mothers / caregivers from both clinics responded similarly in this regard, with eight responses from the Mathibestad area and ten responses from the Makapanstad area. Secondly, financial reasons (n=14, 23.7%), and thirdly psychological reasons (n=11, 18.6%) were mentioned by the Makapanstad area mothers / caregivers mostly. Hygiene, general health and nutrition were also mentioned.

✦ Why is the other option bad ?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Physiologically not suitable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Not nutritious	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Not healthy	1	0	0	[1]	0	0	0	0	{1}	0	0	0	1	0	1 2.9%
Inconvenient	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 2.9%
Psychological reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Immunological disadvantages	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Financial reasons	1	0	1	1	0	1	0	0	0	0	0	0	2	2	4 11.8%
Hygienic reasons	3	0	1	0	2	0	2	0	1	1	1	1	10	2	12 35.3%
Other: -Incorrect mixing procedures	1	3	0	2	0	2	0	1	0	2	1	2	2	12	14 41.2%
Skipped the question	0	0	1	0	0	0	0	1	0	0	0	0	1	1	2 5.9%
TOTAL	6	3	3	4	2	3	2	2	1	3	2	3	16	18	34

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Incorrect mixing procedures (n=14, 41.2%) and hygienic reasons (n=12, 35.3%) were mentioned most often as reasons for an item being an unsuitable choice for baby feeding. Finances was also mentioned by a few mothers / caregivers (n=4, 11.8%). Bottle feeding was less considered a financial burden (11.8%) than breast feeding was considered a financial benefit (23.7%).

As indicated earlier, most of the groups mentioned breast feeding as the best source of milk for the baby. This finding was confirmed by a question put later to the mothers / caregivers when they were asked if a baby should be breast fed. A 100% positive response was achieved from all the groups. It can be concluded that mothers / caregivers from this cultural group felt strongly about breast feeding as the best feeding for their children. If milk other than breast feeding was used, it usually was formula milk of which Nan, Lactogen and S26 were mentioned most often. Powder milks like Nespray were also used, but not as often. The reasons given for using bottle feeding were all valid reasons, and the persons making such a decision were usually medical staff such as the doctor or a member of the clinic, as explained in the results (see discussion in 8.2.3 Sampling unit: Bottle feeding).

✦ How long can one continue to breast feed a baby without giving the baby anything else to eat or drink ?

This question was interpreted differently according to the way it was put by the focus group moderators. The Mathibestad area groups interpreted the question as was intended, namely the number of months breast feeding was continued before any solid food was added to the diet. In the Makapanstad area the responses were made in terms of two sets of interpretations. Firstly, according to the aforementioned interpretation similar to the Mathibestad area and secondly as an interpretation of when breast feeding was stopped completely after weaning foods had already been introduced. The results will be presented in terms of these two sets of interpretations.

✦✦ The number of months breast feeding is continued before any solid food is introduced

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Two weeks	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1 2.9%
One month	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 2.9%
Two months	0	0	0	0	0	0	0	1	0	0	0	1	0	2	2 5.7%
Three months	3	0	2	0	2	2	2	4	2	1	2	2	13	9	22 62.8%
Four months	0	0	0	0	0	1	0	1	1	0	0	1	1	3	4 11.4%
Five months	0	0	0	0	0	1	0	0	0	0	0	2	0	3	3 8.5%
Six months	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1 2.9%
Twelve months	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 2.9%
TOTAL	3	0	2	0	2	5	2	7	3	3	2	6	14	21	35

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most of the mothers / caregivers started giving solid food at the age of three months (n=22, 62.8%). The majority (n=26, 74.3%) of mothers / caregivers started giving solid food before or at the age of three months. Only 8 mothers / caregivers (22.8%) started giving solid food at the recommended age of 4-6 months (6, 50, 56). In this study group children were seldomly weaned after the recommended age. In the Mathibestad area the three month age was standardly practised as the age for introducing solids, while in the Makapanstad area a variety of ages were mentioned varying from 2 weeks to 6 months.

✦✦ When breast feeding was stopped altogether (completely) after weaning foods was introduced

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Twelve months	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 5.6%
Sixteen months	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 5.6%
Eighteen months	0	3	0	2	0	0	0	0	0	2	0	0	0	7	7 38.9%
Twenty months	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 5.6%
Twenty-four months	0	3	0	3	0	0	0	0	0	2	0	0	0	8	8 44.4%
TOTAL	0	6	0	7	0	0	0	0	0	5	0	0	0	18	18

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Only some of the mothers / caregivers (n=18) from the Makapanstad area interpreted the question in this manner. Breast feeding was mostly stopped completely at the age of 18 (n=7) or 24 (n=8) months. The majority (n=16, 88.9%) stopped breast feeding between 18-24 months. Only one mother / caregiver indicated stopping breast feeding as early as 12 months after birth.

✦ How do you know this? (with reference to the question: how long can you continue to breast feed a baby without giving it anything else to eat or drink?)

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Micro environment (own experiences)	1	3	0	2	0	2	0	3	0	3	0	2	1	15	16 55.2%
Meso environment (clinic involvement)	2	0	2	1	2	0	2	0	2	0	2	0	12	1	13 44.8%
TOTAL	3	3	2	3	2	2	2	3	2	3	2	2	13	16	29

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Influences from the micro environment (n=16, 56.2%) and meso environment (n=13, 44.8%) were equally responsible for the choice mothers / caregivers make as to the length of breast feeding for their babies. In the micro environment it was mostly the mother's / caregiver's own experiences that guided her to make this decision, e.g. noticing constipation, loss of weight, unsatisfied vs satisfied babies and adequate growth. In the meso environment the clinic staff was solely responsible for giving advice in this regard. An interesting observation was that the responses for the micro environment (own experiences) came mostly from the Makapanstad area, and that the responses for the meso environment (clinic) came mostly from the Mathibestad area. This reiterates the previous observation that the mothers / caregivers from the Mathibestad area visited the clinic more often.

✦ How long can one continue to breast feed a baby without giving it anything else to eat or drink ?

✦✦ Why? [Reasons for stopping exclusive breast feeding and introducing solids]

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Physiological readiness	4	0	2	0	2	3	1	1	3	2	2	3	14	9	23 85.2%
Health reasons	0	0	0	0	0	0	1	2	0	0	0	0	1	2	3 11.1%
Immunological reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0%
The first few days give just water to clean the stomach and after that give soft pap	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 3.7%
TOTAL	4	0	2	0	2	3	2	3	3	3	2	3	15	12	27

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The reasons given by the mothers / caregivers for introducing solid foods were mostly based on physiological readiness (n=23, 85.2%), concerning digestion, chewing, swallowing and constipation. Health concerns dealt mostly with weight and nutritional issues. In the two youngest age groups only the Mathibestad area mothers / caregivers gave responses, but in the 7-9/12 and older groups both the clinics responded similarly to this probe.

✦✦ Why? [Reasons for stopping breast feeding after weaning]

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Physiological readiness	0	1	0	0	0	0	0	0	0	2	0	0	0	3	3 25.0%
Health reasons	0	2	0	4	0	0	0	0	0	1	0	0	0	7	7 58.4%
Immunological reasons	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 8.3%
For special bonding for the child and mother	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1 8.3%
TOTAL	0	4	0	5	0	0	0	0	0	3	0	0	0	12	12

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The reasons given were health concerns (n=7, 58.4%) rather than physiological readiness. Health issues mentioned included growth, nutritional adequacy and volume of food. Only some focus groups from the Makapanstad area responded in this manner due to the way in which the moderator structured the question / probe.

Since breast feeding is such an important issue, more detailed information in this regard seemed appropriate. A theme for discussion therefore pertained to the reasons for exclusively breast feeding a baby for several months. Most of the reasoning by mothers / caregivers to give breast feeding was based on physiological reasons, but differed from the accepted scientific principles. It is scientifically argued that a baby is not physiologically and nutritionally ready for solid foods before the ages of 4-6/12 due to a yet underdeveloped digestive system, poor chewing and swallowing reflexes, unnecessary exposure to the risk of allergens and simply overfeeding of the baby (14). Most of the mothers / caregivers in the focus groups argued the other way round. Most reasons, all physiologically based, were given for not being able to give a baby solid food any time sooner than 2-3/12, including too small and immature stomachs, swallowing problems, digestive problems and constipation (unable to pass stools). In the Sampling unit: Breast feeding (see 8.2.2) this theme was again brought up, and the responses confirmed the mentioned reasons.

Health issues were indicated as the second group of reasons for stopping exclusive breast feeding. Overweight seemed to be a concern and it was stated that feeding solid food before the age of 3 months might lead to overweight. It was felt that breast feeding was nutritionally adequate until the age of 3 months. In the theme (see 8.2.2 Sampling unit: Breast feeding) that cross checked this issue, the previously mentioned nutritional reason given for stopping exclusive breast feeding was confirmed, namely that due to physiological problems with the baby, mothers / caregivers could not give solid food any sooner. It was also stated that after 3 months of age, breast feeding was not adequate anymore and solid foods should be added to fulfill the nutritional needs of the baby. Other reasons included the age of the child relating to growth and suitability of foods, breast feeding being the best food and health in general. Their knowledge base for this practice was firstly their own experiences, by observing others in the family / community or from experiences with a previous child. If a child became constipated, it was ascribed to poor digestion, or that the solid food blocked the intestines in a very young baby. A baby that cried a lot was seen as an unhappy baby due to receiving solid food before the age of three months. It was perceived that breast fed babies seldomly cried. Secondly, the clinic, that also served as a source of information, was advising that the age of three months was the best age for starting to include solid food.

8.2.1.3 Sick children

Vomiting and diarrhoea are common occurrences among children. The actions taken together with the reasons and causes involved will be discussed.

✦ What does a mother do when a baby is vomiting ?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Micro environment	2	3	2	3	3	2	2	2	3	2	2	2	14	14	28 90.3%
Meso environment	1	0	0	0	0	0	0	0	0	1	0	0	1	1	2 6.5%
Don't know	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 3.2%
TOTAL	4	3	2	3	3	2	2	2	3	3	2	2	16	15	31

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most mothers / caregivers (n=28, 90.3%) gained knowledge from the micro environment to deal with the problem of vomiting. Only two mothers / caregivers referred to the meso environment (clinic) as the means to solve the problem. In the micro environment mothers / caregivers mostly used the mixture for oral rehydration therapy (ORT) as taught by the clinics. There was no difference between the responses from the two clinics or the six different age categories, the decision was unanimous to give "motswako" (mixture of 1L boiled water, 8 tsp of sugar and 1 tsp of salt — the home-made mixture for ORT).

✦ Why does a mother take the actions mentioned against vomiting?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Rehydration	1	3	2	2	2	2	2	2	0	2	1	2	8	13	21 67.7%
To stop the vomiting	2	0	1	1	0	0	0	0	2	2	0	0	5	3	8 25.8%
Don't know	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1 3.2%
No answer given	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 3.2%
TOTAL	4	3	3	3	2	2	2	2	2	4	2	2	15	16	31

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The majority (n=21, 67.7%) were aware of the necessity of rehydration during episodes of vomiting and therefore gave "motswako" to their children. Some mothers / caregivers (n=8, 25.8%), however, were unsure of the exact reason for giving the liquids, but gave it anyway as they knew that the "motswako" would aid in cessation of the vomiting.

✦ What does a mother do when a baby is having diarrhoea ?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Micro environment	3	3	2	3	1	0	2	2	3	2	2	2	13	12	25 96.2%
Meso environment	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 3.8%
TOTAL	3	3	2	3	1	0	2	2	3	3	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The mothers / caregivers again used their micro environment to determine the action to be taken with episodes of diarrhoea (n=25, 96.2%). All the mothers / caregivers also indicated using "motswako" for children with diarrhoea. An equal number of responses came from both clinics (13 versus 12). The group with the poorest response was the 7-9/12 age category with only one response documented.

✦ Why does a mother take the actions mentioned against diarrhoea?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Rehydration	2	3	2	2	2	2	2	2	2	2	2	2	12	13	25 86.2%
To stop the diarrhoea	2	0	0	0	0	0	0	0	0	2	0	0	2	2	4 13.8%
TOTAL	4	3	2	2	2	2	2	2	2	4	2	2	14	15	29

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Rehydration seemed to be the reason of choice for giving "motswako" for diarrhoea (n=25, 86.2%); fairly similar in both clinics (12 versus 13). There was no difference between the responses from the different age groups.

✦ Who taught you to take the described actions against vomiting and diarrhoea ?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Micro environment	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1 3.7%
Meso environment	3	3	2	2	2	2	2	2	2	2	2	1	13	12	25 92.6%
No answer given	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1 3.7%
TOTAL	3	4	2	2	2	2	2	2	2	2	2	2	13	14	27

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Almost all the mothers / caregivers (n=25, 92.6%) indicated the meso environment as the source of information. These responses confirmed that the clinic (meso environment) was the source of information regarding the treatment of vomiting and diarrhoea. The nurses or nursing sisters at the clinics were mentioned as the persons conveying the information to the mothers / caregivers. There was no difference between the responses from the two clinics or between the various age groups.

✦ What causes vomiting in a baby?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	3	4	3	4	2	4	2	5	2	3	1	2	13	22	35 81.4%
Misconceptions	0	0	1	0	0	0	1	0	3	0	2	1	7	1	8 18.6%
TOTAL	3	4	4	4	2	4	3	5	5	3	3	3	20	23	43

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

In the previous few questions / probes mothers / caregivers were asked what action they usually took when their children experienced vomiting and diarrhoea and why. With this probe mothers / caregivers were asked to discuss the causes of these occurrences as perceived by them. The responses given for the causes of vomiting were mainly science based (n=35, 81.4%). These responses concerned hygiene referring to food handling and leftover foods. Some of the other reasons mentioned were the eruption of teeth, giving large volumes of food or too many kinds of foods at the same meal. Only 18.6% (n=8) of the responses were classified as misconceptions. These responses included statements like too much sugar or salt, eating more than one kind of food, unhealthy foods, giving left-over foods, a sunken fontanelle "tlhogana", incorrect mixtures of bottle feeding, if a child is cold. Most of the misconceptions came from the mothers / caregivers in the Mathibestad area, while most of the science based responses were made by mothers / caregivers from the Makapanstad area. All the age groups responded in a similar manner in terms of the science based responses, but the misconceptions were more common in the two older age groups, 10-12/12 and 13-24/12.

✦ What causes diarrhoea in a baby?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	4	3	2	3	2	2	2	4	2	7	1	2	13	21	34 72.3%
Misconceptions	0	1	0	1	1	2	1	1	2	1	2	1	6	7	13 27.7%
TOTAL	4	4	2	4	3	4	3	5	4	8	3	3	19	28	47

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

These results were very similar to that reported for the causes of vomiting. The science based responses (n=34, 72.3%) dominated, including spoiled food and unhygienic handling techniques. Other responses included teeth eruption, high fat intake, fresh milk intake, and incorrect mixing procedures for formula milk. However, even more misconceptions were reported (n=13, 27.7%) than with vomiting. These included walking with the baby in very hot sun, eating bananas, a bulging fontanel "tlhogana", too much sugar or salt, overeating, change of temperature and incorrect mixing procedures for formula milk.

To summarize: it became obvious that vomiting and diarrhoea were a common occurrence among children in these communities. The mothers / caregivers in these two communities had relative standard care procedures for sick children. If children had diarrhoea or were vomiting, they used the mixture that is taught by the clinic staff for ORT, also known as "motswako" in these communities. Most mothers / caregivers used the recipe correctly. However it was also evident from the focus group discussions that some of the mothers / caregivers did not know about the mixture and / or the recipe. Their reason for using the mixture was mainly the replacement of lost water from the body and to stop either the vomiting or diarrhoea. If the symptoms were severe or if the "motswako" mixture had no effect, the common practice was to take the child to the clinic for other medical treatment. It was also stated clearly that people would usually go to the clinic to get help if their children were ill, as the purpose of the clinic was to help cure diseases.

When the mothers / caregivers explained their perceptions of the causes of vomiting or diarrhoea, some interesting responses were made. An ethnographical description of these responses was done to differentiate between the factual reasons and the misconceptions as were given in the interviews by the mothers / caregivers. Science based responses were:

for vomiting

- "dirty food - germs"
- "when the teeth erupt"
- "rotten food"
- "when you prepare the baby's food without washing your hands"
- "last night's food"

for diarrhoea

- "wrong mixture of milk"
- "food that have expired (overstay foods)"
- "when the teeth erupt"
- "milk that doesn't agree with him"
- "eating a lot of fat or fatty foods"
- "left-over food that was left open overnight / after a meal"

It can thus be concluded that for both situations mothers / caregivers made the correct assumptions that non-hygiene could be a cause — referring to the food, handling techniques or utensils used. Teething and improper use of formula milk were also mentioned correctly.

The misconceptions mentioned, included the following:

for vomiting

- "when the food isn't healthy, like a lot of sugar or pap only"
- "when the child gets cold (she is not warm enough)"
- "mixed food - when more than one kind of food are eaten"
- "when the fontanel is down ('tlhogana'), the child starts vomiting"
- "lots of salts"

for diarrhoea

- "when you walk with your baby in very hot sun"
- "too much banana"
- "when the fontanel goes up, the child has diarrhoea"

  [A further explanation regarding this condition, " tlhogana", was provided:

  For both vomiting and diarrhoea "tlhogana" we take the child to the witch doctor. He uses leaves, put it on the fire to make smoke, let the child inhale the smoke and put the ashes on the fontanel. This same procedure is used when / before going into large crowds like weddings or funerals. The leaves are boiled in water which is drunk — this will prevent you from getting sick]
- "Change of temperature"
- "Prepare 125mL + 2 scoops milk - this is too weak and will cause diarrhoea"
- "lots of salts"

8.2.1.4 Clinic involvement

✦ Who told you about this clinic? (informant)

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Micro environment	2	4	0	1	2	0	1	3	0	1	2	2	7	11	18 51.4%
Meso environment	1	0	2	2	0	3	1	2	2	2	0	2	6	11	17 48.6%
TOTAL	3	4	2	3	2	3	2	5	2	3	2	4	13	22	35

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Both the micro environment (parents, mothers, friends, neighbours and fathers) (n=18, 51.4%) and the meso environment (tribal authority, the chief, Department of Health, nurses, nursing sisters, clinic, community) (n=17, 48.6%) were indicated as being the prompt for clinic attendance. In the micro environment the parents (implying the mother in most cases) were most often (n=16,45.7%) the informant for both clinics and all age groups. The mothers / caregivers in the Makapanstad area were more involved with their cultural/tribal leaders and friends in the community as such than the mothers / caregivers in the Mathibestad area. The mothers / caregivers in the Mathibestad area, however were making more use of the clinic / hospital staff.

✦ Reasons mentioned on why the clinics are in the community

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Because of illness	1	0	0	0	2	0	2	0	0	0	1	0	6	0	6 42.86%
Growth monitoring	2	0	0	0	0	0	0	0	1	0	1	0	4	0	4 28.57%
Immunization	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 7.14%
Advice	2	0	1	0	0	0	0	0	0	0	0	0	3	0	3 21.43%
TOTAL	6	0	1	0	2	0	2	0	1	0	2	0	14	0	14

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The clinics were mostly visited due to illness or disease (n=6,%). The clinic was also attended for growth monitoring (n=4) and advice (n=3). Immunization seemed to be of least importance (n=1).

✦ Do you believe what the clinic tells you about feeding your child?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26 100%
No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the mothers / caregivers in both areas indicated that they could believe what they were told at the clinic (100%).

✦ Why do you believe what the clinic tells you about feeding your child?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	3	3	3	2	2	2	2	3	2	3	3	2	15	15	30 100%
Misconceptions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	3	3	2	2	2	2	3	2	3	3	2	15	15	30

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the responses made by the mothers / caregivers in both areas could be classified as science based

responses. Quite a number of the responses were positive and referred to the outcome achieved by following the advice given by the clinic staff. A number of responses also concerned the fact that the clinic staff was well educated and were therefore able to advise the mothers / caregivers on a number of matters. Responses included advice on child feeding, teaching important information concerning a specific issue, and teaching mothers / caregivers the correct way to work with their children. Most of the other responses were very general, just indicating that the child was healthy and therefore the advice was good, or the fact that the clinic staff was always helpful and if the advice was ignored it was to one's own detriment. One of the responses also mentioned the fact that the mothers / caregivers could not think of any reason why the clinic staff would lie to them, and therefore they were trusted.

It can be concluded that the people were making use of the health care clinics. Most adults in the community usually attended the clinic only when they were ill or when they were seeking advice of some kind. Mothers / caregivers with babies usually visited the clinic for growth monitoring and immunization purposes. Both the micro environment and the meso environment were used as a source of information and reference to the clinic. Mostly family members, such as mothers and grandmothers, advised new mothers about the value of the clinic during pregnancy, as well as for the baby. Cultural / tribal leaders in the community and close friends were also responsible for referring people to the clinics.

The purpose of the clinic in terms of baby feeding was investigated. In response to a question on the credibility of the information received from the clinic with reference to baby feeding, an overwhelmingly positive response came from all of the focus groups. The reasons given in this regard included mainly that they had success with the general health and growth status of the child, and that the advice given was always appropriate and successful. They felt that the information gained from the clinic was useful and gave them knowledge on previously unknown situations.

8.2.2 SAMPLING UNIT: BREAST FEEDING

The theme on breast feeding was explored by asking questions and probing on breast feeding as the choice of feeding, the introduction and duration of breast feeding, implementing breast feeding and the eating and drinking practices introduced while breast feeding. The four mentioned topics delineated the context within which the data reduction was done and the results will be presented.

8.2.2.1 Breast feeding as the feeding choice

✦ Should a baby be breast fed?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26 100%
No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0%
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the mothers / caregivers in all of the focus groups felt that a baby should always be breast fed. No negative responses were made, which indicated that all mothers had the intention of breast feeding even though at times circumstances might intervene and force bottle feeding (see 8.2.3 Sampling unit: Bottle feeding). Both clinics' responses were the same.

✦ Reasons for breast feeding a baby

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Physiologically more suitable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional reasons	1	0	0	0	0	1	0	0	0	0	0	0	1	1	2 4.5%
Health reasons	2	4	2	2	2	2	2	3	2	4	2	4	12	19	31 70.5%
Convenience reasons	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1 2.3%
Psychological reasons	0	0	0	1	0	0	0	0	1	0	0	0	1	1	2 4.5%
Immunological advantages	1	0	0	0	0	0	0	1	0	2	0	1	1	4	5 11.4%
Financial reasons	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1 2.3%
Hygienic reasons	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 2.3%
Baby is crying (due to hunger)	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 2.3%
TOTAL	4	4	2	4	2	3	3	5	3	7	2	5	16	28	44

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most (n=31, 70.5%) of the reasons mentioned for breast feeding a baby was health reasons. General health concerns like good health, strength and breast feeding being best were mentioned mostly. All the groups responded to this category, but the mothers / caregivers from the Makapanstad area gave more responses in this regard. The other main category mentioned was immunological reasons (n=5, 11.4%) indicating the prevention of illness; mainly from the Makapanstad area.

✦ Explanations given for not breast feeding a baby

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Mother has illness	0	0	0	0	0	0	1	1	0	0	0	0	1	1	2 8.7%
Baby has illness	0	0	0	0	0	1	0	1	0	0	0	0	0	2	2 8.7%
Breast discomfort	0	0	0	0	0	0	1	0	1	0	2	2	4	2	6 27.3%
Free choice	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1 4.3%
Low milk production	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 4.3%
Mother using drugs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baby failure to thrive	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No answer given	2	0	2	1	2	1	0	0	1	2	0	0	7	4	11 47.8%
TOTAL	3	0	2	1	2	2	2	2	2	2	3	2	14	9	23

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Although all the mothers indicated that breast feeding was the first choice of feeding for any baby, some explained that in some instances breast feeding was not suitable for the baby. These explanations were mostly valid although some mothers (n=11, 47.8%) could not give a reason why they opted for another type of feed. This could be due to the fact that they were advised by the clinic / hospital staff to implement a certain feed but were not informed as to the exact reasons. The main reason put forward was that of breast discomfort (n=6, 27.3%). Other explanations given were illnesses of either mother or baby (n=4, 17.4%). No differences in responses from groups or clinics were apparent.

One of the questions in this Sampling unit was: "should a baby be breast fed?". The mothers / caregivers were probed according to their beliefs on the reasons / advantages of breast feeding and to the reasons why breast feeding would not be a choice (see 8.2.2.2).

Health reasons were mentioned by nearly all the groups. However, most of these were very general:

- "breast milk is good for the baby"
- "a baby that receives breast milk will be strong and healthy"
- "for the baby to grow well"
- "breast is best"
- "it build the body"
- "it's suitable for small children"
- "for her to be healthy"
- "if you do not breast feed, the child will get kwashiorkor"
- "breast feeding gives the baby strength".

The second category of responses dealt with immunological advantages. Responses included:

- "it prevents infections"
- "it prevents illnesses"
- "when the child is sick you can easily feed her with breast feeding"
- "breast milk doesn't have any germs"
- "for the child not to become sick".

These were often linked to the health idea by virtue that breast feeding is good for the general health of the child and therefore will prevent the child from getting ill.

The third and fourth categories of responses worth mentioning, were that of the nutritional and psychological reasons, which received equal numbers of mentioning:

- "breast milk has protein and vitamins"
- "because they have all the vitamins"
- "the breast-fed child is getting a lot of love from the mother"
- "it builds the bonding between the mother and the child".

From these responses it can be concluded that the mothers did not have knowledge on all the advantages of breast feeding (see 3.3.3.1 in Chapter 3). Some reasons mentioned touched on the real issues, like nutritional content, prevention of some infections and bonding. It could be of great value to these mothers to learn more about ALL the advantages of breast feeding to both the mother and the baby. This may then aid in a change of attitude towards breast feeding practices in this community (1, 6, 8, 9, 22, 49, 50, 52, 54, 55, 56, 57, 58, 59, 60, 61).

Mothers / caregivers were also asked to explain why a baby would not be breast fed. Answers in this regard were more reserved as many groups (50%) did not even respond to this question. Most responses referred to breast discomfort and included:

- "when the mother has problems with the breast - e.g. breast abscess"
- "the mother may be suffering from 'rush' (sick) or some other disease"
- "maybe when the mother is having sores on the breast".

The responses to the next two analysis categories could be combined as they all concerned either illness of the mother or the child:

- "maybe the mother is sick and advised by the doctor not to breast feed"
- "when the child gets ill"
- " when they are sickly".

The other responses given were general:

- "when the mother have fear to breast feed the child - she doesn't want her breasts to "fall down", so she only give a bottle"
- "maybe enough milk is not coming from the breast".

These responses indicated that mothers had some knowledge as to the reasons for stopping breast feeding. Issues that may be addressed in nutrition education though, are that of milk production, especially concerning colostrum, of breast feeding and illnesses (which do not normally require breast feeding to be stopped), and of care of the breasts.

8.2.2.2 Introduction and duration of breast feeding

✦ How soon after the baby is born should it get breast milk?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Directly after birth	0	2	1	0	2	2	0	1	2	0	1	2	6	7	13 19.4%
Soon after birth	2	4	3	2	5	0	2	5	2	6	2	3	19	21	40 59.7%
After ½ day	3	0	1	1	0	0	0	0	0	0	0	2	4	2	6 9.0%
After one day or night	0	0	0	0	0	0	0	1	0	0	0	2	0	2	2 3.0%
After a day and night	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 %
After two days	0	1	0	0	0	1	0	0	0	0	0	1	0	3	3 4.5%
After three or more days	0	0	0	0	0	1	0	1	0	0	0	0	0	2	2 3.0%
Depends on clinic / hospital	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1 1.5%
TOTAL	5	7	5	3	10	4	2	8	4	7	4	8	30	37	67

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most of the mothers / caregivers (n=40, 59.7%) indicated that breast feeding should be started soon after birth, or directly after birth (n=13, 19.4%). "Soon after birth" was interpreted as directly after the birth once medical examinations and procedures have been completed; approximately within four hours after the baby was born. "Directly after the baby is born" indicated that breast feeding should be started in the delivery room, which would in most cases only be possible with a lenient clinic / hospital, with a hospital adopting the BFHI or with a home birth. A few mothers (n=6, 9.0%) also indicated the initiation of breast feeding half a day after birth. It is thus clear that the mothers in these communities felt that breast feeding should be initiated as soon as possible. The response categories for one or more days of delay for the initiation of breast feeding were only mentioned in the Makapanstad area. It seemed that the people in the Mathibestad

area were implementing breast feeding within half a day after the birth of the baby.

✦ Reasons for the decision of the time to initiate breast feeding of a baby

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Physiologically more suitable	4	2	4	0	2	0	2	2	2	1	2	2	16	7	23 46.0%
Nutritional reasons	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1 2.0%
Health reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Convenience reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Psychological reasons	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1 2.0%
Immunological reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Financial reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hygienic reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hospital / clinic procedures	1	0	1	0	0	0	0	2	1	1	1	3	4	6	10 20.0%
Perceived lack of milk	0	1	0	1	0	1	0	2	0	0	0	2	0	6	6 12.0%
To allow time for the mother to rest	2	0	0	0	1	0	2	0	0	0	1	0	6	0	6 12.0%
No answer given	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 2.0%
Do not know	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 2.0%
We still can't understand why the baby can't be breast fed immediately	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 2.0%
TOTAL	7	3	5	2	3	3	4	6	4	3	4	6	27	23	50

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

A variety of reasons were put forward to explain the various decisions (see Table) made to initiate breast feeding at a specific time. Four of these were most common. Firstly, physiologically based responses (n=23, 46.0%), where hunger or thirst (noticeable due to crying) and rest for the baby were mentioned. Mothers / caregivers from the Mathibestad area were responsible for about two-thirds (n=16, 70.0%)of the total number of responses categorized as physiologically more suitable (n=23). The 4-6/12 and 7-9/12 groups from the Makapanstad area did not respond to this category at all, while all the other groups gave one or more responses. This category was linked to the answer of breast feeding "directly after birth" and "soon after birth". Secondly, hospital / clinic procedure was the reason for the delay of initiation (n=10, 20.0%), including observation of the baby, bathing of the baby, or time schedules given. The delay was usually only about four hours ("soon after birth"). It was mostly mothers from the older children (10-12/12, 13-24/12, 25-36/12) who responded in this category. Thirdly, perceived lack of milk was the reason for

waiting with breast feeding (n=6, 12.0%), as the secretion of colostrum was not valued as milk. These reasons were linked to a delay of one or more days. This response was only given in the Makapanstad area, and all the groups except the 13-24/12 group gave it. The acceptance and usage of colostrum were not studied explicitly. Therefore only the perceptions of the low value it had and that it should be discarded rather than used, that were uncovered in the focus group interviews, were reported. It might therefore be valuable to investigate the attitudes towards and the usage of colostrum in newborn babies in these communities by means of similar research techniques as were implemented for this research study. Fourthly, the mother was allowed time to rest after the delivery (n=6, 12.0%) before breast feeding was initiated, which was also linked to the "soon after birth" category. This response was only given in the Mathibestad area and by all groups, except the 4-6/12 and 13-24/12 groups.

✦ How long should you give breast milk as the one and only feed to a child?

This question was interpreted differently according to the way it was put by the moderators. The Mathibestad area groups (except for one group) interpreted the question as was intended, namely the number of months breast feeding was continued before bottle feeding or any solid food was added to the diet. In the Makapanstad area the responses were made in terms of two sets of interpretations. Firstly, as the above-mentioned interpretation (similar to the Mathibestad area responses) and secondly, as an interpretation of when breast feeding was stopped altogether after weaning foods were already introduced. The results will be presented in terms of these two sets of interpretations.

FIRST INTERPRETATION

✦✦ The number of months breast feeding is continued before any other feed or solid food is introduced

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Less than three months	1	0	0	0	0	1	0	1	0	0	0	4	1	6	7 17.9%
Three months	6	0	1	0	2	1	2	8	1	1	2	4	14	14	28 71.8%
Ideal age for exclusive breast feeding (4-6/12)	0	0	0	0	0	0	0	1	1	0	0	1	1	2	3 7.7%
More than 6, less than 12 months	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 Months / older	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Skipped the question	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 2.6%
TOTAL	7	0	1	1	2	2	2	10	2	1	2	9	16	23	39

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The mothers mostly introduced solid foods at the age of three months (n=28, 71.8%). The total number of responses were the same for both clinics, but in the 0-3/12 group the Mathibestad area responses dominated, and in the 10-12/12 group the Makapanstad area responses dominated. Some introduced solid

foods before the age of three months (n=7, 17.9%). Most of these mothers were from the Makapanstad area. Only three mothers (7.7%) introduced solid food at the correct age of 4-6 months (10, 50, 65). The total number of responses for this time period regarding solid food introduction corresponded well with the responses received in a similar question that was put to the groups in 8.2.1 Sampling unit: General knowledge on infant feeding and health.

✦✦Why ? [Reasons for stopping exclusive breast feeding and introducing other feeds or solids]

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Physiological readiness	3	0	0	0	1	1	2	2	0	0	2	2	8	5	13 52.0%
Health reasons	2	0	0	0	1	0	0	3	0	0	0	2	3	5	8 32.0%
Immunological reasons	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1 4.0%
Clinic advice	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1 4.0%
No answer given	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 4.0%
Skipped the question	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 4.0%
TOTAL	5	0	1	1	3	1	2	5	1	0	2	4	14	11	25

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Similar to the previous responses, the reasons for stopping exclusive breast feeding were based on physiological readiness (n=13, 52.0%). This included immature digestion, inadequate stomach capacity and constipation. For this probe, more health reasons (n=8, 32.0%) were put forward than with the previous question("reasons for the decision of the time to initiate breast feeding of a baby"; n=0 for health reasons). The health reasons mentioned in this regard were very general and less specific responses, like the child being old enough, grown up enough, breast is best etc., were given. The responses showed that the age of three months was given as a reason for introducing solid foods in a baby's diet. The responses between the clinics were more or less the same.

✦✦ At what age should the child get the first extra food item while still being breast fed?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Two months	0	1	0	0	0	2	0	0	0	0	0	0	0	3	3 11.1%
Three months	3	1	2	0	2	0	2	0	1	1	2	0	12	2	14 51.9%
Ideal age to start weaning (4-6/12)	1	0	0	0	0	0	0	0	1	8	0	0	2	8	10 37.0%
TOTAL	4	2	2	0	2	2	2	0	2	9	2	0	14	13	27

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

felt that breast feeding was the first choice of feeding for a baby. However, exclusive breast feeding, without any additional liquid or solid food was rarely practised. This was confirmed by the fact that ALL the mothers indicated that a child should get something to eat or drink together with breast feeding. This response came from all the different age groups, including the 0-3/12 group. The age for introduction of anything other than breast milk was determined by a few probes and the responses from each confirmed the finding. The age of three months was considered to be the ideal age for the introduction of solid foods in these communities. Most mothers (75%) introduced solid food in the period from two weeks up to three months of age. Most of the others introduced solid food at the recommended age of between four and six months (10, 50, 65). The overall conclusion from all the focus group interviews conducted was that the age of three months was the ideal age for the onset of weaning practices. This was very different to previous beliefs that exclusive breast feeding is practised for a longer period of time (up to six months) in the rural communities (49, 53).

The theme was expanded with discussions concerning the appropriate age / time to stop breast feeding a child. The focus groups who discussed this issue, all (86%) concurred that breast feeding should be stopped between the ages of 18 to 24 months. It was clear from the discussions that mothers were committed to either the age of 18/12 or to 24/12, and not to an age in-between. About half of the mothers / caregivers indicated the 18 month age as appropriate, and the other half indicated 24 months. This practice was much more in line with recommendations that breast feeding should be continued in rural communities at least to the age of two years for the nutritional benefit thereof for the child (10, 12, 53).

8.2.2.3 Implementing breast feeding

✦ How many times during the **DAY** should you normally breast feed your child?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
On demand	1	0	0	0	2	1	0	0	3	0	0	0	8	1	9 16.1%
Hourly (12X)	0	1	0	0	0	0	0	0	1	0	0	0	1	1	2 3.4%
Two hourly	0	1	2	0	1	0	3	0	0	0	0	0	6	1	7 12.5%
Three hourly	1	0	1	0	0	0	1	1	0	1	0	2	3	4	7 12.5%
Four hourly	0	2	0	2	1	2	1	4	1	1	2	4	5	18	23 41.1%
Six hourly	3	1	0	0	0	1	0	0	0	0	0	0	3	2	5 9.0%
12 hourly	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 1.8%
When available	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1 1.8%
Depends on routine	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1 1.8%
TOTAL	6	5	3	2	4	4	5	7	7	2	3	8	28	28	56

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The "day" was specified as 12 daylight hours. Although breast feeding on demand was advocated widely, it seemed not to be the most popular response of all those given (n=9, 16.1%). The mothers / caregivers from the Mathibestad area gave most of these responses (80%) of which more mothers / caregivers were from the 7-9/12 and 13-24/12 groups with only one response from the 0-3/12 group. This indicated that feeding on demand for the very young babies, who should be exclusively breast fed to the age of 4 - 6 months (6, 9, 10, 13, 49, 50, 51), did not readily occur in these communities. The two-hourly response was also mainly made in the Mathibestad area (n=7, 12.5%). Three-hourly feeding responses (n=7, 12.5%) were similar between the two clinics. The category that had the most responses was that of four-hourly feedings (n=23, 41.1%). The 0-3/12 groups had responses in all the different hourly categories and the 4-6/12 group had responses in the two, three and four-hourly categories. This seemed to indicate that not much of a pattern existed in the breast feeding practices of especially the very young child who relied mostly on breast feeding alone.

✦ How many times during the **NIGHT** should you normally breast feed your child?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
On demand	2	0	4	1	3	1	0	2	2	1	0	2	14	6	20 32.8%
Hourly	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 %
Two hourly	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 1.6%
Three hourly	0	0	2	1	0	1	0	1	0	0	0	1	2	5	7 11.5%
Four hourly	0	2	0	1	2	2	1	2	0	1	0	1	3	9	12 19.7%
6 Hourly	1	3	0	0	1	0	1	1	1	1	4	1	10	6	16 26.6%
12 Hourly	0	1	0	0	0	0	0	0	0	0	1	0	1	1	2 3.3%
Skipped question	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 1.6%
Before introduction of solids more often than after introduction	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 1.6%
Not at night	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 1.6%
TOTAL	4	7	7	3	8	4	2	6	5	4	7	4	33	28	61

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The "night" was specified as 12 nighttime hours. Demand feeding (the baby just suckles when it feels like it) at night received more responses (n=20, 32.8%) than for day time (16.1%). As such it was also the most popular response, but again more so with the groups in the Mathibestad area. The next most popular response was the six-hourly regime (n=16, 26.2%) with most responses from the Mathibestad area, and

the four-hourly regime (n=12, 19.7%) with most responses from the Makapanstad area. Very few mothers however could actually tell how often the baby breast-fed during the night, as the baby was kept in the bed and fed when it woke up or cried.

The theme concerning the frequency and feeding time per breast feeding session was quite an important issue as it referred to the quality of the diet of the child and might be important in the evaluation of the nutritional status of breast fed children. During the focus groups interviews the moderators tried to determine how long and how frequent the babies were actually put to the breast; firstly, during the daytime and secondly, during the nighttime. Initially this seemed to be a very good idea to try to determine the breast feeding practices, as the 24h-recall technique did not give satisfactory results concerning this issue. However, the same problems were experienced with the focus groups. Mothers could not really tell how many times or how long breast feeding sessions were. A lot of probing was required to even get the responses, and a lot of guessing took place in the process. However, eventually, with all the responses grouped together, a few conclusions could be drawn in this regard. Breast feeding on demand is marketed worldwide as the best option for a newborn baby (6, 8, 9,13, 22, 49, 50). The fact that breast is best, was well believed in these communities, but real demand feeding not so much. The breast was given to the baby as a pacifier on demand, rather than for actual feeding purposes — hence the remark, "kort-kort", that was given on practically all the 24h-recalls of the children's dietary intakes. The probes for feeding frequency specifically stated that the mothers / caregivers should only consider the FEEDING times, and not the times when breast feeding was given as a comforting tool / as pacifier. Different responses were documented, as presented previously. The most popular response amongst all the groups was four-hourly feeds (3x/day). It was discouraging to find that seven of the eleven responses in the 0-3/12 age category were for three, two or one feed/s per day. This was an inadequate intake for babies in this age group, as they were relying on breast feeding for their total nutrient intake. Not much of a pattern could be substantiated from these results, as the responses throughout the different age categories all varied.

Night FEEDS were questioned in a similar fashion. Demand feeding was much more popular with night time than daytime feeds. Although practices on the frequency and duration of feeding sessions were questioned, these responses remained vague, due to the fact that the mothers could seldomly verify frequency or time spent on a feed. Babies were usually kept with their mothers in bed during the night, and therefore the mothers did not even always realise when the baby drank. From the responses it appeared that demand feeding in this regard was more concerned with pacifying or comforting the child, than feeding the child. Common responses to this probe included: "every time the baby wakes up", "or cries", "often", "whenever the baby wants it", "can't estimate", "many times", "whenever the mouth comes in contact with the breast". The other most popular responses amongst all groups were four and six hourly feeds (3 and 2 times respectively). For the 0-3/12 age group, most of the groups mentioned twice per night.

✦ Decisions made for the length of time to keep a baby on the breast during each feeding session

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
According to time	0	2	0	2	0	1	0	0	0	4	0	0	0	9	9 16.1%
Until baby is asleep	0	1	1	1	0	0	0	4	2	1	0	3	3	10	13 23.2%
Self-determined by the baby	4	2	2	3	2	2	2	4	5	1	2	5	17	17	34 60.7%
TOTAL	4	5	3	6	2	3	2	8	7	6	2	8	20	36	56

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Very few of the mothers / caregivers made structured / definite decisions concerning the length of a feeding session. They rather let the baby itself decide when to stop the feeding (n=34, 60.7%). The clinics responded equally in this regard (n=17 each). The next option most often chosen, was to keep on breast feeding until the baby was asleep (n=13, 23.2%). The mothers / caregivers from the Makapanstad area responded more to this category, and it was also most popular with the older groups of children (10 months and older). The least number of responses was made for timing of feeds (n=9, 16.1%). Only the mothers / caregivers from the Makapanstad area responded in this category.

In summary: the length of the feeding session was thus almost impossible to determine. Mothers found it extremely difficult to put a time period to a breast feeding session. If they eventually did commit themselves to time per feeding session, the answers seemed to be unrealistic, either being too short (5 minutes) or too long (one hour). The most popular response category was "until the baby is satisfied", and the next one was "until the baby is asleep". Thus the baby decided on the length of breast feeding and the mother was hardly aware of the amount of milk that the baby was consuming, because of the indifference regarding the time on the breast or suckling for pacifying or for feeding.

8.2.2.4 Eating and drinking practices with breast feeding

✦ Should the child ever get anything else to eat or drink together with breast feeding ?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26 100%
No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

An overall positive response was achieved from all the groups from both the clinics. This led to a conclusion that true exclusive breast feeding was not really practised in these communities.

✦ How often does the baby get anything else to eat or drink together with breast feeding?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Once / day	1	0	0	0	0	0	0	1	0	1	0	0	1	2	3 7.1%
Twice / day	0	2	0	0	0	1	0	1	0	1	0	0	0	5	5 11.9%
Three times / day	1	2	2	1	2	1	1	0	1	2	2	6	9	12	21 50.0%
Four times / day	1	0	1	0	0	1	0	0	1	0	0	1	3	2	5 11.9%
Five times / day	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2 4.7%
Once / week	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1 2.4%
Twice / week	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1 2.4%
Three times / week	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1 2.4%
After every meal	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1 2.4%
Anytime the baby cries	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 2.4%
Nestum: 2x/day Porridge: 1x/day Purity: 1x/day	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 2.4%
TOTAL	4	4	4	2	2	3	2	5	3	4	2	7	17	25	42

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The frequency of feeding additional food / drinks to breast feeding that was reported by most of the mothers / caregivers (n=21, 50.0%) was three times per day. All the age categories responded to this option and reactions between the two clinics compared well. Twice and four times per day was the next popular choice (n=5, 11.9% respectively).

✦ When does the baby get the additional item that is given with breast feeding?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
After breast feeding	2	3	2	1	2	2	2	1	0	1	2	2	10	10	20 83.3%
Before breast feeding	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2 8.3%
In between breast feeding	0	0	0	1	0	0	0	0	1	0	0	0	1	1	2 8.3%
TOTAL	2	3	2	2	2	2	2	2	1	2	2	2	11	13	24

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The overwhelming response from all the groups was that the ideal time of the day to give a baby something additional was after a breast feeding session (n=20, 83.3%). Thus breast feeding as such would still be the main feed for the baby and the additional food or drink would not fill the stomach before breast feeding.

✦ What does the baby get additionally to breast feeding?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Water	2	0	1	0	1	0	2	0	2	0	2	1	10	1	11 16.7%
Milk	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 1.5%
Other milk products(e.g. yoghurt)	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 1.5%
Cereals - mealie-meal porridge	4	3	0	2	1	2	0	1	1	3	0	2	6	13	19 28.8%
Cereals - commercial products	0	4	0	2	0	2	0	1	0	2	0	2	0	13	13 19.7%
Fruit - fresh	0	0	0	0	0	0	0	1	1	1	0	0	1	2	3 4.5%
Fruit - commercial products (juice)	0	1	0	1	0	0	0	0	1	1	0	0	1	3	4 6.1%
Vegetables - fresh	0	0	0	0	0	0	0	3	0	0	0	2	0	5	5 7.6%
Vegetables - commercial products (Purity)	0	0	0	2	0	2	0	1	0	1	0	1	0	7	7 10.6%
Protein foods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solid foods	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2 3.0%
TOTAL	8	8	2	7	2	6	2	7	5	9	2	8	21	45	66

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

A large variety of products were added to breast feeding. The most popular item added was that of cereals, like maize meal that was used to make soft porridge for the baby (n=19, 28.8%). This was practised by most of the age groups. The second most popular item was a commercial cereal, like Nestum or Cerelac (n=13, 19.7%), which was also mentioned by all the age groups. Most of these responses were made by mothers / caregivers from the Makapanstad area. Water was also added to the child's intake (n=11, 16.7%). This seemed to be more practised in the Mathibestad area. Fruits were used in both areas, but vegetables were only mentioned by the Makapanstad area. Additional milk feeds were rarely used besides breast feeding.

of the items added and reasons for it. All the focus groups indicated that a baby should get some food complementary to breast feeding. Most focus groups felt that the additional foods should be given to the baby after the child was breast fed — even the older age groups revealed this practice. The mothers of two

Most of the mothers / caregivers (n=14, 51.9%) indicated three months as the appropriate age for the introduction of weaning foods. A total of 63% of mothers gave solid food to their babies between the ages of two and three months. This result again proved to be similar to previous answers given. Only a few mothers / caregivers (n=10, 37.0%) indicated the appropriate age of four to six months (10, 50, 65). Mostly mothers / caregivers from the Mathibestad area indicated three months and more mothers / caregivers from the Makapanstad area indicated the ages of four to six months.

SECOND INTERPRETATION

✦ How long should you give breast milk as the one and only feed to a child?

✦✦ When breast feeding was stopped altogether after weaning foods was introduced

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Less than three months	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Three months	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ideal age for exclusive breast feeding (4-6/12)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
More than 6/12, less than 12/12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Twelve to seventeen months	0	0	0	0	0	1	0	0	0	1	0	0	0	2	2 11.1%
Eighteen to twenty four months	0	5	0	1	0	3	0	0	1	5	0	0	1	14	15 83.3%
Twenty five to thirty six months	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1 5.6%
TOTAL	0	6	0	1	0	4	0	0	1	6	0	0	1	17	18

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the responses were in the age category for children twelve months and older (n=18, 100%). All the responses, but one came from the mothers / caregivers from the Makapanstad area. Two of the age groups, 10-12/12 and 25-36/12 , had no responses, but all the other age categories had. Most mothers indicated that breast feeding was stopped completely between the ages of 18 to 24 months (n=15, 83.3%). The 0-3/12 and 13-24/12 groups received the most responses in this regard. A few stopped earlier, between 12 to 17 months (n=2, 11.1%) and only one stopped at the age of 36 months (5.6%). The number of responses related well with the previous, similar question in 8.2.1 Sampling unit: General knowledge on infant feeding and health.

✦✦Why? [For stopping breast feeding after weaning]

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Physiological readiness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Health reasons	0	4	0	0	0	1	0	0	1	3	0	0	1	8	9 81.8%
Immunological reasons	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 9.1%
He will be biting your nipples	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 9.1%
TOTAL	0	4	0	1	0	1	0	0	2	3	0	0	2	9	11

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

As to why breast feeding was stopped completely, answers given concerned health issues (n=9, 81.8%), rather than physiological reasons. Reasons included the relevant age and growth of the child. These responses were mainly given by mothers / caregivers from the Makapanstad area.

✦ At what age should a child start to eat the normal family meals?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Ideal age to start weaning (4-6/12)	0	2	0	0	0	1	0	0	0	1	0	0	0	4	4 13.8%
Seven to nine months	0	1	0	0	0	3	0	2	0	2	0	2	0	10	10 34.5%
Ten to twelve months	0	1	0	1	0	0	0	1	0	1	0	0	0	4	4 13.8%
Thirteen to eighteen months	0	0	0	1	0	1	0	0	0	2	0	1	0	5	5 7.2%
Nineteen to twenty four months	0	0	0	2	0	0	0	0	0	0	0	0	0	2	2 6.9%
When the teeth start to erupt	0	0	0	0	0	1	0	0	1	0	0	1	1	2	3 10.3%
We child knows how to eat alone	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1 3.4%
TOTAL	0	5	0	4	0	6	0	3	1	6	0	4	1	28	29

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The moderator in the Makapanstad area also probed the mothers / caregivers about the timing of introduction of a mixed diet instead of the first solid food eaten. Most mothers (n=10, 34.5%) said that their children received a mixed family diet by the age of 7-9/12. The next most popular age category was that of 13-18/12 (n=5, 7.2%), and then 4-6/12 and 10-12/12 (n=4, 13.8%).

This theme concerned the duration of exclusive breast feeding and / or the ideal time to introduce soft solid foods in the diet of the children, as practised in this community. It was clear from the results that all mothers

of the older age groups of children said that the food should be given first and the breast feed afterwards since the child needed something to drink after he had eaten. This is similar to the belief to give liquids (water) after meals (see explanation for addition of specific items - 8.2.2.2).

Cereals were the most popular group of items added to a baby's diet. The raw cereals, like maize meal or oats, were more popular than the commercial products, like Nestum or Cerelac, mainly because of availability and price. Most of the focus groups said that they gave soft porridge ("bogobe") to the babies. It was most often given without any additions, but some mothers, especially of the older children, said that they might add milk or the thin watery gravy ("sop") in which meat was boiled, to the soft porridge. The reasons given for including soft porridge ("maize meal pap") or any of the commercial brands in the diet of the baby covered a very wide spectrum. Physiological reasons, like the correct soft texture for a baby, to aid in swallowing and chewing were important; also to satisfy hunger and to prevent the baby from getting hungry again too quickly. The perception about hunger was that a baby would cry when he was hungry, and therefore soft porridge was given to prevent him from crying too often. "She will not be satisfied with breast feeding only", was one phrase used by one of the 0-3/12 groups to explain this. Secondly, health reasons were also given for including cereals. These reasons covered general health concerns: "it is good for the baby", or "to make the baby strong and healthy" ("matla"), "for the baby to gain enough weight" and "it has all the nutrients that are good for the baby" ("dikotla"). Unfortunately, soft porridge was also considered to have other special functions, mostly misconceptions, e.g. being responsible for building the body and providing strong bones.

The second item added most often was water. Many reasons given specifically for giving water on a daily basis. According to some of the focus groups water was necessary for the following reasons: "to help the food during digestion", "to help pass the feeds", "too little water leaves the child weak and will cause a sunken fontanel", "to help keeping adequate body water levels" and "to quench thirst". Except for the last reason which is physiologically based, the rest of these reasons were misconceptions. It was believed that water should be consumed after every meal as water was considered essential to aid in the digestion of the food consumed and the passing of food through the digestive system. Therefore it was believed that water should be given AFTER a breast feed or other food eaten. This corresponds with the practice of giving any additional items to eat or drink after a breast feeding session (see previous responses).

Very few fresh fruits were consumed, and if they were, it was for health reasons. Fruits were considered healthy and having all the nutrients that are good for the baby ("dikotla"). Commercial fruit juices were also given to the children. These juices however were not the pure fresh juices, but rather the sweetened, artificial types, as they were cheaper. Thirst was the main reason for giving other drinks. Fresh vegetable intakes were also limited. Mostly potato, sweet potato and carrots were consumed. Purity products were also given to babies, when it could be afforded. Soft texture and healthy foods were the valid reasons for giving these foods to babies. A few misconceptions also existed concerning vegetables: "potatoes and sweet potatoes help to build the body", and "Purity products aid in bones becoming strong".

To conclude on breast feeding as a theme, it is clear that describing the practice in clear-cut terms is very difficult. Mothers hardly practiced exclusive breast feeding; breast feeding together with complementary

food was more common. It was impossible to accurately estimate breast milk intakes in these children, because the mothers could not supply accurate information on the frequency of feeds, nor the duration of each. Attitudes were very positive towards breast feeding, but in an absent minded way. The baby was put to the breast, but the mother was not concerned with the time or rather the amount of milk taken in by the baby. They were mostly concerned that the child were happy and looked well. It seemed as if the breast was presented at every opportunity when the child cried, to stop it from crying, or when the baby was tired to help put it to sleep. If breast feeding alone would not keep the child happy, soft porridge was immediately added to the diet; to prevent hunger, and to keep the child happy. The amount of milk taken in was thus secondary to their actions and intentions.

Mothers added foods to the diets of their small babies far too soon and mostly for the wrong reasons. When food is introduced too early the risk of diarrhoea, malnutrition or other illnesses increase (12, 20, 41) Nutrition education is necessary concerning the value of exclusive breast feeding, the correct age to start weaning foods with the correct reasons for it, the nutritional value and functions of specific foods in the diets of babies and the weaning procedure (1, 10, 12, 50, 65).

8.2.3 SAMPLING UNIT: BOTTLE FEEDING

The theme on bottle feeding was explored by asking questions and probing on bottle feeding as the choice of feeding, the type of bottle feed used, preparation of bottle feeds and the hygiene practices involved with bottle feeding. The four mentioned topics delineated the context within which the data reduction was done and the results will be presented.

8.2.3.1 Bottle feeding as the feeding choice

✦ Is it general practice to give a newborn baby milk to drink from a bottle?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	2	5	2	2	2	2	1	1	5	2	1	1	13	13	26 61.9%
No	1	1	2	0	5	0	1	1	2	1	1	1	12	4	16 38.1%
TOTAL	3	6	4	2	7	2	2	2	7	3	2	2	25	17	42

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

When this question was asked directly in this subsection, the responses seemed to be more positive than was expected after the discussions on breast feeding. The positive response (n=26, 61.9%) came equally distributed from both clinics, but the negative response (n=16, 38.1%) came mainly from the mothers / caregivers from the Mathibestad area. There was no difference between the response from the various age groups, except that the fewest responses were made by the 25-36/12 age group.

✦ Who decided that the baby should get bottle feeding?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Micro environment	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 4.0%
Meso environment	2	2	2	3	2	2	1	2	3	1	1	2	11	12	23 92.0%
Question skipped	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 4.0%
TOTAL	2	2	2	3	2	2	1	2	4	2	1	2	12	13	25

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the focus groups, except two, who answered this question (n=25), said that the people in the meso environment (n=23, 92.0%) made the decision. The meso environment in this instance was either the doctor or the nursing sister at the clinic. The one mother / caregiver with a micro environment-response, decided by herself to give bottle feeding. The responses from both the clinics and all the focus groups were similar.

✦ Why do you think that a baby should not be given bottle feeding?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Physiological reasons	0	0	1	0	1	0	0	1	2	1	0	0	4	2	6 42.9%
Nutritional reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 %
Health reasons	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 7.1%
Convenience reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 %
Psychological reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 %
Immunological advantages	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 %
Financial reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 %
Hygienic reasons	1	0	0	0	0	0	1	1	0	0	1	1	3	2	5 35.7%
No answer given	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1 7.1%
Rather give breastfeeding	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1 7.1%
TOTAL	1	1	2	0	1	0	1	2	2	2	1	1	8	6	14

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Relatively few responses were received in this regard. Most responses fitted into the category of bottle feeding being physiologically unsuitable (n=6, 42.9%). These responses referred to constipation, poor strength of muscles / jaws for sucking and teats too hard for the baby. Hygienic reasons were also mentioned to a large extent (n=5, 35.7%). Responses given were about bottle-care and incorrect mixing procedures. The other reasons given were such that confirmed breast feeding was preferred as the ideal feed for a baby.

- Why do you think that a newborn baby should be given bottle feeding?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Mother has illness	1	0	1	0	2	0	1	0	1	0	0	0	3	0	6 15.4%
Mother is using drugs/medication	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 %
Baby has illness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 %
Breast discomfort	1	0	2	1	0	1	0	0	0	1	2	1	5	4	9 23.1%
Free choice	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 2.5%
Low milk production	0	3	0	2	0	2	0	1	0	1	1	1	1	10	11 28.2%
Failure to thrive	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 %
Perceived lack of milk	1	0	0	0	1	2	1	1	1	0	1	0	5	3	8 20.5%
Physiological reasons	0	1	0	1	0	1	0	0	0	1	0	0	0	4	4 10.3%
TOTAL	3	4	3	4	3	6	2	2	3	3	4	2	18	21	39

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The results identified three main categories as the reasons for bottle feeding. Low milk production (n=11, 28.2%) was mentioned most often which meant the mother had an insufficient volume of milk; the child always cried for more milk with none coming from the breast (7). Secondly, breast discomfort (n=9, 23.1%), which meant having some kind of breast illness like thrush, abscesses, mastitis or sores was also mentioned often and thirdly was the perceived lack of milk (n=8, 20.5%). The latter could be ascribed to breast milk that was not yet flowing and thus left the child unsatisfied from breast milk alone. The colostrum or early breast milk is believed to be watery in contrast to stabilized breast milk, and is thus regarded to be unsatisfying or is not given to the child. Illness of the mother also drew a few responses, as well as using the bottle to give water to a baby.

8.2.3.2 Type of bottle feed

✦ What was in the bottle (type of milk)?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Milk	3	3	2	2	2	2	2	1	2	2	1	4	12	14	26 89.7%
Water	0	0	0	0	0	0	0	0	0	1	1	0	1	1	2 6.9%
Juice	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 3.4%
TOTAL	3	3	2	2	2	2	2	1	2	4	2	4	13	16	29

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Babies who drank from a bottle mostly consumed formula milk (n=26, 89.7%). The groups responded similarly in this regard. Babies also got water or artificial juice from a bottle, but not as much as reported previously (see 8.2.2.2 in Sampling Unit: Breast feeding).

✦ What different brands of formula are used?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Nan	3	3	1	2	4	1	1	1	2	1	1	2	12	10	22 34.4%
Lactogen	2	2	0	2	0	2	0	0	0	1	0	2	2	9	11 17.2%
S26	1	1	6	2	2	0	0	0	2	1	1	0	12	4	16 25.0%
SMA	1	0	4	1	0	0	0	0	0	0	0	0	5	1	6 9.3%
Nespray	0	2	0	0	0	1	1	0	1	1	0	1	2	5	7 10.9%
Klim	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 1.6%
Other: It depends on the age of the baby	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 1.6%
TOTAL	8	8	11	8	6	4	2	1	5	4	2	5	34	30	64

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

From the results it seemed that four brands of formula were commonly used in these two areas. The two most popular brands were that of Nan (n=22, 34.4%) and S_{26} (n=16, 25.0%). Nan was very popular in nearly all the focus groups (19 of the 26). S_{26} was less popular, and mainly used by the younger and older age groups. Lactogen (n=11, 17.2%) and SMA (n=6, 9.3%) were the other two brands mentioned. Lactogen was used by all the age categories and SMA only up to the age of six months. Other milk used was Nespray full cream powder (n=7, 10.9%) and Klim (n=1, 1.6%). Most of the formula milk usage

occurred within the first three age categories; up to the age of nine months.

In this Sampling Unit one of the aims was to determine which type of milk was used for bottle feeding. Distinctions were made between the different brands of formula milk and full cream milk powders used. To clarify their choice of the different brands of formula or other milk, mothers / caregivers were asked why they used the particular type and brand of milk, as mentioned. Six different types of milk were mentioned and the results will be discussed accordingly. All the reasons were categorized according to nutritional, health and physiological reasons.

Nan: Most of the reasons mentioned fit into the nutrition category. Some of the answers were:

- "Nan is good for the baby"
- "Nan is healthy and has a lot of vitamins"
- "Nan is best because it has vitamins, iron and body building stuff"
- "Nan has all the proteins"
- "Nan is marked 0-6 months"

Only one reason was given for the health category:

- "Nan is healthy - like breast feeding"

The physiologically based responses included:

- "Nan is like breast feeding, even the taste"
- "Lactogen was given first, but the child vomited, so I changed to Nan"

One of the responses given was very unspecific so that it could be categorized in each of the three categories:

- "Nan is like breast feeding"

Lactogen: Most of the responses given for this brand also fell under nutritional reasons:

- "Lactogen is not so rich, it is just like mother's milk"
- "Lactogen is the same as other formulae"
- "Lactogen is best for babies"

The other reasons were physiological reasons:

- "Tried other formulae, baby refused them but accepted Lactogen Number 1"
- "Lactogen was given first, but the child vomited, so I changed to Nan"

Again, one of the responses given was so unspecific that it could be categorized in each of the three categories:

- "Lactogen is not so rich, it is just like mother's milk"

S_{25}: Most reasons could be interpreted from a nutritional point of view:

- "Give S_{26} because it is a small child / baby"

- " S_{26} has iron"
- " S_{26} has all the vitamins that is needed by the child"

One reason only was given for physiological reason category:

- " S_{26} is like breast feeding, even the taste"

Again one of the reasons could be interpreted in all three categories:

- " S_{26} is like breast feeding"

SMA: This brand of milk received one reason only, which could also be interpreted in all three categories:

- "SMA is like breast feeding"

Nespray: Although not a formulae milk, Nespray was also used for bottle feeding purposes. The reason mentioned by the mothers / caregivers fell under the nutritional reasons:

- "Nespray is suitable for ten month old babies"

The second reason was a very general reason, and did not fit into any of the categories:

- "Nespray was used by their parents, everybody always used it - they didn't know any others"

Klim: Although Klim was mentioned as being used, no specific reason was given to explain the usage

The mothers / caregivers mostly used formula milk (like Nan or Lactogen) for the young babies, but rather used the full cream milk powders (like Nespray) available on the market for the older children. Apparently, all the types of milk were considered just the same as breast feeding, and therefore used. An aspect that would be interesting to investigate further would be to identify what the mothers / caregivers considered as "being the same as breast feeding". The reasons given was very general and resembled the marketing strategy of the formulae: breast milk substitute or the same as breast milk.

✦ Do you ever use fresh cow's milk to give to your baby in a bottle?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	0	0	0	1	0	0	0	1	2	2	1	2	3	6	9 20.4%
No	3	3	2	5	2	2	2	1	4	10	1	0	14	21	35 79.6%
TOTAL	3	3	2	6	2	2	2	2	6	12	2	2	17	27	44

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Very few mothers / caregivers used cow's milk in bottle feeding (n=9, 20.4%). Of these, only one mother / caregiver had a baby in the 4-6/12 and one in the 10-12/12 age category. The other children were older

than one year. More mothers / caregivers of the Makapanstad area indicated the use of cow's milk. The rest of the focus groups gave a negative response to cow's milk usage (n=35, 79.6%).

✦ What are the positive reasons for using cow's milk?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Nutritional reasons	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 50.0%
Health reasons	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 50.0%
TOTAL	0	0	0	0	0	0	0	0	2	0	0	0	2	0	2

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Although a number of focus groups responded positively to using cow's milk, only one group gave reasons for it. The reasons mentioned were either nutritional (due to vitamin content) or health (it is like breast feeding) in nature.

✦ What are the negative reasons for using cow's milk? (Not to use cow's milk)

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Nutritional reasons	2	0	2	0	0	0	0	0	1	0	1	0	6	0	6 66.7%
Health reasons	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1 11.1%
Hygiene reasons	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1 11.1%
No - we don't have any cows	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 11.1%
TOTAL	2	0	4	1	0	0	0	0	1	0	1	0	8	1	9

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most of the reasons for not using cow's milk were nutritional in nature (n=6, 66.7%). Statements included: "too much fat and iron"; "too rich and creamy"; "it does not have the same vitamins like formula and breast milk"; "it is simply not right for the baby" and that "it is not pasteurized".

✦ Is anything added to cow's milk when a bottle feed for a baby is made (prepared)?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
No	1	0	0	1	0	0	0	1	2	2	1	2	4	6	10 90.9%
No answer given	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 9.1%
TOTAL	1	0	0	1	0	0	0	1	2	3	1	2	4	7	11

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

This question was included in the interview schedule in order to determine if the mothers added anything, like water, to make the milk less concentrated, or like sugar to add energy or to improve taste. No positive responses were received.

8.2.3.3 Preparation of bottle feeds

✦ How do you know how to make a bottle of milk for the baby? (Who taught you?)

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Micro environment	3	4	2	4	2	2	2	3	2	3	2	1	13	17	30 75.0%
Meso environment	0	2	0	2	0	1	0	2	0	1	0	2	0	10	10 25.0%
TOTAL	3	6	2	6	2	3	2	5	2	4	2	3	13	27	40

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The micro environment responses (n=30, 75.0%) were dominant to the meso environment responses (n=10, 25.0%). The micro environment category consisted mostly of one response: reading the instructions on the tin, and therefore knowing how to make the bottle feed. The parents of the mother were another source of information and some mothers decided on their own how to make up the feed. Meso environment responses included one response only referring to the clinic staff teaching the mothers the correct procedure. Mothers / caregivers from the Mathibestad area referred to the micro environment only as their source of knowledge. The mothers / caregivers in the Makapanstad area also mentioned the meso environment as another source of knowledge. This differed from previous findings that showed that the people in the Mathibestad area made more use of their community clinic.

The preparation of bottle feeds was further investigated. The source of information for obtaining the correct procedure for mixing bottle feeds seemed correct and adequate (reading instructions from the tin), but the actual methodology practiced was questionable. The following questions thus arose: were the instructions read correctly, or did it just seem the correct answer to be given? Would the parents (mothers) of these mothers really have had the knowledge of formula feeding to teach their children? The mothers / caregivers

who made use of their meso environment to obtain information used the clinic staff. This could be regarded as a more reliable source that would be more likely to result in bottles being prepared correctly. Unfortunately, even the mothers / caregivers that consulted the clinic staff, did not always mix the formula correctly, as will be discussed.

The mothers / caregivers of each focus group were asked to make up one bottle feed. A genuine baby bottle filled with water was given to any one mother / caregiver in the focus group and she would then add the number of scoops of powdered formula as she thought was correct. The other focus groups members had to help if necessary until everybody was happy with the recipe - and this recipe was documented as the group's response. Only 55.6% (n=15) of the recipes given displayed the correct / ideal measurement (one scoop of formula per 25mL water). Of the remaining recipes given, 29.6% (n=8) were too weak a mixture of milk. Some mixtures were:

- 125mL water with four scoops milk (instead of five scoops)
- 200mL water with two scoops milk (instead of eight scoops)
- 175mL water with six scoops milk (instead of seven scoops).

It seemed that the most common mistake was to use one scoop less than required. The result would be a slightly weak mixture which could be of disadvantage to the nutritional health of the baby (6, 49, 50, 52, 54, 57).

The remaining number of recipes (n=4, 14.8%) given by the focus groups, were for mixtures made up too strong. Some mixtures were:

- 125mL water with 10 scoops milk (instead of five scoops)
- 200mL water with 10 scoops milk (instead of eight scoops)
- 100mL water with five scoops milk (instead of four scoops)
- 125mL water with six scoops milk (instead of five scoops).

In this regard it seemed that one or two scoops were added additionally to the feed. This led to over-concentration of the feed, which might lead to dehydration and other problems (6, 49, 50, 52, 54, 57).

These findings revealed a problem concerning the mixing procedures for bottle feeding, as only about half of the responses were correct. Most of the mothers / caregivers indicated that they read the instructions on the tins, but in practice it appeared not to have any positive effect on the mixing procedure applied. The strength of the milk was altered (diluted or over-concentrated) which in turn compromised the quality of the feed. In both instances, the mothers were unaware of the consequences of their decisions to the child. Therefore, education regarding the correct mixing procedures for bottles is imperative. However, knowing the correct mixing procedure would not necessarily lead to it being practiced. Further investigation into the reasons for making feeds either too weak or too strong, is thus indicated. Information on the implementation of over- or underdilution of feeds, should therefore also be shared with these communities.

8.2.3.4 Hygiene practiced with bottle feeding

✦ What type of water do you use to make a bottle for your baby?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Boiled cooled water	3	2	0	2	1	1	0	2	1	1	2	1	7	9	16 61.5%
Boiling water	0	0	2	0	1	1	2	0	1	0	0	0	6	1	7 27.0%
Unboiled water	0	1	0	0	0	0	0	0	0	1	0	1	0	3	3 11.5%
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT , MAKAPANSTAD = MP

Most of the water used in these communities was from boreholes (75%); however not purified. Mothers were asked if they ever tried to amend this situation by applying suitable techniques. Mothers tried to purify their own water by means of boiling. Boiled, cooled water (n=16, 61.5%) was mainly used in both clinics. Boiling water (n=7, 27.0%) was also used. These responses came mainly from the Mathibestad area. Unboiled water (n=3, 11.5%) was used in the Makapanstad area only.

✦ What are the reasons for the type of water chosen to make a bottle for your baby?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Hygiene	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26 100%
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The only reason mentioned for using previously boiled and then cooled water to make bottle feeds was for hygiene purposes. All the groups responded positively in this regard (100%). This verified the fact that mothers were aware of the importance of hygiene, especially concerning the type of water to use for food / bottle preparation.

✦ Is cow's milk boiled when it is used for baby feeds?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	0	0	0	1	0	0	0	1	1	1	1	2	2	5	7 77.8%
No	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 11.1%
No answer given	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 11.1%
TOTAL	0	0	0	1	0	0	0	1	2	2	1	2	3	6	9

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The few people that used cow's milk, mostly boiled the milk (n=7, 77.8%) before using it. Most of the answers were from mothers / caregivers in the Makapanstad area.

✦ What are the reasons given for boiling cow's milk?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Hygiene reasons	0	0	0	0	0	0	0	1	1	1	1	2	2	4	6 85.7%
Physiological reasons	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 14.3%
TOTAL	0	0	0	1	0	0	0	1	1	1	1	2	2	5	7

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Reasons provided for boiling the milk was mainly hygienic in nature (n=6, 85.7%), namely to boil the milk to kill all the germs. This may be connected to the issue of using milk from cows on the premises, and need to be further looked into. The only other response was physiological in nature, namely that a baby should have warm milk to drink. One group only responded negatively to boiling milk without giving any reasoning.

✦ Do you prepare food or milk feeds in advance for a day's meal?

Questions were answered separately for solid food and milk feeds in bottles.

RESPONSES ON FOOD PREPARATION ONLY

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1 4.8%
No	2	3	2	1	2	2	2	2	1	2	0	0	9	10	19 90.4%
Left out question	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 4.8%
TOTAL	3	3	2	1	2	2	2	2	1	2	0	1	10	11	21

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

One group responded positively to this question (n=1, 4.8%), and the rest negatively (n=19, 90.4%). The positive response was made by a 25-36/12 group from the Makapanstad area. Focus groups from both areas responded mostly to the negative. What was interesting though, was that none of the 25-36/12 group gave a negative answer. This might have suggested that the older children started to use the family foods.

✦ What are the reasons mentioned (if any) for preparing food in advance?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Availability	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2 100%
TOTAL	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD =MP

The few mothers / caregivers who responded positively to preparing food in advance were asked their reasons for doing so. These reasons (n=2) all had to do with availability. The child should be able to eat food anytime when he was hungry, or food should be available even when the electricity was cut off. This was only mentioned by the one group from the Makapanstad area.

✦ Give an explanation of where the food is kept if prepared in advance?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Cold storage	0	0	0	0	0	0	0	0	1	0	0	1	1	1	2 40.0%
Other	0	0	0	0	0	0	0	0	2	0	0	1	2	1	3 60.0%
TOTAL	0	0	0	0	0	0	0	0	3	0	0	2	3	2	5

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Refrigeration (cold storage) (n=2, 40%) was only mentioned once by each clinic as a means of food

storage. Other responses included areas like the floor, stove or the shade (n=3, 60.0%). Only the 13-24/12 and 25-36/12 age groups from both clinics gave responses.

RESPONSES ON BOTTLE PREPARATION (MILK FEEDS) ONLY

✦ Do you prepare bottles of milk in advance for a day's meal?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1 4.2%
No	2	3	2	2	2	2	2	2	1	1	2	1	11	11	22 91.6%
Left out question	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 4.2%
TOTAL	3	3	2	2	3	2	2	2	1	1	2	1	13	11	24

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The same line of questioning was followed for the preparation of bottle feeds as for food preparation in advance. The overwhelming response was negative (n=22, 91.6%). This time the clinics and the age groups responded in a similar fashion. Only one focus group responded positively.

✦ What are the reasons mentioned for preparing bottles of milk in advance? (positive reasons)

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Availability	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 %
Milk leftovers kept to use later	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1 100%
TOTAL	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The only positive reason mentioned by one group was to keep the feed leftover for later use; nothing should be wasted.

✦ What are the reasons mentioned for preparing bottles of milk in advance? (negative reasons)

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Hygiene reasons	1	0	0	1	0	0	1	0	0	0	2	0	4	1	5 83.3%
	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 16.7%
TOTAL	1	0	0	1	0	0	1	0	1	0	2	0	5	1	6

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Negative reasons were hygienic in nature (n=5, 83.3%). Mothers / caregivers knew that flies could easily contaminate a bottle feed or that the heat from the sun could cause the milk to go sour. Therefore the preparation of bottle feeds in advance was not advisable.

✦ Give an explanation of where the bottles are kept if prepared in advance?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Cold storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 %
Other storage	1	0	1	0	1	0	0	0	1	0	0	0	4	0	4 100%
TOTAL	1	0	1	0	1	0	0	0	1	0	0	0	4	0	4

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

When asked about bottle preparation in advance, all but one of the groups responded negatively. However when they were asked where the prepared milk feeds were kept, more than one group gave answers. This may be explained in terms of the fact that they did not consider milk left over in a bottle as being prepared in advance, and that milk left in a bottle was always re-used. No cold storage was used for milk left over in bottles, and it was mostly kept on the floor or in the shade (n=4, 100%). This matter may need more investigation to clarify the practices in an exact way, but milk made in advance seemed to be kept unrefrigerated until consumption.

Hygiene and bottle feeding are very important issues in poor communities. The concept of hygiene includes the water used, as well as the storage procedures practised. The water source in both these communities mainly was unpurified borehole water. However, 61.5% of the mothers / caregivers indicated that the water for bottle feeding was boiled first, and then cooled down before use. They were all aware of the importance of hygiene in health (see 8.2.3.4). Water was boiled to kill germs. Even the mothers who used cow's milk for bottle feeding, boiled the milk first for hygiene purposes. Bottles were apparently not made in advance, but if a bottle feed was not finished by a child during one feeding session, the mother would keep the rest of the bottle contents until the next feed, so as not to waste any of this expensive product. Mothers kept these feeds mostly unrefrigerated, and in the open. Some was kept on the stove where it would probably have stayed longer at a lukewarm temperature. Some was kept in the shade, where it was more exposed to flies and environmental heat. These were prime circumstances for contamination (6, 49, 50, 54, 52, 57).

In summary: it was evident that nutrition education regarding these issues is imperative. Education regarding the ideal type of bottle feeding in the situations indicated for its use, is very important.

8.2.4 SAMPLING UNIT: WEANING

The theme on weaning was explored by asking questions and probing on first weaning (complementary) foods, meals / food intakes, food preparation and milk drinking practices. The four mentioned topics delineated the context within which the data reduction was done and the results will be presented.

8.2.4.1 First weaning foods (complementary foods)

✦ What is the first type of solid food that a baby normally gets to eat?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Cereals - maize meal porridge	2	3	2	2	2	5	2	6	2	3	2	3	12	22	34 53.1%
Cereals - com-mercial products	3	2	1	2	1	3	4	3	0	1	1	2	10	13	23 35.9%
Fruits - fresh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fruits - com-mercial products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetables - fresh	0	0	0	0	0	0	0	1	0	1	0	2	0	4	4 6.3%
Vegetables - com-mercial products	0	0	0	0	1	0	0	0	0	0	1	1	2	1	3 4.7%
Meats	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eggs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other milk products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Soup (commercial)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	5	5	3	4	4	8	6	10	2	5	4	8	24	40	64

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The mothers / caregivers were probed about the first item of food that a child was given to eat other than milk. The responses were classified according to the main categories of foods according to types, namely cereals, fruits, vegetables, meats, eggs and commercial baby foods. An overwhelming response was received for cereals as a group (n=57, 89%); maize meal (n=34, 53.1%) and commercial cereal products (n=23, 35.9%). Of these 60% were soft porridge (n=34), 28% Nestum (n=16) and 12% Cerelac (n=7) (not indicated in table). The only other two food categories mentioned, were equally responded to, namely for fresh vegetables (n=4, 6.3%) and commercial baby foods, like Purity (n=3, 4.7%). These last two items were mostly mentioned by the older age groups, 10-12/12 and older. Only two of these age groups mentioned the commercial product. There was no real difference between the different age categories with reference to the rest of the responses. However, it was only groups from the Makapanstad area that mentioned vegetables, but both areas mentioned the commercial product. It can be concluded that soft porridge as prepared specifically for babies (see discussion on food preparation), was used most often by all groups in both areas.

✦ Why specifically is this type of solid food given first to the baby?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Nutritional reasons	1	1	0	1	1	0	0	2	0	0	0	0	2	4	6 12.5%
Health reasons	1	2	0	2	0	3	0	1	0	2	1	0	2	10	12 25.0%
Physiological reasons	2	3	2	2	0	0	2	2	0	5	1	3	7	15	22 45.8%
Availability	0	0	1	0	1	0	1	0	2	0	0	0	5	0	5 10.4%
Financial reasons	0	0	0	0	0	0	1	0	1	0	0	0	2	0	2 4.2%
Don't know why it is necessary	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1 2.1%
TOTAL	4	7	3	5	2	3	4	5	3	7	2	3	18	30	48

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The responses received from this probe were categorized according to nutritional, health, physiological, availability and financial reasons. The physiological reasons (n=22, 45.8%) received the most responses. Every age group responded in this category except the 7-9/12 group in both areas, and the Mathibestad area 13-24/12 age group. The physiological reasons mentioned, included ease of swallowing; small and immature stomachs / ease of digestion; keeping the child satisfied for a longer period; teething; size of the child; ease of eating; and it being good for a baby, which were all valid reasons (12, 14). The general health reasons (n=12, 25.0%) primarily came from the Makapanstad area groups. In the Mathibestad area only the youngest and oldest age groups responded in this category. Responses included general statements like making the child strong; for the baby to put on some weight (look fat); for growing; and it being good and healthy for the baby. The next two categories received a fairly similar number of responses, namely nutritional reasons (n=6, 12.5%) and availability (n=5, 10.4%). Nutritional reasons were mostly mentioned by the age groups younger than 10-12/12 and also mainly by the groups from the Makapanstad area, while the matter of availability were mentioned in the middle age groups and only by mothers / caregivers in the Mathibestad area. Nutritional reasons included an item being good for the baby; suitability; containing healthy substances in general; also specifically vitamins, calcium and iron; and the fact that the foods aids in bone growth. Availability primarily stated the fact that maize meal was used on a day to day basis in the home and was therefore the most convenient product to give to babies. Financial reasons (n=2, 4.2%) indicated that maize meal was not expensive and could therefore be used, especially if not enough money was available for buying Nestum. The financial reasons were only mentioned by the focus groups from the Mathibestad area and only by two of the groups. It can thus be concluded that soft porridge were mostly given to babies due to its soft texture, its satiety value, its perceived nutritional value (which in some instances were totally incorrect), and its availability. The focus groups in the Makapanstad area focused more on physiological, health and nutritional aspects, while the mothers / caregivers from the Mathibestad area focused more on physiological, financial and availability aspects.

✦ What is the next two weaning items (complementary foods) mentioned?

Mothers / caregivers were asked which next two items were given to a baby after he/she has eaten food for the first time. In the focus groups the mothers / caregivers were specifically asked to list the foods as second and third foods. These foods will be presented separately. The same food categories were used as with the initial food product introduced.

✦✦ The second weaning food introduced

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Cereals - maize meal porridge	0	1	1	0	0	0	0	0	0	0	0	0	1	1	2 6.5%
Cereals - commercial products	1	0	1	1	0	1	0	0	1	0	0	0	3	2	5 16.1%
Fruits - fresh	1	0	0	0	0	2	0	0	1	0	0	1	2	3	5 16.1%
Fruits - commercial products	1	2	0	1	1	0	0	2	0	0	0	1	2	6	8 25.8%
Vegetables - fresh	1	0	0	0	1	0	3	0	0	1	2	0	7	1	8 25.8%
Vegetables - commercial products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meats	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eggs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other milk products	0	0	0	0	0	0	0	1	0	0	0	1	0	2	2 6.5%
Soup (commercial)	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 3.2%
TOTAL	4	3	2	2	2	3	3	3	2	2	2	3	15	16	31

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The second food item included in a baby's diet covered a variety of items. Commercial fruit products and fresh vegetables (n=8, 25.8% each) were mentioned most frequently in this regard. However, the mothers / caregivers from the Makapanstad area were more in favour of the commercial fruits while the mothers / caregivers from the Mathibestad area favoured fresh vegetables (like pumpkin, potato). Fresh fruits (like banana or squeezed orange) were also mentioned, as was commercial cereals (like Nestum) (n=5, 16.1% each). None of these items could be specifically linked to any one age group as a variety of responses came from each group.

✦✦ The third weaning food introduced

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Cereals - porridge	2	0	0	1	1	0	0	0	0	0	1	0	4	1	5 12.8%
Cereals - commercial	0	4	0	0	1	0	0	0	0	2	1	0	2	6	8 20.5%
Fruits - fresh & fresh juice	0	0	0	2	1	0	3	3	0	0	0	1	4	6	10 25.6%
Fruits - commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetables - fresh	0	0	1	0	0	0	0	0	1	1	0	0	2	1	3 7.7%
Vegetables - commercial	1	0	1	0	0	2	0	0	0	1	1	1	3	4	7 18.0%
Meat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eggs	0	0	0	1	0	0	0	0	1	1	0	0	1	2	3 7.7%
Commercial fruit juice	1	0	0	0	0	0	0	0	0	0	0	1	1	1	2 5.1%
Cold drinks - other	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1 2.6%
TOTAL	4	4	2	4	3	2	3	3	2	5	3	4	17	22	39

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The third food item included in a baby's diet was similar to the previous ones mentioned, although a few new items were included. The category mentioned most often by both areas was that of fresh fruits (n=10, 25.6%), including items like apple, pear, banana and orange. The second highest category of responses was that for commercial cereals, like Nestum or Cerelac (n=8, 20.5%), and commercial vegetable products (Purity) (n=7, 18.0%). The cereals were mentioned more often by the Makapanstad area and the vegetables were mentioned by both. Other items that were also mentioned included porridge, fresh vegetables like merogo (green leaves like spinach, etc.) or potatoes, eggs and a few even mentioned commercial fruit juices or cold drinks. No clear distinction could be made between the two clinics or the various age groups.

It could be concluded that the mothers / caregivers followed a similar regime to the one suggested by health professionals (see Chapter 3). Cereals, like soft maize meal porridge, Nestum or Cerelac were usually given as a starter food. If maize meal porridge was given first, Nestum or Cerelac was usually the second item included and vice versa. Fruits were also a popular choice, but usually only after the cereals. Commercial fruit products were followed by the fresh product. Fresh vegetables were given as an introduction to vegetables, followed by the commercial products. Although most mothers / caregivers gave soft maize meal porridge alone as an introductory food, some also added sugar or the watery gravy from boiled meat to the porridge. The use of commercial cold drinks or fruit drinks was also popular; even with younger children.

- Why specifically these next two types of weaning items?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Nutritional reasons	0	0	1	2	1	2	0	1	3	1	0	0	5	6	11 24.4%
Health reasons	3	1	2	1	4	1	2	4	1	2	2	2	14	11	15 55.6%
Physiological reasons	1	2	0	0	0	0	0	0	0	0	1	0	2	2	4 8.9%
Acceptability	0	1	0	0	0	0	0	0	0	2	0	0	0	3	3 6.7%
Availability	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 2.2%
To give fresh food to the baby	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1 2.2%
TOTAL	5	4	3	3	5	4	2	5	4	5	3	2	22	23	45

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Mothers / caregivers were probed for their reasons for including these specific second and third foods (see 8.2.4.1) in the specific order that they mentioned. In contrast to the reasons mentioned for the introduction of the first food (see previous probe), the physiological reasons were not the choice reason category, but rather the health reasons (n=25, 55.6%). Responses included the general statement that the foods would aid in the child being healthy and strong; that it would aid in weight gain; that soft porridge contained starch which was needed by the body; that it built the body (the whole spectrum of foods); and that fruits and vegetables made strong bones. Some of these responses clearly were misconceptions. Nutritional reasons (n=11, 24.4%) were also mentioned frequently. None of the youngest (0-3/12) and oldest (25-36/12) age groups gave responses in this category. Responses included statements like: these foods (wide spectrum) contained lots of vitamins; these foods (mashed potato, eggs, merogo) were good for the baby ("dikotla") and contained protein; eggs had protein and vitamins; soft porridge had starch which was needed by the body; and these foods (yoghurt, Purity, banana, orange) had vitamins, protein and carbohydrates. Some of these responses indicated that the mothers / caregivers knew about the correct terminology concerning nutritional aspects of foods, but that they could not link the terminology to the correct foods and often not for the right reasons. The other categories received only a few responses. Physiological reasons (n=4, 8.9%) concerned only the soft, suitable texture of the food given (Purity, Nestum, potato) and that these foods (Purity and Nestum) would not cause constipation. Acceptability (n=3, 6.7%) was only mentioned by the Makapanstad area and indicated that certain foods (Nestum, Purity, Maggi soup) were added for taste or for a change / variety. Availability (n=1, 2.2%) was only mentioned once by the mothers / caregivers from the Mathibestad area and referred to the maize meal being available in the home. The main response categories received nearly an equal number of responses from both clinics and from most groups. It can be concluded that mothers / caregivers did not really know the true nutritional or other reasons for following a specific order of introducing solid foods into the diet of the baby. A number of the reasons given could be interpreted as being correct, but they were vague; quite a number of misconceptions existed regarding the necessity of including certain foods into the weaning diet.

8.2.4.2 Meals / food intakes

✦ How many times does a child get solid food on the same day?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Two times	2	1	0	0	0	1	0	0	0	0	0	0	2	2	4 9.0%
Three times	2	3	5	2	2	2	2	2	5	1	2	5	18	15	33 73.3%
Four- six times	1	0	1	0	0	0	0	1	2	1	0	2	4	4	8 17.7%
TOTAL	5	4	6	2	2	3	2	3	7	2	2	7	24	21	45

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The most common meal pattern for children who had been weaned (n=33, 73.3%) was that of three meals a day. All the focus groups from both areas and from all the age categories responded very consistently with the same answer. Some mothers / caregivers (n=8, 17.7%) used a four-to-six meal pattern. This pattern was equally used in both areas by a variety of age groups. Only the 7-9/12 age group never indicated this pattern at all. A few of the focus groups also said that they only gave their children solid food twice a day (n=4, 9.0%). This was mainly for the younger children in the 0-3/12 and 7-9/12 age groups from both areas. It was thus clear that the three meal pattern was established very early on in the life of a child.

✦ Why does a child get solid food for the specified number of times on the same day?

Three response categories (two times, three times, four - six times) were formed when the question on the number of feeding times per day was asked in the focus groups (see previous probe). The mothers / caregivers were then also probed with regard to their reasons for choosing a specific regime for giving solid food to their children in the weaning stage. Each of the regime choices was considered separately in order to consolidate the responses. All the reasons given for using a specific regime were categorized according to nutritional, health, physiological, immunological and household practices reasons.

FEEDING REGIME: 3x / DAY

DATA CATEGORIES (3x/day)	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Nutritional reasons	1	0	1	0	0	0	2	0	0	0	1	0	5	0	5 20.0%
Health reasons	0	0	1	0	0	0	0	0	0	1	0	1	1	2	3 12.0%
Physiological reasons	1	3	0	2	2	2	0	3	0	1	0	1	3	12	15 60.0%
Immunological reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Household practices (habit)	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2 8.0%
TOTAL	2	3	2	2	2	2	2	3	1	2	2	2	11	14	25

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The three meal a day regime was most popular as stated previously (see 8.3.4.2) and also received the most reasons (n=25, 69.44% from a total of 36 reasons given) from the mothers / caregivers when probed about it. The physiological reasons were most popular (n=15, 60.0%), especially in the Makapanstad area. Physiological responses referred to satisfying hunger; preventing crying due to hunger; and spreading the food throughout the day to prevent hunger. The other categories had few responses allocated to them. These included nutritional reasons (n=5, 20.0%), referring to balancing the diet and preventing overweight; health reasons (n=3, 12.0%), referring to the baby being strong and healthy and to grow up well; and household practices (n=2, 8.0%), referring to the usual method and following the practice of adults. The age groups contributed equally towards these responses.

FEEDING REGIME: 2x / DAY

DATA CATEGORIES (2x/day)	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Nutritional reasons	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 25.0%
Health reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Physiological reasons	1	1	0	0	0	1	0	0	0	0	0	0	1	2	3 75.0%
Immunological reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Household practices (habit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	2	1	0	0	0	1	0	0	0	0	0	0	2	2	4

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The two meal a day regime was not very common and only a few reasons were given (n=4, 11.1% from

a total of 36 reasons given). The physiological reason category, which mostly concerned satisfying hunger, received the most responses (n=3, 75.0%). Only one nutritional reason was given and this stated that two meals a day was a balanced diet for a baby. These responses were given mostly by the youngest age group.

FEEDING REGIME: 4x / DAY

DATA CATEGORIES (4x/day)	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Nutritional reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Health reasons	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1 14.3%
Physiological reasons	1	0	1	0	0	0	0	1	2	1	0	0	4	2	6 85.7%
Immunological reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Household practices (habit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	0	1	0	0	0	0	1	2	1	0	1	4	3	7

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The four-six meal a day regime was a little more popular (n=7, 19.4% from a total of 36 reasons given). These reasons given were also mostly physiological of origin (n=6, 85.7%), consisting of statements concerning the prevention of hunger and thus crying babies; that small children should eat more than others; and that they are hungry more often. The one health reason (n=1, 14.3%) given was the general statement that the baby should get enough energy in order to be strong.

In summary: in the Sampling Unit on Breast feeding (see 8.2.2.4) the mothers / caregivers were asked how many times the breast fed child received something to eat or drink together with breast feeding. A three-meal-a-day frequency of feeding additional food / drinks to breast feeding was established by most mothers / caregivers (50.0%). Two and four meals (11.9% each) per day were also implemented. In this Sampling Unit (8.2.4.2) mothers / caregivers were asked how many times a child received only solid food during the day. It could be concluded that the meal patterns of the child during the weaning phase followed a similar trend than with the introduction of weaning / complementary foods. The three-meals-a-day meal pattern was most common (73.3%), followed by four-six meals (17.7%) and two meals(9.0%). These figures included children from the older age groups who were not being breast fed anymore. It could therefore be concluded that many of the mothers / caregivers who started off with a two or four meal-a-day pattern when introducing the first complementary food item, switched over to a three meal-a-day pattern during the final weaning-from-the-breast phase. In the Sampling Unit: Nutrition knowledge (8.2.5) mothers / caregivers were also asked what the ideal eating pattern for a child would be. Again a large number of mothers / caregivers chose the three meals-a-day pattern (65%). Some mothers / caregivers however stuck to their four-to-six (17.7%) or two (9.0%) meals-a-day pattern in the final weaning phase. This was probably not

continued into late childhood as very few mothers / caregivers indicated in the nutrition knowledge section that they only gave two meals. A three-meal pattern was thus established very early in the life of a child.

The quantities of food consumed by the children were examined. However, the way in which the data were reported made an evaluation quite difficult. In order to describe the current situation, the mixing procedure of commercial baby foods, the volumes of food intake as reported by the mothers / caregivers, as well as their reasons for using these quantities will be presented. Due to a huge variety of answers given in this regard, no conclusions on an average volume of intake could be drawn.

MIXING PROCEDURES FOR COMMERCIAL CEREAL PRODUCTS

The following recipes were acquired during the focus group interviews:

AGE CATEGORY	RECIPE REPORTED
0-3/12	4 Teaspoons of Nestum, heaped (28mL) + 50mL water
4-6/12	6 Tablespoons of Nestum (120mL) + 50mL water
4-6/12	5 Tablespoons of Nestum (100mL) + 75mL water
0-3/12 and 7-9/12	4 Tablespoons of Nestum (80mL) + 50mL water
10-12/12	10 Tablespoons of Nestum (200mL) + 125mL water
13-24/12	5 Tablespoons of Nestum (100mL) + 50mL water

AGE CATEGORY	VOLUME CONSUMED PER MEAL (CEREAL)
0-3/12	35mL, 125mL, 175mL, 250mL, 300mL, 600mL
4-6/12	75mL, 150mL, 250mL
7-9/12	180mL, 250mL, 400mL, 600mL
10-12/12	175mL, 250mL, 400mL, 600mL,
13-24/12	125mL, 250mL, 400mL, 600mL
25-36/12	250mL, 300mL, 600mL

The volumes reported seemed to be unrealistic and should be reported with caution. These volumes were checked numerously in the focus group situation, but the same reply was always given. One explanation for these huge quantities could be drawn from an observation by the researcher. It was observed that mothers / caregivers put the mentioned amount of porridge into a bowl as they started to feed the baby. Often they did not finish this quantity at that specific feeding time. Thus the food might be kept over for later use, as was previously reported (see 8.2.3.4), or be given to other children. The volumes reported with the Nestum-mixing procedures seemed to be more realistic in terms of volumes per age category.

✦ What are the reasons for giving the specified amount of food each time the child eats?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Nutritional reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Health reasons	0	0	0	0	0	0	0	0	1	0	0	2	1	2	3 10.0%
Physiological reasons	4	4	2	2	2	2	2	2	2	1	2	1	14	12	26 86.7%
Immunological reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Financial reasons	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1 3.3%
TOTAL	4	4	2	2	3	2	2	2	3	1	2	3	16	14	30

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The reasons for giving the specified volumes of food were categorized according to nutritional, health, physiological, immunological and financial reasons. Nearly all of the responses given by these mothers / caregivers were categorized under physiological reasons (n=26, 86.7%): mostly to prevent hunger and crying; to keep the baby satisfied until the next feed; and to give food according to body size. Only a few health reasons (n=3, 10.0%), concerning being strong and healthy, and to eat enough to grow well (given by the 25-36/12 age groups) were given. Only one financial reason (3.3%), which concerned the cost of living that prevented mothers / caregivers to give more food, were given by the 7-9/12 group.

Physiological reasons given by the various age groups for the different volumes given were as follows:

0-3/12 - "because the baby would not cry when he has eaten so much"
- "for her to be satisfied"
- "because the baby is growing up so they must get enough food"
- "for her not to get hungry quicker"
- "because the child is still young"
- "the child must not eat too much because he will vomit"

4-6/12 - "because the baby would not cry when he has eaten so much"

7-9/12 - "the amount is right for the baby - finishes it all"
- "enough food so that the baby will not get hungry"

10-12/12- "they have an appetite"
- "for the baby to eat enough for the whole day"
- "because the stomach is not big enough to eat so much"

13-24/12- "he gets 125mL because he must get fruit as well"

25-36/12- "this amount of food stays in the stomach for a long time before the baby will get hungry again"

- "that is her timetable - according to the age of the child, the size of the plate increases"

These responses indicated that mothers / caregivers mostly decided on the volume of food given to the baby according to the behaviour of the child. If the child cried "too much", hunger was assumed and more solid food was given.

8.2.4.3 Food preparation

✦ Is the child's food prepared separately from that of the family?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	3	3	1	2	2	2	1	2	1	2	2	0	10	11	21 80.8%
No	0	0	1	0	0	0	1	0	1	0	0	2	3	2	5 19.2%
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most of the mothers / caregivers in both areas (n=21, 80.8%) confirmed that the children's food was prepared separately from that of the rest of the family (12). Only the focus groups from the 25-36/12 age groups from the Makapanstad area did not respond positively to this probe. There was a similar number of positive and negative responses between the two clinics.

✦ Why is the child's food prepared separately from that of the family ?

Positive reasons

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Physiological reasons	0	1	1	0	0	0	0	3	1	0	0	0	2	4	6 22.2%
Acceptability	3	2	1	1	2	2	1	2	1	2	1	0	9	9	18 66.7%
Availability	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1 3.7%
Tradition	0	0	0	1	0	0	0	0	0	0	1	0	1	1	2 7.4%
TOTAL	3	3	2	2	2	3	1	5	2	2	2	0	12	15	27

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The mothers / caregivers were probed about their reasons for preparing food separately for the child. Most of the positive responses were categorized in terms of acceptability for the child (n=18, 66.7%). The reasons were about salt, oil and spices in adult's food which were unacceptable for babies / young children, and adults eating different kinds of food than children. These responses came in equal numbers from the two areas, with the least responses from the oldest age groups. A number of physiological reasons were also given (n=6, 22.2%) by the two youngest and the 10-12/12 age groups. These were about the different textures of the food; cooking the food longer; and washing the maize meal before preparing the porridge. Two of the groups (7.4%) mentioned their traditions as reasons. Firstly, that the children's food had to be prepared in their own pot separately, and secondly that when the mother was pregnant, the child would get sick if eating from the same pot. It was also reported that children ate at different times, therefore food had to be made separately for them in order to be available when they should eat / be fed (n=1, 3.7%).

✦ Why is the child's food prepared separately from that of the family?

Negative reasons

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Physiological reasons	0	0	0	0	0	0	1	0	1	0	0	2	2	2	4 80.0%
Acceptability	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 20.0%
Availability	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tradition	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	1	0	2	0	0	2	3	2	5

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The negative reasons or reasons for not preparing children's food separate to that of adults, were categorized similarly to the positive reasons. Fewer reasons were mentioned, as this was not the usual practice. Most of the responses (n=4, 80.0%) were physiological of origin, and they were all about the baby being grown up and able to eat anything the family eats. These responses were made by the age groups of 10-12/12 and older from both areas. The only other response was about acceptability and stated that the child could not eat tasteless food.

✦ What additions are made to the food of the child?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Fats	2	3	2	2	1	2	1	2	1	1	1	1	8	11	19 34.5%
Milk or milk products	2	1	1	0	0	1	2	1	1	2	2	1	8	6	14 25.5%
Protein foods	0	0	0	0	0	1	0	2	0	1	0	0	0	4	4 7.3%
Sugar	1	1	1	1	1	0	1	1	0	1	0	0	4	4	8 14.6%
Spices	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1 %1,8
Salt	0	1	0	1	0	0	0	1	0	3	0	1	0	7	7 12.7%
Nothing	0	0	0	2	0	0	0	0	0	0	0	0	0	2	2 3.6%
TOTAL	5	6	4	6	2	4	4	7	2	8	3	4	20	35	55

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

During the individual interviews where usual intake was recorded, hardly any additions to foods were mentioned at all, even with various probes on the issue. The only practice mentioned was the addition of scoops of formula powder to the "pap" of babies and young children. Sugar and margarine were hardly ever mentioned, even when questioned about it. Therefore this probe was included in the focus group interviews to verify the practices. From this data it became clear that mothers / caregivers added some extras to children's food. The additions were classified according to logical food groupings. The fat category received the most responses (n=19, 34.5%). This consisted of margarine only (all margarine in this community is called Rama). The category mentioned second most often was that for milk or milk products (n=14, 25.5%), which referred to milk or formula powder usually added to pap or sometimes to potato. Sugar (n=8, 14.6%) and salt (n=7, 12.7%) were also mentioned, followed by protein foods (peanut butter) (n=4, 7.3%). The peanut butter and salt were only mentioned by groups from the Makapanstad area, although all the other foods were mentioned by both areas.

✦ Why are some items added to the food of the child?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Nutritional reasons	0	0	1	0	0	0	0	1	1	0	2	1	4	2	6 18.7%
Acceptability	3	4	2	2	2	2	2	2	1	2	2	2	12	14	26 81.3%
TOTAL	3	4	3	2	2	2	2	3	2	2	4	3	16	16	32

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The reasons mentioned were mostly to increase acceptability (n=26, 81.3%), e.g. making the food tasty; for the child to enjoy her food; and that the baby wanted fatty foods. Acceptability seemed to be an issue favoured by all the focus groups in both areas to a similar extent. Two of the reasons were categorized as being nutritional (n=6, 18.7%): to give the baby energy and strength; and for the necessary vitamins for good health.

Preparation of food The mixing procedures of baby foods were examined. In various focus group discussions the mothers / caregivers mentioned washing the maize meal before cooking it, and also serving a separately prepared soft porridge for the babies than that prepared for adults. To determine if these different techniques had any influence on the nutritional content of the porridge, it was decided to have these products analyzed. Three mothers / caregivers were asked to prepare the porridge as they normally would. Two mothers prepared soft porridge as used for babies and one mother prepared soft porridge as eaten by adults (control). The preparation methods used are summarized in Table 68.

TABLE 68: PREPARATION TECHNIQUES FOR SOFT MAIZE MEAL PORRIDGE

PREPARATION	MOTHER - A BABY	MOTHER - B BABY	MOTHER - C CONTROL - ADULT
Water	700mL water	750mL	850mL
Maize meal	250mL	250mL	250mL + 180mL
Method	1. Boil water 2. 250mL maize meal mixed with 200mL cold water 3. Mix with fork 4. Pour off water 5. Add maize meal to boiling water 6. Stir and boil till cooked	1. Boil water 2. 250mL maize meal mixed with 150mL cold water 3. Mix with fork 4. Add maize meal to boiling water 6. Stir and boil till cooked	1. Boil water 2. Add 250mL maize meal 3. Mix with fork 4. Boil for ± five minutes 5. Add 180mL more maize meal while stirring 6. Stir and boil till cooked
Serving	250mL cooked porridge thinned with 50mL water	250mL cooked porridge thinned with 50mL water	-

The samples of the maize meal porridge were analyzed by the Animal Nutrition and Animal Products Institute of the Agricultural Research Council (ARC) in Irene, Pretoria. The results are summarized in Table 69.

TABLE 69: NUTRIENT ANALYSIS OF MAIZE MEAL PORRIDGE

SAMPLES ANALYZED	NUTRIENT ANALYSIS (per 100g)				
	DM %	PROTEIN %	FAT %	TOTAL NON-STRUCTURAL CARBOHYDRATES %	ENERGY kJ/kg
Mother - A Baby	10.78	0.95	0.05	12.22	199
Mother - B Baby	11.76	0.90	0.07	11.76	211
Mother - C Control -adult	12.61	1.10	0.10	16.95	244
Maize meal* cooked soft porridge (/100g)	-	1.2	0.3	11.4	217

*Analysis from the NRIND Food Composition Tables (105); DM = dry material

The results indicated that there was not much difference between the analyzed samples and the standard analysis from the NRIND analysis tables. The different preparation technique seemed not to have an impact on the nutrient intake of the children. It was however observed that this specific technique (washing the meal beforehand) leads to an end product with a very smooth creamy texture which was highly suitable as a first weaning food. The amount of water added to the final product before serving it to the child, might vary, and this might lead to further differences in nutrient intakes.

The mothers / caregivers were also probed extensively on their weaning practices. Mothers / caregivers indicated that the food of the children was prepared separately to that of the rest of the family (see discussion of results, 8.2.4.3). The mothers / caregivers also gave reasons for this practice. Explanations were given on the actual preparation techniques followed by the mothers / caregivers in order to explain why the food had to be prepared separately. These explanations will be presented as they were given. Some of the methods concerned the issue of preparation technique:

- "boil the meat for a long period so that it should be soft, and all other foods are boiled and mashed"
- "just boiled"
- "boiled and mashed"
- "boiling the food in the traditional way - like the rest of the family's food"
- "boiled and mashed and then something is added"

Some of the preparation techniques were about the texture of the food:

- "the child's food must be soft. Even the porridge are boiled until it is fine like Nestum"
- "boil food until they are soft"

Some of the mothers / caregivers explained about additions to the food:

- "don't add spices"
- "no salt is added to the porridge"

An interesting technique on the preparation of maize meal porridge for babies were mentioned:

- "the maize meal is washed thoroughly, drained and then cooked in new water (to try and wash away the extra starch), until soft"
- "a mug is filled ½ with maize meal and then filled up with water, mixed, then scoop the rest of the water off, and then boiled"
- "boil water, maize meal mixed with water, pour off, mix again with water and boil"
- "the child's porridge must be boiled for a long time"

From these explanations, it seemed that the food for children was generally overcooked, usually with a lot of water. Education regarding preparation techniques will be of value in these communities.

8.2.4.4 Milk drinking practices

✦ When a child starts to eat solid food as a meal, does he/she still get milk to drink as well?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26 %
No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 %
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the mothers / caregivers indicated positively (n=26,100%) that children should still receive milk to drink even when they started to eat solid food as a meal (when breast feeding was stopped).

✦ What are the reasons given for stopping milk feeds when a child starts to eat solid food as a meal?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Nutritional reasons	0	0	0	0	0	0	3	0	0	0	2	2	5	2	7 87.5%
Physiological reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mother's own choice (not interested)	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 12.5%
TOTAL	0	0	0	0	0	0	3	0	1	0	2	2	6	2	8

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The reasons given by the various focus groups who responded to this probe had to do with the children being old enough to be weaned completely from breast feeding. Only the few groups who responded to the question on the age of stopping milk feeds (next probe) responded in this regard as well (only focus groups with children aged > 10-12/12). The responses were mainly categorized as nutritional reasons (n=7, 87.5%): the child was now eating enough food to sustain his needs and thus the child relied less on breast feeding and therefore it could be discontinued. One focus group stated that when the child drank one cup of milk additionally, it was time to stop breast feeding. The only other response category indicated was that of the mother's own choice (n=1, 12.5%): at that stage the mother was not interested in breast feeding anymore.

✦ If he/she does not get milk as well, what was the time (age) for stopping the milk feeds?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Eighteen months	0	0	0	0	0	0	1	0	0	0	2	1	3	1	4 57.1%
Two years	0	0	0	0	0	0	1	0	1	0	0	1	2	1	3 42.9%
TOTAL	0	0	0	0	0	0	2	0	1	0	2	2	5	2	7

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Although all the mothers / caregivers indicated that their children received milk while they were being weaned, some of the mothers / caregivers indicated an age for stopping milk feeds. It was only the mothers / caregivers from the older age categories (>10-12/12) that responded due to the fact that they might probably already had weaned their children or an older child. Two ages were given as ideal for stopping milk feeds: 18 months (n=4, 57.1%) and 24 months (n=3, 42.9%). This confirmed previous results which also indicated that milk feeds were stopped completely between the ages of 18 to 24 months. (See similar data in 8.2.1.2 Sampling Unit: General knowledge on infant feeding and health and 8.2.2.2 Sampling Unit: Breast feeding.)

✦ If he/she does get milk to drink as well, what is the type of milk given to the child?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Breast feeding	2	0	0	0	1	0	0	0	0	0	0	0	3	0	3 7.1%
Formula milk	2	1	2	0	1	0	1	1	6	2	1	0	13	4	17 40.5%
Other powder milks	0	2	0	2	0	2	2	2	0	2	1	2	3	12	15 35.7%
Cow's milk	0	0	0	0	0	0	0	2	1	1	1	1	2	4	6 14.3%
No answer given	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1 2.4%
TOTAL	4	4	2	2	2	2	3	5	7	5	3	3	21	21	42

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

As all of the focus groups responded positively towards giving a child milk during weaning, the mothers/caregivers were probed on the type of milk used. As expected, breast feeding was the least popular choice of milk at this stage (n=3, 7.1%). Only three of the focus groups from the Mathibestad area mentioned breast feeding as still being the choice of milk with a fully weaned child. The most popular choice of milk was formula milk (n=17, 40.5%), like Nan or Lactogen, while other powdered milks (n=15, 35.7%), like Nespray, was also mentioned. However, there was an interesting difference in the responses between the two clinics. It was mostly mothers / caregivers from the Mathibestad area that indicated formula milk as their choice of milk (13 versus 4), and it was mainly mothers / caregivers from the

Makapanstad area that indicated other powder milks as their choice of milk (12 versus 3). Only a few of the mothers / caregivers (n=6, 14.3%) indicated the use of cow's milk as a choice of milk for their children; from the older age groups (>10-12/12) only.

To clarify their practices for using the different types of milk, mothers / caregivers were asked why they used the particular type of milk as mentioned. Four different categories on milk types were created (breast feeding, formula milk, other powder milks and cow's milk) and the ethnography will be presented accordingly. The reasons were categorized according to general health, nutritional, physiological, financial and own personal reasons.

Breast feeding: Most of the reasons mentioned fit into the general health category. Some of the answers were:

- "for the baby to be strong and healthy"
- "it's healthy for the baby"

One reason was given for the financial category:

- "you don't spend money for breast feeding"

Only one reason was given for own personal reasons:

- "give breast before a meal"

Formula milk: Most of the reasons mentioned for this choice of milk fitted into the general health category:

- "for the baby to be strong and healthy"
- "so that the baby does not lose weight"
- "to give the baby strength ("dikotla")"
- "Nan is like breast feeding "
- "Formula is suitable for the baby"
- "Formula is good for the baby"
- "It keep the baby healthy"

Two nutritional reasons were also given for using formula milk:

- "it has all the proteins"
- "it has all the vitamins that is needed by the body of the child"

Three of the reasons mentioned were classified as physiological:

- "to replace breast feeding"
- "they have grown up and can't drink formula anymore"
- "Nan will no longer be suitable for a two year old child - it's for small children"

Other powder milks: Nearly all the reasons mentioned for this choice of milk were categorized as general health reasons:

- "Nespray is good for the growing baby"
- "Nespray gives the baby energy"
- "for the baby to be strong and healthy"
- "so that the baby does not lose weight"
- "to give the baby strength ("dikotla")"
- "Nespray is like cow's milk, it has substances that is good for the body ("dikotla")"
- "Nespray is healthy"
- "Nespray build up the bones "
- "It keep the baby healthy"

Only one nutritional reason was mentioned:

- "it has all the proteins"

Two of the reasons mentioned were classified as physiological:

- "Nespray is good for big babies"
- "Nespray is given to older babies"

Cow's milk: Two of the reasons mentioned for this choice of milk were in the general health category:

- "for the baby to be strong and healthy"
- "Fresh milk has a lot of fat/cream and therefore you can't use it"

Only one nutritional reason was given for using cow's milk:

- "it has all the proteins"

From these results it was evident that mothers / caregivers did not really know why they chose a specific milk. If the baby grew and appeared to be healthy, the choice of milk was considered to be good. Nutrition education regarding the different types of milk available for a weaned child should be an important aspect to be covered in an education program.

✦ In what utensil does the child get the milk that he/she drinks additionally to his/her food?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Bottle	2	1	1	0	2	1	1	1	0	1	0	1	6	5	11 25.6%
Mug/cup	1	5	2	2	0	3	2	2	2	4	2	7	9	23	32 74.4%
TOTAL	3	6	3	2	2	4	3	3	2	5	2	8	15	28	43

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most of the mothers / caregivers indicated that a weaned child drank his / her milk from a mug or a cup

(n=32, 74.4%). All the focus groups, except the 7-9/12 group from the Mathibestad area, mentioned a mug / cup with most of the responses coming from the Makapanstad area. Only a few groups responded with bottle feeding (n=11, 25.6%). It could be concluded that mothers / caregivers encouraged cup / mug drinking when the babies were weaned onto a family diet.

✦ How is the milk mixed if it is not cow's milk?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Correct measurement	0	1	3	0	1	0	1	1	1	1	1	1	7	4	11 42.3%
Too weak	2	2	0	2	0	2	1	1	0	0	1	1	4	8	12 46.2%
Too strong	0	0	0	0	0	0	0	1	1	1	0	0	1	2	3 11.5%
TOTAL	2	3	3	2	1	2	2	3	2	2	2	2	12	14	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

With each of the focus groups interviews, the mothers / caregivers were given water measured in a bottle to show the volume clearly to the group (different quantity each time; prepared by the researcher and not the moderator), a mug and spoon, a tin with formula powder and the applicable scoop. Any one person was asked to mix in the correct quantity of formula milk for the amount of water given, while instructed by the rest of the group. It was agreed beforehand that no focus group would continue unless the whole group agreed on the method. Each group thus provided a recipe, although for different quantities of water. The correctness of the mixing method was verified by categorizing the recipes according to the correctness of the measurement (in terms of 1 scoop per 25 mL), as was done when the bottle feeding mixing method was checked.

Most of the methods given by mothers / caregivers could be categorized as incorrect (n=15, 57.7%), either being too weak or too strong. The largest number of groups mixed the milk too weak (less scoops, more water)(n=12, 46.2%). Of these responses, 67% were made by groups from the Makapanstad area and 33% from the Mathibestad area. A number of the focus groups (n=11, 42.3%) however used the correct measuring techniques. Most of these groups (63.6%) were from the Mathibestad area (n=7), and only four (36.4%) from the Makapanstad area. A few groups only (n=3, 11.5%) indicated a mixture of milk and water which was too strong (more scoops, less water); two from the Makapanstad area and one from the Mathibestad area.

It was alarming to observe that a large number of the focus groups in the 0-3/12 age category (80%) and 4-6/12 age category (40%) mixed the milk too weak. These children would probably get weak milk from early babyhood until they were weaned completely. This might indicate that these children might not get all the critical nutrients necessary, especially during the first six months of growth when no solid foods were added to the diet and during which time the infant should double his / her birth weight (14). In the other age groups, the mixing procedures varied.

Some of the mothers / caregivers mixed the milk similar to the findings of bottle mixing, where only one or two scoops less than the required number were used. Recipes included:

- 125mL water + 4 scoops milk powder
- 210mL water + 6 scoops milk powder
- 100mL water + 3 scoops milk powder

These milk mixtures were approximately ¾ strength.

Some of the other recipes given produced milk of ⅔ strength:

- 150mL water + 4 scoops milk powder
- 200mL water + 5 scoops milk powder

Some of the milk mixtures ended up being ½ or ⅓ of the strength it should be:

- 105mL water + 2 scoops milk powder
- 200mL water + 3 scoops milk powder

or even worse:

- 125mL water + 1 scoop milk powder

Only 11.5% of the mothers / caregivers indicated that they made the milk mixtures too strong, and from the recipes given it was clear that only one additional scoop was added:

- 100mL water + 5 scoops milk powder
- 125mL water + 6 scoops milk powder.

Because the mothers / caregivers mainly used formula milk or other powder milk for their children when they started to eat solid food, the milk mixing procedure should have been exactly the same as for a bottle feed (1 scoop formula per 25 mL water). The bottle feed mixing procedure was thus compared with the mug mixing procedure to determine any similarities or differences. Nine of the focus groups gave a different recipe for mixing milk for mug drinking in this Sampling unit (Weaning) than the recipe that they gave for mixing milk for bottle feeding in the Sampling unit: Bottle feeding. The other focus groups' recipes' were classified similarly for mug mixing and bottle feed mixing (correct / weak / strong). In six of the nine focus groups the bottle feed mixing procedure was correct, in two it was too weak and in one it was too strong. In nine out of nine focus groups however the mug mixing procedure they followed during weaning was incorrect and the milk was always mixed weaker compared to that for bottle feeding. This data might indicate that mothers / caregivers did not consider the quality of the milk for an older child (who drinks from a mug instead of a bottle and eats the family foods) as important as for a baby who totally relied on the milk as a source of food. They might have felt that less formula or powder might be given without any harmful effects.

It could be concluded that the mixing procedures for milk given to weaned children were much poorer than that for bottle-fed babies. The implication of this finding is even worse if it is taken into consideration that these children were also not receiving the required quantities of milk as recommended for their age

categories. Additionally, the milk given to a large number of children was too weak and would thus not fulfill the nutritional requirements and growth needs of these children. Mothers / caregivers need education regarding the use of powdered milks for their children.

✦ What is the type of water used for mixing artificial milk feeds?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Boiled, cooled	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boiled	3	0	2	0	1	0	2	0	3	0	1	0	12	0	12 40.0%
Unboiled	0	3	0	2	1	4	0	2	0	2	1	3	2	16	18 60.0%
TOTAL	3	3	2	2	2	4	2	2	3	2	2	3	14	16	30

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Mothers / caregivers were asked to specify the type of water used when they mixed milk feeds. Only type was asked in order to have a cross control on the temperature of the water (see the following probe). From these responses, only two categories of responses could be identified, namely boiled and unboiled water. None of the interpreters categorized any of the answers under boiled and cooled water. Most mothers / caregivers (n=18, 60.0%) used the water directly, i.e. unboiled. Some mothers / caregivers (n=12, 40.0%) also indicated boiling the water. It was interesting to note that nearly all the responses for using unboiled water came from the mothers / caregivers in the Makapanstad area, while all the responses for using boiling water came from the Mathibestad area. In each area all the focus groups responded in a similar manner and no distinction could be made between age categories.

✦ What is the temperature of the water used to make these milk feeds?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Warm/lukewarm (boiled, cooled)	3	3	2	2	2	2	2	2	2	2	1	2	12	13	25 96.2%
Boiling water	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cold water (as such)	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1 3.8%
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

In order to verify the afore-mentioned data, this question about the temperature of the water used was more direct . The mothers / caregivers (n=25, 96.2%) all indicated the practice of boiling and cooling water before use, with only one focus group (n=1, 3.8%) indicating not to boil the water. More research concerning these practices is needed to verify this data.

These two probes were put to the mothers / caregivers as to have a cross control on the temperature of the water. Different responses were received from the two probes although technically they were the same. With the first probe mothers / caregivers indicated that they either used boiled (40%) or unboiled (60%) water, while boiled and cooled water never were mentioned. This was in contrast with previous results (see 8.2.3. Sampling Unit: Bottle feeding) indicating that 11.5% of the mothers / caregivers used unboiled water when mixing bottle feeds, and 61.5% used boiled, cooled water. Nearly all the responses for using unboiled water came from the mothers / caregivers in the Makapanstad area and for using boiling water came from the Mathibestad area which was also similar to the previous results (see 8.2.3 Sampling Unit: Bottle feeding). These results might also be an indication of the higher level of clinic involvement in the Mathibestad area which was also noted in previous results (see 8.2.1.1 and 8.2.1.4, Sampling Unit: General knowledge on infant feeding and health). These responses on the second probe seemed to be the "correct" ones rather than the "practiced" ones. The actual practice need to be investigated or rather observed instead of accepting only the mother's account of what she does. Previous research has shown that even if people do have adequate nutrition knowledge, it does not automatically follow that they will practice their knowledge (38, 39, 106).

These answers (similar to that of the mixing techniques) were all too different between clinics to be accepted without question. It appeared that the mothers / caregivers in the Mathibestad area seemed to know all the correct answers, probably due to sufficient clinic involvement. But the results on the practices were too erratic between the different Sampling Units. The practices need to be investigated more closely in future research in order ot plan a meaningful intervention.

✦ How much milk does a weaned child get to drink on one day?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
≤250mL	2	4	1	1	1	1	1	1	1	0	2	4	8	11	19 42.2%
251-500mL	0	0	1	3	1	1	0	2	5	4	0	2	7	12	19 42.2%
501-750mL	0	1	0	0	0	1	1	0	0	1	0	2	1	5	6 13.3%
751-1000mL	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1 2.2%
≥1000mL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	2	5	2	4	2	3	2	4	6	5	2	8	16	29	45

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the mothers / caregivers in the various focus groups had to respond to this probe with an actual quantity of milk that should be or was given to a weaned child. This was done in order to determine the average intake of milk by children who were not breast fed anymore, but were eating solid food as the rest of the family and got their milk from another source. The quantities given by the mothers / caregivers were purely guesstimates of the actual volumes consumed. The two categories mentioned most often were ≤ 250mL

were that the child was eating solid food and therefore did not rely on breast milk as his food anymore; if a child drank one cup of milk it was time to stop breast feeding; mothers lost interest. This was in contrast to the recommendation that breast feeding should be continued for at least two years; even longer if

CHAPTER 9

RESULTS OBTAINED FROM QUALITATIVE RESEARCH METHODS: NUTRITION KNOWLEDGE AND ATTITUDES

CHAPTER 9 RESULTS OBTAINED FROM QUALITATIVE RESEARCH METHODS: NUTRITION KNOWLEDGE AND ATTITUDES

"In content analysis, a researcher uses objective and systematic counting and recording procedures to produce a quantitative description of the symbolic content in a text" ; "It yields repeatable, precise results about the text" (Neuman 1997:273)(73).

In this chapter the findings on nutrition knowledge will be discussed in the first Sampling Unit and findings on attitudes on nutrition in the following Sampling Unit.

9.1 PRESENTATION AND DISCUSSION OF FOCUS GROUP DATA

9.1.1 SAMPLING UNIT: NUTRITION KNOWLEDGE

The responses concerning nutrition knowledge and attitudes towards nutrition were categorized according to either science based responses or to misconceptions (refer to Figure 15 in Chapter 8). Results and discussions are presented accordingly. The theme on nutrition knowledge was explored by asking questions and probing on the following topics: meal frequencies, hygiene control of meals, foods and drinks given to the child, and sources and functions of nutrients. These topics also delineated the context within which the data reduction was done and the results will be presented.

9.1.1.1 Meal frequencies

✦ How many times a day should an adult eat?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Two times	0	1	1	1	0	1	0	1	0	1	1	2	2	7	9 14.5%
Three times	3	3	2	5	1	3	2	5	2	7	2	5	12	28	40 64.5%
Four to six times	0	3	0	1	1	2	0	3	0	1	0	1	1	11	12 19.4%
Once a day	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1 1.6%
TOTAL	3	7	3	7	2	6	3	9	2	9	3	8	16	46	62

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The majority response was for an adult to eat three times daily (n=40, 64.5%). If the results are considered as a whole, 83.9% of the subjects in these communities were eating three or more meals a day. This differed from previous findings indicating that only 25% of the adult urban population consumed three meals daily (17). Only 14.5% of the respondents indicated the two-meal eating pattern, while (n=12, 19.4%) said

that they ate four to six times a day. This would seem to relate to eating two or three meals and two or three snacks per day. Only one respondent said that only one meal per day is the ideal.

✦ Why should an adult eat the number of times specified?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Nutritional reasons	2	0	2	0	0	0	0	0	0	0	0	1	4	1	5 13.5%
Health reasons	0	1	0	1	1	0	0	0	2	1	1	0	4	3	7 18.9%
Physiological reasons	1	3	0	1	2	5	2	3	0	1	0	1	5	14	19 51.4%
Immunological reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Financial reasons	0	0	0	0	0	0	1	0	1	0	0	0	2	0	2 5.4%
Cultural reasons	0	0	0	0	0	3	0	0	0	0	1	0	1	3	4 10.8%
TOTAL	3	4	2	2	3	8	3	3	3	2	2	2	16	21	37

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Reasons for meal frequency decisions for adults were mainly physiologically based (n=19, 51.4%). The reasons were related to energy expenditure with reference to their activities, breast feeding that added additional requirements for producing breast milk, and satisfying hunger. The next category of importance was that for health reasons (n=7, 18.9%). All the reasons mentioned were variations on one theme, namely strength and health. Nutritional reasons (n=5, 13.5%) were mostly mentioned by the two youngest age categories from the Mathibestad area. Their reasons included the balancing of food intake and an adequate food intake.

✦ How many times a day should a child eat?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Two times	1	2	0	0	0	0	0	0	0	0	0	0	1	2	3 7.5%
Three times	1	3	2	2	2	2	2	2	5	1	2	2	14	12	26 65.0%
Four to six times	1	0	1	0	0	0	0	1	2	0	0	5	4	6	10 25.0%
One time	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 2.5%
TOTAL	4	5	3	2	2	2	2	3	7	1	2	7	20	20	40

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most subjects (n=26, 65.0%) indicated the three meal and the four-to-six meal (n=10, 25.0%) eating

patterns. These responses corresponded with the meal pattern recommendations for children, suggesting three to seven meals a day for children due to a small stomach capacity (9, 12, 13, 14). Three subjects (7.5%) said that their babies ate twice a day only, with one subject responding to the one meal a day category. All of these babies were in the 0-3/12 age group and were actually still mostly relying on breast feeding. A once / twice a day eating pattern would therefore be acceptable, as they should not have been receiving solid food meals yet (10, 12).

✦ Why should a child eat the number of times specified?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Nutritional reasons	0	0	1	0	0	1	1	2	1	0	1	1	4	4	8 25.0%
Health reasons	0	0	0	2	2	1	1	0	1	0	0	0	4	3	7 21.9%
Physiological reasons	2	4	1	1	0	1	0	2	2	1	0	1	5	10	15 46.9%
Immunological reasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cultural reasons	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1 3.1%
Socio-cultural reasons	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 3.1%
TOTAL	3	4	2	3	2	3	2	4	4	1	2	2	15	17	32

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most reasons for the chosen meal patterns were physiologically based (n=15, 46.9%). Most of these reasons dealt with hunger, stomach capacity and age. The nutrition (n=8, 25.0%) and the health (n=7, 21.9%) categories were equally popular. Nutrition reasons included quantity of food, balancing food intake and satiety. Health reasons mentioned were growth, gaining weight, avoiding disease and general strength. The cultural reason category was linked to three meals a day with one response only, and stated that it was the way people were used to doing it. Only one reason was categorized in the socio-cultural category, namely that the time of the day was used as an indication to feed the baby. Not much difference occurred between age groups or between clinics, except for the physiological reasons being more popular in the Makapanstad area.

In conclusion: it was clear from these responses that most mothers / caregivers knew the reasons for giving three or more meals per day to their children. Hunger and satiety, stomach capacity and adequate growth were mostly responsible for decisions on meal frequency. Few, if any, snacks were included in the meal patterns of these children. Nutrition education on meal patterns, taking into consideration age and inclusion of solid foods in the diet of the baby, might be very helpful to mothers / caregivers with very young babies in order to prevent overfeeding or underfeeding of babies. Education on balanced food intake for the older toddler would also be helpful, as these active children did not seem to get any nutritional snacks in between meals.

9.1.1.2 Hygiene control of meals

✦ Should you keep milk/food that is left over from one feed to give to the child the next time that he/she is hungry?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	1	0	0	0	0	1	0	0	0	0	0	1	1	2	3 10.7%
No	2	3	2	2	2	2	2	2	2	2	2	2	12	13	25 89.3%
TOTAL	3	3	2	2	2	3	2	2	2	2	2	3	13	15	28

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most mothers / caregivers from both clinics and all age groups responded negatively to this prompt (n=25, 89.3%). Just a few focus groups responded positively (n=3, 10.7%). The positive responses covered the whole age spectrum; one each from the 0-3/12, 7-9/12 and 25-36/12 age groups.

✦ What are the reasons for keeping leftover milk/food from one feed to give to the child the next time that he/she is hungry?

Positive responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Availability	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1 33.3%
Other: Only if there is a fridge available	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1 33.3%
If it is not a long time you can keep it	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 33.3%
TOTAL	1	0	0	0	0	1	0	0	0	0	0	1	1	2	3

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

As only a few mothers / caregivers gave positive responses to this prompt, the data are limited and not unanimous. Availability of both food and cooling facilities, and storage for short periods of time were mentioned as reasons. These responses seemed to be linked with financial reasons, indicating that when milk or food was available, nothing should be wasted, but rather saved for use until all was consumed.

✦ What are the reasons for keeping leftover milk/food from one feed to give to the child the next time that he/she is hungry?

Negative response

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Hygiene	2	4	4	6	3	3	3	5	2	3	2	4	16	25	41 95.4%
Other: If food contains sugar it draws water and it can't be kept	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 2.3%
The child needs fresh food each time	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1 2.3%
TOTAL	2	4	4	6	4	3	3	5	2	4	2	4	17	26	43

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

As was shown in the previous results (see 8.2.3.4 Sampling Unit: Bottle feeding), the negative response was given for hygiene reasons (n=41, 95.4%). Most of the mothers / caregivers felt that the milk / food would be contaminated if kept, which might ultimately lead to vomiting, diarrhoea or some other infection. All the groups responded equally, although the mothers / caregivers from the Makapanstad area gave the most responses.

✦ Do you check the milk or food of the child to see if it is not bad/off before you give it to the child?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	3	3	2	2	2	2	2	2	2	1	2	2	13	12	25 96.2%
No	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 3.8%
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Although nearly all the mothers / caregivers (n=25, 96.2%) indicated that food or milk was not left over for later use, nearly all of them responded positively to checking food to see if it still was edible. Only one group in the 13-24/12 age category from the Makapanstad area had a negative response indicating that food was not kept, thus no checking was needed.

✦ How do you check the leftover milk/food before giving it to the child?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Senses: taste	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26 92.2%
Senses: smell	0	0	0	0	0	0	1	0	0	0	1	0	2	0	2 7.1%
TOTAL	3	3	2	2	2	2	3	2	2	2	3	2	15	13	28

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Mainly the senses were used to determine freshness of foods: taste (n=26, 92.9%) and smell (n=2, 7.1%). All the groups responded similarly to taste, but only two of the Mathibestad area groups responded to smell. The taste sensation of sour food was mainly used as an indicator of staleness of food items.

✦ What are the reasons for checking the leftover milk/food of the child?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Hygiene reasons	4	2	2	3	2	2	2	3	2	2	2	2	14	14	28 93.4%
Other: We do not give leftover food to the child, therefore it isn't necessary to check foods because only fresh foods are given	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1 3.3%
To check if it is too warm or too cold	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1 3.3%
TOTAL	4	2	3	3	2	2	2	3	2	3	2	2	15	15	30

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

These responses showed that most of these mothers / caregivers (n=28, 93.4%) knew about the importance of hygiene and the health of their children. All the groups from both the clinics responded in this way. Only one group from the Makapanstad area stuck to their first response and indicated that no checking was necessary since no leftover food or milk was given to their children.

In summary: these results indicated that mothers / caregivers knew about food contamination. Nearly all the mothers / caregivers indicated that hygiene was an important issue regarding the feeding of their children. It seemed to be well known that keeping food or milk could lead to the contamination thereof and subsequently causing disease or infections. But some misconceptions also existed: "if food contains sugar, it draws out water, and it can't be kept"; "the child needs fresh food each time". These issues should be addressed in order to improve hygiene practices concerning food preparation and food storage.

Mothers / caregivers however also indicated that they checked leftover food before giving it to their children for the following reasons: checking the freshness of food items; determining if milk was sour; to check that no rotten food was given to the children. The manner of checking leftover food or milk was correctly explained by all the focus groups. It can be concluded that more food or milk was probably kept for later use than was admitted by the mothers / caregivers. This could also be linked to the previous responses on the storage place for leftover milk or food (see 8.2.3.4 Sampling Unit: Bottle feeding). Mothers / caregivers initially indicated that no advance preparation took place. However, leftover food or milk was kept in the shade or some other storage space. In such a case it would be necessary to check food or milk before usage. These findings indicated the need for proper education concerning hygienic food practices by mothers / caregivers.

9.1.1.3 Foods given to the child

✦ Should a baby / child drink milk every day?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26 100%
No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All of the focus groups, including all age categories in both areas (n=26, 100%), gave a positive response regarding daily milk intake by babies or young children. All the mothers / caregivers thus valued the importance of milk as a daily food for children. However, this response did not imply that the belief was practiced. To verify the belief, actual intakes should also be taken into consideration (see the following probe on volume of food intake).

✦ Why should a baby drink milk every day?

Positive responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	3	5	2	4	2	3	2	3	3	3	2	2	14	20	34 100%
Misconceptions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	5	2	4	2	3	2	3	3	3	2	2	14	20	34

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the focus groups responded positively to the drinking of milk, but for different reasons. Some of these reasons were only vaguely stated, while others were more specific in nature. All the reasons presented were however scientifically sound (n=34, 100%). Reasons included milk having energy, vitamins, calcium, or protein, milk generally keeping a baby strong and healthy, for building the body, for growing up, to build strong bones and because milk is good for babies. No distinction in responses could be made between the various age groups, but more responses came from the Makapanstad area. The ethnographic descriptions of the reasons for giving or withholding milk will be discussed after all the results regarding foods or groups of foods have been reported.

✦ How much milk (additional to breast milk or solid food) should a baby / child drink every day?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
≤ 250 mL	2	7	2	6	0	5	1	4	2	8	2	3	9	33	42 84.0%
250 - 500 mL	0	0	0	0	2	0	0	1	0	0	0	1	2	2	4 8.0%
500 - 750 mL	0	0	0	0	0	0	1	1	0	0	0	1	1	2	3 6.0%
750 - 1000 mL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 1000 mL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other: measure according to age	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 2.0%
TOTAL	3	7	2	6	2	5	2	6	2	8	2	5	13	37	50

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

This question was put to the mothers / caregivers in an attempt to determine the average volume of milk consumed additional to solid food or breast milk. Although determining exact intakes would have been ideal, average intakes were determined. Most of the children in all of the age categories (n=42, 84.0%) consumed on average 250mL or less milk per day.

Only four focus groups (8.0%) indicated 250-500mL per day. These were from the 7-9/12, 10-12/12 and 25-36/12 groups. Only three focus groups (6.0%) from the 10-12/12 and 25-36/12 age groups drank 500-750mL per day and were thus taking in the recommended amount of two to three cups of milk per day (1, 18, 83). The intake category of 250 - 500 mL might only be adequate for some of the children in these age groups, as the top of the range of intake corresponded with the minimum of the recommended intake. Only 6.0% of the group therefore had an adequate intake of milk (and 92.0% an inadequate intake) even though it was said (previous probe) that children, for the correct reasons, should drink milk daily.

✦ Should a child eat meat every day?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	1	0	0	0	0	0	0	0	0	1	0	0	1	1	2 6.1%
No	5	3	2	2	2	2	2	2	2	5	2	2	15	16	31 93.9%
TOTAL	6	3	2	2	2	2	2	2	2	6	2	2	16	17	33

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The responses from practically all the focus groups (n=31, 93.9%) were in the negative for the probe on the daily consumption of meat by children . All of the focus groups in all of the age categories, from both the clinics, responded in this way. Only two of the focus groups (n=2, 6.1%) responded positively to this probe, both being from different clinics and from totally different age categories.

✦ What are the negative reasons for giving a child meat every day?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	1	2	0	1	0	0	0	0	0	0	0	0	1	3	4 14.3%
Misconceptions	3	2	2	1	2	2	2	2	2	2	2	2	13	11	24 85.7%
TOTAL	4	4	2	2	2	2	2	2	2	2	2	2	14	14	28

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Even though two groups responded positively to the daily consumption of meat, they could not provide any positive reasons. Some of the negative reasons (n=4, 14.3%) were science based, regarding difficulty in chewing or expensiveness of the product. These science based answers came from the two youngest age categories (0-3/12 and 4-6/12), although only the mothers / caregivers from the Makapanstad area mentioned the chewing difficulties and only the mothers / caregivers from the Mathibestad mentioned money. All of the other responses (n=24, 85.7%) were misconceptions coming equally from all the age categories and the two clinics. The misconception occurring most often was the belief that meat might cause worms in children and should therefore be avoided. This is a traditional belief that is common in many rural communities (12, 107).

✦ If you don't have meat, what can you give in the place of meat?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Other animal proteins	1	0	1	0	0	0	1	0	4	0	1	1	8	1	9 16.9%
Plant products	2	3	1	0	2	0	2	2	1	2	2	2	10	9	19 35.9%
Vegetable proteins	2	1	1	0	0	1	0	0	0	0	0	0	3	2	5 9.4%
Miscellaneous products	2	1	0	4	0	1	1	4	0	3	0	3	3	16	19 35.9%
Other: Porridge and milk	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 1.9%
TOTAL	7	5	3	5	2	2	4	6	5	5	3	6	24	29	53

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The mothers / caregivers were probed in this manner to determine which foods were used regularly as a source of protein in the diets of their children, since meat was not given regularly. Two categories of foods were mentioned equally as being the most popular replacement for meat. Firstly, plant proteins (n=19, 35.9%) and secondly, miscellaneous products (n=19, 35.9%). The plant protein category consisted of only one item mentioned, namely soya mince. There was very little distinction between the various age groups and none between the clinics. Soya mince was the least used by the 4-6/12 and 7-9/12 age groups and not at all by these groups in the Makapanstad area. In the miscellaneous products category, only one item was mentioned as a meat replacer, namely a Purity vegetable and meat product. This finding is of concern as only one focus group mentioned this product (n=1, 1.9%), while all the other focus groups mentioned unsuitable meat replacers(n=18, 34.0%), e.g. Maggi soup, Royco soup, Oxtail soup, and "sop" (a term used for the water in which the meat for the family was boiled and then used as a type of gravy with stiff porridge). These products were used by all the age groups, but it was more common in the Makapanstad area than the Mathibestad area. Other animal proteins mentioned (n=9, 16.9%), included items like viennas, fish, milk, eggs in the age categories from 10-12/12 to 25-36/12, and minced meat in the 0-3/12 and 4-6/12 age groups. Nearly all these responses were from the Mathibestad area. Some vegetable products were also considered meat replacers (n=5, 9.4%). These included items like potato, pumpkin, merogo (green leaves like spinach, etc.) and Purity vegetables. These were mostly used by the younger age groups (0-3/12 and 4-6/12).

✦ What are the reasons for giving meat replacers to a child?

Positive responses

The reasons given for using certain food items are presented in relation to the food categories as they were mentioned for the foods (other than meat) used as a source of protein in the diets of children. These categories were other animal protein, plant protein, vegetable, miscellaneous and other products. Some of the reasons were mentioned exclusively for a certain food item and others were applicable to a number of food items and will be discussed accordingly (see Table 70).

TABLE 70: MEAT REPLACER CATEGORIES

REASONS FOR USING ITEMS AS MEAT REPLACERS **Positive responses**	MEAT REPLACER CATEGORIES														
	OTHER ANIMAL PROTEIN					PLANT PROTEIN	VEGETABLE PRODUCTS			MISCELLANEOUS PRODUCTS					OTHER:
	Vienna	Fish	Milk	Egg	Minced meat	Soya mince	Vegetable (potato/ pumpkin)	Me-rogo	Purity (veg)	Maggi soup	Oxtail soup	Sop	Purity (veg + beef)	Royco soup	Porridge with milk
1. It is a meat substitute	☻					☻☻☻	NO		☹	☻☻	☹		NO		NO
2. It is also good for growth	☻					☻☻	REA-			☹			REA-		REA-
3. They have the same vitamins that are found in meat		☻			☻☻	☹☹☹☹	SONS			☹		☹	SONS		SONS
4. It has a meat flavour						☹☹☹☹	GIVEN			☹☹☹☹	☹☹☹	☹	GIVEN		GIVEN
5. It is dried meat						☹									
6. For variety						☻									
7. To get something salty						☹						☹			
8. To gain weight						☹						☹			
9. They are soft						☹				☹	☹	☹			
10. They taste like meat						☹				☹	☹				
11. They are body builders		☻	☻	☻		☻									
12. It's like meat								☹		☹		☹			
13. To be strong and healthy												☹			
14. It will help him to grow up								☹							
15. It will keep her body strong					☻	☻									
16. They are having vitamins						☻		☻						☹	
17. It's healthy								☻							
18. They don't eat meat						☻									

☻/☹ - each face resembles one response made by any focus group ☻ - science based response ☹ - misconception

All the different foods mentioned in each category are included in Table 70 and also all the different reasons given for their usage. In order to differentiate between science based responses and misconceptions, two keys were used: ☻ for the science based responses and ☹ for the misconceptions. By using the different keys, it was possible to indicate if a specific reason was used correctly / incorrectly for the different food items mentioned.

Plant proteins: only soya mince was mentioned, but almost all the reasons for giving meat replacers, were associated with the product. Most of the reasons given were misconceptions with regard to using it as a meat substitute. These included responses regarding flavour (meat / salt), texture (soft) and taste (meat). Misconceptions included were that the product was dried meat, and that the vitamin content was similar to that of meat thus being the important characteristic. However, some science based responses were also included, e.g. soya being a meat substitute, a body builder and good for growth.

Other animal proteins: not many reasons were given for these few products, but all were scientifically sound, e.g. a meat substitute, good for growth and body building.

Vegetables: few reasons were given for these products, which indicated a lack of knowledge in this regard. Some of the reasons mentioned however were misconceptions, e.g. merogo being like meat and vegetable Purity being a substitute for meat. The only science based responses were very general, e.g. being healthy.

Miscellaneous products: only one suitable food was mentioned, namely vegetable and beef Purity, but once again no reasons were given. All the other products mentioned were soups, and all the responses were misconceptions with regard to replacing meat in the diet of the child, e.g. soups are meat substitutes, have similar vitamins, have meat flavour and is like meat.

✦ What are the reasons for not giving meat replacers to a child?

Negative responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	0	0	0	1	0	1	0	0	0	1	0	0	0	3	3 50.0%
Misconceptions	0	0	1	2	0	0	0	0	0	0	0	0	1	2	3 50.0%
TOTAL	0	0	1	3	0	1	0	0	0	1	0	0	1	5	6

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the negative responses with regard to not including a substitute for meat in the diet, were given for the inclusion of soya products only. The responses were equally divided between science based responses and misconceptions. The mothers / caregivers were not prepared to give soya to babies without teeth, if they themselves had not tried it yet and also due to the spiciness of some of the products. Misconceptions

however were that soya would also cause worms, and that it was actually also a meat product. The ethnographic descriptions of the reasons for giving or witholding meat and meat replacers will be discussed after all the results regarding foods or groups of foods have been reported.

✦ Would you give a meat replacer to your child?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	2	3	2	0	2	0	2	2	1	2	2	2	11	9	20 80.0%
No	0	0	1	2	0	0	0	0	0	1	0	0	1	3	4 16.0%
No answer given	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 4.0%
TOTAL	3	3	3	2	2	0	2	2	1	3	2	2	13	12	25

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most mothers / caregivers (n=20, 80.0%) indicated that they would give these substitute products. Those who declined (n=4, 16.0%) were mostly from the 4-6/12 age category and from both areas.

✦ Should a child eat a starchy food like pap, rice, samp, mealie rice or bread with each meal?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	0	1	1	1	0	1	0	1	2	2	0	1	3	7	10 35.7%
No	3	2	2	1	2	1	2	1	0	1	2	1	11	7	18 64.3%
TOTAL	3	3	3	2	2	2	2	2	2	3	2	2	14	14	28

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Contrary to the expectation, most of the mothers / caregivers (n=18, 64.3%) replied negatively for the inclusion of starchy foods on a regular basis in the child's diet. Both areas reacted fairly similarly in this regard and only the 13-24/12 age group gave more positive responses. The mothers / caregivers in the Makapanstad area responded equally to the positive and negative, but the mothers / caregivers in the Mathibestad area responded mainly in the negative.

✦ What are the reasons for giving a child starchy food like pap, rice, samp, mealierice or bread with each meal?

Positive responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	0	1	1	1	0	1	0	2	1	2	0	2	2	9	11 84.6%
Misconceptions	0	0	0	0	0	0	0	0	1	0	0	1	1	1	2 15.4%
TOTAL	0	1	1	1	0	1	0	2	2	2	0	3	3	10	13

DIFFERENTIATED BY CLINIC. MATHIBESTAD = MT ; MAKAPANSTAD = MP

The few mothers / caregivers who reacted positively, gave science based responses (n=11, 84.6%). These included starch being an energy source, providing strength, building the body. One of the groups indicated that a child could eat starch, but not in too large quantities since this would lead to all the negative effects as mentioned under the negative responses. Misconceptions were that starch built bones and caused a dry skin.

✦ What are the reasons for not giving a child starchy food like pap, rice, samp, mealierice or bread with each meal?

Negative responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	1	0	0	0	1	0	2	0	0	1	2	0	6	1	7 35.0%
Misconceptions	1	2	1	1	2	1	0	2	0	1	0	1	4	8	12 60.0%
Don't know	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 5.0%
TOTAL	3	2	1	1	3	1	2	2	0	2	2	1	11	9	20

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most of the negative responses to the inclusion of starch in the daily food intake of the child were misconceptions (n=12, 60.0%). These included responses like starch causing constipation, cramps, poor digestion, allergies and sores. It was also believed that starch was too rich for the child. Science based responses (n=7, 35.0%) referred to overweight and illness due to eating too much starchy foods and the texture of samp being too hard. The ethnographic descriptions of the reasons for giving or witholding starchy foods will be discussed after all the results regarding foods or groups of foods have been reported.

✦ Which type of bread is the best to eat (white, brown or wholewheat)?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Brown bread	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26 100%
White/whole wheat bread	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the mothers / caregivers (100%) in all the groups from both areas indicated brown bread as being the best kind of bread to use.

✦ What are the reasons mentioned for using white, brown or wholewheat bread?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	3	3	2	2	2	1	2	1	2	1	1	2	12	10	22 59.5%
Misconceptions	0	1	1	1	2	2	0	2	1	2	2	0	6	8	14 37.8%
No answer	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 2.7%
TOTAL	3	4	3	4	4	3	2	3	3	3	3	2	18	19	37

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most of the reasons given by the mothers / caregivers for choosing brown bread were scientifically sound (n=22, 59.5%), but non-specific and also applicable for the other types of bread. These reasons included it being an energy source, a stomach filler preventing constant hunger, providing strength and starch, and it being healthy. Some misconceptions (n=14, 37.8%) however were also apparent: bread being a source of a lot of vitamins and protein and on the other hand being a poor source of starch; white bread had more starch and therefore was more unsuitable than brown bread; the starch in white bread caused worms.

✦ Should a child eat vegetables and fruit every day?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	0	3	2	1	2	2	2	2	2	2	2	2	10	12	22 84.6%
No	3	0	0	1	0	0	0	0	0	0	0	0	3	1	4 15.4%
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most of the mothers / caregivers (n=22, 84.6%) reacted positively to the eating of vegetables and fruit on a daily basis. The responses were basically equal from the two clinics, but all the 0-3/12 age groups from the Mathibestad area and one of the 4-6/12 age groups from the Makapanstad area responded negatively (n=4, 15.4%). This could be regarded as an acceptable response as these small infants might not have been eating solid food yet.

✦ What are the reasons mentioned for a child to eat fruit and vegetables every day?

Positive reasons

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Scienced based responses	0	4	2	1	1	3	4	2	0	3	3	3	10	13	26 65.0%
Misconceptions	0	0	1	1	2	2	0	2	2	2	1	1	6	11	14 35.0%
TOTAL	0	4	3	2	3	5	4	4	2	5	4	4	16	24	40

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

A large number of positive responses (n=40) for eating fruit and vegetables were made; most responses were science based (n=26, 65.0%), and a number were misconceptions (n=14, 35.0%). Science based responses included fruit and vegetables containing vitamins, providing variety to the diet, inducing growth and keeping them healthy and strong. Responses based on misconceptions mostly concerned the belief that fruit and vegetables aided bone growth and had protein to build the body. Least of the misconceptions came from the mothers / caregivers in the two lowest age categories (0-3/12, 4-6/12). More responses came from the mothers / caregivers in the Makapanstad area, but the distribution between science based responses and misconceptions was similar in both areas.

✦ What are the reasons mentioned for a child not to eat fruit and vegetables every day?

Negative reasons

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Scienced based responses	2	0	0	1	0	0	0	0	0	0	0	0	2	1	3 75.0%
Misconceptions	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1 25.0%
TOTAL	3	0	0	1	0	0	0	0	0	0	0	0	3	1	4

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Only a few negative responses were made, and from these, most were science based (n=3, 75.0%). All of these concerned financial issues, such as too little money to buy these products or to buy them every

day. The only misconception mentioned was that fruit and vegetables had too much vitamins which might have an effect on the child. All of these responses came from the 0-3/12 and the 4-6/12 age groups and mostly from the Mathibestad area. The ethnographic descriptions of the reasons for giving or witholding fruit and vegetables will be discussed after all the results regarding foods or groups of foods have been reported.

✦ Should a child eat a lot of fat (oil, butter, margarine) every day?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26 100%
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

An unanimous negative response (100%) was made by all groups from both clinics.

✦ What are the reasons given for eating a lot of fat (oil, butter, margarine) every day?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Scienced based responses	2	2	2	1	0	0	1	2	0	1	1	3	6	9	15 39.5%
Misconceptions	2	1	0	2	2	3	2	1	4	3	2	1	12	11	23 60.5%
TOTAL	4	3	2	3	2	3	3	3	4	4	3	4	18	20	38

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Several reasons were given of which most were misconceptions (n=23, 60.5%). About half of the science based responses were mentioned by the mothers / caregivers of the 0-3/12 and 4-6/12 age groups and the rest mostly by the mothers / caregivers of the 10-12/12 and 13-24/12 age groups. Aspects of overweight, diarrhoea and development of chronic diseases were mentioned. The misconceptions were mostly mentioned by the 7-9/12 and 13-24/12 age groups and least by the 4-6/12 group. Aspects mentioned in this regard were sores developing internally and on body surfaces, inhalation problems, high blood pressure and other diseases. Most of the science based responses were from the Makapanstad area, while the misconceptions were equal among the two clinics. The ethnographic descriptions of the reasons for giving or witholding fat will be discussed after all the results regarding foods or groups of foods have been reported.

✦ What is the best way to use fat in the diet?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Spreads	0	3	3	2	1	2	0	1	1	2	1	1	6	11	17 35.4%
Cooking	1	0	3	1	0	0	0	0	1	0	2	2	7	3	10 20.8%
Additions to food purely for flavour	2	3	0	0	2	2	2	4	0	2	2	2	8	13	21 43.8%
TOTAL	3	6	6	3	3	4	2	5	2	4	5	5	21	27	48

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Although the mothers / caregivers said that fat should not be used in the diet of the child, everybody explained how they used fat in the diet. Most of the responses were made for adding some form of fat to different food products in order to improve either the taste or the flavour (n=21, 43.8%). All the groups indicated fat usage in this manner, except the 4-6/12 age groups from both the clinics and one group from the 13-24/12 group. The practice explained was that of margarine ("Rama") added to porridge or potatoes. The second most popular practice was spreading margarine / fat on bread (n=17, 35.4%), and using it as a cooking medium (n=10, 20.8%), e.g. for frying. Usage on bread was mentioned by all the age groups, but fat as a cooking medium was not mentioned by the middle age groups (7-9/12, 10-12/12) at all. Mothers / caregivers from the Mathibestad area apparently used fat more as a cooking medium, while mothers / caregivers from the Makapanstad area often added more fat for flavour.

In conclusion: for a more complete evaluation on the suitability of foods for children, all the categories of food were considered in terms of the bodily functions. For growth purposes, foods with a higher protein content were considered together, and included milk, meat and meat replacers. Most of the mothers / caregivers indicated that milk should be given on a daily basis, but if the quantities actually given were taken into consideration, the actual intake of milk was very low indeed (below 250mL / day). This indicated that milk was not a major source of protein in the diets of the children. This was practiced even though the mothers / caregivers knew the correct reasons for the importance of daily milk intake. The next protein food discussed was that of meat. There was a negative response to daily consumption of meat and any other animal proteins. This was due to a very strong cultural belief that all kinds of meat caused worms in children and should therefore be avoided (12, 107). The value of meat replacers in children's diets was also examined. The result of these probes indicated that mothers / caregivers gave plant proteins (soya products) and miscellaneous products (including suitable Purity products and unsuitable soups and gravy) instead of meat to their children. Some of the mothers / caregivers even mentioned vegetables as being a suitable replacer for meat. The protein intake of the children in the age group naught to three years seemed to be poor in quality due to very low meat and milk intakes and unsuitable meat replacers. The nutritional evaluation (see 7.3 in Chapter 7) showed that the protein intakes were sufficient in all the RDA-age groups, varying between 84 - 360% of the reference value and in the WHO-age groups varying between 119-390% of the reference value. The calcium intakes however were low, varying between 44-52% of the reference value in the RDA-age groups.

To evaluate the energy content of the diet, the intakes of carbohydrate-rich foods and fats were considered together. The mothers / caregivers reacted negatively to the regular inclusion of starch-rich foods in the diets of their children. In the probe put to the mothers / caregivers, all kinds of starch-rich foods were mentioned by name (e.g. pap, rice, samp, mealierice, bread). All of these were considered unsuitable for the children. Only maize meal porridge, which was washed first to remove the white starchy residue, was considered a suitable product for the children. This porridge was further diluted to obtain a suitable textured product for the child. It seemed clear that no other starch-rich foods, except soft maize meal porridge, was given to children due to a lot of misconceptions regarding starch as such. Fat was also considered as being an item that should be excluded from the diets of children. The reasons put forward (as discussed previously) dealt mainly with long-term chronic illness, but also that fat was responsible for sores and inhalation problems. From the nutritional evaluation (see 7.3 in Chapter 7) it could be concluded that the contribution of carbohydrate-rich foods was adequate (contributing 67-75% of the total energy intake). However, soft porridge seemed to be the most popular / only starchy food included in the diet according to the cultural beliefs; leading to a poorly varied diet. The contribution of fats to the total energy intake of the child seemed fairly low (contributing 21-25% of the total energy intake).

Lastly, the intake of vitamin and mineral rich foods was evaluated. This was done by probes on the intake of fruits and vegetables by the children in the various age groups. An overall positive response was reported by all the mothers / caregivers of children eating full diets (7-9/12, 10-12/12, 13-24/12, 25-36/12 age groups) in both areas. However, misconceptions concerning the value of fruit and vegetables were also reported (e.g. the suitability of vegetables as a milk / meat replacer). The foods in this category did not contribute much to the volume of food consumed, as financial constraints prevented them from including much of these foods in the child's diet.

These results confirmed the finding that children aged naught to three years old had a fairly unbalanced diet, considering the protein, carbohydrate, fat, vitamin and mineral content of the diet (see nutritional evaluation in 7.3). The variety of foods included also seemed to be very limited. The focus of the nutrition intervention in this regard needs to be on the education of mothers / caregivers on the value of balanced diets of their children, how to balance their intakes correctly, suitable food choices and compilation of a suitable diet, as well as reasons for changing to all of these practices.

Ethnographic descriptions

Milk The results (see 9.1.1.3) showed a positive inclination towards giving milk daily to children. All the positive reasons were science based, but they could also be grouped according to types of responses. Firstly, very generalized responses included:

- "to keep the child strong and healthy"
- "it keep the body strong"
- "to keep her healthy"
- "because milk is good for the baby"

Some of the responses focused on growth:

- "because the child is young, he must get milk to grow well"
- "to grow up"

Other responses focused on nutritional content:

- "milk give the baby energy"
- "to get vitamins, calcium and protein"

Some responses focused on the functions of milk in the body:

- "it build the body"
- "it keeps their bones strong"

These responses confirmed that the mothers / caregivers did not have a sound knowledge concerning the importance of milk in the child's diet. Although all their responses were science based, it was very basic and generalized. Nutrition education should be directed at providing information on the nutrients provided by milk and its functions in the body of the child, as well as the quantities of milk that children should consume.

Meat and possible replacers of meat Only negative reasons for meat usage was given (see 9.1.1.3). Two reasons were scientifically sound:

- "because they don't have teeth"
- "you can't afford meat every day"

All of the other responses given were misconceptions regarding meat usage. The reason given by nearly all the groups was:

- "it will cause worms"
- "it causes worms in the intestines and even then, only cow's meat and not chicken"

One other reason only was given:

- "it's got a lot of iron"

The fact that iron was considered an element that should not be consumed in large quantities, was worrisome. None of the mothers / caregivers who believed that meat was necessary for daily consumption, could provide reasons for their belief. Substitutes for meat products were mostly given for flavour or variety and not for growth needs. The possible meat replacers mentioned by the mothers / caregivers were not always suitable products (see 9.1.1.3). The reasons given for their suitability as a meat replacer were largely misconceptions based on very vague ideas for the necessity of meat or a replacer of meat in the diet. The most common recurring reasons for using both soups and soya were:

- "It has a meat flavour"
- "They have the same vitamins that are found in meat"
- "They are soft"
- "They taste like meat"
- "To gain weight"

and for using soya:

- "It is dried meat"

and for the soup products alone:

- "It is a meat substitute"
- "it's like meat"

It was clear that a very strong cultural belief regarding meat consumption was practiced in this community, and nutrition education should be aimed at eradicating the misconceptions. Information regarding the nutritional content of meat, the value of an adequate iron intake for children and the value of meat in the diet of the child should be incorporated in a nutrition education programme.

Starchy foods To determine starch consumption on the whole focus groups were asked "should a child eat a starchy food like pap, rice, samp, mealierice or bread with each meal?" (see 9.1.1.3). Some of the negative responses given were scientifically sound:

- "He will be overweight"
- "The child does not have teeth to eat stampmielies yet"
- "He will be fat and get ill easily"

Others were misconceptions firstly to do with gastrointestinal discomfort:

- "It causes constipation and cramps"
- "A lot of starch make them constipated ('intestines styf')"

and secondly to do with digestion:

- "It is too rich for the child"
- "That is why we make it differently for the child - take out the starch and make slap pap"

and thirdly with skin health:

- "It will cause sores on the child"

The positive responses also included scientifically based responses:

- "To supply them with energy"
- "To provide strength"
- "Because starch plays an important role in the body; the body needs it"
- "For the child to grow up to be strong"

as well as some misconceptions:

- "To build their bones"
- "But not too much - it will cause the skin to be dry "

The type of bread used was also determined (see 9.1.1.3). All the mothers / caregivers preferred brown bread over any other type. Scientific responses included:

- "It stays long in the stomach - keeps you from getting hungry"
- "It gives strength"
- "It's healthy because it has starch"

Misconceptions concerning bread use included:

- "It has a lot of vitamins"
- "Because it does not have too much starch"
- "White bread has a lot of starch, so it causes constipation"
- "Because white bread has a lot of starch, it causes worms"
- "When you have eaten brown bread, you will get enough food for the whole day"

Misconceptions also existed regarding the suitability and need for starch in the diet of the child. Starch was wrongly considered as the cause of sores on the skin, constipation and poor digestion thus causing cramps. Due to a belief that starch was too rich for the child, the practice of washing and diluting the maize meal to make soft porridge for the children was used. Even the positive views on using starch seemed vague and nonspecific. Mothers / caregivers had knowledge on the suitability of brown rather than white bread, but their opinions for doing so were based on misconceptions, like the belief that certain kinds of bread had more starch than others, which was bad for the child. Nutrition education should focus on a clear definition of starch, its functions in the human body and suitable food sources to incorporate in the diet of the child. This information could be linked to the ideal sequence for introducing different solid foods (starch types) in the diet of the child. Eradication of misconceptions should also receive attention.

Fruit and vegetable groups The positive responses for including fruit and vegetables (see 9.1.1.3) in the diet were rather vague:

- "It will give the baby strength"
- "The child needs a variety of foods"
- "To keep the child healthy"
- "For a child to be normal"

and the misconceptions involved growth:

- "To build their bones"
- "It has proteins"
- "It makes the body and the bones strong"
- "It build up the body - (it's body builders)"

Negative responses were mainly financial:

- "We don't have enough money to give them every day"
- "Can't afford them"

and the misconception:

- "Lots of vitamins have an effect on the child"

These responses showed that the mothers / caregivers of babies or children did not have adequate nutrition knowledge, even about the most basic information regarding foods to incorporate in the diets of children to supply adequate nutrients. Mothers / caregivers were not aware of the functions of specific nutrients and in which foods these nutrients occurred. Nutrition education should focus on the variety of foods from this group and the various vitamins and minerals supplied, with their functions in the body.

Fat All the mothers / caregivers said that fat should not be eaten at all or only in very small quantities, thus indicating a negative opinion on dietary fat (see 9.1.1.3). The science based responses included:

- "The baby will become too fat if she eats too much fat"
- "It will cause heart diseases"

and some of the misconceptions were:

- "The baby will get sores on the body if she eats too much fat"
- "It will cause sores in the stomach"
- "The child will not inhale easily"
- "It will cause the child to have a high blood pressure every day"

Although limiting fat in the diet was quite a good practice, these mothers / caregivers were doing it for the wrong reasons, i.e. based on misconceptions. These mothers / caregivers should be educated on the value of fat in the diet (energy and fat-soluble vitamin content) and on suitable fat sources to use. There seemed to be a misconception that an increased fat intake alone was responsible for people becoming overweight. The long-term effects of consuming more energy than required on a daily basis, should also be addressed.

9.1.1.4 Drinks given to the child

✦ What do you give your baby to drink when he / she is thirsty?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Cold drinks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26 100%
Juice	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

An unanimous answer in favour of water was given to this probe.

✦ What are the reasons for giving your baby these specific liquids to drink?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	3	3	3	4	2	2	2	1	2	2	2	1	14	13	27 81.8%
Misconceptions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Response = science Interpretation = misconception	0	0	0	0	0	1	0	2	0	2	0	1	0	6	6 18.2%
TOTAL	3	3	3	4	5	3	2	3	2	4	2	2	14	19	33

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Nearly all the reasons given were scientifically based (n=27, 81.8%). The only other response made was scientific as such, but due to the interpretation by the mothers / caregivers, the response was classified as a misconception (n=6, 18.2%). This response given concerned blood volume, but the interpretation given was that water was necessary to increase the blood volume of the child, as if that was the only substance responsible for blood volume. The other reasons presented, included very basic responses like the body needs water, and water has an important role, but it was never specifically mentioned what these needs / functions were. Thirst, relief of constipation and replacement of lost urine were also mentioned.

✦ Do you think that it is important to see to it that a baby or young child gets enough liquids to drink every day?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26 100%
No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the groups responded equally and in the positive to this question.

✦ Why do you think it is important to see to it that a baby or young child gets enough liquids to drink every day?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	3	3	2	1	2	1	2	1	4	1	2	1	15	8	23 63.9
Misconceptions	0	1	2	1	1	1	0	1	1	2	1	2	5	8	13 36.1
TOTAL	3	4	4	2	3	2	2	2	5	3	3	3	20	16	35

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The responses in this regard were mostly science based (n=23, 63.9%). More of the responses were coming from the Mathibestad area than from the Makapanstad area. These responses included items on digestion, body water content, passing of stools, dehydration and general comments like the need for water. A number of misconceptions were also apparent (n=13, 36.1%). These came from the 4-6/12, 7-9/12, 13-24/12 and 25-36/12 age groups. More misconceptions came from the Makapanstad area which included items like increased blood production, to help blood flow, to soften the skin and it loosens the stomach of the child.

✦ What liquids should they get to drink?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Cold drinks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water	3	2	2	2	1	2	2	2	2	2	2	2	12	12	24 68.6%
Juice (pure)	1	0	0	0	1	0	0	0	0	0	1	1	3	1	4 11.4%
Milk (drink)	1	2	0	0	0	0	0	1	1	1	0	0	2	4	6 17.1%
Purity liquid	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1 2.9%
TOTAL	5	4	2	2	2	3	2	3	3	3	3	3	17	18	35

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Previously mothers / caregivers said that they gave their children only water to drink. When the probe was put in a different manner, the responses were more varied. A large number of the mothers / caregivers (n=24, 68.6%) still indicated water as being the choice drink to give to babies to drink. Other drinks included milk (n=6, 17.1%) and juice (n=4, 11.4%). Not all the groups responded in this regard. Cold drinks were not mentioned at all.

✦ Which types of drinks is the best for children to drink between meals?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Cold drinks	3	1	1	0	0	1	1	0	0	0	1	4	6	6	12 33.3%
Water	0	1	0	2	0	1	0	1	1	1	0	0	1	6	7 19.4%
Juice - Purity	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1 2.8%
Breast feeding	1	0	0	0	1	0	0	0	0	0	0	0	2	0	2 5.6%
Milk	0	2	1	1	1	1	2	1	1	1	1	2	6	8	14 38.9%
TOTAL	4	4	2	3	2	4	3	2	2	2	2	6	15	21	36

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

This probe was added to the interview schedule as a cross control of the previous questions on drinking patterns. Other drinks were mentioned as being ideal for drinking between meals. Cold drinks (n=12, 33.3%), Purity juice (n=1, 2.8%), milk (n=14, 38.9%) and breast feeding (n=2, 5.6%) were mentioned in addition to water (n=7, 19.4%). Water was mentioned much less (19.4%) with this probe than with the two previous probes (9.1.1.4) on drinking practices, where it was indicated that 100% of the mothers / caregivers gave their babies water to drink when they were thirsty; and when it was asked what liquids babies / young children should get to drink, only 68.6% indicated water. With this probe contrasting responses concerning cold drink usage were given. With the previous probes cold drinks were never mentioned, but with this probe mothers / caregivers indicated that cold drinks were given to babies aged 0-3/12 and 4-6/12.

- Why are these specific drinks best to give between meals?

Some of the reasons given were exclusive for a certain drink and others were applicable to a number of drinks. The reasons given for using certain drinks will be presented relative to the drink categories specified and discussed accordingly (see Table 71).

TABLE 71: REASONS FOR USING TYPES OF DRINKS BETWEEN MEALS

REASONS FOR USING TYPES OF DRINKS BETWEEN MEALS		DRINK CATEGORIES					
		COLD DRINKS		WATER	FRUIT JUICE (Pure)	OTHER PRODUCTS	
		Juice - artificial	Sweetened concentrates		Purity (juice)	Milk	Breastfeeding
1.	Because they have sugar and sugar gives the baby energy	☻	☻☻☻				
2.	These liquids will loosen the stomach for the child so that he can pass stools easily	☹				☹	
3.	Milk has vitamins and will keep the body strong					☻	
4.	It does not stay in the stomach long, so the stomach will be empty and he will eat again	☻				☹	
5.	If the child gets other drinks, the child loses his appetite, but not with water			☻			
6.	For her stomach not to be hard			☻			
7.	Because this will make the baby strong and healthy					☻☻☻	
8.	For a balanced diet					☻	
9.	To have enough blood in the body			☹			
10.	To have more water in the body	☹		☹	☹		
11.	They are best	☹				☻	
12.	They stay long in the stomach	☹				☹	
13.	They help the child grow					☻	
14.	Milk has substances that are good for the body (dikotla)					☻	
15.	Because this will easily be taken in by the baby	☻				☻	
16.	Breast feeding is healthy and easy to get / available						☻
17.	It will build the body					☻	
18.	The food will easily be digested			☹		☹	
19.	To pass the food the child has eaten					☹	
20.	Water is important in the body	☻		☻☻			
21.	Milk is good for the baby					☻	
22.	Milk has Calcium					☻	
23.	Because with every meal we need something to pass the food	☹					☹
24.	To prevent thirst	☻					

☻/☹ - each face resembles one response made by any focus group ☻ - science based response ☹ - misconception

Cold drinks Most of the cold drinks used, were the sweetened concentrates to which only water was added, or the cheaper, artificial, sweetened types of juice drinks. These were very popular among the mothers / caregivers from both areas. The reasons given for using these items between meals were equally divided between misconceptions and scientific facts. Scientifically based responses included it being an energy source with a low satiety level, easy to administer, able to combat thirst. Misconceptions included the belief that cold drinks were necessary to combat constipation, that they were the best source of water and would also increase the water content of the body, that they had a high satiety level and that cold drinks were needed to carry food from the stomach through the body. Most of these responses were regarding the artificial juices that were freely available in these areas. The sweetened concentrates were correctly regarded as a sugar / energy source.

Water The responses were partly scientifically based and partly misconceptions. Water was correctly mentioned as being necessary to prevent constipation and that it would not affect the appetite as some of the other drinks might do. Some responses were very unspecific in that the mothers / caregivers only stated that water was important, with no specific reason mentioned. Misconceptions were that water increased the body water and blood content, and that it had to be present for proper digestion of food.

Pure fruit juice This category was only mentioned once in that it supplied water to the body which could be regarded as a misconception.

Other products Quite a number of mothers / caregivers mentioned milk / breast feeding as a suitable drink between meals. This indicated that milk was not considered a food, but rather a drink. Most of the responses were science based, focusing on the nutrient content (vitamins, calcium), providing a balanced diet and for growth and body building. Some of them, however, were very non-specific, like milk is best or good for the baby. Misconceptions ranged from preventing constipation, low satiety value versus high satiety value to aiding digestion and food passage through the gut.

To summarize: an effort was made to determine the variety of drinks children in these communities consumed and the reasons for it. This issue was probed in three different ways in order to cross control the items mentioned first. The importance of this strategy became apparent during the analysis phase (transcription and reduction) when it was discovered that more types of drinks were mentioned from the first probe in this line of questioning (one type of drink) to the second probe (four types of drinks) to the last probe (five types of drinks). This seemed to stress the fact that most of the mothers / caregivers knew the answer that was expected nutritionally, and gave this answer first and foremost, but when probed on the issue, they divulged information regarding other products (not nutritionally as suitable) also given to the children. If one probe only would have been included in the moderator schedule, only one type of drink used would have been listed. It is therefore valuable to have cross control questions / probes concerning certain issues.

Water was mentioned firstly as the most important drink given to children. Other liquids mentioned thereafter included milk and artificial juices. Water was thus given regularly to the children, but not as exclusively as was initially reported. It also became clear that the "juice" mentioned did not imply pure fruit juices like *Liquifruit / Ceres*, but rather the cheaper, artificial products available in the market. These were

even given to very small babies. The other important aspect to consider in this regard, was the misconceptions concerning the need for the intake of liquids. The need for liquid being available during / directly after eating solid food in order to aid the digestion process and the movement of food through the bowel was often, and in no uncertain terms, mentioned. Mothers / caregivers need to be educated regarding suitable drinks for children exclusively breast fed, and for those in the weaning stage. The fact that milk / breast milk was considered a suitable drink between meals rather than being an important part of food intake, should also be addressed.

9.1.1.5 Nutrition knowledge

Mothers / caregivers were asked to discuss the ideal foods that they gave to their babies / children in order to achieve a healthy balanced diet. The probes were structured according to the various functions that nutrients fulfill in the human body. This was done to determine if the mothers / caregivers had any knowledge on nutrition and nutritious foods and the reasons why certain foods were very important. It could thus be determined if any nutrition education is necessary regarding food choices and balancing the diet of a child nutritionally.

The responses will be discussed according to six different probes regarding the functions of nutrients in the body as they were put to the mothers / caregivers:

✦ What should you eat to:

- grow the body
- keep the eyes healthy
- prevent you from getting sick
- build teeth and bones
- give you energy / strength to do your work
- to help sores and scratches to heal quickly.

The reasons mentioned by the mothers / caregivers are presented in a result-matrix (table format). In some instances the reasons provided for using certain foods to fulfill the specific function had no relevance to the probe (inappropriate reasons), and foods mentioned in this regard would thus be considered invalid to this probe (invalid food responses). It will however be presented in the result-matrix to complete the data set and it will thus show the number of misconceptions that existed regarding each probe. These inappropriate reasons are presented in an italic font in the reason column and the food responses mentioned with it are shadowed to distinguish it from appropriate reasons. All the foods mentioned were grouped according to similarity (kinds of foods) in terms of function(s) in the body, namely:

- milk products
- meat and meat replacers
- fruit & vegetables - vit A rich
- fruit & vegetables - vit C rich

- fruit & vegetables - other
- bread & cereals
- fat
- other

Mothers / caregivers were asked which foods should be eaten in order to grow the body. The nutrients / foods expected to be mentioned in the ideal / correct answer were milk and milk products for calcium, protein for bone growth and meat, fish, eggs and meat replacers for protein and iron for growth of the body (14). It was clear from the responses (see Table 72) that a large variety of answers were given to this probe. Most of the foods mentioned came from food categories (n=60, 76.9%) other than those foods considered to be mainly responsible for growth, namely milk, meat and replacer products (n=18, 23.1%). The science based responses included items like milk, cheese and meat. The functions mentioned for these foods were mostly correct and included items on building and strengthening bones, supplying suitable nutrients and building or growing the body in general. A misconception identified was that meat was responsible for the building of bones. (Although it contributes to growth, it is not considered the main nutrient source needed for the building of bones specifically).

A large number of fruit and vegetables (carrots, merogo, cabbage, banana, apple, and fruit and vegetables as a general response category) were mentioned wrongly as being responsible for growth of the body. These were considered misconceptions as these foods are not solely responsible for growth. These foods were mainly considered being both rich in protein and vitamins, and responsible for building bones, which they are not. Some of the food items already mentioned for this probe (cheese, meat, carrots, merogo, cabbage, potato, banana, apple, the general categories of fruit and vegetables, pap and bread) were provided with reasons that did not tie in with the probe itself (invalid reasons), and therefore were considered misconceptions. These misconceptions included the prevention of illnesses, the provision of vitamins, and starch,and consuming these foods to be healthy and strong; all of which were correct for the foods mentioned, but incorrect for the probe.

In summary: it could be concluded that the mothers / caregivers in these areas did not really have knowledge as to which foods were necessary in the diet of a child for growth of the child as such. A lot of misconceptions also existed in this regard.

The second probe concerned the foods that should be eaten in order to keep the eyes healthy (see Table 73).

TABLE 72: FOODS AND REASONS MENTIONED TO GROW THE BODY

REASONS MENTIONED FOR THE FOOD ITEM BEING IDEAL FOR GROWTH	FOODS MENTIONED: TO GROW THE BODY																			
	MILK PRODUCTS		MEAT & REPLA-CERS	FRUIT & VEG-(Vit A-rich)					FRUIT & VEG(Vit C-rich)		FRUIT & VEG(Other)					BREAD & CEREALS		F A T	OTHER	
	milk	cheese	meat	carrots	merogo	pump-kin	peas	spinach	cabbage	orange	potato	bana-na	apple	fruit	veg	pap	bread		foods with vitamins & CHO	sta rch
1. To build the bones				☹					☹		☹	☹								
2. To prevent illnesses				☻					☻		☻	☻								
3. They have vitamins					☻							☻☻	☻	☻☻	☻	☹				
4. To keep the body strong		☻	☻		☻						☻									
5. They have starch			☹													☻☻☻ ☻☻	☻			
6. To strengthen bones	☻	☻																		
7. To build the bones	☻	☻	☹			☹			☹		☹									
8. Provides Calcium	☻																			
9. They have vitamins and proteins	☻	☻												☻	☻					
10. To be strong and healthy		☻										☻	☻	☻	☻					
11. To build the body	☻	☻		☹	☹		☹		☹	☹		☹☹	☹☹	☹☹	☹☹	☹				
12. Don't know					☹															
13. It gives the body strength									☻											
14. To keep you well															☻				☻	
15. To be strong			☻☻		☻						☻				☻	☻	☻		☻	☻
16. It helps you to grow well					☹															
17. They have proteins								☹	☹											
18. They have proteins which builds the body	☻	☻																		

☻/☹ - each face resembles one response made by any focus group ☻ - science based response ☹ - misconception

TABLE 73: FOODS AND REASONS MENTIONED TO KEEP THE EYES HEALTHY

REASONS MENTIONED FOR THE FOOD ITEM BEING IDEAL FOR HEALTHY EYES	FOODS MENTIONED: TO KEEP THE EYES HEALTHY												
	MILK PRODUCTS		MEAT & REPLACERS	FRUIT & VEG (vit A-rich)		FRUIT & VEG (Vit -Crich)	FRUIT & VEG (other)	BREAD & CEREALS		FAT	OTHER	
				carrots	yellow peaches	cabbage					Don't know	
1. For the eyes to be bright				☻☻		☹						
2. It has substances that are good for the eyes				☻								
3. It has vitamins and carotene				☻								
4. Do not know				☹								
5. It has lots of proteins				☹								
6. It has vitamins				☻								
7. It has calcium				☹								
8. For the eyes to have good vision				☻								
9. No answer given				☹							☹	
10. To keep the eyes clear				☻								
11. The eyes will see well				☻								
12. It has vitamin A				☻	☻							

☻/☹ - each face resembles one response made by any focus group ☻ - science based response ☹ - misconception

The ideal / correct answer to this probe was that vitamin A or carotene is an essential nutrient for healthy eyes and should be taken in by means of dark green or yellow or orange fruit or vegetables (14). It was obvious from the responses (see Table 73) that nearly all of the mothers / caregivers knew that carrots are important for healthy eyes. However, it was also evident that the mothers / caregivers did not always have clarity concerning the reasons for the importance of carrots, and also that no other foods in the same food category were hardly ever mentioned in the same regard. Only vegetables were mentioned as ideal foods of which most were from the fruit & vegetables - vitamin A rich category (the number of responses in this category were n=14 (87.5%) compared to responses from any other category n=2 (12.5%). Only two types of fruits and vegetables other than carrots were mentioned as being suitable of which one was vitamin A rich (yellow peaches) and one was vitamin C rich (cabbage). Most of the reasons given were very general, e.g. to be able to see well, for the eyes to be bright and for good vision. Only one focus group mentioned the correct reason, namely the vitamin A content of carrots. A number of misconceptions also became evident from the responses. These included carrots being high in protein and calcium and therefore being good for eyesight.

In conclusion: the mothers / caregivers in these communities knew which food to eat in order to have a high vitamin A intake, but they did not have knowledge as to why this nutrient is essential to consume. Nutrition education regarding vitamin A rich foods and their functions in the body is thus essential.

The third probe was about the foods that should be eaten to prevent you from getting sick (see Table 74).

TABLE 74: FOODS AND REASONS MENTIONED TO PREVENT YOU FROM GETTING SICK

REASONS MENTIONED FOR THE FOOD ITEM BEING IDEAL TO PREVENT YOU FROM GETTING SICK	FOODS MENTIONED: TO PREVENT YOU FROM GETTING SICK																												
	MILK		MEAT & PROD.			FRUIT & VEG (vit A-rich)									FRUIT & VEG (vit C-rich)			FRUIT & VEG (other)									BREAD	OTHER	
	cheese	milk	meat	fish	eggs	carrots	merogo	pumpkin	apricot	spinach	peach	mango	beans	green veg	cabbage	orange	tomato	pear	banana	apple	pineapple	fruit	gems	potato	veg	bread	clean foods	do not know
1. To be strong + healthy			☻	☻					☻				☻			☻☻		☻	☻☻	☻☻	☻	☻						
2. To prevent illness							☻		☻							☻☻		☻	☻☻	☻☻	☻							
3. It has a lot of iron										☻					☹													
4. For the body to be strong and healthy		☻			☻																					☻		
5. They have vitamins from the sunlight							☹								☹													
6. They have vitamins					☺						☻	☻		☻	☻	☻☻			☻☻	☻		☻			☻			
7. To be healthy						☻		☻☻							☻☻		☻	☻	☻				☻	☻			☻	
8. To give your body a boost								☻							☻		☻						☻					
9. *To grow*	☻	☻			☻			☺							☺		☺						☺					
10. To get vitamins								☻							☻		☻						☻					
11. Fruits have natural proteins																				☹								
12. To be strong	☻	☻			☻																	☻			☻			
13. Don't know							☹															☹			☹			☹
14. *To build the body*	☻	☻	☻	☻	☻	☺		☺							☺	☺						☺		☺	☺	☺			

REASONS MENTIONED FOR THE FOOD ITEM BEING IDEAL TO PREVENT YOU FROM GETTING SICK	FOODS MENTIONED: TO PREVENT YOU FROM GETTING SICK																												
	MILK		MEAT & PROD.			FRUIT & VEG (vit A-rich)									FRUIT & VEG (vit C-rich)			FRUIT & VEG (other)								BREAD	OTHER	
	cheese	milk	meat	fish	eggs	carrots	mero ho	pumpkin	apricot	spinach	peach	mango	beans	green veg	cabbage	orange	tomato	pear	banana	apple	pine apple	fruit	gems	potato	veg	bread	clean foods	do not know
15. To have strength						☻		☻							☻	☻								☻				
16. *To build bones*											☹	☹				☹			☹	☹								
17. No answer given																☹												
18. It gives the body strength																☻			☻	☻								
19. *It has Calcium and minerals*							☻																					

☻/☹ - each face resembles one response made by any focus group ☻ - science based response ☹ - misconception

TABLE 72 continued.....

Ideally, the vitamins and minerals found in the fruit and vegetable group are to be considered important in maintaining health and immunity against disease and the fibre content for preventing constipation (14). Most of the responses (see Table 74) were given for foods in the fruit and vegetable category. This was calculated to be 81.1% (n=86) from the total number of responses (n=106) given for this probe from all the focus groups. Foods mentioned more often were pumpkin, cabbage, orange, banana, apple, and fruit in general. Most of the reasons provided concerned vitamins and minerals, although it was not always used in the correct context. Correct reasons mentioned were for instance "to prevent illness", "it has lots of iron", "they have vitamins from the sunlight", "they have vitamins", and "to give your body a boost". In some instances however, the reason linked to the probe, but the foods mentioned as performing these functions were completely incorrect. This was true for cabbage and foods having a lot of iron, and for merogo and cabbage which were supposed to have vitamins from the sunlight. Foods mentioned from the milk and meat categories were all suitable. The number of responses from these two categories were calculated to be 15.1% (n=16). The reasons were also mostly correct, except for eggs being thought of as rich in vitamins, and therefore preventing illness. Some of the reasons for the foods mentioned were not connected to the specific probe put to the mothers / caregivers, and were therefore considered as misconceptions, e.g. pumpkin, cabbage, tomato and gems were mentioned for their growth properties which have nothing to do with preventing illness. It is also true that these foods on their own would not promote growth. Cheese, milk, meat, fish and eggs were correctly mentioned for building the body, but carrots, pumpkin, cabbage, orange, fruit, potato, vegetables and bread were misconceptions. Building the body did also not tie in with prevention of illness. Peaches, mango, orange, banana and apples were also mentioned as being important for preventing illness due to the fact that they build bones. The last misconception concerned merogo, which was considered important due to its high calcium and mineral content, and therefore aids in the prevention of diseases. Although spinach contains calcium, it is not considered a valuable source due to the poor bioavailability in the body and the main function of calcium is not to prevent illness (14).

In conclusion: it became clear that the mothers / caregivers in these two communities were not really able to relate specific foods with the functions that they perform in the body. Some nutrition-related concepts were known to them but not in the correct context.

The fourth probe put to the mothers / caregivers concerned the issue of foods necessary to build teeth and bones (see Table 75).

TABLE 75: FOODS AND REASONS MENTIONED TO BUILD TEETH AND BONES

REASONS MENTIONED FOR THE FOOD ITEM BEING IDEAL FOR BUILDING TEETH AND BONES	FOODS MENTIONED: BUILD TEETH AND BONES												
	MILK PRODUCTS		MEAT & REPLACERS		FRUIT & VEG (VITC-rich)	FRUIT & VEG (Other)				BREAD & CEREALS	FAT	OTHER	
	milk	cheese	meat	fish	orange	pear	apple-green	mealies	veg	starch		don't know	sugar
1. For the teeth to be strong	☻		☹				☹						
2. For the gums to be strong	☻		☻				☻						
3. Don't know							☹☹	☹				☹	☹
4. For the bones to be strong	☻☻		☻		☹		☹☹☹☹		☹	☹			
5. To keep your teeth strong	☻☻	☻		☹			☹☹☹☹☹ ☹☹						
6. They have calcium which is good for the bones	☻	☻		☹			☹						
7. They have iron	☹☹	☹	☻										
8. Because it has proteins	☻												
9. It has Mentadent P							☹						
10. It has vitamins	☻		☹				☻☻						
11. To build bones and teeth	☻					☹	☹						
12. It has calcium	☻						☹						
13. No answer given							☹						
14. *Milk has lots of fat*	☻												
15. It can harden your teeth								☹					

☻/☹ - each face resembles one response made by any focus group ☻ - science based response ☹ - misconception

Calcium and protein are considered the main contributors to the growth and development of bones and teeth, and the major food sources are milk and milk products. These are therefore considered important components of the diet in order to promote bone and teeth formation and growth (14). The responses in this regard (see Table 75) were mostly misconceptions concerning the foods mentioned and their supposed functions. The results indicated that these foods were not considered the most important source of calcium. When the total number of responses given, were calculated, milk products received 31.5% (n=17) responses and meat & replacers 13.0% (n=7)responses, resulting in 44.5% of the total responses (n=54). All the foods mentioned in both categories were suitable, including milk, cheese, meat and fish. The reasons given for using these foods were quite vague, i.e. for the teeth to be strong, for the bones to be strong, to build teeth and bones. Calcium was mentioned twice only and protein once only. One evident misconception was that milk and cheese (and meat) contained iron that was important for building teeth and bones. The other misconceptions about meat specifically included the belief that meat was important for the strength of teeth and that it contained vitamins which were also important for building teeth and bones. Fish was also considered to have a high calcium content and to be important for strong teeth.

Most of the other foods mentioned for building teeth and bones were misconceptions. When calculated, these responses added up to 50.6% (n=30) of the total number of responses. Foods mentioned were oranges, pears, mealies, vegetables, starch, sugar and most often mentioned, apples (n=22, 40.7%). The reasons given for using these foods were very general. The only reason that could be interpreted as scientifically based, were that of apples being good for strong gums and that apples contained vitamins. The other reasons were all misconceptions of which apples, containing Mentadent P for building teeth and bones, and apples containing calcium, were the most obvious. Other misconceptions were that mealies would harden teeth, that pears would build bones and teeth, and that starch would make bones strong. For this probe, only one item mentioned was provided with a reason that did not link to the original question, namely milk which was considered to have a high fat content. Although it is true, it was totally irrelevant to building teeth and bone.

In conclusion: it was evident that mothers / caregivers in these communities had little knowledge on the types of foods needed to build the teeth and bones in the body. More than half the responses were misconceptions indicating that education regarding specific foods containing calcium and protein and reasons for its importance need to be included in a nutrition education program.

The next probe put to the mothers / caregivers in the various focus groups was to identify the foods and the reasons for eating foods that would give you energy / strength to do your work (see Table 76).

TABLE 76: FOODS AND REASONS MENTIONED TO GIVE YOU ENERGY / STRENGTH TO DO YOUR WORK

REASONS MENTIONED FOR THE FOOD ITEM BEING IDEAL FOR PROVIDING ENERGY / PROVIDING STRENGTH	FOODS MENTIONED: GIVE YOU ENERGY / STRENGTH TO DO YOUR WORK																	
	MILK PRODUCTS		MEAT & REPLACERS			FRUIT & VEG (VIT A-rich)		FRUIT & VEG (Other)		BREAD & CEREALS					FAT	OTHER	
	milk	cheese	meat	fish	eggs	carrots	mero-ho	potato	veg	starch	samp	pap	grainy foods	brown bread	bread		sugar cane	sugar
1. To prevent them from getting sick	☻		☻								☹☹	☹			☹		☺	☺
2. To have energy	☹		☹								☻						☻	☻☻
3. Don't know	☹						☹					☹	☹	☹				☹☹
4. It build the body	☻			☻		☹		☹				☹☹						☹
5. They have starch											☻	☻☻☻			☻☻			
6. They have vitamins												☹			☹			
7. To be brave / full of life																		☻
8. To be strong	☻	☻		☻	☻				☻	☻		☻☻			☻			☻☻☻
9. Sugar has glucose																		☻
10. Sugar has starch																		☹
11 It gives strength												☻☻						
12. They have proteins	☻	☻		☻	☻				☺						☺			☹
13. For the body to be strong												☻						

☻/☹ - each face resembles one response made by any focus group ☻ - science based response ☺ - misconception

The responses given by the groups varied and included an equal number of misconceptions and science based responses (see Table 76). Foods rich in carbohydrate, protein and lipid may be used as sources of energy in the form of glucose, amino acids, fatty acids and glycerol. The major function of carbohydrates is as a source of energy. Glucose is the major source of energy for both nervous tissue and the lungs and the most common source of energy for muscles. However, muscles can also use fatty acids, although less efficiently. Fat is a concentrated source of energy which can be used to enhance the kilojoule content of the diet and is also the form in which excess energy is stored. Only proteins in excess of needs for other functions will be utilized as a source of energy (14, 18). Therefore the categories of bread & cereals, fat and sugars are considered to be the appropriate responses to this probe. Most of the mothers / caregivers responded in this way. When the total number of responses were calculated, 69.2% (n=45) were for bread, cereals, fat and sugar, but 30.8% of the responses were for the categories of milk, meat & replacers, fruit and vegetables. Most of the responses were made in the correct categories with appropriate foods like samp, pap, brown bread/bread and sugar, with science based reasons linked to them (n=25, 38.5%). Science based responses for the carbohydrate rich products included that these foods would provide energy, that they contained starch and that they would provide strength. Misconceptions mentioned were that these foods would supply vitamins and that sugar was starch. Foods from other categories mentioned included milk as an energy source and milk, cheese, fish, eggs and vegetables to provide strength.

Some of the reasons provided did not tie in with the initial probe put to the mothers / caregivers and were therefore considered inappropriate. These included milk, meat, samp, pap, bread and sugar which would prevent illness and therefore provided energy or strength. Milk, fish, carrots, potato, pap and sugar were considered as foods that built the body and therefore they were linked to providing energy and strength to the body. Lastly, milk, cheese, fish, eggs, vegetables, bread and sugar were all considered to have protein and therefore aided in providing strength and energy. Although some of the foods mentioned were appropriate with the reasons given, a large number of the responses provided were inappropriate or purely misconceptions.

In conclusion: it was clear that most mothers / caregivers knew which foods contributed to energy intake, but that some also considered protein-rich foods as being energy sources. Although the correct foods were mostly mentioned, mothers / caregivers hardly ever knew the reasons why these foods served as energy sources in the body. Nutrition education should thus be directed at appropriate foods for energy, as well as reasons for their inclusion in the diets of children.

The last probe concerning food choices was for foods to help sores and scratches heal quickly (see Table 77).

TABLE 77: FOODS AND REASONS MENTIONED TO HELP SORES AND SCRATCHES TO HEAL QUICKLY

REASONS MENTIONED FOR THE FOOD ITEM BEING IDEAL TO HELP SORES / SCRATCHES TO HEAL QUICKLY	FOODS MENTIONED: TO HELP SORES AND SCRATCHES TO HEAL QUICKLY																												
	MILK	MEAT & PROD.				FRUIT & VEG (Vit A-rich)			FRUIT & VEG (Vit C-rich)			FRUIT & VEG (Other)								BREAD		FAT		OTHER				
	milk	fish	peanut-butter	meat	eggs	carrots	mero ho	spinach	cabbage	oranges	tomato	cauliflower	cucumber	veg	fruit	beetroot	potato	apple	banana	rice	samp	fatty food	oil	non fat food	vitamins	high roughage food	chocolate	don't know
1. To be healthy and strong								☻	☻☻			☻	☻	☻☻	☻☻					☹	☹			☻				
2. It build the body								☹	☹			☹	☹											☹				
3. Fat free food won't cause skin eruptions								☹	☹			☹	☹											☹				
4. *Fat free food won't cause weight gain*								☻	☻			☻	☻											☻				
5. Don't know / not sure / no answer given			☹				☹☹		☹					☹	☹	☹						☹	☹	☹	☹	☹	☹	☹☹
6. For the body to be healthy	☻	☻				☻	☻		☻					☻☻	☻☻													
7. They have vitamins, iron and protein														☹	☹													
8. To give us energy										☹									☹									
9. To build up the body / skin									☹	☹	☹					☹	☹		☹									
10. To restore blood														☹	☹													
11. They have vitamins	☻													☻				☻										
12. They have proteins														☹				☹										

REASONS MENTIONED FOR THE FOOD ITEM BEING IDEAL TO HELP SORES / SCRATCHES TO HEAL QUICKLY	FOODS MENTIONED: TO HELP SORES AND SCRATCHES TO HEAL QUICKLY																												
	MILK	MEAT & PROD.				FRUIT & VEG (Vit A-rich)			FRUIT & VEG (Vit C-rich)			FRUIT & VEG (Other)									BREAD		FAT		OTHER				
	milk	fish	peanut-butter	meat	eggs	carrots	merobo	spinach	cabbage	oranges	tomato	cauliflower	cucumber	veg	fruit	beetroot	potato	apple	banana	rice	samp	fatty food	oil	non fat food	vitamins	high roughage food	chocolate	don't know
13. To prevent us from getting sick														☻☻	☻		☻											
14. To heal							☻							☻	☻													
16. One shouldn't eat cheese, because it is very fatty and will cause sores on the skin	☹																											
16. Boiled or fried eggs are good for the skin					☹																							
17. To give strength		☻		☻													☻											
18. *Merogo is a starchy food*							☹																					

☻/☹ - each face resembles one response made by any focus group ☻ - science based response ☹ - misconception

TABLE 75 continued

Vitamins, minerals and proteins are needed for maintenance and healing of tissues. Foods from the categories of milk, meat & replacers, and fruit and vegetables are considered appropriate answers (14). The results showed that these were the most popular food choices made. When the total number of responses were calculated, 82.7% (n=67) were from the milk, meat, fruit and vegetable categories. The three fruit and vegetable categories however received the most responses of all (n=59, 72.8%). From the milk product category, only milk was mentioned with positive reasons of general health and milk as a source of vitamins. However, a misconception was revealed as it was noted that milk or cheese should be avoided due to its fat content as this would lead to sores on the skin. In the meat & replacer category, fish was mentioned with regard to general health, and both fish and meat with regard to providing strength. Peanut butter was also mentioned, but no reason for its usage could be provided. Boiled or fried eggs were mentioned as being good for the skin, but no clear reason was provided. In the fruit & vegetable category a large number of foods were mentioned with science based reasons. Spinach, cabbage, cauliflower, cucumber, carrots, merogo and vegetables and fruit in general were associated with making the body strong and healthy; vegetables and apples were mentioned as a source of vitamins; vegetables, fruit and potatoes specifically were eaten to prevent illness; merogo, vegetables and fruit were eaten for healing purposes and potatoes provided strength. Some of these foods, however, were also linked to misconceptions. Spinach, cabbage, cauliflower and cucumber were eaten to heal sores, because they built the body and because they were fat free and would not cause skin eruptions; vegetables and fruit in general aided in healing because it was rich in vitamins, iron and protein and because it restored blood; oranges and bananas gave energy; cabbage, orange, tomato, beetroot, potato and banana were eaten because they built up the body and skin and therefore aided healing; vegetables and apples had protein. Misconceptions in the bread and cereal category were that rice and samp made you healthy and strong and therefore helped to heal sores / scratches. Two of the reasons mentioned did not tie in with the original probe: spinach, cabbage, cauliflower, cucumber and nonfat food were eaten because they were fat-free foods which would not cause weight gain, and merogo was eaten because it was a starchy food. None of these reasons could however be linked with aiding the healing process.

From these results on the foods and reasons mentioned to help heal sores and scratches it was clear that the mothers / caregivers did not really have sound knowledge as to the choosing of foods that would aid the healing process or why these foods in particular should be used. Nutrition education should thus be directed at rectifying this lack of knowledge.

In conclusion: it could thus be stated that the nutrition knowledge of the mothers / caregivers were inadequate. Only some mothers / caregivers in some of the focus groups were able to supply answers concerning nutritious food choices and reasons for these choices for themselves and their children. Mostly mothers / caregivers were unable to identify foods needed for growth, for healthy eyes, to prevent illness, to build teeth and bones, to provide energy and to heal wounds. They were also unable to link nutritious foods to specific functions that they perform in the body. It became clear that mothers / caregivers knew words like starch, vitamins, minerals and protein, but that they did not know the meaning of these terms and applied them incorrectly with regard to the purposes they serve in the human body. Nutrition education is thus essential and should be directed at specific nutrient-rich foods and the functions they fulfill in the body, and how this is linked to a healthy diet for both mother and child.

9.1.2 SAMPLING UNIT: ATTITUDE TOWARDS NUTRITION

The last Sampling Unit deals with the attitudes of mothers / caregivers towards nutrition. As explained previously, the responses were categorized in terms of either science based responses or misconceptions (refer to Figure 15 in Chapter 8). However, some of the responses given by mothers / caregivers did not always reflect the reasons for a specific choice, but rather supported their positive attitude and action towards a specific practice or idea. Results and discussions are presented accordingly. Discussions focused on general health and the association with food, money influencing food choices and about traditions and culture affecting food preparation and food availability for children to get a complete picture of the practice. Attitudes towards nutrition was thus explored by asking questions and probing on health and eating, food and money, and traditions and culture. The three mentioned topics delineated the context within which the data reduction was done and the results will be presented.

9.1.2.1 Health and eating

✦ Do you think that the food you eat is important for good health?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26 100%
No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	00 %
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the mothers / caregivers in all the focus groups in both areas responded positively to this probe (100%). These mothers / caregivers seemed to be convinced that the food eaten was linked to health in some way.

✦ Why do you think that the food you eat is important for good health?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	2	4	3	2	2	2	3	3	2	7	2	3	14	21	35 92.1%
Misconceptions	1	0	0	0	0	0	0	1	1	0	0	0	2	1	3 7.9%
TOTAL	3	4	3	2	2	2	3	4	3	7	2	3	16	22	38

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most of the reasons (n=35, 92.1%) given to this probe could be categorised as science based responses. This question was interpreted by mothers / caregivers that good health was a result of their food practices which they believed to be correct. The answers given could be regarded as indicative of their positive

attitude. Some of the responses concerned general health, like preventing illness, healthy skin, adequate growth, etc. Other responses had to do with the food and perceived nutrient intake, like protein intake, vitamin and protein content of foods and eating fresh foods, indicating that after eating food one felt full of energy / strong. However, some misconceptions also existed (n=3, 7.9%), for instance the belief that any person would automatically eat the correct foods since any person knew what his/her body needed instinctively, or that the person buying the food "automatically" bought the right foods, or that all foods eaten would produce a balanced nutrient intake.

✦ Do you think that it is important to know how to eat healthy?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26 100%
No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the mothers / caregivers in all of the focus groups felt positive about knowing how to eat healthy.

✦ Why do you think that it is important to know how to eat healthy?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	3	3	3	2	2	2	2	3	3	4	3	4	16	18	34 100%
Misconceptions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	3	3	2	2	2	2	3	3	4	3	4	16	18	34

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the groups responded equally and all were science based responses. The responses given could broadly be grouped as attitudes concerning nutritional issues and those concerning general health. The nutrition-related attitudes were about eating foods with a high vitamin and protein content, to avoid eating foods without these nutrients, or eating foods with too much starch, or eating unnecessary foods. Another attitude that needed mentioning was that they believed that if a person did not know which foods were healthy he/she might end up losing weight or becoming sick (i.e. Kwashiorkor). One needed to know which foods were healthy for growing and building the body and which foods were important to eat. The health-related attitudes that featured prominently were that one should know which foods were healthy in order to become strong and healthy and to prevent illness. If healthy foods were not known, it might lead to eating foods that would harm the body. Healthy foods eaten would lead to a long and healthy life.

In conclusion: during the discussion of attitudes towards nutrition, various important themes / topics were

touched on which all contributed to the perceived attitudes. First of all the theme of food and the association with general health became apparent. Three of the probes on attitudes were about the association between food and health. In all three instances similar types of responses were received - all were about either general health-related issues, nutrition-related issues or disease prevention. The general attitude towards food and health was that if people were not ill with disease, the food that they ate were automatically healthy for them and prevented illness. The perception of health and food were different to the scientific view, indicating that specific healthy foods should be eaten in order to have a healthy body (14, 18). Nutrition-related responses mostly dealt with the intake of appropriate quantities of vitamins and proteins in order to be strong and healthy, and to have adequate energy levels, and to live a long life. The main perception on inadequate intakes of nutrients was that it might cause illness, or that it might harm the body in some way. The main misconception in this regard was that the people believed that they did not seriously have to control or check their food intake because they instinctively knew what their body needed and additionally, the person buying the food for the family would "automatically" buy the correct foods, or that all the foods eaten would "automatically" produce a balanced nutrient intake.

All the mothers / caregivers felt that the food eaten had an important association with good health. This attitude was confirmed a few times with various probes. There was a general perception that if a person was healthy (meaning without disease at that moment), the food that was consumed was considered as being healthy. The following responses substantiate this conclusion:

- " Sure it's healthy, because the one that's buying it choose healthy ones"
- "because we eat fresh foods from the garden, like maize, pumpkin, maraka, watermelon"
- "because we're not getting ill"
- "it's because we are healthy and still alive"
- "because the food is healthy - it makes you healthy"

No other reasons could be provided except that if illness was not present, it could be concluded that a person was healthy. Some mothers / caregivers said that foods were healthy because they contained substances which built the body, or which fought the bacteria causing diseases, or which contained vitamins that would prevent illness. To just consume food, was thus considered far more important than the kinds or amounts of foods consumed. Food as a general concept was considered important and not necessarily specific types of foods with their specific functions in the body.

To conclude the description on food and health, some ethnographic descriptions will be presented. Most responses were very generally stated indeed. The responses were categorised according to general responses, food / nutrient based responses and misconceptions, and will be presented as such. Some of the general responses given for associating food and health were:

- "because we are healthy"
- "because we are healthy and strong"
- "the baby is an example of health"
- "we are not losing weight"

- "we grow"
- "our skins are healthy"
- "because our skin is clear"
- "it's because we are healthy and still alive"
- "I don't get any problems after eating"
- "because the food is healthy - it makes you healthy"
- "I just eat what's available when I'm hungry but I have no health problems"
- "because we eat healthy food"

Some of the responses indicated food as being important for health in the sense that it prevented illness. These responses were also very general indeed:

- "because they eat foods that have vitamins e.g. fruits and vegetables, and vitamins prevent you from getting ill"
- "because they are healthy and they are not ill"
- "because we are not getting ill from what we are eating"
- "because I'm not getting sick after every meal"
- "because the foods that she eats will fight bacteria and prevent disease"
- "because I'm not getting ill unless I have eaten something which is not suitable for me (e.g. upset stomach from dirty food)"

The last group of positive science based responses associated the food or food content (nutrient content of the food) with a positive health effect:

- "because they eat foods that have vitamins e.g. fruits and vegetables, and vitamins prevent you from getting ill"
- "it have vitamins"
- "the foods we eat have substances that build the body"
- "because the foods she eating has lots of proteins, e.g. pap "
- "because after eating she feels full of energy / strong"
- "the food have proteins and vitamins"
- "because we eat fresh foods from the garden, like maizes, pumpkin, maraka, watermelon"

Some of the misconceptions regarding the attitudes towards food and health included:

- "sure it's healthy, because the one that's buying it choose healthy ones"
- "they are balanced"
- "because she knows what her body needs"

From the above it became clear that a general concept existed of certain substances being in foods that would be responsible for health, but that their attitudes were not substantiated by nutrition knowledge. Education in this regard is thus imperative as it would guide mothers / caregivers to choose foods for specific reasons and for specific health purposes.

✦ Do you think that a child that looks fat is healthy and well fed?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	1	0	2	1	0	2	0	0	3	0	0	0	6	3	9 23.7%
No	2	3	4	2	2	1	2	2	5	2	2	2	17	12	29 76.3%
TOTAL	3	3	6	3	2	3	2	2	8	2	2	2	23	15	38

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Mixed responses were received to this probe. Most of the mothers / caregivers (n=29, 76.3%) however responded negatively to this question.

✦ Why do you think that a child that looks fat is healthy and well fed?

Positive responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	0	0	1	0	0	1	0	0	0	0	0	0	1	1	2 20.0%
Misconceptions	1	0	3	0	0	1	0	0	2	0	0	0	6	1	7 70.0%
No answer	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1 10.0%
TOTAL	1	0	4	1	0	2	0	0	2	0	0	0	7	3	10

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Only two (20.0%) of the responses given could be categorized as science based responses. Although it was indicated that a fat child is a healthy child, the response also revealed that the child gained too much weight from eating too much food. Secondly, it was stated that the large / fat child was the healthy one that was not contracting diseases like any other thin emaciated child who was always sick with infections. The remaining responses (n=7, 70%) were all based on misconceptions, including the beliefs that fatness was hereditary and healthy, that fatness showed that a mother / caregiver cared for her child, and that fat children ate well and therefore did not become ill and lastly that being fat showed that the child was fed well and therefore was healthy. No positive responses came from two age categories (10-12/12 and 25-36/12 groups). The 4-6/12 group gave the most positive responses, but also most of the misconceptions as well. The mothers / caregivers in the Mathibestad area were responsible for most of the misconceptions and the only misconceptions from the mothers / caregivers in the Makapanstad area came from only the 7-9/12 age groups.

✦ Why do you think that a child that looks fat is healthy and well fed?

Negative responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	1	4	0	1	0	0	2	1	2	1	1	1	6	8	14 43.8%
Misconceptions	0	1	1	2	2	1	0	2	0	3	3	3	6	12	18 56.2%
TOTAL	1	5	1	3	2	1	2	3	2	4	4	4	12	20	32

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Although most of the responses for this probe were correctly answered in the negative (n=32), the majority of reasons given in this regard seemed to be misconceptions (n=18, 56.2%). The misconceptions included statements like looking fat or round was always due to oedema, that a fat body caused poor breathing due to choking ("the fat block her throat"), that obese babies only had fat in their bodies which caused illness, or that the problem with obesity was that it induced laziness. The science based responses (n=14, 43.8%) were generally about obesity being the cause of illnesses and that a healthy baby was of average weight. For this probe more responses came from the Makapanstad area; most being misconceptions. In the Mathibestad area there were equal numbers of misconceptions and science based responses.

In summary: mothers / caregivers were probed about their attitudes towards children being fat and therefore probably healthy. Although most of the mothers / caregivers replied correctly by denying such a belief, they could not verify their response by giving appropriate reasons for it. Mothers / caregivers could only generally state that babies should be of average weight and that overweight might be the cause of illness in the baby. Most of the other perceptions concerning overweight, were misconceptions due to a lack of information. It was believed that most fat babies were not really fat, but had Kwashiorkor, which is characterised by oedema which would therefore make them look fat. This misconception may have been due to inadequate nutrition information on PEM. The other main misconception that existed was that fat children were not able to breathe properly and would get high blood pressure or asthma as a result. These results showed that the mothers / caregivers had been exposed to information associating poor health with obesity, but that they did not understand the rationale as such.

✦ Do you think that the types of food that you eat prevents you from getting ill?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26 100%
No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the mothers / caregivers (100%) in both areas responded positively to this prompt.

✦ Why do you think that the types of food that you eat prevents you from getting ill?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	3	3	2	2	2	2	2	4	2	3	3	3	14	17	31 100%
Misconceptions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	3	2	2	2	2	2	4	2	3	3	3	14	17	31

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the responses provided by the mothers / caregivers in both areas could be classified as science based responses. The mothers / caregivers also responded fairly similarly from all age groups and both areas, with a few more responses coming from the Makapanstad area. Most of the science based responses were general health or nutritional related responses. The responses in the health category were all in a similar trend: the people believed that since they were in good health and not ill with any identifiable disease, the food eaten was regarded healthy, or that the food that they ate did not cause illness and would fight the bacteria. The nutrition related responses included those where some of the nutrients were mentioned as being responsible for health (vitamins), or that the food contained substances that would build the body. It could thus be concluded that very few specific reasons could be given by the mothers / caregivers on this issue. (Also refer to 9.1.2.1 - the discussion on the importance of healthy eating).

✦ Are you willing to eat foods that you have never eaten before?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	2	3	1	1	2	2	2	2	0	2	2	2	9	12	21 75.0%
No	1	0	1	0	0	0	0	0	2	0	3	0	7	0	7 25.0%
TOTAL	3	3	2	1	2	2	2	2	2	2	5	2	16	12	28

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most of the mothers / caregivers (n=21, 75.0%) felt that they would like to try new foods, or foods that they have never eaten before. More positive responses came from the Makapanstad area, but fairly equally from all the age groups in both clinics. Only the 13-24/12 age group from the Mathibestad area did not give a positive reply at all to this probe. Only seven (25.0%) negative responses were given of which most were made by the 25-36/12 age group from the Mathibestad area. No negative responses were made by the 7-9/12 and 10-12/12 age groups.

✦ Why are you willing to eat foods that you have never eaten before?

Positive responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	2	3	1	1	2	2	2	3	0	2	3	3	10	14	24 100%
Misconceptions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	2	3	1	1	2	2	2	3	0	2	3	3	10	14	24

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the reasons presented by the mothers / caregivers to substantiate their positive attitude towards this matter were science based responses (n=24, 100%). Most of the responses could be classified as the mothers / caregivers wanting to improve their eating habits, for instance that they wanted to taste new foods in order to be able to eat it in future, or getting exposed to new foods when the women left their mother's houses to live with their husbands and their families. Some responses indicated the mother's / caregiver's willingness to try new foods in order to introduce more healthy foods into the diet, since a new food might also be needed by the body. It was also stated that a new food should be tasted to determine its suitability as a healthy food. Some responses also indicated availability of food as a reason to try new foods. Lack of money was a restricting factor in trying out new foods. Poor availability of commonly used foods might also lead the mothers / caregivers to try something new.

✦ Why are you not willing to eat foods that you have never eaten before?

Negative responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	1	0	1	0	0	0	0	0	3	0	1	0	6	0	6 100%
Misconceptions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	0	1	0	0	0	0	0	3	0	1	0	6	0	6

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the negative responses given could also be considered as being science based responses. Mostly people would not try new foods due to their lack of knowledge concerning these foods, or a fear of experimenting with new things or in this instance foods (neophobia)(108).

The discussion on attitudes towards trying new foods revealed interesting trends. Most of the positive attitudes towards trying a new or unknown food concerned improving their eating habits:

- "we'd love to taste strange foods, but we don't have money to buy them"
- "to know the taste so that I can eat them next time"

General comments included:

- "you desire it"
- "to know the taste - whether it is sweet or not"
- "because they like to try a strange thing"

Availability of foods also plays a role in the attitudes towards new foods:

- "we will eat something new if there isn't something familiar available due to lack of money"
- "we'd love to taste strange foods but we don't have money to buy them"

Health related attitudes included:

- "want to taste new food because it will also be needed by the body"
- "they want to taste first because they don't know if it is suitable or not"

Some negative attitudes towards tasting unknown foods were however also apparent:

- "it can cause you some disease"
- "because you don't know the effect of the food on you"
- "I can't taste something I don't know - maybe they can cause me some disease"

It was clear from these responses that people mostly had a positive attitude towards trying something new or strange in order to improve their eating habits or health, to discover new tastes or to have something to eat if there was nothing familiar available to eat. The biggest fear of eating new foods was for contracting some unknown disease which could be explained in terms of neophobia (108).

9.1.2.2 Food and money

✦ Do you think that the most foods that you have available to eat are good for you?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	3	3	2	2	2	1	2	2	2	2	2	2	13	12	25 96.2%
No	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1 3.8%
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Only one of the focus groups (n=1, 3.8%) responded negatively to this probe. This group of mothers / caregivers had children in the 7-9/12 age category and were from the Makapanstad area.

✦ Why do you think that the most foods that you have available to eat are good for you?

Positive response

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	3	3	2	2	2	1	2	4	1	4	3	3	13	17	30 100%
Misconceptions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	3	2	2	2	1	2	4	1	4	3	3	13	17	30

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Responses given by all the mothers / caregivers could be classified as science based responses. These responses however varied from general comments to more specific nutritional or health based responses. Some of the general comments included that only food that was well liked was prepared and therefore it was good; that the food eaten satisfied hunger and therefore the body's needs; all food was considered healthy and that they felt healthy and strong. One person also said that she felt she knew what her body needed. Some of the other responses focused on the fact that the mothers / caregivers were not ill as the foods eaten prevented disease. Some of the responses focused more on the nutritional aspects of foods. Some of the responses given were that food was good for you because it provided energy, it built the body and aided in growth and prevented weight loss. These responses confirmed the fact that mothers / caregivers were not really informed or knew about the nutritional content of foods and the functions of these nutrients in the body.

were science based (n=7, 41.2%), including statements of the father needing a lot of food due to hard work and a bigger body. The rest of the statements were culturally induced misconceptions (n=10, 58.8%), including statements like it being the traditional way, due to respect, receiving the privilege of more food due to working for an income for the family.

Negative responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	2	2	1	1	2	0	2	0	1	0	3	1	11	4	15 83.3%
Misconceptions (cultural)	0	0	1	0	0	1	1	0	0	0	0	0	2	1	3 16.7%
TOTAL	2	2	2	1	2	1	3	0	1	0	3	1	13	5	18

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The negative responses given supported the rejection of the culturally accepted belief. Most of the negative responses were from the Mathibestad area (n=13), with only a few responses from the mothers / caregivers from the Makapanstad area (n=5). Both science based responses and misconceptions were given. Most of the responses were however science based (n=15, 83.3%), as they were opposing the cultural practices that existed for a long time. These responses included the fact that it was now considered that everybody should get an equal share, changed cooking habits, females were allowed to eat more meat, children should also be considered and adults did not need to grow anymore. The misconceptions were less in number (n=3, 16.7%), and only covered a few aspects like the opinion that the father should change his buying habits to buy more food so that everybody could eat, or that the love for fathers and children was now considered to be the same as for the rest of the family.

Ethnography

In order to describe the cultural issue of the father or head of the household always receiving the biggest portion of food, an ethnographical description of the data from the focus group interviews was done. Most of the mothers / caregivers approved of this practice, and the reasons given for actually practising this cultural belief could be divided into science based responses and misconceptions. The science based responses included the following:

- "Because he is working so hard he should get the most food (help with the RDP putting in electricity)"
- "For him to be strong and have strength"
- "Because he works hard and gets home tired"
- "Because he is the one who is working for them"

Culturally based misconceptions were apparent and these included the following:

- "It was believed that babies are not supposed to eat meat - only it's gravy"
- "He was the head of the family and if there was meat left, it was left for the father. If the father is not there, it is left for the mother"
- "Because it is the rule"
- "Because we were taught that by our grandparents"
- "It was respect given to him"
- "He must eat too much (most), because he is the head"
- "Because it is our culture"
- "Because he is a man"

The negative responses in this regard were fewer and mostly science based:

- "He should not get more, our needs are the same"
- "We must eat the same portion sizes"
- "Because he is so old he must not eat enough, he must think of the child"
- "If he get the biggest portion, he is going to be too fat"

The misconceptions were more focused against the culture and could thus be considered as anti-cultural:

- "He is not the one who cooked the meal, the one cooking should get more"
- "Because the father doesn't always have money to buy food".

In summary: it became clear from these responses that the mothers / caregivers still believed in and practiced their cultural beliefs; believing that they were the best. It was also believed that the fathers / sons should always receive the biggest portion of protein rich foods. Nutrition education with regard to these practices and beliefs seems essential in order to improve feeding practices and the nutritional status of children in these communities.

It can be concluded that the interpretation of the results on attitudes revealed that the attitudes of the mothers / caregivers were based on misconceptions formed within the specific cultural group and that the attitudes were not based on sound scientific knowledge. If their knowledge on these various subjects is increased, it would probably lead to more positive attitudes towards nutrition and health.

✦ Why do you think that the most foods that you have available to eat are good for you?

Negative response

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1 100%
Misconceptions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The only negative response given was a financially based response. The mothers / caregivers in this group felt that the food that they had available to them was not good for them since they did not have enough money to buy healthy foods.

✦ Do you think that you should have a lot of money to eat healthy?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	1	2	0	1	2	2	1	1	1	1	0	0	5	7	12 46.2%
No	2	1	2	1	0	0	1	1	1	1	2	2	8	6	14 53.8%
TOTAL	3	3	2	2	2	2	2	2	2	2	2	2	13	13	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

This probe received a mixed response. The negative response was given a few more times (n=14, 53.8%) than the positive response (n=12, 46.2%). More groups in the Makapanstad area said that money was essential and more groups in the Mathibestad area said that money was not so important.

✦ Why do you think that you should have a lot of money to eat healthy?

Positive reasons

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	1	0	0	1	0	0	0	2	0	1	0	0	1	4	5 35.7%
Misconceptions	0	2	0	0	2	3	1	0	0	0	0	0	3	5	8 57.1%
No answer given	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1 7.1%
TOTAL	1	2	0	1	2	3	1	2	1	1	0	0	5	9	14

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The responses given by the focus groups for the necessity of having a lot of money were mostly misconceptions (n=8, 57.1%), although some responses were science based (n=5, 35.7%). Most of the reasons given in favour of having a lot of money, concerned the issue of buying power rather than nutritional needs or health, e.g. being able to buy anything that they wanted to and that a lot of money was needed to stay healthy. The science based responses came from various age categories. It was said that healthy foods such as milk, vegetables and fruits were expensive foods to buy, and that you needed money to live and with no money available food could not be bought.

✦ Why do you think that you should have a lot of money to eat healthy?

Negative reasons

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	2	1	2	0	0	0	1	1	1	2	1	2	7	6	13 86.7%
Misconceptions	0	0	0	0	0	0	1	0	0	0	1	0	2	0	2 13.3%
TOTAL	2	1	2	0	0	0	2	1	1	2	2	2	9	6	15

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Most of the responses given were science based responses (n=13, 86.7%) and only a few misconceptions (n=2, 13.3%) were reported. The two misconceptions mentioned were both made by focus groups in the Mathibestad area. They said that one needed to eat a healthy product like merogo or soup only once a week or once a month when you had money available, and that would be often enough. The other misconception was that one could buy anything you want with a small amount of money. The science based responses were mainly about the fact that healthy foods might be just as expensive as unnecessary / luxury items like sweets, etc. It was also felt that if more money was available and a choice needed to be

made, it would have been for the unhealthy nice products. With a little money wisely spent, healthy foods could however also be bought.

In summary: nearly half (46%) of the mothers' / caregivers' attitudes were that a lot of money was needed for them to be able to eat healthy. The concept of a "healthy food" was unclear, however. When these mothers / caregivers were asked why they would need a large amount of money, it was reported that they wanted to be able to buy whatever they felt like eating, for instance "to buy anything that you think is suitable for the body", or "for you to have everything you wish to eat", and " so that if they need something, they can go and buy it". The opposing response, however, strengthened this perception towards purchasing power. The mothers / caregivers said that if more money became available to them or to others in the household, it was usually not used to buy nutritional foods. It was rather used to buy sweets and other unhealthy foods or luxury items without which one could live anyway. The general attitude uncovered was that more money would not necessarily lead to better and more nutritional eating practices as would be expected, but rather to even poorer eating practices. Only one of the focus groups indicated that money was an important issue for their health and that the foods that they ate were not good for them due to a lack of money.

Some of the science based responses given for a lot of money being important for healthy eating, focused on their inability to buy expensive foods such as milk, fruit and vegetables due to a lack of money, as being the restraining factor, while others just said that without money you can not live. Others groups gave valid reasons for money not being the most important issue for healthy eating, e.g. that unnecessary and / or unhealthy foods were bought when a lot of money was available. If only foods that were needed were bought, not a lot of money was necessary. With a little money people would only buy what was good for them. It was also stressed that if a budget was used and if they planned ahead concerning the foods to buy, it was not so important to have a large amount of money. Some of the mothers / caregivers also considered planting their own vegetables and fruits as an option to counteract a lack of money to buy expensive fruit and vegetables in the supermarkets.

Misconceptions regarding money and food was also evident. People thought that a lot of money was necessary for healthy eating in order to be able to buy anything they wanted to eat. Food and money were thus not considered in terms of health, but rather in terms of being able to eat anything wished for, which could in turn be much more detrimental to health. Another misconception was that one could buy anything one wanted with a small amount of money, and that it was not important to eat healthy items every day - once a week or month was quite enough.

From these discussions it became clear that these mothers / caregivers needed some education regarding budgeting for buying healthy foods and wise spending of money on food products. Misconceptions concerning the role of money in healthy eating should be eradicated and people should be empowered to make healthy food choices in order to eat healthy even with the small amount of money available to them.

9.1.2.3 Traditions and culture

✦ Do you think that the traditional ways of food preparation are the best?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	7	3	1	1	2	2	2	4	2	1	2	2	16	13	29 70.7%
No	1	0	6	1	0	0	0	2	0	1	0	1	7	5	12 29.3%
TOTAL	8	3	7	2	2	2	2	6	2	2	2	3	23	18	41

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

This probe resulted in different responses from the different focus groups. Both positive (n=29, 70.7%) and negative (n=12, 29.3%) responses were received from both areas. Positive responses came from all the age categories in both areas, while the negative responses were only made by a few groups.

✦ Why do you think that the traditional ways of food preparation are the best?

Positive responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses (culture)	1	3	0	1	0	1	0	0	0	1	0	1	1	7	8 27.5%
Science based responses (health)	3	0	2	2	3	0	2	2	2	0	2	2	14	6	20 69.0%
Science based responses (socio-economic)	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1 3.5%
Misconceptions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	4	3	2	3	3	2	2	2	2	1	2	3	15	14	29

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The attitude of the people towards food preparation was the driving force for their actions in this regard. All the responses were science based and could be categorized in terms of cultural, health or socio-economic soundness. Although this probe referred to TRADITIONAL practices, only a few culturally based responses were made (n=8, 27.5%). These referred to their culture as being the reason for the practice, the tastiness of the food prepared in this manner or that their mothers taught them the correct ways. These responses were mainly made by the two youngest age categories with most of the responses from the Makapanstad area. More responses (n=20, 69.0%) were received in the health category, where it was referred to as being a healthy way / lifestyle as all the ancestors practised food preparation in this manner

and were in good health. The socio-economic aspect received one response (3.5%) only from one 7-9/12 group in the Makapanstad area. It was said that traditional cooking did not require any expensive food items or ingredients.

✦ Why do you think that the traditional ways of food preparation are the best?

Negative responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses (culture)	1	0	2	2	0	0	0	0	0	1	0	0	3	3	6 85.7%
Science based responses (health)	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1 14.3%
Science based responses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	0	2	2	0	0	0	0	0	1	0	1	3	4	7

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

All the negative responses were science-based and were classified in terms of cultural or health perceptions. The cultural science based responses were most common (n=6, 85.7%). These responses included attitudes towards taste, which was considered boring, or comments on the limited variation in the diet or that the food prepared in this way might be unhygienic and not prepared with acceptable techniques. Only one health-related attitude was expressed in the Makapanstad area. This explained the belief that the food was prepared with incorrect cooking methods thus leading to nutrient loss.

In summary: a probe concerning the traditional ways of food preparation was included in an effort to determine what influence culture had on the eating habits and therefore the nutritional status of the mothers / caregivers. Responses were mostly made about health. Mothers / caregivers with a positive attitude in this regard revealed that the traditional ways of food preparation were the best due to the fact that all the ancestors used it and that they were all healthy and strong and did not become ill. The perception thus existed that if a person was healthy and well, the food that he/she ate was healthy and therefore all the food practices were also healthy and good. Mothers / caregivers with a positive attitude towards cultural practices concluded that people who ate in the traditional ways were healthy and that the traditional ways prevented illness. It was also believed that the food prepared according to the cultural ways was very tasty and did not need any expensive ingredients.

A number of the negative responses focused on anti-cultural practices, indicating that the traditional cultural practices were no longer acceptable as the people were exposed to nutritionally more acceptable methods of food preparation. Some of these unacceptable practices were the boiling of meat in water only, no varied diet, not reading instructions or measuring ingredients and keeping mixtures, e.g. suurpap at a warm

temperature to ferment where it could easily be contaminated as well. The spicelessness and overcooking of foods also seemed to be a problem. Some of these mothers / caregivers were quite prepared to change from the traditional methods to a more varied and less strict approach to food preparation.

Ethnography

Mothers / caregivers were asked to explain or describe their traditional cooking methods. A variety of different methods and dishes were described as the mothers / caregivers were not probed according to a specific food or group of foods. A few ethnographic descriptions are given for different types of foods

Methods for meat preparation included:

- "boil meat in water until soft, add potato, onion, and spices"
- "wash the meat first, then add to water together with tomato, onion and spices all at once, and boil"
- "boil meat and add spices and salt"
- "meat is boiled only in water"
- "vegetables in meat - some add it immediately and others add it later"
- "meat is washed, put in the pot, add salt and water and boil for one hour"

Vegetable preparation techniques were also described in different ways:

- "pumpkin is washed and then boiled in water until soft and add margarine"
- " 'semphemphe' is a dish made from a vegetable that looks like a watermelon on the outside and is yellow and soft on the inside. It is peeled, boiled, and mixed until smooth (take all the hard bits out). Maize meal is added, it is boiled again and sugar is added"
- "'sephuru' is a dish made from beans (small brown beans). Boil until soft, mash it, pour maize meal, boil it again, cool it, make cakes and eat it like bread with tea"
- " 'ditloo' is very similar to green beans but it tastes different. Samp and peanuts and beans are mixed and eaten for supper"
- " 'leraka' is a dish eaten for breakfast which is very similar to Ditloo"
- "pumpkin is boiled with water only"
- "dikgobe ' is dry maize kernels which is boiled first, and then fried with salt and a little bit of water and stirred until it is brown"
- "fresh merogo is boiled, dried, then cooked with tomato and onion"
- "pumpkin is cooked with potato"
- " 'dithotse' - this is the beans that come from the pumpkin, we fry them with oil and pour salts and then you eat them with pap",
- " 'dinawa ' - brown beans. You can make soup or samp",
- "merogo is eaten fresh or dried".

A lesser variety of techniques for starchy foods was mentioned as the maize meal was mostly used to prepare pap ("bogobe") in a variety of consistencies. Other methods included:

- " 'ting' or 'suurpap'. Maize meal is mixed with 2 cups of boiling water and 4 cups of cold water. Close it with a lid and leave in the sun for one day. It's quicker when a metal tablespoon or a potato is added to the mixture"
- " 'motswiwtlane ' (suurpap)"
- "the maize meal is washed before cooking"

Other descriptions were more general in nature, and described only the meal patterns or general items prepared:

- "lots of variety was included in the diet, for example 'leraka' for breakfast and 'semphemphe' for supper, but nowadays there are less variety - we eat mostly only pap"
- "the modern way of cooking is to cook food only for a certain period of time to retain more vitamins and not till it is very soft"
- "the food is boiled in water - no spices are added"
- "moro wa phiri' (hyena's soup) - you mix water with salts and chillies, than you eat it with pap"
- "sometimes when we dry food, germs goes there"

✦ Should a father or head of the house always get the biggest portion of food?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	2	1	2	1	1	1	2	6	1	6	1	2	9	16	25 69.4%
No	1	2	0	1	1	1	0	1	1	1	1	1	4	7	11 30.6%
TOTAL	3	3	2	2	2	2	2	7	2	6	2	3	13	23	36

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

Traditionally the father and older sons had the first right to the protein-rich food and thus received the biggest portion since the father is the head of the household and the oldest (38). The perception of the mothers / caregivers towards this issue was examined by means of this probe. The results showed that this tradition was still practised and considered important (n=25, 69.4%). All the focus groups responded positively towards this issue with most of the responses coming from the 10-12/12 and 13-24/12 age groups. However, some of the mothers / caregivers (n=11, 30.6%) felt that this tradition was really old-fashioned and should not be practised any more.

✦ Why should a father or head of the house always get the biggest portion of food?

Positive responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	0	0	0	1	0	2	1	2	0	2	0	2	1	9	10 38.5%
Misconceptions (cultural)	4	0	4	0	1	1	2	0	1	1	2	0	14	2	16 61.5%
TOTAL	4	0	4	1	1	3	3	2	1	3	2	2	15	11	26

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The responses on this probe could be divided between science based responses and misconceptions due to cultural beliefs. The science based responses (n=10, 38.5%) were less common in all the focus groups. All the groups, except the 0-3/12 group, gave science based responses, but nearly all came from the Makapanstad area with only one science based response from the Mathibestad area. The science based responses were about energy utilization, referring to concepts like working hard, being strong and healthy and tiredness due to hard work. The misconceptions were more common and much more diverse (n=16, 61.5%). It was interesting to note that most of the misconceptions were from the mothers / caregivers in the Mathibestad area (87.5%). The misconceptions due to cultural beliefs concerned issues like the father being the head of the family, that it was a cultural rule to give the father the biggest portion, and the fact that babies should not eat meat but only the watery gravy.

✦ Why should a father or head of the house always get the biggest portion of food?

Negative responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	1	2	0	0	0	1	0	0	1	0	1	1	3	4	7 77.8%
Misconceptions (cultural)	0	0	0	1	1	0	0	0	0	0	0	0	1	1	2 22.2%
TOTAL	1	2	0	1	1	1	0	0	1	0	1	1	4	5	9

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The science based responses were more common in the negative responses to this probe (n=7, 77.8%). Two of the focus groups (22.2%), however, did not give a science based response at all (the 4-6/12 and 10-12/12 groups). The science based responses were mainly about the fact that all adults had the same needs and therefore one person should not necessarily get more of one kind of food than the other, and that the men abused this practice by just taking all the meat. It was accepted in these groups that everybody should get equal portions and that overeating of one kind of food item could lead to obesity. The

only two misconceptions came from the 4-6/12 and 7-9/12 groups, one from each area. These misconceptions could also be classified as being anti-cultural. These included beliefs that the person that cooked the food should get more, or that the one who bought the food should get the most. These were in contrast to the science based responses which actually considered the health of the child.

✦ Do you think that this is the correct way?

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Yes	0	2	0	1	0	1	0	2	1	2	0	2	1	10	11 37.9%
No	3	1	2	2	2	1	2	0	1	0	2	1	12	6	18 62.1%
TOTAL	3	3	2	3	2	2	2	2	2	2	2	3	13	16	29

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

More of the mothers / caregivers reacted in a negative manner (n=18, 62.1%) than with the first probe (n=11, 30.6%). This might indicate that although some of the mothers / caregivers were practising this cultural belief, they did not necessarily think that it was the right thing to do. Only a small number of the focus groups (n=11, 37.9%) indicated that they really believed that this practice was correct and acceptable whereas with the first probe more groups were positive (n=25, 69.4%).

✦ Why do you think that this is the correct way?

The mothers / caregivers were probed about the abovementioned cultural belief. The mothers / caregivers all reacted to this probe as if this belief was still widely accepted and practised in this community. Their positive or negative responses thus regarded their attitudes towards this cultural practice under discussion namely the father receiving the biggest portions of food or the only meat available. Both the positive and negative responses drew practically equal responses (17 positive and 18 negative).

Positive responses

DATA CATEGORIES	RESPONSES PER AGE CATEGORY (months)														
	0-3 n=6		4-6 n=4		7-9 n=4		10-12 n=4		13-24 n=4		25-36 n=4		CLINICS - TOTAL RESPONSES		
	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	MT	MP	TOT
Science based responses	0	0	0	1	0	0	0	3	0	1	0	2	0	7	7 41.2%
Misconceptions (cultural)	0	0	0	0	0	1	0	4	0	2	0	2	0	10	10 58.8%
TOTAL	0	1	0	1	0	1	0	7	0	3	0	4	0	17	17

DIFFERENTIATED BY CLINIC: MATHIBESTAD = MT ; MAKAPANSTAD = MP

The positive responses, thus supporting the previous positive belief towards implementing this cultural belief, came exclusively from the mothers / caregivers in the Makapanstad area. Some of these responses

CHAPTER 10

EXECUTIVE SUMMARY AND RECOMMENDATIONS FROM THE QUALITATIVE AND QUANTITATIVE RESEARCH

CHAPTER 10 EXECUTIVE SUMMARY AND RECOMMENDATIONS FROM THE QUANTITATIVE AND QUALITATIVE RESEARCH

"People cannot be developed, but can be supported to develop themselves" Kavishe (1995:371)(109).

10.1 BACKGROUND

This research study was undertaken to obtain baseline data on the nutritional status and feeding practices of two rural communities. Two health care clinics in the Moretele District in the Hammanskraal area north of Pretoria were identified for the investigation. Children between the ages of naught to 36 months, who were visiting the baby clinic with their mothers / caregivers, were targeted.

This exploratory investigation can primarily be described as cross sectional, prospective and descriptive in the qualitative and quantitative research domains. The study aimed to examine, explore and describe the feeding practices of the studied children and to determine whether or not malnutrition existed in the identified communities. The results of the investigation could be used to substantiate recommendations aimed at the improvement of the feeding practices and the nutritional status of the children, if and where applicable.

Two health care clinics, the Makapanstad and Mathibestad clinics, within the Moretele district / Hammanskraal area which is approximately 45 kilometres outside Pretoria, were identified as ideal for the purpose of the study. These clinics were situated in the non-urban more rural part of the district, approximately 30 kilometres outside the Hammanskraal-proper town area. Individual interviews, using structured questionnaires, and anthropometry were done in the quantitative research domain, and structured focus group interviews in the qualitative research domain. The research was conducted by the researcher and two field workers from September 1995 to March 1996. The two field workers/interviewers (one per clinic) of the same ethnicity as the study group were used to overcome the cultural, literacy and language problems associated with cross cultural research. Convenience sampling was used to draw the sample from mothers / caregivers and their children (six age categories) that visited the baby / child or immunisation clinic on a Tuesday morning in the two areas. Incentives (food parcels), for participating in the research study, were handed out.

Descriptive statistics were done on the quantitative data and the data were presented as frequencies, means, standard deviations and percentages. Inferential statistics were done to test for differences between the two clinics. Content analysis and ethnography were used to analyze the qualitative data. Systematic coding of data as part of the content analysis produced numerical descriptions, while ethnography provided descriptive data / results.

This research study was in line with the conceptual framework and "Triple-A Approach" for addressing malnutrition, which has been adopted as a general developmental strategy (109) (see Chapter 3). The conceptual framework is based on the UNICEF-framework (see Figure 5 in Chapter 3) which is useful in reflecting the many dimensions of the malnutrition problem. It also encourages understanding of the ethical and scientific positions which it encompasses and emphasises good nutrition as an outcome of food security, health and care (109, 110). The

"Triple-A approach" (see Figure 16) is a cyclic process of assessment of the situation, analysis of the problem, and action to solve the problem(s) (12, 32, 109, 110).

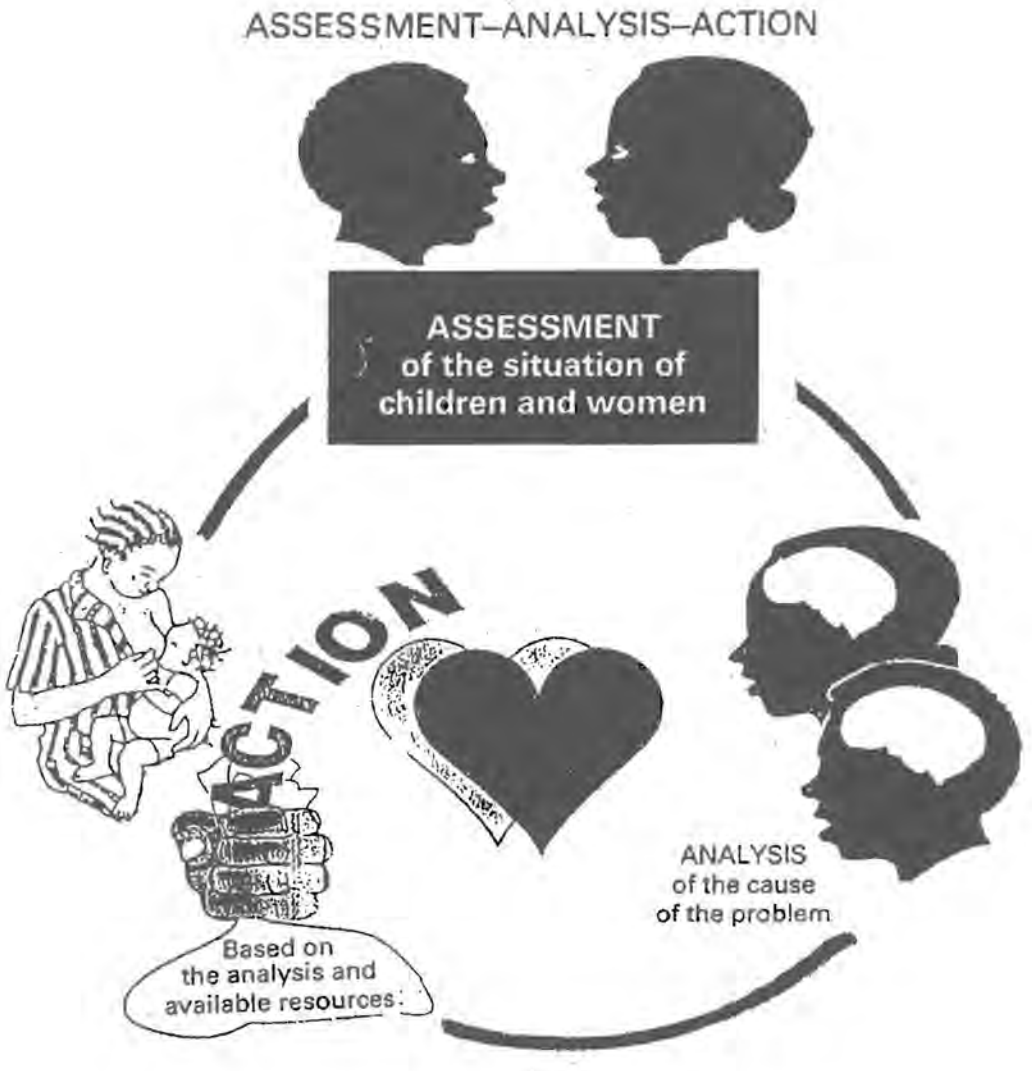


FIGURE 16: "TRIPLE-A" CYCLIC PROCESS OF ASSESSMENT, ANALYSIS AND ACTION USED IN THE DEVELOPMENT OF THE NUTRITION STRATEGY APPROACH TO ADDRESSING MALNUTRITION (109).

The "Triple-A approach" provides a good basis for adaptive programming, which is essential in dynamic situations, and it also indicates where resources should be allocated for maximum quality and impact. The cyclic process avoids delays in taking action and focuses better on each (i.e. assessment, analysis and action) (109, 110). The process uses nutrition information at community level which in turn enables the community to analyse their own problems and utilize their own resources more effectively. It therefore facilitates "adaptive coping" processes, and put the community in control of their own situation, which is an essential ingredient of programme ownership (23, 38, 109). The ultimate aim being the creation of behaviour conducive to nutrition improvement up to the national level by each individual from the household and will help to improve and support care practices (109, 110).

The methodology of the research can be depicted in the "Triple-A approach" (see Figure 17); for the conceptual framework of this research study refer to 4.3.1 in Chapter 4.

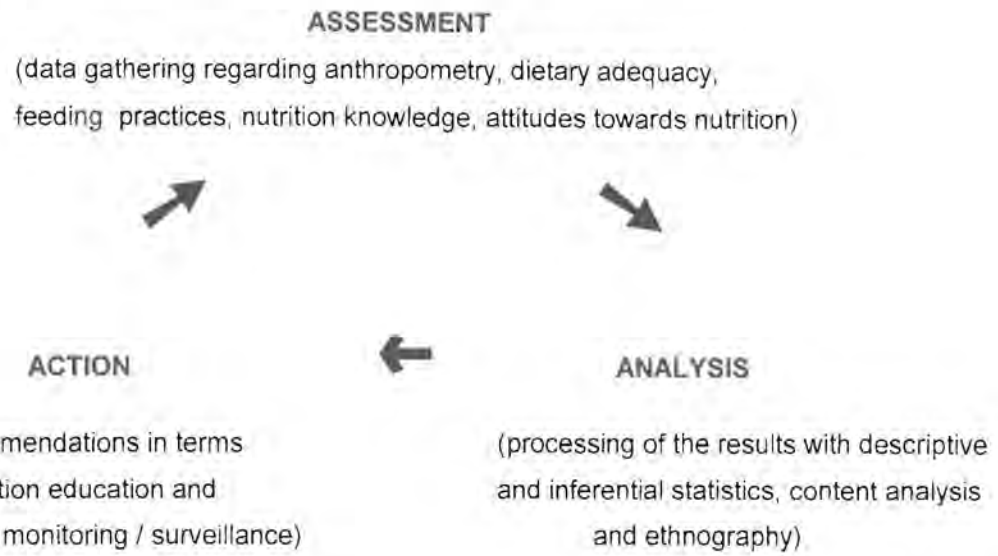


FIGURE 17: RESEARCH METHODOLOGY DEPICTED IN THE TRIPLE-A APPROACH

The community was involved in the assessment as they were willing to participate and provide the information needed. The focus group interviews provided a rich source of data which enabled the researcher to describe the current situation. The analysis of the data provided a description of the communities and their nutrition related problems; however no fundamental analysis was done. The action part of the approach flows directly from the quantitative and qualitative analysis and culminates in two recommendations which could probably aid in solving and preventing current and future nutrition problems (refer to Figure 17).

10.2 RESULTS AND RECOMMENDATIONS

The summary, conclusions and recommendations will be presented according to the objectives of the research study (see Chapter 4).

10.2.1 QUANTITATIVE RESULTS

10.2.1.1 Anthropometry

The **first research objective** addressed within the **quantitative** research domain was:

> "What is the nutritional status of children (0-36 months old) in the Moretele district with reference to the weight-for-height, the weight-for-age and the height-for-age ?"

An anthropometric history was compiled for each child in the sample. Current values were obtained by actual measurements during the individual interviews and the previous data were obtained from the mother / caregiver or the growth chart. The actual measurements served as the

end point of the history with the birth data as the starting point. Calculated averages are reported.

Weight The results for weight showed that the weights of the children of both sexes increased in the first three years of life. At the age of three years the children's weights were on the same percentile as their birth percentile (or even higher), thus indicating that wasting (low weight-for-height) seemed not to be a serious problem in this community (21, 95). However, at the age of 12-24 months there was a slight decline in the percentile curve. The children from the Makapanstad area mostly had lower weights than those in the Mathibestad area. This corresponded with previous research findings indicating that wasting occurred only in a very small percentage of children in South Africa (5). The South African Vitamin A Consultative Group (SAVACG) also reported that wasting was less prevalent than stunting (111).

Length The children from the Makapanstad area showed an initial increase in length (according to the growth percentiles) with a slight decline in the 12-24 month period. However, it recovered to the birth percentile (girls) and to the fifth percentile (boys). The Mathibestad area children had stature problems with the most severe decline in the 12-24 month age groups. At the age of three years the girls' lengths almost recovered to their birth percentile, but the boys' lengths remained below the fifth percentile. These values indicated a lower than normal height-for-age (stunting), but should be interpreted as sub-optimal growth rather than pronounced stunting (21, 95). This finding differed from previous findings indicating pronounced stunting among three to five year old black children (5). However, Steyn et al (5) also reported that the prevalence of stunting was greater than that of underweight, which is similar to the pattern of growth in the children in this study group. SAVACG reported a similar pattern of growth for children aged 6-71 months in a national South African survey, where one in four children was stunted and one in ten children was underweight (111). It was reported that the prevalence of stunting (23% or one in four children) peaked in the 12-23 month group which is similar to the findings in this study group (111).

Head circumference These results appeared to be more favourable in the Makapanstad area than in the Mathibestad area. The measurement of the boys and girls from the Mathibestad area followed the growth curve up to the age of six months. Thereafter the curves flattened out considerably to below the fifth centile. The measurements of the boys recovered to the 25th centile, but that of the girls remained below the fifth centile. The measurement of the boys and girls from the Makapanstad area followed their initial growth curve well, but both groups also showed a decline in the 12-24 month age period. However, at three years of age the average measurement was either similar to the birth percentile or even higher.

Weight-for-height These percentiles showed less dramatic results. Children from the Makapanstad area showed a growth curve similar to the percentiles. Abnormal percentiles were more evident in the children from the Mathibestad area. Both sexes had higher weight values relative to their growth in length, which is an indication of lower growth in height. A normal weight-for-height indicates either normal or stunted growth (6, 95).

In conclusion: it appeared that the children in both areas grew according to their birth percentiles. At the age of three years they were very close to their birth percentiles for weight and head circumference. For length the average measurement was lower than the birth percentile, and the weight-for-height was higher than the birth percentile. The abnormalities reported in the growth pattern seemed to occur at a similar stage in the life of the child, namely between the ages of 12-24 months, peaking at 18 months. These results corresponded with previous research done in South Africa (112) and could probably be associated with changes in the food intake which impacts the growth profile at this specific time in the life cycle; e.g. the sudden almost complete exclusion of milk from the diet, and / or the lack of other sources of high biological value protein in the diet. It was found that the children in these groups were initially not allowed to eat much additional protein like meat, due to the fact that it was culturally believed to cause worms (see qualitative results: 9.1.1.3 in Chapter 9) (12, 107). Inappropriate feeding practices, like too early introduction of solids, giving solid food before breast feeding and infrequent consumption of micronutrient rich foods might also have contributed to the poor growth pattern (111). This pattern of growth confirmed the theory on the weanling's dilemma (8, 12, 13, 63), which is associated with poor growth occurring at the age of six months to two years whereafter the nutritional status stabilizes again (8, 12). The growth pattern appeared to be worse in the Mathibestad area indicating more growth faltering, although pronounced wasting and stunting were not found.

10.2.1.2 Dietary adequacy

The **second research objective** addressed within the **quantitative** research domain was about the feeding practices of the children:

> "How nutritionally adequate is the diet of children (0-36 months old) in the Moretele district?"

A detailed 24-hour recall of usual food intake was done for each child (in terms of types, methods, portion sizes). The food intake data were coded as previously described and analyzed by means of a software program (Foodfinder)(129)(see Chapter 5). The nutrient calculations were compared to both the RDA (1989) and WHO dietary reference standards.

Energy and all the macronutrients were consumed in adequate quantities. The protein intake (10-11% of total energy intake) compared well with the research findings of Steyn et al (5)(15%), Walker (17)(10-14%) and Van Staden et al (101)(13%) in black rural communities; the carbohydrates (67-75% of total energy intake) to that of Steyn et al (68%)(5), Walker (65-80%)(17) and Van Staden et al (50-54%)(101); and the fat (21-25% of total energy intake) to Steyn et al (19%)(5), Walker (10-25%)(17) and Van Staden et al (35-39%)(101). The main recommendation would be to decrease the intake of starch rich foods to 60-65% and to increase the animal / plant protein intake. Emphasis should be on the sources of protein in the diet, focusing on high biological value proteins that would be affordable to sustain growth and development.

The vitamin A intakes were adequate except for the 13-36 month age groups (both areas) who had an inadequate intake. The intake of iron-rich foods was fairly low, but still adequate if fixed cut-off points were implemented in the RDA-analysis. The research findings of Van Staden et al (101) confirmed that 70-80% of their study group had iron intakes lower than 67% of the RDA, and SAVACG(111) found a high prevalence of anaemia and poor iron status in the national South African survey. The South African National Nutritional Status Study Group (SANNSS) also reported that the intake of iron was low in population groups vulnerable for iron deficiency, namely young children, adolescent girls and women (113). It may, however, be of value to consider the sources of iron consumed in these communities. Intakes should be evaluated in terms of the bioavailability of iron (14), as most of the diets were composed of low bioavailable iron sources like cereals, as well as containing polyphenols (tannins in tea) which inhibit iron absorption (7, 114). The intake of zinc was also low in all the age groups according to both sets of standards. SANNSS (113) similarly found that the zinc intake was low in all population groups of all ages.

The intakes of the other micronutrients were adequate (in terms of both sets of standards) except for vitamin B_3, vitamin D and calcium. Niacin intakes were either low or just above the fixed cut-off level RDA (reference standards). It may be of value to look into the niacin intakes of the children in these communities, and to ensure that adequate niacin is consumed in all age groups, due to the fact that pellagra is still found in countries where corn/maize is a major staple, such as South Africa (35).

Vitamin D was consumed to a level of about 35% of the reference value, which indicated a very low food intake. Generally this is not considered a problem due to the high sunlight availability in SA. But it must be taken into consideration that the dark pigmentation of the skin (similar to the children in this study group) may prevent sufficient ultraviolet light from penetrating the skin (14). The vitamin D status of these children needs to be evaluated more closely to prevent rickets or osteomalacia that could occur at a later stage in their lives.

The calcium intake should be considered in conjunction with that of vitamin D. The calcium intakes hardly reached a level of 50% of the reference values in all age groups. This finding confirmed previous research findings of poor calcium intakes (39-48% with intakes <67%RDA)(101), low milk intakes (7), and low calcium intakes in black rural and urban settings due to infrequent consumption of milk and milk products (113). For infants and children vitamin D is an essential vitamin that ought to be present in the body to absorb and use calcium effectively (14). If both calcium and vitamin D are continuously deficient, rickets (reduced bone quality and normal bone quantity), reduced growth or osteomalacia may result eventually. It is therefore imperative to give attention to the intakes of iron, zinc and calcium and vitamin D) on the whole in these communities as they play such an important role in growth (114). Even though the protein and kilojoule intakes were sufficient, it was only marginally so. For growth to occur optimally, all the nutrients implicated in the process need to be present simultaneously (14).

10.2.1.3 Food security

The **third research objective addressed within the quantitative** research domain dealt with the feeding practices of the children:

"What are the mothers / caregivers perceptions of hunger and food security with reference to the household, themselves and their children?

The adapted Radimer hunger scale (42, 48) was implemented to evaluate the food security of the mothers / caregivers. Each mother / caregiver completed a hungerscale questionnaire during the individual interviews. Household hunger, as well as the individual hunger of the mother / caregiver and her child was evaluated. Three response categories, namely "never", "sometimes" and "most times", existed as possible options.

A summary was compiled from the mean responses in each subtype of hunger in order to present an overview on food security / insecurity (Table 78). For example in the household hunger category five questions were asked. The responses, indicating the worst scenario ("never", "sometimes" or "most times"), were summated and a mean value for each scenario was calculated.

TABLE 78: SUMMARY OF THE RESPONSE RATES OF THE TWO CLINICS CONCERNING THE DIFFERENT TYPES OF HUNGER ON THE HUNGER SCALE

TYPE OF HUNGER	RESPONSE RATE (%)					
	WORST SCENARIO		INTERMEDIATE SCENARIO		BEST SCENARIO	
	MP	MT	MP	MT	MP	MT
HOUSEHOLD HUNGER	46.59	15.95	29.41	54.16	24.00	29.89
WOMEN'S HUNGER	60.68	24.72	23.24	45.23	16.08	30.05
CHILDREN'S HUNGER	65.79	33.43	17.70	42.70	16.51	23.87
TOTAL HUNGER (MEAN OF THREE HUNGER TYPE MEANS)	57.69	24.70	23.45	47.36	18.86	27.94

DIFFERENTIATED BY CLINIC: MAKAPANSTAD = MP; MATHIBESTAD = MT

It can be concluded that the mothers / caregivers from the Makapanstad area responded more often to the worst possible scenario in each of the three categories on the hunger scale. The mothers / caregivers from the Makapanstad area could be perceived as being food insecure to a percentage of 57.69% (mean of the responses to the worst scenario [food insecurity] for each question for all three hunger types). The perception of the prevalence of children's hunger was the highest (65.79%), followed by women's hunger (60.68%) and household hunger (46.59%). This is different to the findings of Radimer(1990)(60) and Keane & Willetts (1994)(68), indicating that when money is tight in a family situation, parents (specifically the mothers) would frequently go without food (becoming food insecure) to ensure that their children are fed.

The mothers / caregivers from the two clinics responded significantly different ($P<0.05$) to the

questions in the three categories. The mothers / caregivers from the Mathibestad area could be perceived as being food insecure to a percentage of 24.70% (mean of the responses to the worst scenario [food insecurity] for each question for all three hunger types). In this area the perception of the prevalence of children's hunger was the highest (33.43%), followed by women's hunger (24.72%) and lastly household hunger (15.95%). The results from the Makapanstad area revealed a similar tendency; the frequency rates however differed and food insecurity appeared to be worse. However, anthropometrically the children from the Makapanstad area were less affected as their growth profile appeared to be better than that of the Mathibestad area children, and nutritionally their dietary evaluation did not show a significant difference.

The results from the hunger scale should however be interpreted with caution. The hungerscale was used on a totally different cultural and language group as the standardization group (48). Uncontrolled, even uncontrollable misunderstanding and / or difference(s) in interpretation of the questions could influence the results. These results however could be regarded as indicative of existing perceptions regarding food security in the two communities.

10.2.2 QUALITATIVE RESULTS

Focus groups were used to discuss various aspects concerning feeding practices and nutritional knowledge and attitudes. A structured interview schedule had been developed, including six major topics on nutrition of the child. Four topics covered the feeding practices and two topics the nutrition knowledge and attitudes towards nutrition. All the questions / probes included in the interview schedule were identified from the literature as being appropriate to best explore the feeding practices, nutrition knowledge and attitudes towards nutrition of the mothers / caregivers included in the study group. Content analysis and ethnography were used in the analysis of data.

10.2.2.1 General knowledge on infant feeding and health

Many of the responses given by the mothers / caregivers were restructured into physical units referring to the micro environment and meso environment. An interesting observation was that the responses referring to the micro environment (own experiences) mostly came from the Makapanstad area, and that the responses referring to the meso environment (clinic) mostly came from the Mathibestad area. This supported the observation that the mothers / caregivers from the Mathibestad area made more use of the clinic. This observation was further supported by the fact that the mothers / caregivers in the Mathibestad area practiced the weaning age (three months) as recommended by the clinic staff correctly, in contrast to the mothers / caregivers from the Makapanstad area who used a variety of weaning ages. Weaning / introduction of complementary foods was usually not started before the age of three months.

Breast feeding was the choice feeding that most mothers gave to their newborn babies. Bottle feeding was only given in cases where breast feeding was physiologically or clinically impossible. It became evident from these general discussions that mothers / caregivers were not fully informed

on the advantages and disadvantages of bottle feeding, since they did not consider bottle feeding as a financial burden (11.8%) when implemented. Formula powder was used by these mothers / caregivers, though not as bottle feeding, but scoops of formula powder as such were added to the soft porridge of the babies.

The importance of the clinic to the people in the community was noticeable. It was stated clearly that the people went to the clinic to get help if their children were sick with any type of illness, as the purpose of the clinic was to help cure diseases. When a child became sick, mothers / caregivers would implement the knowledge gained from the clinic first, but if these curative measures (like "motswako") did not take effect, the general practice was to take the child to the clinic for other medical treatment. The credibility of the clinic staff in terms of information received with reference to baby feeding was very high. All the mothers / caregivers had a highly positive view of the clinic in their area and they felt that the information gained from the clinic was useful and made them knowledgeable on previously unknown matters. It could be concluded that the clinics played an invaluable role in the communities and that they could be used positively to train the staff even more in terms of health care practices and nutrition. They could then train the mothers / caregivers of the children during their clinic visits to get them involved in the health care of their children. This is important as most of the mothers / caregivers did not consider nutrition or the actual food intake behaviour as being important in evaluating the health status of their babies. No consideration was given to the type of foods, variety, nutritional value or quantity of foods given to the child. Only the general appearance of the child and the weight measurements recorded on the growth chart during clinic visits were considered as important indices of good nutritional status. Education regarding general baby care, the growth progress of babies, their nutritional needs and food intake behaviour could benefit the nutritional status and general wellbeing of communities.

10.2.2.2 Breast feeding

The **first research objective** addressed within the **qualitative** research domain was about the feeding practices of children:

"What are the breast feeding practices of mothers in the Moretele district?"

Initiation of breast feeding was discussed at length by the focus groups. It was concluded that the mothers / caregivers from the Makapanstad area experienced a delay of one or more days in the initiation of breast feeding (due to a perceived lack of milk as colostrum was not viewed as milk), while the mothers / caregivers from the Mathibestad area were implementing breast feeding within half a day after the birth of the baby. This is similar to the research findings in KwaZulu-Natal and in the Western Cape, where breast fed infants were only put to the breast for the first time the day after birth (112).

Information on the duration of breast feeding sessions remained vague. Mothers / caregivers could not tell how long a child was breast fed during each session. Obtaining accurate breast milk intakes in these communities were thus very difficult. This was similar to the results obtained from

the quantitative questionnaires (24h-recall of food intake)(see 7.3 in Chapter 7). Mothers / caregivers were not concerned about the volume of milk taken in by the baby during breast feeding, but rather with the happiness and physical appearance of the child. The child received breast feeding for several reasons: to stop crying, to quench thirst, to feed, to be put to sleep. If the breast feeding alone would not keep the child happy, food was immediately added to the milk feeds.

All the focus groups responded positively to giving the baby something to eat / drink together with breast feeding. Exclusive breast feeding was rarely practised in these communities which is similar to previous research findings (115, 116). Babies were mostly given additional food / drinks about three times per day. Most mothers / caregivers indicated that the ideal time of the day to give a baby something additional was after a breast feeding session. The age of three months was indicated as being the appropriate age for the introduction of solid foods. A total of 63% of mothers / caregivers gave solid food to their babies between the ages of two and three months, and a mixed family diet by the age of 7-9/12. It can be concluded that mothers / caregivers were adding foods to the diets of their small babies far too soon and mostly unnecessarily.

Recommendations from this research study concerning breast feeding is that a nutrition education program in this regard should be developed and implemented. It is of the utmost importance to make the mothers / caregivers attentive of the value of breast feeding to the child, and to refine the actual practices. Nutrition education, concerning the value of initiating breast feeding soon after birth, exclusive breast feeding, the value of a specific breast feeding routine, ad lib breast feeding (various purposes), the correct age to add complementary foods with the correct reasons for it, the nutritional value and functions of specific foods in the diets of babies and the weaning procedure, is recommended (14, 35).

10.2.2.3 Bottle feeding

The **second research objective** addressed within the **qualitative** research domain was also about the feeding practices of children:

"What are the formula feeding practices of mothers / caregivers in the Moretele district?"

It was clear from the discussions in the focus groups that the mothers / caregivers involved in this research study preferred breast feeding over bottle feeding. The reasons given dealt mainly with the physiological suitability of the feed. Hygiene was also mentioned as a concern / or reason to avoid bottle feeding. Some of the reasons given for giving bottle feeding to a baby were acceptable (illness and breast illness) and were medically / clinically substantiated. Some of the other reasons mentioned, however, were unjustifiable (free choice, perceived lack of milk, low milk production).

Cow's milk was seldomly used in bottle feeding. Reasons why cow's milk was not used, was mainly twofold: not being of a suitable composition and being unpasteurized. The conclusion was made that some mothers / caregivers misinterpreted the term "cows' milk" as that one should have

one's own cow to milk, hence the concern about pasteurization and the reported reaction that they did not own any cows.

Formula milk and full cream milk powders were frequently used by the mothers / caregivers. The preparation of bottle feeds was also investigated. The source of information for mixing procedures seemed correct and adequate (reading instructions from the tin), but the actual mixing method practiced was questionable. Only about half of the recipes reported were of the correct/ideal measurement (one scoop of formula per 25mL water). Two-thirds of the remainder of recipes reported were too weak and a third were too strong, therefore altering the quality of the feed. In both instances the mothers / caregivers were unaware of the consequences of the over dilution / under dilution to the child. Further investigation into the reasons for making feeds either too weak or too strong is indicated.

Choosing the ideal type of feed for a baby is an issue that each mother has to address when she is pregnant. It is thus very important to inform all mothers / caregivers of the choices available, the situations indicated for the use thereof, as well as about the advantages and disadvantages of each (14, 117). If it is unavoidable to introduce bottle feeding, mothers / caregivers should be informed about the appropriate choice and the correct mixing procedures. However, knowing the correct mixing procedure, will not necessarily lead to it being practiced. Knowledge is just one part of the decision making process; the mother's / caregiver's values, experiences and problems are part of the process (118).

Recommendations concerning bottle feeding are that a clients-centered interactive nutrition education program should be implemented. With interactive nutrition education the learners share their problems, knowledge and experience with the other group members (118). When feeding practices are discussed, issues such as breast feeding or bottle feeding problems would be addressed. Ultimately such an educational training program would aid in the advancement of proper breast feeding practices and avoidance of introducing bottle feeding. Training of the clinic staff on these issues would be the ideal approach. They could in turn become educators / group facilitators responsible for the education of the mothers / caregivers who have to introduce bottle feeding (118). Other topics that should be included are: the suitability, advantages and disadvantages of all the available feeds, proper training on mixing procedures and problems with over dilution or under dilution of feeds, hygiene practices, purifying water, ideal handling techniques and the keeping of leftover feeds.

10.2.2.4 Weaning

The **third research objective** addressed within the **qualitative** research domain was also about the feeding practices of children:

"What are the weaning practices of mothers / caregivers in the Moretele district?"

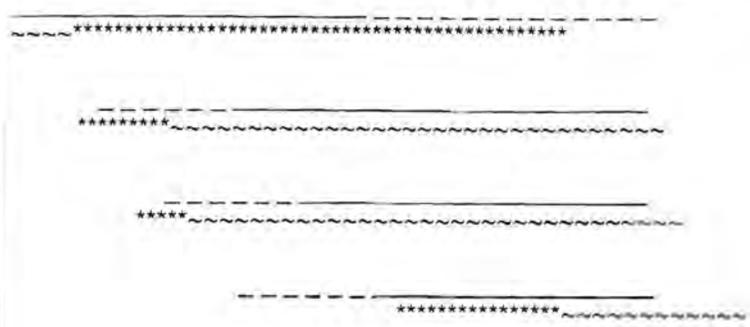
Mothers / caregivers did not know the reasoning behind the sequence for the introduction of solid foods into the diet of the baby. Vague reasons were given and a lot of misconceptions were reported. Soft porridge was mostly given to babies due to its soft texture, its satiety value, its perceived nutritional value and its availability. It seemed that the food for children was often overcooked; usually with a lot of water in order to achieve a soft textured product. The maize meal was washed and thinned with water and also boiled for a long period of time. With continual washing and adding of water a very soft textured product was achieved. This finding supported previous findings which indicated that traditional starchy staple porridges were usually diluted with water to achieve an appropriate consistency, but which consequently compromised the nutritional intake due to the decreased energy density of the food (12, 13, 64, 66).

A few additions were made to the food of the children. Margarine and formula powder were mostly added to the soft porridge. This practice should be encouraged as margarine could improve the kilojoule content of the child's diet and the formula powder could improve the protein and micronutrient content of the diet. The volume of milk drunk by these children when weaned was poor. Most of the children did not even consume 250mL milk additional to their weaning foods. This does not comply to the needs for growth and could eventually lead to suboptimal bone growth. The milk (other than breast milk) given to children was also often made too weak and thus contributed suboptimally to the nutritional requirements and growth needs of these children.

Children's food was prepared separately in their own pot according to the cultural belief. The main reason being that children ate at different times of the day than the adults. It was also reported that when the mother was pregnant, the child would get sick if eating from the same pot. It became evident that the mothers / caregivers in these communities still adhered to their cultural beliefs in terms of food choices and cooking practices for babies and young weaning age children.

In Table 79 the results from this research study are compared to the weaning recommendations (10).

TABLE 79 : COMPARISON OF RESULTS TO THE BASIC WEANING RECOMMENDATIONS (10)

Weaning foods	**Months** 0 3 6 9 12 15 18 21 24
Breast milk	
Staple weaning food and other grains	
Soft fruits and vegetables	
Meats and other protein rich foods	

	ideal	study group
Transitional period	- - - - -	**********
Given regularly	______	~~~~~~~

Reflections

1. Breast milk should be given exclusively for the first four to six months. In developing countries breast feeding should be encouraged throughout the first two years, even if it provides only a small part of total intake.
In this study group breast milk was given exclusively for the first one to two months only, but continued to the age of eighteen to twenty-four months.

2. Beginning at four months and no later than six months, the infant is gradually introduced to complementary / weaning foods. The sequence of introduction is not precise and schedules will vary since each infant will progress at his/her own rate. A staple food that is kilojoule dense and adequate in protein is important and variety is essential in providing for complete nutritional needs. Iron, zinc, vitamin D, and vitamin A-rich foods should be emphasized. Initially, complementary foods are given once a day, then gradually the frequency is increased so that the infant is eating two to four meals per day by about six months of age. Infants over six months of age need to eat meals and snacks about four to six times a day in addition to breast feeding.
In this study group cereals were introduced as early as two months. The next two types of foods introduced were fruits and vegetables. Meat was generally not given to small children. Children followed a regime of three meals a day from very early on and snacks were not introduced to the diets of children.

3. To avoid bacterial contamination, only freshly cooked or freshly peeled or washed foods should be used. The hands of both the food provider and child should be washed before handling food.
In this study group foods not finished at one mealtime were kept for later use under unsuitable conditions, increasing the risk for infection.

4. Throughout the latter half of the first year of life, variety in taste and texture of diet is expanded. As the child approaches one year of age, he should be encouraged to feed himself, and by two years of age, he should be consuming a varied diet from the family diet with choices from each of the food groups.
In this study group the children were introduced to the full family diet by the age of twelve to eighteen months. However cultural practices were adhered to with regard to the inclusion of a limited variety of nutritious foods.

Recommendations concerning weaning are that an interactive nutrition education program regarding food preparation will be of value in these communities. Sharing problems, knowledge and experience about weaning could have a positive effect on the practices (114). Nutrition education, especially about the use of milk other than breast milk (powder milks / formulas) after weaning, its value in the diet and its importance for growth and health in specified quantities, needs to be implemented in these communities.

10.2.2.5 Nutrition knowledge

The **fourth research objective** addressed within the **qualitative** research domain was about the nutrition knowledge of the mothers / caregivers:

> "What is the nutrition knowledge regarding infant feeding of the mothers / caregivers of children (0-36 months old) in the Moretele district?"

The children in these communities appeared to be eating an acceptable number of meals. Most mothers / caregivers knew the reasons for giving three or more meals to their children. Meal frequencies were best explained by remarks on hunger and satiety, stomach capacity and adequate growth. Poor between meal snacking was identified which might contribute to a lower total energy intake. This finding supported findings in the literature indicating that weaning foods were not given three times per day in developing countries (12, 13, 66). Van Staden et al (1994:93)(101), however, reported that about one-third of daily energy and nutrient intakes came from between-meal eating. Children, especially in the older age groups where the children are more active, should receive snacks in-between meals. Mothers / caregivers should take age and inclusion of solid foods in the diet of the baby into consideration when planning the frequency of their children's meals. For the small babies it would mean less meals and no snacks, and for the older children it might mean two to three meals with snacks in-between.

The evaluation of the diets of the children showed that only 6.0% of the children had an adequate intake of milk. Poor nutrition knowledge concerning foods that aid in building strong teeth and bones was identified, as well as misconceptions concerning food choices in this regard, probably due to the misinterpretation of product advertisements and media coverage. Meat intake was poor, and mothers / caregivers hardly had any knowledge on the nutritional value of meat and other proteins in the diet of the child, and did not know any of the functions proteins fulfill in the body. Adequate energy foods were consumed, but the mothers / caregivers did not have a clear idea about the different suitable energy-rich foods and why they should be included in the daily diet. The variety of foods included in the diet of the child seemed to be very limited. Foods rich in vitamin A and carotene were consumed infrequently. These results confirmed that the children, aged naught to three years old, did not have a nutritionally balanced diet, considering the protein, carbohydrate, fat, vitamin and mineral content of the diet, which could probably partially be explained in terms of the revealed lack of knowledge, as well as the limited variety in the diet.

Recommendations concerning nutrition knowledge are that the mothers (and adults) in these communities should be educated about the value of a balanced food intake and suitable meal and snacking patterns, taking the budget into consideration. The focus of the nutrition intervention needs to be on the value of children's diets, how to balance their intakes correctly, nutritionally sound food choices and the compilation of a suitable diet, as well as reasons for implementing these recommendations. Nutrition education concerning food choices should address cultural beliefs as well. There also seemed to be a need for education on hygiene concerning food preparation and food storing practices. Leftover food or milk was kept in the shade or some other storage space, and unboiled water was used frequently in the preparation of milk feeds. Although most of the mothers / caregivers were aware of the causes of vomiting and diarrhoea, some culturally accepted misconceptions were also still perceived as causes. Education is necessary to eradicate these misconceptions and to establish the correct nutrition knowledge concerning hygiene, which would then hopefully be implemented as sound practices.

10.2.2.6 Attitudes on nutrition

The fifth research objective addressed within the **qualitative research** domain was about attitudes:

> "What is the attitudes towards nutrition of the mothers / caregivers of children (0-36 months old) in the Moretele district?"

Most mothers / caregivers considered money an important factor in order to be healthy. They also considered all the foods that they consumed as being unhealthy, which was not the case. Their perception was that the food that they had available to them was not good for them since they did not have enough money to buy healthy foods (own perceptions). Although this could be regarded a valid response to a certain extent, some misconceptions concerning the role of money in healthy eating need to be addressed, and people should be guided to make healthy food choices even with the small amount of money available to them.

The mother's / caregiver's perception of the relationship between food and health could be summarized as follows: "we are healthy, therefore the foods we eat are healthy", which is the opposite to the known and accepted reasoning that one should eat healthy foods in order to be healthy. This is in agreement with findings from previous research (46). Food as a common concept was considered important and not specific types of foods with their specific functions. This finding is in agreement with previous findings that the functions of foods and their importance for consumption were not really known nor practised (46).

The focus group results showed that the mothers / caregivers had been exposed to information associating poor health with obesity, but that they did not understand the reasons for it. It would also be necessary to include nutrition education on PEM and the symptoms of malnutrition in order to clear up all the misconceptions regarding body weight and health.

Traditions and cultural beliefs were still adhered to in these communities. However, some mothers / caregivers indicated that they thought that some of these practices were old fashioned and needed to be changed. The traditions mentioned, concerned the allocation of food to different family members which could also contribute to household food insecurity. Having enough food at household level does not guarantee the nutritional wellbeing of every household member, especially the children, as has been reported previously (see conclusions on food security, 10.2.1.3) (119). Most of the mothers / caregivers in the Makapanstad area still had a positive attitude towards cultural issues while the mothers / caregivers from the Mathibestad area were more open to change.

Nutrition knowledge concerning the use of healthy foods, and reasons for overweight and underweight were poor and should be included in a nutrition education programme. An increase in knowledge on nutrition and nutrition related matters could positively influence the attitudes on nutrition, and more positive attitudes will probably improve nutrition practices (113, 114, 120). If the people participate in an interactive nutrition education program by discovering their problems and finding solutions to their problems, they will probably change their attitude towards the aspects involved and agree to the changes recommended. They will also be able to make informed decisions about their diet, since they will be empowered to take control of their eating habits and the associated outcomes by changing their practices (118, 120).

A summary of the forementioned results on the nutritional status and feeding practices is presented in Figure 18, based on the UNICEF model (causes of child malnutrition / survival and development; see Chapter 3; Figure 5).

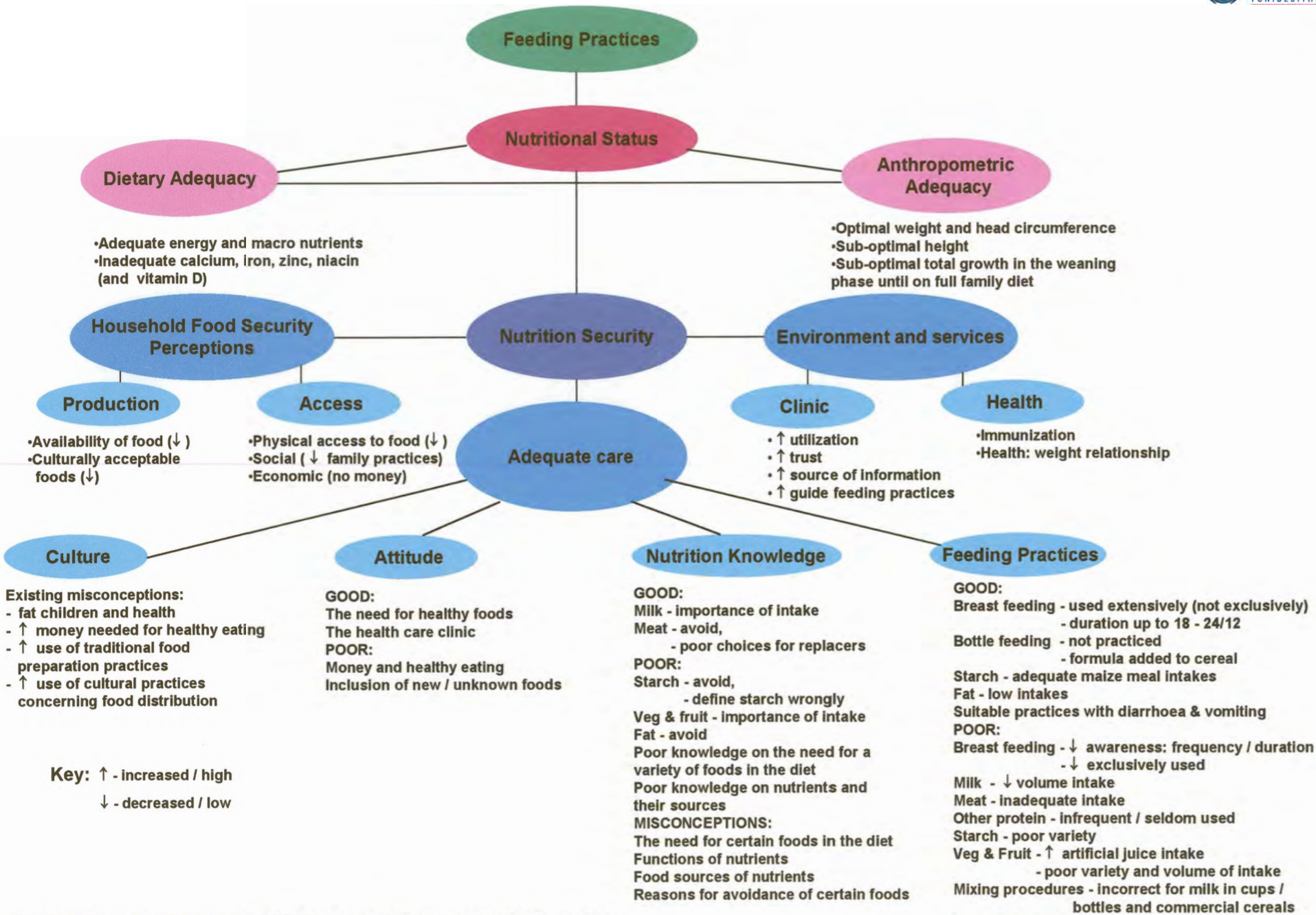


FIGURE 18: A SUMMARY OF FEEDING PRACTICES AND NUTRITIONAL STATUS (AS STUDIED) IDENTIFIED IN THE MORETELE DISTRICT

10.3 REFLECTIONS ON RECOMMENDATIONS

During the data analysis it became clear that the mothers / caregivers of the children in the research group had inadequate nutrition knowledge leading to unsatisfactory feeding practices of their children. Adherence to strict cultural beliefs and practices further impeded the quality of the feeding practices. Nutrition knowledge needs to be changed in a first step towards implementing improved feeding practices (6, 12). Therefore much emphasis has been placed in the discussion and recommendations on the role of nutrition education. The nutrition education should be focused on improving current knowledge, attitudes and practices, as well as eradicating misconceptions in order to improve the health status of the people in these communities in the long run. Nutrition education as such forms part of the so called food-based strategies (121).

Food - based approaches promote the consumption of foods that are naturally rich in micronutrients or are enriched through fortification. The quality and quantity of foods ingested impact on the nutritional status of the individual, as has been shown in Figure 5 and Figure 6. Micronutrient malnutrition and its effects on human life and its negative impact on economic development can be largely eliminated by improving the nutritional quality of the food supply and by educating people about good dietary practices (120, 121). Because children, who are the future workforce, are frequently the victims of these deficiencies, failure to deal with the problem may jeopardize the future of a nation (121). Food - based strategies, which include food production, dietary diversification, food fortification and nutrition education are the most sustainable approaches to increasing the micronutrient status of populations. These strategies also are the only viable, cost-effective and sustainable solution to micronutrient malnutrition (121).

Various reasons and advantages were given by the Food and Agriculture Organization of the United Nations and International Life Sciences Institute (1997)(121) to implement food - based strategies; amongst others food - based strategies:

- *are preventive, cost-effective, sustainable and income generating*
  Measures to improve malnutrition in South Africa should support small scale black farmers to produce a variety of food products and should support income-generating activities in the rural areas (25, 38, 119);

- *are culturally acceptable and feasible to implement*
  Underwood (1985)(63) indicates that it is to the advantage of poor families to use local foods more appropriately. The thin culturally acceptable gruels fed to infants contribute to an insufficient energy intake. This can be addressed by adding oil, peanut butter, avocado, sugar and soya to the traditional porridge (12). In the Moretele communities margarine and formula powder were added to the porridge. These practices should be reinforced and other culturally acceptable additions like sugar or soya could also be promoted;

☞ *promote self-reliance and community participation*

Traditional technologies should be promoted and home gardens, multi-mixes and simple recipes are ways in which traditional weaning diets and family nutrition can be improved (12, 63). However, gardening projects must lead to increased consumption of the micronutrient rich food produced for it to be of any value. These projects should therefore be linked to nutrition education programmes. Community participation and the involvement of women are usually the key to building support and achieving the change that results in nutritional benefits (121). Community - based programs should focus on the processing of local foods at a subsidized price; to ensure effective and competitive markets to achieve low prices for the consumer, but also fair prices for the producer (12, 63, 121);

☞ *take into account the crucial role of breast feeding and the special needs of infants during the critical weaning period*

Breast milk should be given exclusively for the first four to six months and encouraged through the weaning phase to the age of 18 to 24 months. WHO and UNICEF have launched an international programme to promote breastfeeding in 1991 (the international Baby Friendly Hospital Initiative). The South African national breastfeeding policy is based on this joint WHO/UNICEF statement and provides practical guidelines that include the information, protection and support that women need to breast feed successfully (6, 26, 54). Formula feeding for babies should thus be discouraged and in 1981 the WHO International Code of Marketing of Breast milk Substitutes was approved and implemented internationally (12, 54, 63). The South African code of ethics on the marketing of breast milk substitutes is based on this document (6).

To improve the diets of young children, many interventions are focused on the type and quality of weaning foods (12). In the absence of inexpensive, high quality weaning foods, people end up buying inferior substitutes such as potato chips, cheese curls, sugar, sweets or biscuits. This seems to be in wide use among the poor (12, 51) and was also witnessed in the Moretele communities;

☞ *foster the development of sustainable, environmentally sound food production systems*

With sufficient access to water, fertile soils and seed or seedlings and an understanding of the local conditions, small scale producers may have a significant increase in success with small or large scale production of vegetables and fruit. Perishable goods need to be processed or preserved to increase year-round availability of seasonal micronutrient-rich foods (121);

☞ *build alliances among government, consumer groups, the food industry and others to achieve the goal of preventing micronutrient malnutrition*

Food supplementation programmes are extremely effective in preventing malnutrition in both developing countries and poor communities (122). Promotion of household food security will be the end-result of such cooperation (food stamp programme / general consumer subsidy / price control on basic commodities)(38). The benefit of these programs is to the children and to the society by creating a healthy population able to learn, work and earn (122). Walker & Vorster (1993:2)(123), Coovadia (1993:18)(25) and the SAHR (1996:141-150)(26) list the options for possible dietary interventions in South Africa as follows:

- channelling food supplies to various vulnerable groups in general; specifically to malnourished children and pregnant women
- school-feeding schemes — the Primary School Nutrition Programme
- provision of food stamps
- provision of cheaper food — especially the cereal staple foods — via subsidization of their cost, and making them VAT free
- stabilisation of food prices
- fortification of cereal products with calcium, iron, vitamin A and B vitamins (121, 124)
- public work schemes for the unemployed
- vitamin A supplementation for prevention of measles
- improving women's nutrition to reduce low birth weight babies
- iron supplements targeted to specific groups with increased needs — especially young children and infants.

Appropriate food vehicles and fortificants should be selected to enhance the micronutrient status of the target group (121, 124).

Nutrition education as a component of food - based strategies emphasizes prevention. To improve child feeding practices, parents, family members, other caregivers and health care providers must have access to nutrition information regarding the following aspects:

- the timely introduction of complementary foods
- the types of food required in order to make informed choices
- the quantities of food required
- hygienic practices of food preparation and storage
- the importance of frequent and active feeding
- customs and cultural beliefs about food (12, 26, 49, 51, 64, 69, 114).

Nutrition education must focus on the imparting of the necessary information, but also on the motivation of people to change their behaviour (6, 12, 120). Cultural factors and taboos have a powerful influence on feeding practices and eating patterns. Young mothers / caregivers often find it impossible to ignore their elders or peer group, even though they are ill-informed (6, 69). Health workers should be motivated to apply and share their knowledge. Educational materials should be made available and used continuously in clinics; verifying that the materials are targeted to the right audiences (12,125). The role of the media in direct public advertising, the availability of other information and promotional materials on infant / child nutrition and food products should be monitored. The media, e.g. television services, could be used very effectively for health education and health promotion as they exert tremendous power over children's food choice decisions (38, 40, 111, 115, 118). Facilitated group discussions provide an alternative method to lecture and one-on-one approaches for conducting educational interventions at clinic sites (118). It is a client-centered, interactive form of education wherein the learners share their problems, knowledge, and experience through group discussions. A supportive leadership style is used and discussions are based on participatory learning where the clients collaborate and engage in active reformulating of the issues being

discussed, which helps to internalize attitude and/or behaviour change. It is more likely to be meaningful to the participants as it allows them to access nutrition information within a supportive environment where their culture, prior experience, and personal concerns are respected. It empowers clients to make positive changes in nutrition behaviour (118). A meaningful approach could be to have a focus group discussion where nutrition-related problems are uncovered and thereafter are followed-on with a facilitated group discussion on the solutions to the problems uncovered.

Vorster & Labadarios (1993:5)(23) point out that in SA evidence shows that there is a need for responsible and effective nutrition education as part of any nutrition intervention programme implemented. In such programmes, dietitians or nutritionists should function as the educators, supervisors, coordinators, researchers, consultants, advocates, planners and evaluators. Naidoo et al (1993:26)(38) suggest that nutrition education should be actively promoted in SA by education departments, health departments and services, the private sector, the media and the community. It should be included in the curricula of all schools and training institutions (38).

Adoption of food - based strategies makes possible the **redirection of funds** previously devoted to curative health care and social welfare to other developmental activities. One such activity is **nutritional surveillance** as a preventive health care measure. Growth monitoring may be an effective nutrition intervention strategy fundamental to the improvement of health / nutritional status in these communities. For it to be effective, a two stage process of screening and intervention needs to be implemented: early detection of growth faltering followed by appropriate remedies (30, 31). If such a process is in regular use, it will have the potential of increasing child survival, but also improving child development (30). The greatest success with such a surveillance approach has been achieved where there is an extensive community infrastructure and health services to support family-based monitoring (30). In many communities the approach seems to be to assume that once growth faltering is identified, the mother / caregiver will automatically improve feeding practices. This may only work sometimes, especially when food supplements are provided to the community from outside sources. The best approach would rather be to identify the corrective interventions by considering the complex factors which are producing malnutrition in the local circumstances (30). Taylor (30) states that growth monitoring can serve many objectives, being the following:

- education and motivation
- screening, early detection and risk assessment
- entry point for comprehensive health care
- entry point for women's participation
- mechanism to promote community awareness, organisation and empowerment
- health indicator ; impact assessment
- instrument for supervision
- advocacy.

10.4 IMPLEMENTATION OF RECOMMENDATIONS

The recommendations based on the findings in this research study are aimed at improving the nutritional status and feeding practices of children, as well as early detection of nutrition related problems in the Moretele district / Hammanskraal area. The two recommendations that would probably most aid these communities are the implementation of **nutritional surveillance** and a **nutrition education programme**.

To improve nutritional status by means of early detection a **nutritional surveillance programme** should be implemented in the clinics as a preventive health care measure to address the problems faced in the communities of Makapanstad and Mathibestad. Growth monitoring should be implemented as a two stage process of screening and intervention. The focus would thus be on early detection of growth faltering, followed by appropriate intervention strategies such as medical care, nutrition education, correction of incorrect practices or nutrition intervention thereby increasing child survival, but also improving child development (30, 31).

Clinic staff, care groups and dietitians should be involved in these programmes, preferably coordinated from a central facility like a nutrition unit. Education may be given in the form of group work, lectures, practical demonstrations, practical sessions for the mothers / caregivers and visible nutritional surveillance charts on the growth of the children (refer to aforementioned discussion).

Community involvement could be achieved by involving the mothers / caregivers in the measurements for growth monitoring, caring for children while programmes are being held, involving mothers / caregivers in practical demonstrations, family visits and even food production (a community vegetable garden) may be practiced by all. Involvement by all members of the community would be the ideal to strive for (109, 126).

To improve nutrition knowledge, attitudes and feeding practices a **nutrition education programme** for the mothers / caregivers should be implemented. The approach for the nutrition education should be based on the K-A-P Model 1 where: knowledge (K) ↔ attitude (A) ↔ practice (P) (127). It was found in the research of Schwartz (1975:30)(127) that there is a relationship between knowledge and attitudes and between attitude and practice, but that there was no direct relationship between knowledge and practice. Other research findings supported this approach (106, 116, 128). With this approach , nutrition education should cognitively focus on the identified nutrition problems, which would in turn influence the attitude of the mothers / caregivers which would in turn have a positive effect on the nutritional practices of the mothers / caregivers. As discussed previously, facilitated group discussions as part of interactive nutrition education would serve an ideal approach for conducting educational interventions at health care clinics (118). This approach would allow the mothers / caregivers to access nutrition information within a supportive environment where their culture, prior experience, and personal concerns are respected. This interaction would probably empower them to make positive changes in their nutrition behaviour (118).

The nutrition education programme for the communities in the Moretele district should focus on the critical issues identified (see Table 80).

TABLE 80: THEMES AND TOPICS FOR A NUTRITION EDUCATION PROGRAMME FOR THE MORETELE DISTRICT

THEMES	TOPICS
Health education	- the relationship between food and health - overweight in children: not always oedemic due to malnutrition - overfeeding of children: effects and problems - money and healthy food choices - health education in terms of family and individual needs
Basic nutrition	- foods and their functions in the body - nutrients and food sources - role of nutrients in preventing PEM - recommended inclusion of important foods: ~ increased milk intake ~ variety of starch products ~ variety of vegetables / fruits ~ less artificial juices ~ suitable protein-rich foods - recommended quantities of important foods
Feeding practices	- initiation of breast feeding directly after birth - longer exclusive breast feeding - breast feeding routine: frequency and duration of feeds - ideal time for introducing weaning / complementary foods - ideal types of weaning foods - order of introducing weaning foods - elimination of using left-over foods - correct mixing procedures for milk for cup drinking (and bottle feeding where needed) - hygiene procedures for milk and food preparation
Meal planning	- devising healthy meal plans for the whole family - budgeting in terms of meal planning - compiling a healthy meal - making wise food choices - introducing snacks in the diets of children - ideal foods / drinks for snacking
Culture	- food choices and cultural beliefs: addressing misconceptions - fat children as being healthy - food distribution among family members - traditional food preparation techniques for children's food.

Nutrition can no longer exist on the fringes of development programmes if the before-mentioned goals need to be achieved. Focus should be placed on nutrition, especially on preventive measures and improved child feeding in order to achieve declines in mortality and morbidity.

10.5 RECOMMENDATIONS FOR FUTURE RESEARCH

Some insight was gained during the research leading to recommendations for future research. The following recommendations are formulated to improve on the research techniques and / or overcome shortcomings in this study:

10.5.1 A more detailed analysis of food intake needs to be done. The actual quantities of food consumed by these children remained unclear whatever the amount of probing. It is recommended that the researcher / field worker(s) should be present during feeding sessions of the children in order to determine more accurately the exact quantities of food consumed by these children.

10.5.2 It is recommended that observation of the food preparation techniques for babies, weaning children and weaned children should be done. Thus practices might be identified to provide reliable evidence concerning thinning of porridge, additions made to food as well as the serving techniques involved.

Both 10.5.1 and 10.5.2 are recommended with caution as the presence of any observer in a family setting may influence the behaviour of the mother / caregiver to be different than under normal circumstances.

10.5.3 Due to the number of topics included in the interview schedule, the focus group interview tended to be long and tiring. It might add to the quality of the data to have a few follow-on focus group interviews on identified themes; probing in more detail on each theme. Only a few groups of people, unknown to each other, should participate.

10.5.4 It is recommended that the origin of the wrong perceptions and poor attitude towards nutrition should be studied in order to gain insight. The latter is necessary to plan appropriate training programmes in terms of the best approaches, the contents, the tools, etc.

The insight gained during the research guided the following recommendations for new research:

10.5.5 A longitudinal approach where infants are measured from birth onwards is recommended. This may either be implemented as a research study, or ideally a nutritional surveillance programme should be run in the clinics where not only weight, but also height, head circumference and mid- upper-arm-circumference are measured and monitored monthly. Data on growth and development would thus be available to be used in the "Triple-A Approach" to combat malnutrition in communities.

10.5.6 The low birth percentile (25th) found in these communities may be due to poor prenatal growth or it may be genetically predisposed, indicating that the people in this cultural groups are smaller in size from birth onwards. A longitudinal study should be done on pregnant women and their babies in order to determine

if babies are born with low birth weights or if they are genetically smaller

10.5.7 An in-depth exploration of breast feeding practices is necessary in order to determine the quality of the breast feeding as implemented. The feeding frequencies, time spent per feeding session, feeding quality with reference to feeding or pacifying for different age groups should be evaluated, as well as the feeding practices with a child during the weaning process. Observation of the practices could contribute to better knowledge and understanding.

Again observation as technique is recommended with caution as the presence of any observer in a family setting may influence the behaviour of the mother / caregiver to be different than under normal circumstances.

10.5.8 A culturally more suitable questionnaire should be developed and standardized to determine hunger / food insecurity in these communities. It appeared that the mothers / caregivers in this cultural group had difficulty in understanding the questions.

LIST OF REFERENCES

LIST OF REFERENCES

1. Frankle RT, Owen AL. Nutrition in the community. The art of delivering services. 3rd ed. London: Mosby; 1993.

2. Patel DN, Pettifor, JM. Malnutrition in South Africa. S Afr J Food Sci Nutr 1992; 4(2):22-23.

3. Ocloo E. Chronic undernutrition and the young. Proc Nutr Soc 1993; 52:11-17.

4. Passmore R, Eastwood MA. Davidson and Passmore. Human Nutrition and Dietetics. 8th ed. London: Churchill Livingstone; 1986.

5. Steyn NP, Badenhorst CJ, Nel JH, Jooste PL. The nutritional status of Pedi preschool children in two rural areas of Lebowa. S Afr J Food Sci Nutr 1992; 4(2):24-28.

6. Kibel MA, Wagstaff LA, editors. Child Health for all. A manual for southern Africa. 2nd ed. Cape Town: Oxford University Press; 1995.

7. Steyn NP, Badenhorst CJ, Nel JH, Ladzani R. Breast-feeding and weaning practices of Pedi mothers and the dietary intakes of their preschool children. S Afr J Food Sci Nutr 1993; 5(1):10-13.

8. Ng'andu NH, Watts TEE. Child growth and duration of breast feeding in urban Zambia. J Epidemiol Comm Health 1990; 44:281-285.

9. Prentice A. Breast feeding and the older infant. Acta Paediatr Scand 1991; 374 Suppl:78-88.

10. Hendricks KM, Badruddin SH. Weaning recommendations: the scientific basis. Nutr Rev 1992; 50(5):125-133.

11. Martorell R. Enhancing human potential in Guatemalan adults through improved nutrition in early childhood. Nutr Today 1993 Jan/Feb; 6-13.

12. Huffman SL, Martin LH. First feedings: optimal feeding of infants and toddlers. Nutr Res 1994; 14:127-159.

13. Walker AF. The contribution of weaning foods to protein-energy malnutrition. Nutr Res Rev 1990; 3:25-47.

14. Guthrie HA, Picciano MF. Human Nutrition. London: Mosby; 1995.

15. Savage King F, Burgess A. Nutrition for developing countries. 2nd ed. Oxford: Oxford University Press; 1993.

16. Hansen JDL. Protein energy malnutrition (PEM) in perspective. S Afr J of Food Sci Nutr 1993; 5(1):2-4.

17. Walker, ARP. Nutrition-related diseases in southern Africa: with special reference to urban African populations in transition. Nutr Res 1995; 15(7):1053-1094.

18. Weigly ES, Mueller DH, Robinson CH. Robinson's Basic Nutrition and Diet Therapy. 8th ed. London: Prentice-Hall; 1997.

19. Dennill K, King L, Lock M, Swanepoel T. Aspects of primary health care. Halfway House: Southern Book Publishers; 1995.

20. Bellamy C. The State of the World's Children. New York: UNICEF; 1998.

21. Uvin P. The state of world hunger. Nutr Rev 1994; 52(5):151-161.

22. Jelliffe DB, Vahlquist B. The mother / child dyad - nutritional aspects. In: Hambræus L, Sjölin S, editors. Symposia of the Swedish Nutrition Foundation XIV. The mother / child dyad - nutritional aspects. Stockholm: Almqvist & Wiksel International; 1979.p.150-155.

23. Vorster HH, Labadarios D. Addressing malnutrition in South Africa. SA J Clin Nutr 1993; 6(3):4-5.

24. Walker ARP, Walker BF. Impoverished Africa: who needs what? S Afr J Food Sci Nutr 1993; 5(2):56-60.

25. Coovadia HM. Overview of malnutrition among children in South Africa. SA J Clin Nutr 1993; 6(3):17-19.

26. South African Health Review. Durban: Health Systems Trust and the Henry J Kaiser Family Foundation; 1996.

27. Barron P. South African Health Review. Durban: Health Systems Trust; 1998.

28. Bellamy C. The state of the world's children 1999. Education. New York: UNICEF; 1999.

29. Lee RD, Nieman DC. Nutritional Assessment. Oxford, England: Brown & Benchmark Publishers; 1993.

30. Taylor CE. Child growth as a community - surveillance indicator. Indian J Pediatr 1988; 55 Suppl:16-25.

31. Growth monitoring: intermediate technology or expensive luxury? Lancet 1985 Dec; 14:1337-1338.

32. Zeitlin M. Nutritional resilience in a hostile environment: positive deviance in child nutrition. Nutr Rev 1991; 49(9):259-267.

33. Classification of infantile malnutrition. Lancet (i) 1970; 2:302.

34. Waterlow JC. Protein-energy malnutrition. 2nd ed. London: Edward Arnold; 1992.

35. Latham MC. Human Nutrition in the Developing world. Rome: Food and Agricultural Organization of the United Nations; 1997.

36. Scrimshaw NS. Nutrition: prospects for the 1990's. Annu Rev Public Health 1990; 11:53-68.

37. Terry RD. Introductory Community Nutrition. Dubuque: Wm. C. Brown Publishers; 1993.

38. Naidoo S, Padayachee GN, Verburgh AP. The impact of social and political factors on nutrition in South Africa. SA J Clin Nutr 1993; 6(3):20-26.

39. Parraga IM. Determinants of food consumption. J Am Diet Assoc 1990; 90(5):661-663.

40. Crockett SJ, Simms LS. Environmental influences on children's eating. J Nutr Educ 1995; 27(5):235-249.

41. National Institute for Economic Policy. Children, poverty and disparity reduction. Towards fulfilling the rights of South Africa's children. Pretoria: Office of the Reconstruction and Development Programme; May 1996.

42. Kendall A, Olson CM, Frongillo EA. Validation of the Radimer/Cornell Measures of hunger and food insecurity. J Nutr 1995; 125:2793-2801.

43. Beckman D, Cohen MJ, Kennedy E. Position of The American Dietetic Association: World hunger. J Am Diet Assoc 1995; 95(10):1160-1162.

44. Kendall A, Olson CM, Frongillo EA. Relationship of hunger and food insecurity to food availability and consumption. J Am Diet Assoc 1996; 96(10):1019-1024.

45. Cohen BE. Food security and hunger policy for the 1990s. Nutr Today 1990 Jul/Aug; 23-27.

46. Van Wyk JJ. Sosio-kulturele verband van voedsel en voedselgebruike. J Diet Home Ec 1990; 18(3):80-85.

47. Quin PJ. Foods and feeding habits of the Pedi. S Afr Med J 1964 Dec; 969-971.

48. Radimer KL, Olson CM, Campbell CC. Development of indicators to assess hunger. J Nutr 1990; 120:1544-1548.

49. Lipsky S, Stephenson PA, Koepsell TD, Gloyd SS, Lopez JL, Bain CE. Breast feeding and weaning practices in rural Mexico. Nutr and Health 1994; 9:255-263.

50. Wells D. Infant feeding. Nutr Food Sci 1995 Mar/Apr; 2:42-44.

51. Abrahamsson L. The mother's choice of food for herself and her baby. In: Hambræus L, Sjölin S, editors. Symposia of the Swedish Nutrition Foundation XIV. The mother / child dyad - nutritional aspects. Stockholm: Almqvist & Wiksel International; 1979:103-107.

52. Zetterström R. Trends in research on infant nutrition, past, present and future. Acta Pædiatr 1994; 402 Suppl:1-3.

53. Roberts GJ, Cleaton-Jones PE, Richardson BD, Sinwell RE, Lucas VS. Breast and bottle feeding in rural and urban South African children. J Hum Nutr Diet 1995; 8:255-263.

54. Tan JCH, Jeffery HE. Factors that influence the choice of infant feeding. Paediatr Child Health 1995; 31:375-378.

55. Ransome OJ, Chalmers B, Herman AAB, Reinach SG. Factors influencing breast-feeding in an urban community. S Afr Med J 1989 Oct; 76:431-433.

56. Lambert EJ, Hall MA. Infant nutrition part 1: preweaning (0-4 months). Br J Hosp Med 1995; 53(11):567-569.

57. Walker ARP. Infant feeding practices in South Africa. An appraisal of their significance to health. S Afr Med J 1978; 54:820-822.

58. Power DJ, Willoughby W, De Waal RH. Breast feeding in Cape Town. S Afr Med J 1979; 56:718-721.

59. Ransome OJ, Chalmers B, Herman AAB, Reinach SG. Infant feeding in an urban community. S Afr Med J 1989 Oct; 74:393-395.

60. Coveney J. Is breast milk the best food for all infants? Hum Nutr: Appl Nutr 1985; 39A:179-188.

61. Sjölin S. Causes and consequences of early weaning. In: Hambræus L, Sjölin S, editors. Symposia of the Swedish Nutrition Foundation XIV. The mother / child dyad - nutritional aspects. Stockholm: Almqvist & Wiksel International; 1979:109-112.

62. Piwoz EG, Creed de Kanashiro H, Lopez de Romaña G, Black RE, Brown KH. Feeding practices and growth among low-income Peruvian infants: a comparison of internationally - recommended definitions. Int J Epidemiol 1996; 25(1):103-113.

63. Underwood BA. Weaning practices in deprived environments: the weaning dilemma. Pediatrics 1984; 75 Suppl:194-198.

64. Stordy BJ, Redfern AM, Morgan JB. Healthy eating for infants - mother's actions. Acta Pædiatr 1995; 84:733-741.

65. Lambert EJ, Hall MA. Infant nutrition part 2: weaning - 1 year. Br J Hosp Med 1995; 54(7):327-330.

66. Guldan GS, Zhang MY, Zhang YP, Hong JR, Zhang HX, Fu SY, et al. Weaning practices and growth in rural Sichuan infants: a positive deviance study. J Trop Pediatr 1993 June; 39:168-175.

67. Underwood BA, Hofvander Y. Appropriate timing for complementary feeding of the breast-fed infant. Acta Paediatr Scand 1982; 294 Suppl:1-32.

68. Keane A, Willetts A. Factors that affect food choice. Nutr Food Sci 1994 July/Aug; 4:15-17.

69. Jelliffe DB, Jelliffe EFP. Cultural traditions and nutritional practices related to pregnancy and lactation. In: Hambræus L, Sjölin S, editors. Symposia of the Swedish Nutrition Foundation XIV. The mother / child dyad - nutritional aspects. Stockholm: Almqvist & Wiksel International; 1979:48-61.

70. Richter LM. Malnutrition and children's social and cognitive development in South Africa. SA J Clin Nutr 1993; 6(3):28-31.

71. Dane FC. Research Methods. Pacific Grove, California: Brooks / Cole; 1990.

72. Greenbaum TL. The practical handbook and guide to focus group research. Lexington, Toronto: D.C. Heath and Company; 1988.

73. Neuman WL. Social research methods: qualitative and quantitative approaches. Boston: Allyn & Bacon; 1997.

74. Babbie E. The Practice of Social Research, 6th ed. Belmont, California: Wadsworth Publishing Company; 1992.

75. Denzin NK, Lincoln YS, editors. Handbook of Qualitative Research. London: Sage Publications; 1994.

76. Retief A. Method and theory in cross-cultural psychological assessment. Research report series: 6. Pretoria: HSRC; 1988.

77. Schoeman JB. Essays on cultural psychology. Pretoria: Westford hospitaal; 1988.

78. Biesheuvel S. Cross-cultural psychology: its relevance to South Africa. In: Mauer KF, Retief AI. Psychology in context: Cross-cultural research trends in South Africa. Pretoria: HSRC; 1987.

79. De Villiers M, Smuts J, Eksteen LC, Gouws RH. Nasionale Woordeboek. Afrikaanse woordverklaring, 6de uitgawe. Goodwood, Kaap: Nasou Beperk; 1984.

80. Morgan DL. Focus Groups as Qualitative Research. Qualitative Research Methods Series: volume 16. London: SAGE Publications; 1988.

81. Krippendorf K. Content Analysis. An introduction to its methodology. The Sage COMMTEXT Series: volume 5. London: SAGE Publications; 1980.

82. Sanjur D. Social and cultural perspectives in nutrition. London: Prentice-Hall; 1982.

83. Mahan LK, Arlin M. Krause's Food Nutrition & Diet Therapy, 8th ed. London: W.B. Saunders Company; 1992.

84. Obert JC. Community Nutrition, 2nd ed. London: Collier Macmillan Publishers; 1986.

85. Langenhoven ML, Conradie PL, Wolmarans P, Faber M. MRC Food Quantities Manual, 2nd ed. Parow: Medical Research Council; 1991.

86. Mouton J, Marais HC. Basiese begrippe: metodologie van die gedragswetenskappe. Pretoria: RGN; 1991.

87. Smit GJ. Navorsingsmetodes in die gedragswetenskappe. Pretoria: HAUM; 1983.

88. Patton MQ. Qualitative Evaluation Methods. London: SAGE Publications; 1980.

89. Miles MB, Huberman AM. Qualitative Data Analysis. London: SAGE Publications; 1994.

90. De Vos AS, editor. Research at grass roots: a primer for the caring professions. Pretoria: Van Schaik; 1998.

91. Stewart DW, Shamdasani PN. Focus Groups. Theory and Practice. Applied Social Research Methods Series: volume 20. London: SAGE Publications; 1990.

92. Dey I. Qualitative data analysis: a user-friendly guide for social scientists. London: Routledge; 1993.

93. Deacon RE, Firebaugh FM. Family resource management. Principles and applications. 2nd ed. Boston: Allyn & Bacon; 1988.

94. Compton NH, Hall OA. Foundations of Home Economics Research. A human ecology approach. Minneapolis: Burgess Publishing Company; 1972.

95. Gorstein J, Sullivan R, Yip R, De Onis M, Trowbridge F, Fajans P, et al. Issues in the assessment of nutritional status using anthropometry. Bull W H O 1994; 72(2):273-283.

96. Waterlow JC, Buzina R, Keller W, Lane JM, Nichaman MZ, Tanner JM. The presentation and use of height and weight data for comparing the nutritional status of groups of children under the age of 10 years. Bull W H O 1977; 55(4):489-498.

97. WHO working group on infant growth. An evaluation of infant growth: the use and interpretation of anthropometry in infants. Bull W H O 1995; 73(2):165-174.

98. Hamill PVV, Drizd TA, Johnson CL, Reed RB, Roche AF, Moore WM. Physical growth: National Centre for Health Statistics percentiles. Am J Clin Nutr 1979; 32: 607-629.

99. World Health Organization. Measuring change in nutritional status. Annex 3. Reference data for the weight and height of children. Geneva: WHO; 1975.

100. Dickin K, Griffiths M, Piwoz E. Designing by Dialogue. A program planners' guide to consultative research for improving young child feeding. Washington: SARA; 1997.

101. Van Staden E, Langenhoven ML, Donald PR, Laubscher JA. Dietary intake of children with failure to thrive. S Afr J Food Sci Nutr 1994; 6(3):90-93.

102. Prentice A. Does mild zinc deficiency contribute to poor growth performance? Nutr Rev 1993; 51:268-270.

103. Hautvast JLA, Van Der Heijden LJM, Luneta AK, Van Staveren WA, Tolboom JJM, Van Gastel SM. Food consumption of young stunted and non-stunted children in rural Zambia. Eur J Clin Nutr 1999; 53:50-59.

104. Mackeown JM, Cleaton-Jones PE, Senekal M. Individual food items in the diets of South African preschool children - energy, total protein, carbohydrate, fibre, added sugar and fat intake. S Afr J Food Sci Nutr 1994; 6(3):94-98.

105. Langenhoven M, Kruger M, Gouws E, Faber M. MRC Food Compositiion Tables. 3rd ed. Parow: Medical Research Council; 1993.

106. Kruger R, Gericke GJ, Strasheim A. Voedinggedrag, voedingkennis en doelstellingoriëntasie van blanke vroue. J Diet Home Ec 1990; 18(1):12-17.

107. Zam DESK. Infant feeding - some lessons from Yangon. World Health Forum 1994; 15:400-402.

108. Bosman DB, Van Der Merwe IW, Hiemstra LW. Bilingual Dictionary, 8th ed. Goodwood: Tafelberg; 1995.

109. Kavishe FP. Investing in nutrition at the national level: an African perspective. Proc Nutr Soc 1995; 54(2):367-378.

110. Steyn NP. Nutrition insecurity - a complex problem. S Afr Med J 1998 May; 88(5):639-640.

111. Labadarios D, Van Middelkoop A, Coutsoudis A, et al. Anthropometric, vitamin A, iron and immunisation coverage status in children aged 6-71 months in South Africa, 1994: South African Vitamin A Consultative Group (SAVACG). S Afr Med J 1996 April; 86(4):354-357.

112. Faber M, Oelofse A, Kriek JA, Benadé AJS. Breastfeeding and complementary feeding practices in a low socio-economic urban and a low socio-economic rural area. S Afr J Food Sci Nutr 1997; 9:43-51.

113. Labadarios D. Micronutrient deficiencies among South Africans. S Afr Med J 1999 Feb; 89(2):4-6.

114 Glinsman WH, Bartholmey SJ, Coletta F. Dietary guidelines for infants: A timely reminder. Nutr Rev 1996; 54(2):50-57.

115. MacIntyre UE, Ruhle M. Impoverished Africa - time to restress the value of breast-feeding. S Afr Med J 1995 Jan; 85(1):4-5.

116 Zöllner E, Carlier ND. Breast-feeding and weaning practices in Venda, 1990. S Afr Med J 1993 Aug; 83:580-583.

117. Donald P, Gie R, Henning PA, Hesseling PB, Labadarios D, Mare H, et al. Breast-milk substitutes - a South African perspective urgently needed. S Afr Med J 1995 April; 85(4):242-243.

118. Abusabha R, Peacock J, Achterberg C. How to make nutrition education more meaningful through facilitated group discussions. J Am Diet Assoc 1999; 99(1):72-76.

119. Steyn NP, Robertson H-L, Mekuria M, Labadarios D. Household food security - what health professionals should know. S Afr Med J 1998 Jan; 88(1):75-79.

120. Manciaux M, Pechevis M. Socio-economic planning - Legislative measures for improvement of the nutritional status of the mother/child dyad. In: Hambræus L, Sjölin S, editors. Symposia of the Swedish Nutrition Foundation XIV. The mother / child dyad - nutritional aspects. Stockholm: Almqvist & Wiksel International; 1979:143-149.

121. Food and Agriculture Organization of the United Nations and International Life Sciences Institute. Preventing micronutrient malnutrition: A guide to food-based approaches. Washington: International Life Sciences Institute; 1997.

122. Karp RJ. Head start, nutrition, and problems of poverty in childhood. J Am Coll Nutr 1999; 18(2):100-101.

123. Walker ARP, Labadarios D, Vorster HH, Glatthaar II, Meulenberg-Buskens I. Dietary interventions in South African populations: where are we going? SA J Clin Nutr 1993; 6(2):3-4.

124. Pankhurst R. The role of industry in micronutrient intervention programmes. S Afr Med J 1999; 89(2):34-35.

125. Knapp STF. Reflections on nutrition education for the rural, low-income community. Nutr Today 1991 Dec; 26:32-37.

126. Igbedioh SO, Edache A, Kaka HJ. Infant weaning practises of some Idoma women in Makurdi, Nigeria. Nutr and Health 1995;10:239-253.

127. Schwartz NE. Nutritional knowledge, attitudes, and practices of high school graduates. J Am Diet Assoc 1975 Jan; 66:28-31.

128. Jalso SB, Burns MM, Rivers JM. Nutritional beliefs and practices. J Am Diet Assoc 1965; 47:263.

129. Medical Research Council. Foodfinder. Dietary analysis software release 1.5. Parow: MRC; 1991.

130. Runyon RP, Haber A. Fundamentals of Behavioral Statistics. 4th ed. London: Addison-Wesley Publishing Company; 1980.

ADDITIONAL LITERATURE

131. Barness LA. Bases of weaning recommendations. J Pediatr 1990; 117 Suppl 2:84-85.

132. Forgac MT. Timely statement of The American Dietetic Association: Dietary guidance for healthy children. J Am Diet Assoc 1995; 95(3):370.

133. Radimer KL, Olson CM, Greene JC, Campbell CC, Habicht J. Understanding hunger and developing indicators to assess it in women and children. J Nutr Educ 1992; 24 Suppl:36-45.

134. Steyn NP, Nel JH, Kunneke E, Tichelaar HY, Oelofse A, Prinsloo JF, et al. Differences between underweight and normal-weight rural preschool children in terms of infant feeding practices and socio-economic factors. S Afr Med J 1998; 88(5):641-646.

135. Whitehead RG. The human weaning process. Pediatrics 1985; 75 Suppl:189-193.

136. Solomons NW, Gross R. Urban nutrition in developing countries. 1995 April; 54(4):90-95.

137. Lopez LM. Pilot assessment of an instrument to measure psychological influences on eating among low-income women. J Nutr Educ 1993 Dec; 25:300-306.

138. Mills A. Dietary survey of infants aged 6 to 12 months. Nutr Food Sci 1993 May/June; 3:9-13.

139. Craig AP, Albino RC. Urban Zulu mothers' views on the health and health care of their infants. S Afr Med J 1983 April; 63:571-572.

140. Kuhnlein HV. Culture and ecology in dietetics and nutrition. J Am Diet Assoc 1989; 89(8):1059-1060.

141. Ferrinho P de LGM, Gear JSS, Reinach SG, Bac M. Early life nutrition in the Gelukspan health ward. S Afr Med J 1991 Dec; 80:588-591.

142. Frongillo EA, Habicht J. Investigating the weanling's dilemma: lessons from Honduras. Nutr Rev 1997 Nov; 55(11):390-395.

143. Satter EM. The feeding relationship. J Am Diet Assoc 1986; 86(3):352-356.

144. Popkin BM. The nutrition transition in low-income countries: an emerging crisis. Nutr Rev 1994 Sep; 52(9):285-298.

145. Hofvander Y. Patterns of breast feeding and weaning in developing countries. In: Hambræus L, Sjölin S, editors. Symposia of the Swedish Nutrition Foundation XIV. The mother / child dyad - nutritional aspects. Stockholm: Almqvist & Wiksel International; 1979:69-73.

146. Morgan JB, Kimber AC, Redfern AM, Storfy BJ. Healthy eating for infants — mothers' attitudes. Acta Pædiatr 1995; 84:512-515.

147. Glanz K, Eriksen MP. Individual and community models for dietary behaviour change. J Nutr Educ 1993 Mar-Apr; 25(2):80-86.

148. McCann MF, Bender DE, Rangel-Sharpless MC. Infant feeding in Bolivia: a critique of the World Health Organization. Indicators applied to demographic and health survey data. Int J Epidemiol 1994; 23(1):129-137.

149. Martines JC, Habicht J, Ashworth A, Kirkwood BR. Weaning in Southern Brazil: is there a "weanling's dilemma"? J Nutr 1994; 124:1189-1198.

150. Cameron N, Kgamphe JS. The growth of South African rural black children. S Afr Med J 1993 Mar; 83:184-190.

151. Beaudry M. World hunger: let's dare to work towards a solution. J Can Diet Assoc 1991; 53(3):151-156.

152. Gericke GJ, Borchardt S, Crous JM. Venda-kindervoedingpraktyke: stad en platteland. J Diet Home Ec 1987; 5(2):48-54.

153. Odendaal M, Gericke GJ, Van Staden DA, Beyers M, Van Der Walt F. Die voedingstatus van die Vendakind: stad en platteland. J Diet Home Ec 1988; 16(1):18-24.

154. Leedy PD. Practical Research. 5th ed. New York: Macmillan; 1993.

155. Trollip AM. Die betekenis van die geakkultureerde kledingpraktyke vir geselekteede Ndzundza-Ndebele-vroue. D Phil-proefskrif. Universiteit van Pretoria; 1991.

156. Green F. Voedinggedrag en voorligtingvoorkeure van blanke vroue in 'n lae sosio-ekonomiese stratum in Pretoria. M Dieetk verhandeling. Universiteit van Pretoria; 1996.

ADDENDA

ADDENDUM A: QUESTIONNAIRE USED FOR QUANTITATIVE RESEARCH

HAMMANSKRAALPROJECT

QUESTIONNAIRE

OFFICE USE ONLY

V1	RESP NO				1-3

V2	CARD NO	1	4

V3	GROUP NO		5

ANSWER ALL THE QUESTIONS IN THE QUESTIONNAIRE:

A. **DEMOGRAFIC INFORMATION**

1. WHAT IS THE NAME OF THE :

MOTHER	
CARETAKER	
CHILD	

2. WHO IS THE PERSON THAT BROUGHT THE CHILD TO THE CLINIC TODAY ?

MOTHER	1
CARETAKER	2

V4		6

3. WHAT IS THE SEX OF THE :

CARE-TAKER	FEMALE	1	MALE	2
CHILD	FEMALE	1	MALE	2

V5		7
V6		8

4. TO WHICH ETHNICAL GROUP DOES THE MOTHER BELONG ?

TSWANA	1
NORTHERN-SOTHO	2
VENDA	3
SOUTHERN-SOTHO	4
PEDI	5
XHOSA	6
SHANGAAN	7
ZULU	8
NDEBELE	9
SWAZI	10
*OTHER(specify)	
*OTHER(specify)	

V7			9-10

*OTHER . . . . . .

5. WHAT IS THE AGE OF THE :

MOTHER	< 20 YEARS	1
	20 - 24 YEARS	2
	25 - 29 YEARS	3
	30 - 34 YEARS	4
	> 34 YEARS	5
CHILD	0 - 6 WEEKS	1
	6 WEEKS - 3 MONTHS	2
	3 - 6 MONTHS	3
	6 - 9 MONTHS	4
	9 - 12 MONTHS	5
	12 - 24 MONTHS	6
	24 - 36 MONTHS	7

V8		11
V9		12

6. WHAT IS THE POSITION OF THE CHILD IN THE FAMILY ? (CHILDNUMBER...)

FIRST CHILD	1
SECOND CHILD	2
THIRD CHILD	3
FOURTH CHILD	4
FIFTH CHILD	5
SIXTH CHILD OR MORE	6
'OTHER(specify)	

V10		13

'OTHER . . . . . .

7. WHAT IS THE AGE AF THE CHILD JUST OLDER THAN THIS ONE ?

NO OLDER CHILD	1
9 - 12 MONTHS	2
12 - 24 MONTHS	3
2 - 3 YEARS	4
3 - 4 YEARS	5
4 - 5 YEARS	6
5+ YEARS	7
DOES NOT KNOW	8

V11		14

8. WHAT IS THE AGE AF THE CHILD JUST YOUNGER THAN THIS ONE ?

NO YOUNGER CHILD	1
0 - 6 MONTHS	2
6 - 12 MONTHS	3
12 - 18 MONTHS	4
18 - 24 MONTHS	5
2 - 2½ YEARS	6
DOES NOT KNOW	7

V12		15

9. ON WHICH FEED IS THE CHILD **NOW** ?

EXCLUSIVE BREASTFEEDING	1
BREAST- AND BOTTLEFEEDING	2
EXCLUSIVE BOTTLEFEEDING	3
BREASTFEEDING AND SOLID FOOD	4
BOTTLEFEEDING AND SOLID FOOD	5
BREASTFEEDING AND BOTTLEFEEDING AND SOLID FOOD	6
SOLID FOOD AND COW'S MILK IN A MUG	7
SOLID FOOD ALONE	8

V13		16

10. IF THE CHILD STILL DRINKS MILK IN A BOTTLE AT ALL, SPECIFY THE TYPE OF MILK THAT HE / SHE IS DRINKING :

. . . . . .

. . . . . .

FRESH COW'S MILK	1
POWDERED BABY'S MILK (S26, SMA, NESPRAY etc)	2
POWDERED MILK (ELITE, FARMERS PRIDE, PROTEA)	3
INSTANT MILK CREAMERS (CREMORA, ELLIS BROWN)	4
DOES NOT DRINK A BOTTLE AT ALL	5

V14		17

11. IF THE CHILD IS EATING SOLID FOOD ALREADY, HOW OLD WAS HE / SHE WHEN THIS WAS STARTED ?

(CHOOSE ONE WAY OF ANSWERING ONLY)

V15		18-19

CHILD IS NOT EATING SOLID FOOD AT ALL		1
MONTHS (AGE) WHEN HE STARTED EATING	1 - 2 MONTHS	2
	3 MONTHS	3
	4 MONTHS	4
	5 MONTHS	5
	6 MONTHS	6
	7 MONTHS	7
	8 MONTHS	8
	9 - 12 MONTHS	9
	12 - 18 MONTHS	10
	18 - 24 MONTHS	11
	24 - 30 MONTHS	12
	30 - 36 MONTHS	13

IF SHE DOES **NOT** KNOW THE AGE - CONTINUE WITH THE PHYSICAL INDICATORS.

(IF SHE DID KNOW THE AGE - LEAVE THE PHYSICAL INDICATORS)

PHYSICAL INDICATORS WHEN HE STARTED EASTING	BABY DOES NOT SIT ALONE YET	14
	SIT UPRIGHT ALONE	15
	WHEN THE FIRST TOOTH ERUPTED	16
	STARTED CRAWLING	17
	STARTED WALKING	18
	*OTHER (specify)	

*OTHER : . . . . . .

. . . . . .

. . . . . .

12. WHAT WAS THE MAIN REASON WHY YOU STARTED GIVING SOLID FOOD TO THE BABY TO EAT ?
(MARK ONLY THE MAIN REASON !)

CHILD IS NOT EATING SOLID FOOD YET	1
CHILD IS OLD ENOUGH (see previous question)	2
CHILD IS SICK	3
CHILD REFUSES BREAST	4
CHILD DOES NOT COPE WELL WITH BREASTFEEDING	5
MOTHER MUST GO BACK TO SCHOOL	6
MOTHER DOES NOT HAVE ENOUGH MILK	7
MOTHER IS SICK AND DRINK LOTS OF PILLS (eg. breast abcess)	8
MOTHER IS EXPECTING ANOTHER BABY (eg. childspacing)	9
MOTHER MUST GO BACK TO WORK	10
MUST STOP BREASTFEEDING AND CANNOT AFFORD OTHER MILK	11
CULTURAL REASON (eg. everybody wean children at a specific time) INDICATE WHICH PLEASE	12
PEER GROUP PRESSURE (eg. an adolessent who does not want to be different) INDICATE WHICH PLEASE	13
WHEN THE MOTHER IS IN MOURNING BECAUSE A CHILD HAS DIED	14
WHEN THE MOTHER IS WORKING WITH ILL PEOPLE WHICH CONTAMINATES HER MILK	15
MOTHER MUST GO BACK TO SCHOOL	16
NO SPECIFIC REASON	17
*ANY OTHER (specify)	

V16			20-21

*OTHER (specify) : . . . . . .

. . . . . .

13. IN WHICH RESIDENCIAL AREA (DISTRICT) IN HAMMANSKRAAL ARE YOU LIVING (FILL IN THE SPACES PROVIDED BELOW) :

MOTHER	
CARETAKER	

V17			22-23
V18			24-25
V19			26-27

14. HOW LARGE IS THE "FAMILY" THAT LIVES AND EATS TOGETHER ?

2	1
3 - 5	2
6 - 10	3
11 - 15	4
> 15	5

V20		28

15. WHICH PEOPLE IS LIVING TOGETHER IN THE HOUSE WHERE THE MOTHER LIVES? **(INDICATE WITH A CROSS IN THE X-COLUMN WHICH PEOPLE LIVES IN THE HOUSE AND WRITE NEXT TO IT IN THE NUMBER-COLUMN HOW MANY PEOPLE OF THAT KIND IS LIVING IN THE HOUSE, FOR EXAMPLE :**
(OTHER CHILDREN / 10 / 5)

	X	NUMBER
MOTHER/CARETAKER/WIFE	1	
FATHER/HUSBAND	2	
OWN CHILD/CHILDREN	3	
PARENTS OF THE MOTHER /CARETAKER/WIFE	4	
PARENTS OF FATHER/HUSBAND	5	
GRANDPARENTS OF THE MOTHER/CARETAKER/WIFE	6	
GRANDPARENTS OF THE FATHER/HUSBAND	7	
BROTHERS/SISTERS OF THE MOTHER/CARETAKER/WIFE	8	
BROTHERS/SISTERS OF THE FATHER/HUSBAND	9	
OTHER CHILDREN (*specify)	10	
FRIENDS (*specify)	11	
OTHER FAMILY (*specify)	12	

V21			29
V22			30
V23			31
V24			32
V25			33
V26			34
V27			35
V28			36-37
V29			38-39
V30			40-41
V31			42-43
V32			44-45

16. WHO TAKES CARE (FEEDS, DRESSES, BATHS) OF THE CHILD IN THE DAY ?
(MARK ONLY ONE !)

MOTHER	1
FATHER	2
GRANDMOTHER	3
BROTHER	4
SISTER	5
OTHER ADULT FAMILY MEMBER (specify)	6
*OTHER (specify)	

V33		46

*OTHER : . . . . . .

17. WHAT IS THE OCCUPATION OF THE MOTHER ? :

HOUSEWIFE	1
GOING TO SCHOOL	2
SECRETARY	3
CLEANING LADY	4
TEACHER	5
CLERK	6
SHOPASSISTANT	7
NURSE	8
CASHIER	9
VENDOR (FRUIT & VEG)	10
DOMESTIC WORKER	11
LOOKING FOR WORK	12
*OTHER (specify)	

V34			47-48

*OTHER (specify): . . . . . .

18. IS THE FATHER IS CONTRIBUTING MONEY TO THE FAMILY ?

YES	1	NO	2

V35		49

IF YOU ANSWERED YES, CONTINUE WITH THE FOLLOWING QUESTION (NO 19). IF THERE IS NO FATHER INVOLVED, GO ON TO QUESTION NO 20

19. WHAT IS THE OCCUPATION OF THE FATHER ?

CLERK	1
TEACHER	2
CONSTRUCTIONWORKER	3
DRIVER	4
WORKMAN/ARTISAN	5
SHOPASSISTANT	6
POLICEMAN	7
FACTORY WORKER	8
VENDOR (FRUIT & VEG)	9
MOTORVEHICLE MECHANIC	10
MINEWORKER	11
SOLDIER (ARMY)	12
UNEMPLOYED	13
DO NOT KNOW	14
*OTHER (specify)	

V36			50-51

POST MATRIC QUALIFICATION	1
MATRIC	2
ST. 10	3
ST. 9	4
ST. 8	5
ST. 7	6
ST. 6	7
ST. 5	8
ST. 4	9
ST. 3	10
ST. 2	11
ST. 1	12
GRADE 2	13
GRADE 1	14
NO SCHOOLING	15

*OTHER (specify): . . . . . .

20. WHAT IS THE HIGHEST QUALIFICATION THAT THE MOTHER HAS ACHIEVED ?

V37			52-53

B. ENVIRONMENTAL FACTORS

21. HOW MANY ROOMS DOES THE HOUSE

B. ENVIRONMENTAL FACTORS

21. HOW MANY ROOMS DOES THE HOUSE WHERE THE MOTHER LIVES, HAVE ?

ONE	1
TWO	2
THREE	3
FOUR	4
FIVE OR MORE	5

V38		54

SPECIFY THE ROOMS (NAME THEM): . . . . . .

. . . . . .

. . . . . .

. . . . . .

22. WHAT BUILDING MATERIAL WAS MAINLY USED TO BUILD THE FRAME / STRUCTURE OF YOUR HOUSE ?

BRICKS	1
ZINC	2
WOOD	3
CLAY	4
*OTHER (specify)	

V39		55

23. WHERE DO YOU GET YOUR DRINKING WATER FROM ?

(MARK ONLY THE ONE YOU USE MOSTLY)

TAP IN THE HOUSE	1
PIT	2
RIVER / STREAM	3
TAP OUTSIDE	4
BOREHOLE WITH PUMP	5
RAINWATERTANK	6
BUY FROM WATERTANKERS	7
*OTHER (specify)	

V40		56

*OTHER (specify) : . . . . . .

24. IF YOU DO NOT GET WATER FROM A TAP, WHAT DO YOU DO WITH IT BEFORE YOU DRINK IT ?

USE AS SUCH	1
BOIL AND COOL IT	2
USE WATERPURIFICATION-TABLETS	3
*OTHER (specify)	

V41		57

*OTHER : . . . . . .

. . . . . .

25. IS THERE ELECTRICITY IN YOUR HOUSE ?

YES	1	NO	2

V42		58

26. INDICATE HOW YOU MAINLY PREPARE YOUR FOOD :

OPEN FIRE	1
GAS STOVE	2
PARAFFIN STOVE	3
ELECTRIC STOVE	4
COAL STOVE	5
*OTHER (specify)	

V43		59

*OTHER : . . . . . .

27.HOW DO YOU GET HOLD OF THE FOOD THAT YOU PREPARE ?

	YES	NO
PLANT YOUR OWN	1	2
BUY FROM A SHOP	1	2
GET/ BUY FROM FARMER/ EMPLOYER	1	2
BUY FROM MARKET	1	2
*OTHER (specify)	1	2

V44		60

*OTHER : . . . . . .

. . . . . .

28. WHO MOSTLY (USUALLY) BUYS THE FOOD WHICH THE FAMILY EATS ?

SELF (MOTHER)	1
CARETAKER	2
FATHER	3
FAMILYMEMBER	4
FRIEND	5
*OTHER (specify)	

V45		61

*OTHER : . . . . . .

. . . . . .

29. WHO USUALLY PREPARES THE FOOD FOR THE FAMILY ?

SELF (MOTHER)	1
CARETAKER	2
FAMILYMEMBER	3
FRIEND	4
*OTHER (specify)	

V46		62

*OTHER : . . . . . .

. . . . . .

C. **HEALTH FACTORS**

30. DO YOU VISIT THE CLINIC / HOSPITAL ?

YES	1	NO	2

V47		63

31. HOW OFTEN ARE THE CLINIC / HOSPITAL VISITED ?

FIRST TIME VISIT	1
1 TIME PER WEEK	2
1 TIME EVERY TWO WEEKS	3
1 TIME PER MONTH	4
1 TIME EVERY SECOND MONTH	5
1 TIME EVERY 6 MONTHS	6
1 TIME A YEAR	7
ONLY WHEN THE CHILD GETS SICK	8
NEVER	9
*OTHER (specify)	10

V48			64-65

*OTHER (specify) : . . . . . .

. . . . . .

32. WHY DID YOU BRING THE CHILD TO THE CLINIC TODAY ?

	YES	NO
IMMUNIZATION	1	2
SIX WEEKS CHECK UP	1	2
WEIGHING AND MEASURING	1	2
ADVICE WITH PROBLEMS	1	2
SICK CHILD	1	2
*OTHER (specify)	1	2

V49		66

*OTHER (specify) : . . . . . .

. . . . . .

33. DOES THE CHILD HAVE A "ROAD TO HEALTH" CARD ?

YES	1	NO	2

V50		67

ANTHROPOMETRIC INFORMATION

1. Information about the child at birth :

   Birthweight : . . . . . .

   Length at birth : . . . . . .

   Headcircumference at birth : . . . . . .

2. Age of the child when the clinic was visited for the first time :

   . . . . . .

3. Previous information (after birth) : records of length, weight and headcircumference as recorded with previous visits to the clinic (use the "Road to Health" card to record the information)

DATE	AGE	LENGTH		WEIGHT		HEADCIRCUM-FERENCE	
		(cm)	pers	(kg)	pers	(cm)	pers

3. Current information (as measured today) :

SEX	
CURRENT AGE	months
CURRENT LENGTH	cm
CURRENT WEIGHT	g
CURRENT HEADCIRCUMFERENCE	cm

KANTOORGEBRUIK - ANTROPOMETRIESE DATA

V51	RESP NO				1-3

KOLOM NR	4-6	7-10	11-12	13-16	17-18	19-22	23-24	25-26	27-29	30-33	34-35	36-39	40-41	42-45	46-47	48-49
KAART NR	**OUD**	**LENGTE**	**L-P**	**GE-WIG**	**G-P**	**KOP-OMTR**	**K-P**	**G vir L - P**	**OUD**	**LENGTE**	**L-P**	**GE-WIG**	**G-P**	**KOP-OMTR**	**K-P**	**G vir L - P**
2																
3																
4																
5																
6																
7																
8																

KANTOORGEBRUIK - ANTROPOMETRIESE DATA

V52 (geslag)		50
V53 (maande)		51-54
V54 (cm-lank)		55-59
V55 (gram)		60-64
V56 (cm-kop)		65-68

24H RECALL OF USUAL FOODINTAKE

1. BREAKFAST (rising - 09:00)		
FOODS	PREPARATION	PORTIONSIZE

2. MORNING SNACK (09:00 - 12:00)		
FOODS	PREPARATION	PORTIONSIZE

DATAVERWERKING : ONTBYT + OGGENDVERSNAPERING

VOEDSELSOORT	KODE - NRIND				GEWIG			

3. LUNCH (12:00 - 14:00)		
FOODS	PREPARATION	PORTIONSIZE

4. AFTERNOON SNACK (17:00 - 20 :00)		
FOODS	PREPARATION	PORTIONSIZE

DATAVERWERKING : MIDDAGETE + MIDDAGVERSNAPERING

VOEDSELSOORT	KODE - NRIND				GEWIG			

3. SUPPER (17:00 - 20:00)		
FOODS	PREPARATION	PORTIONSIZE

4. LATE NIGHT SNACK (20:00 - SLEEP)		
FOODS	PREPARATION	PORTIONSIZE

DATAVERWERKING : AANDETE + AANDVERSNAPERING

VOEDSELSOORT	KODE - NRIND				GEWIG			

DATAVERWERKING : * TOTALE VAN AL DIE BOGENOEMDE MAALTYE EN VOEDSELSOORTE GENUTTIG

VOEDSELSOORT	KODE - NRIND				GEWIG			

QUESTIONNAIRE:HUNGERSCALE

V57	RESP NO				1-3

V58	CARD NO	9	4

OFFICE USE

		NEVER	SOME-TIMES	MOST TIMES	VER-AND.		
1.	Do you worry that your food will run out before you get money to buy more ?	1	2	3	V59		5
2.	Does the food that you buy last until you get money to buy more ?	1	2	3	V60		6
3.	Do you run out of foods to prepare a meal with, without having any money to buy more?	1	2	3	V61		7
4.	Do you worry that you will have food to eat tomorrow ?	1	2	3	V62		8
5.	Can you afford to buy the kind of foods that you think your family should eat ?	1	2	3	V63		9

6.	Do you have enough money to eat the way you should ?	1	2	3	V64		10
7.	Are your money enough to buy enough food to keep you from getting hungry ?	1	2	3	V65		11
8.	Are you most of the times hungry, but you don't eat because you can't afford enough food?	1	2	3	V66		12
9.	Do you eat less than you think you should, because you don't have enough money for food?	1	2	3	V67		13
10.	Do you have enough money to give your child(ren) a good meal ?	1	2	3	V68		14
11.	Do you have enough money to feed your child(ren) the way you think is right ?	1	2	3	V69		15
12.	Do you have enough money to give your child(ren) enough food ?	1	2	3	V70		16
13.	Is/are your child(ren) sometimes hungry because you don't have enough money to buy food?	1	2	3	V71		17

AGREEMENT

THE BREASTFEEDING AND WEANING PRACTICES OF MOTHERS IN THE BOPHUTHATSWANA-AREA (HAMMANSKRAAL) AND THE FEEDINGPRACTICES OF THE CHILDREN AFTER WEANING UNTIL THE AGE OF THREE YEARS.

I (name) _____ hereby give my permission to take part in the abovementioned research study.

I understand that the purpose of the study is to determine what the breastfeeding- and weaningpractices, nutritional knowledge and attitude towards nutrition of the mothers/caretakers are, and what the nutrition practices and nutritional status of the children are, and that my participation in the project will imply the following :

* *the duration of the project will be for a period of approximately two months in which time the clinic will be visited two times on prearranged times in order to give information about myself and my child.*

* *with the first visit the following information will be required :*
  - ☺ *demographic questionnaire (general information about myself and my living conditions)*
  - ☺ *anthropometrical measurements (measurements of the body of the child)*
  - ☺ *dietary history (information about the child's eating habits)*
  - ☺ *hungerscale (questions about the availability of food for the family)*

* *with the second visit there will be a groupdiscussion for about one hour (about eating habits, knowledge and attitudes on nutrition), in which I will participate.*

Advantages for my participation in the project includes my contribu-tion to the description of the nutritional status of the Hammanskraal community with the result of an intervention afterwards in order to improve the nutritional status of the community, especially the children.

I have had a chance to ask questions and think about the answers.

I understand that I have agreed to take part in the study on a <u>voluntary</u> basis.

I understand that I may withdraw from the study at any stage without any consequences.

I understand that I cannot hold the University of Pretoria responsi-ble for any inconvenience that I may experience because of the study.

***HANDTEKENING**_____ **DATUM**_____*

***GETUIE**_____*

***HANDTEKENING**_____ **DATUM**_____*

TUMELANO

LETHLA LA KAROLO YA BO-MME BA BA ANYISANG BANA LE TSELA YA GO BA FEPA KA DIJO GO FITHLA BA LATLHA LETSELE MO TIKOLOGONG YA KUDUBE HAMMANSKRAAL.

*Nna (leina ka botlalo)*_____ *Ke naya ka tumelano le tetla ya gore ke tsaya karolo mo dipatlisisong.*

Ke tlhaloganya gore lebaka la go ba mo dipatlisisong ke go bona mokgwa o bo-mme ba ba anyisang masea le mosuta wa dijo o bo-mme ba di nayang bana fa ba latlha letsele le kitso ya bo-mme ka mefuta ya dijo mo kgodisong ya ngwana mabapi le phepo. Le go bona seemo sa bana mabapi le phepo eo'ba e bonang fa ba gola :

* *Nako ya tirigalo eno e tla tsaya sebaka sa dikgwedi tse pedi (2 months). Thulaganyo e tla diriwa le kliniki e gaufi le nna gore ketla e etela gabedi go naya bopaki ka ga ngwana wa me.*

* *Lethla la ntlho la leeto la kliniki ke tla neela ka botlalo dintlha tse di latelang :*
  - ☺ *mokgwa wa botshelo ba me ka kakaretso.*
  - ☺ *bolekanya mmele jwa ngwana wa me.*
  - ☺ *Mokgwa wa thulaganyo ka go ja ga ngwana.*
  - ☺ *Mofuta wa dija tse re di baakanyang mo lapeng.*

* *Lethla la leeto la bobedi kwa kliniking - go tla baana le lekgotla la bomme go buisana mabapi ka ga kitso le mokgwa wa dijo o o nono-fileng. Le nna ke tla baya mongwe wa bo-mmemo lekgotleng le go tsaya karolo.*

Mosola wa tiro eo ketsayang tshwetso ya go direla sechaba. Sa bo mmaabana ba Hammanskraal gonthusa ka go ba naya maele le dilgakololo gore batho ba je dijo tse di nonofileng go tshela sentle. Ke bone tshone ya go botsa dipotso le go nagana dikarabo.

Ke ithaupa go tsaya tshwetso eno ya mofuta yono kwa ntle ga pateletso.

Go tswa mo gonna go ikogela morago ga ke sa batla go tswelelapele. Ga kena ke pateletsa University of Pretoria, morago ga go bona dintlha kana dikaraboi tseo di sa intumedising.

SETLANO_____ ***LETLHA***_____

PAKI_____

SETLANO_____ ***LETLHA***_____

ADDENDUM B: INTERVIEW SCHEDULE — FOCUS GROUPS

HAMMANSKRAALPROJECT

FOCUSGROUPS : GROUPINFORMATION

DAY : .....

DATE : .....

TIME BEGIN : .....

TIME ENDED :. .....

FOCUSGROUPLEADER : .....

AGE CATEGORY	0-3 months	4-6 months	7-9 months	10-12 months	13-24 months	25-36 months

GROUPMEMBERS :

NO	NAME AND SURNAME : **MOTHER / CARETAKER**	NO	NAME AND SURNAME : **CHILD**	AGE - CHILD
1		1		
2		2		
3		3		
4		4		
5		5		
6		6		

FOCUSGROUPSCHEDULE

(☞ = *leading comments to help the focusgroupleader to get better or more relevant responses*

(* = subquestions that should be asked after the main question in order to get more useful information)

A. GENERAL KNOWLEDGE ON INFANT FEEDING AND HEALTH

(Generally speaking and not referring to this child)

1. Who told you about this clinic and the reason that it is here?

. . . . . .

. . . . . .

2. Who taught you how to care for your baby ?
(meaning bathing, dressing, changing the nappy etc.)

. . . . . .

. . . . . .

☞ *mother, grandmother, other family, other adults in the community, clinic staff*

3. How old were you when you were taught how to care for your baby?

. . . . . .

4. How do you do you know that your baby is healthy and growing well?

. . . . . .

. . . . . .

. . . . . .

5. Who taught you how to feed your baby ?

. . . . . .

. . . . . .

6. What is the best kind of milk for a baby ?

. . . . . .

. . . . . .

* Why is it the best? *(Compare breast- and bottlefeeding with each other and indicate which one is the best and also why)*

. . . . . .

. . . . . .

* Why is the other option bad ?

. . . . . .

. . . . . .

7. How long can one continue to breastfeed a baby without giving it anything else to eat or drink ?

. . . . . .

. . . . . .

* Why ?

. . . . . .

. . . . . .

* How do you know this ?

. . . . . .

. . . . . .

8. What does a mother do when a baby is vomiting ?

. . . . . .

. . . . . .

* Why?

. . . . . .

. . . . . .

9. What does a mother do when a baby is having diarrhoea ?

. . . . . .

. . . . . .

* Why ?

. . . . . .

. . . . . .

* Who taught you this ?

. . . . . .

. . . . . .

B. BREASTFEEDING

10. Should a baby be breastfed ?
YES / NO

* Why ?

. . . . . .

. . . . . .

* When not ?

. . . . . .

. . . . . .

11. How soon after a baby is born should it get breastmilk ?

. . . . . .

. . . . . .

* Why ?

. . . . . .

. . . . . .

12. How many times during the day should you normally **FEED** (not comfort) your child ?

. . . . . .

. . . . . .

13. How many times during the night should you normally **FEED** (not comfort) your child ?

. . . . . .

. . . . . .

14. How do you decide how long to keep the baby on the breast during each feeding session ?

. . . . . .

. . . . . .

☞ *time, satisfied, asleep*

15. How long should you give breastmilk as the one and only feed to the child ?

. . . . . .

. . . . . .

☞ *hours, days, months, years*

* Why ?

. . . . . .

. . . . . .

16. Should the child ever get anything else to eat or drink together with breastfeeding ?

YES \ NO . . . . . .

. . . . . .

☞ *never, allways, sometimes - specify*

IF YES :

* When does the baby get this? (before / after a feed or between feeds)

. . . . . .

. . . . . .

* What does the baby get additionally ?

. . . . . .

. . . . . .

☞ *water, sugarwater, formulamilk, solid food*

* Why ?

. . . . . .

. . . . . .

* How much of this does the baby get ?

. . . . . .

. . . . . .

* How often does the baby get this ?

. . . . . .

. . . . . .

17. At what age should the child get the first extra fooditem while still breastfeeding ?

. . . . . .

. . . . . .

☞ *specify age or stage of development (sit alone, teeth erupt, etc.) of the child*

C. BOTTLEFEEDING

18. Is it general practice to give a newborn baby milk to drink from a bottle ?

YES \ NO

IF NO (leave when yes) :

* Why ?

. . . . . .

. . . . . .

IF YES (leave when no) :

* Who decided that the baby should get bottlefeeding?

. . . . . .

. . . . . .

☞ *family, doctor, self, clinic sister*

* Why ?

. . . . . .

. . . . . .

. . . . . .

19. What was in the bottle (type of milk) ?

. . . . . .

☞ *formula (eg. S26, Nan), powdered milk + water, fresh cowsmilk, fresh goatsmilk, sourmilk, condensed milk + water, Cremora + water, Ideal milk + water, Ultramelmilk etc.*

IF FORMULA MILK (powdered baby milk):

* What types are used ?
(allow each person to specify the powder she is using) (give six answers)

. . . . . .

. . . . . .

. . . . . .

☞ *(SHOW EXAMPLES OF THE PACKING MATERIALS) : Nan, S26, SMA, Lactogen, Similac, Pelargon, Infasoy, Isomil*

* Why do you each use this specific one ?

. . . . . .

. . . . . .

20. How do you know how to make a bottle of milk for your baby ?

. . . . . .

. . . . . .

☞ *decide on your own, read the instructions, clinic sister's advice, mother's advice, etc. (SHOW THEM THE PACKAGING AGAIN IF THEY DON'T KNOW)*

21. How do you prepare a bottle of milk for your baby ?

(demonstrate please - let one of the mothers demonstrate exactly how she prepares a bottle of 150ml and when she is finished, the other mothers must make comments on the method)

GIVE THEM A REAL BABYBOTTLE AND A TIN OF FORMULA WITH THE SCOOP AND ASK THEM TO DEMONSTRATE WITH 150ml.

Your comments : . . . . . .

. . . . . .

☞ *ask type and amounts involved eg. 2 teaspoons powdered milk (Numel) and a full bottle (250ml) water*

22. What type of water do you use to make a bottle for your baby ?

. . . . . .

* Why ?

. . . . . .

. . . . . .

23. Do you ever use fresh cow's milk to give to your baby in a bottle?

YES \ NO

IF NO - continue with the next question

IF YES :
Is it necessary to boil fresh cow's milk before you can give it to your baby in a bottle ?

YES \ NO
* If you answered yes or no : why ?

. . . . . .

. . . . . .
* Do you add anything to cow's milk when you give it to your baby in a bottle ?

YES \ NO

IF NO - continue with the next question

IF YES :
* What ?

. . . . . .

. . . . . .
☞ *sugar, oil*
* Why ?

. . . . . .

. . . . . .

24. Do you prepare food or bottles of milk in advance for a day's meals ?

YES \ NO

IF NO - continue with the next question

IF YES :
* Why ?

. . . . . .
* Where do you keep it ?

. . . . . .

. . . . . .
☞ *on the stove, in the cupboard, fridge, shade etc.*

D. WEANING

25. What is the first type of solid food that a baby normally gets to eat ?

. . . . . .

. . . . . .

☞ *commercial baby cereal (Nestum) / babafood (Purity), boiled porridge, boiled porridge mixed with milk, vegetables, fruit, egg etc.*

* Why this type specifically?

. . . . . .

. . . . . .

* What is the next TWO types of foods (in order) that is usually given to the baby ?

. . . . . .

. . . . . .

* Why these specifically ?

. . . . . .

. . . . . .

26. When a child starts to eat solid food as a meal, does he/she still get milk to drink as well ?
YES \ NO

IF NO (leave this if they answered yes) :

* How soon after the child starts to eat solid food do you stop to give him / her milk in a bottle / breastfeeding ?

. . . . . .

. . . . . .

* Why ?

. . . . . .

. . . . . .

IF YES (leave this if they answered no) :

* What type of milk does he / she drink now ?

. . . . . .

. . . . . .

☞ *formula powdered milk + water, fresh cow's milk, fresh goat's milk, sourmilk, condensed milk + water, Cremora + water, Ideal milk + water, Ultramelmilk etc.*

* Why ?

. . . . . .

. . . . . .

* In what does he/she drink the milk?

. . . . . .

☞ *plastic mug or cup, glass*

IF THE MILK IS GIVEN IN ANYTHING OTHER THAN A BOTTLE(eg MUG/CUP):

* How is the milk mixed if it is not cow's milk ?

☞ *volume water and amount of milkpowder*

(demonstrate please - let one of the mothers demonstrate exactly how she prepares a bottle of 150ml and when she is finished, the other mothers must make comments on the method)

GIVE THEM A REAL MUG AND A TIN OF MILKPOWDER WITH A SPOON AND ASK THEM TO DEMONSTRATE. (CHECK THE AMOUNTS AS WELL)

Your comments : . . . . . .

. . . . . .

* What type of water is used to make the feeds with ?

. . . . . .

. . . . . .

☞ *tap-, borehole-, pit-, fountainwater*

* What is the temperature of the water used to mix the milk?

. . . . . .

. . . . . .

☞ *cold-, lukewarm-, warm-, refrigerated tapwater, luke-warm-, refrigerated boiled water, boiling water*

27. How many times does a child get solid food on the same day ?

. . . . . .

. . . . . .

☞ *1, 2, 3 x times, only when he/she wakes up in the morning, only with the evening meal etc.*

* Why in this way ?

. . . . . .

. . . . . .

28. What amount of food does the child get each time he/she eats ?

. . . . . .

. . . . . .

☞ *show examples of teaspoons and tablespoons and ask the amount of units each time*

* Why does he/she get so much ?

. . . . . .

. . . . . .

29. How much milk does a weaned child get to drink on one day ? (Total volume)

. . . . . .

. . . . . .

☞ *amount of cups, bottles, litres (use examples)*

WITH EACH FOCUSGROUP, JUST ASK THE VOLUME THAT THE CHILDREN IN THIS AGEGROUP DRINKS

* Why ?

. . . . . .

. . . . . .

30. Are the child's food prepared separately from that of the family?

YES / NO . . . . . .

* Why ?

. . . . . .

. . . . . .

31. Explain how the food for the child is prepared

. . . . . .

. . . . . .

☞ *just boiled - pieces, boiled until soft/mashed, boiled and then mashed, strained*

* Are anything added to the child's food during preparation?

. . . . . .

. . . . . .

☞ *water, milk, butter/margarine, sugar, butter /margarine and sugar, oil*

* Why ?

. . . . . .

. . . . . .

E. NUTRITION KNOWLEDGE

32. What causes vomiting in the baby ?

. . . . . .

. . . . . .

33. What causes diarrhoea in the baby ?

. . . . . .

. . . . . .

34. How many times a day should an adult eat ?

. . . . . .

* Why ?

. . . . . .

. . . . . .

35. How many times a day should a child eat ?

. . . . . .

* Why ?

. . . . . .

. . . . . .

36. Should you keep the milk/food that is left over from one feed to give to the child the next time that he/she is hungry ?
YES / NO

* Why ?

. . . . . .

. . . . . .

. . . . . .

37. Do you check the milk or food of the child to see if it is not bad/off before you give it to the child?
YES / NO

* Why ?

. . . . . .

. . . . . .

* How ?

. . . . . .

. . . . . .

38. Should a baby / child drink milk every day ?

YES / NO

* Why ?

. . . . . .

. . . . . .

* How much ?

. . . . . .

. . . . . .

39. Should a child eat meat every day ?

YES / NO

* Why ?

. . . . . .

. . . . . .

40. If you don not have meat, what can you use in the place of meat ?

. . . . . .

. . . . . .

☞ *eg legumes or soya*

* Would you give it to your child ?

YES / NO

* Why / why not ?

. . . . . .

. . . . . .

41 Should a child eat a starchy food like pap, rice, samp, mealierice or bread with each meal?

YES / NO

* Why ?

. . . . . .

. . . . . .

42. Which type of bread is the best to eat - white, brown or wholewheat ?

. . . . . .

* Why ?

. . . . . .

. . . . . .

43. Should a child eat vegetables and fruit every day ?

YES / NO

* Why ?

. . . . . .

. . . . . .

44. Is it better to eat vegetables and/or fruit cooked or raw ?

. . . . . .

* Why ?

. . . . . .

. . . . . .

45. Should a child eat a lot of fat (oil, butter, margarine) every day?
YES / NO

* Why do you think so ?

. . . . . .

. . . . . .

* What is the best way to use fat in the diet ?

. . . . . .

. . . . . .

* *Spread on bread, fry your food etc.*

46. What do you give your baby to drink when he/she is thirsty ?

. . . . . .

. . . . . .

* Why ?

. . . . . .

. . . . . .

47. Do you think that it is important to see to it that a baby or young child get enough liquids to drink, every day ?
YES / NO

* Why ?

. . . . . .

. . . . . .

* What liquids should they get to drink ?

. . . . . .

. . . . . .

* How much liquid do you think that a child should drink in a day ?

. . . . . .

. . . . . .

48. Which types of drinks is the best for children to drink between meals ?

. . . . . .

. . . . . .

* Why these ?

. . . . . .

. . . . . .

49. What should you eat to :

* **grow the body :** . . . . . .

reason = ...

. . . . . .

* **keep the eyes healthy :** . . . . . .

reason = ...

. . . . . .

* **prevent you from getting sick :** . . . . . .

. . . . . .

reason = ...

. . . . . .

* **build teeth and bones :** . . . . . .

. . . . . .

reason = ...

. . . . . .

* **give you energy / strength to do your work :** . . . . . .

. . . . . .

reason = ...

. . . . . .

* **help sores /scratches to heal quickly :** . . . . . .

. . . . . .

reason = ...

. . . . . .

F. ATTITUDE TOWARDS NUTRITION

With each question, let the group respond in a positive / negative way first, and then they should explain the reason for their answer.

(Circle the correct choice below)

50. Do you think that the food you eat is important for good health?
YES / NO
* Why do you think so ? . . . . . .

. . . . . .

. . . . . .

51. Do you think that a child that looks fat is healthy and well fed?
YES / NO
* Why ? . . . . . .

. . . . . .

. . . . . .

52. Do you think that the types of food that you eat prevents you from getting ill ?
YES / NO
* Why ? . . . . . .

. . . . . .

. . . . . .

53. Are you willing to eat foods that you have never eaten before ?
YES / NO
* Why ? . . . . . .

. . . . . .

. . . . . .

54. Do you believe what the clinic tells you about feeding your child?
YES / NO
* Why do you feel this way ? . . . . . .

. . . . . .

. . . . . .

. . . . . .

55. Do you think that the most foods that you have available to eat, are good for you ?
YES / NO
* Why do you think so ? . . . . . .

. . . . . .

. . . . . .

. . . . . .

56. Do you think that you should have a lot of money to eat healthy?
YES / NO
* Why ? . . . . . .

. . . . . .

. . . . . .

57. Do you think that it is important to know how to eat healthy ?
YES / NO
* Why ? . . . . . .

. . . . . .

. . . . . .

. . . . . .

58. Do you think that the traditional ways of food preparation are the best ?
YES / NO
* Why ? . . . . . .

. . . . . .

. . . . . .

* Explain what the trsditional ways of food preparation are :

. . . . . .

. . . . . .

. . . . . .

. . . . . .

59. Should the father or head of the house always get the biggest portion of food ?
YES / NO
* Why is this so ? . . . . . .

. . . . . .

. . . . . .

* Do you think that this is the correct way ?

YES / NO
* Why ?

. . . . . .

. . . . . .

. . . . . .

. . . . . .

ADDENDUM C: INSTRUCTIONS FOR THE PILOT STUDY

HAMMANSKRAALPROJEK

*

LOODSSTUDIE

VOORSKRIFTE VIR ONDERHOUDVOERING

A. VRAELYS (DEMOGRAFIESE-, OMGEWINGS- EN GESONDHEIDSFAKTORE)

Neem noukeurig die inligting in die volgorde soos wat dit op die vraelys verskyn af - vul in waar spasies gelaat is en trek kruisies in die ruimtes daarvoor gelaat. Indien daar enige addisionele inligting wat van toepassing blyk te wees deur die respondent verskaf word, vul dit in in die ruimtes wat daarvoor gelaat is of selfs in die oop ruimtes langs die vrae.

By die vrae waar daar 'n 'ANDER - opsie beskikbaar is, en die respondent maak daarvan gebruik, maak seker dat u volledige beskrywende inligting rondom die antwoord bekom en in die oop ruimtes invul aangesien dit kan lei tot moontlike toevoegings op die vraelys.

By vraag 4 moet beide die ouderdomme van die moeder en kind apart in die twee kolomme ingevul word.

By vraag 9 kan die tipe melk voltooi word ter verklaring.

By vraag 10 moet slegs een van die antwoordtegnieke gebruik word. Vra vir die moeder watter manier die maklikste vir haar gaan wees om te antwoord : ken sy die ouderdomme van die mylpale wat haar kind behaal het, of kan sy net die mylpale as indikator van ouderdom onthou.

By vraag 11 mag daar ook net een opsie gekies word.

By vraag 13 moet elke alternatief deurgegaan word, gemerk word indien dit van toepassing is, en die betrokke aantal persone daarnaas ingevul word.

B. ANTROPOMETRIESE INLIGTING

Probeer om die betrokke kind se "Road to Health" kaart te bekom vir die invul van al die nodige inligting vir vraag nr 1 en 2.

Vir vraag nr 3 sal u al die metings self moet doen, behalwe die eksakte ouderdom van die kind, wat u vanaf die kind se kliniekkaart kan kry of vanaf die moeder :

lengte - meetmat (Nestlé)
(maak seker dat die kind plat lê wanneer die lengtemeting geneem word

massa - elektroniese skaal (moeder + baba)

kopomtrek - kopomtrekmeetband
(maak seker dat die kopband styf om die kind se kop pas (let op na moontlike hareprobleme)

C. 24H HERROEP VAN GEWOONTELIKE INNAME

Hierdie vorm is vir die neem van 'n dieetgeskiedenis van die kind van die moeder en **NIÉ** van die moeder self nie.

Begin u ondersoek deur te verneem of die vorige dag se eetpatroon van die kind dié van 'n tipiese dag was:

* indien wel - neem gister se eetpatroon af.
* indien nie - stel met behulp van die moeder/versorger 'n gewoontelike eetpatroon van die kind vas.

Verduidelik net vinnig wat die dieetgeskiedenis behels :

* 'n Dieetgeskiedenis is 'n metode wat gebruik word om 'n gewoontlike eetpatroon vas te stel.
* Vertel dus vir my wat u kind gewoonlik alles eet of drinkvandat hy/sy wakker word in die oggend, totdat hy/sy weer gaan slaap in die aand.
  (Onthou ook as dit nog 'n baba is dat die kind gedurende die nag ook moontlik iets mag drink - voltooi dit dan by die laataand tydvak en dui slegs langsaan aan wanneer die baba elke keer drink)

As die persoon nie spontaan wil vertel nie, gee leiding deur elke tydvak afsonderlik te bespreek. Noem die tydvak, laat die respondent toe om te vertel wat haar kind alles gedurende die periode eet en drink, en as sy klaar is, kontroleer dit dan ten opsigte van die detailinligting wat nog nodig mag wees

Kontroleer ALLE hoeveelhede noukeurig. Maak gebruik van die gegewe eetgerei om huishoudelike/volume mates te bekom:

A. Blikbord - 600ml gelykvol tot by die rand van die bord

B. Blikbeker - 400ml gelykvol

C. Plastiekglas - 300ml gelykvol ; 210ml tot by 1e randjie

D. Plastiekpapbakkie - 600ml gelykvol ; 290ml halfvol

E. Glasbakkie - 400ml gelykvol ; 175ml halfvol (tot byronding)

F. Porseleinbord - 500ml gelykvol tot by gekleurde rand

G. Porseleinkoppie en piering - 225ml gelykvol ; 200ml koffievol

H. Plastiekeetlepel - 10ml gelykvol ; 20ml hoogvol

I. Plastiekteelepel - 5ml gelykvol ; 7ml hoogvol

J. Metaaleetlepel - 10ml gelykvol ; 20ml hoogvol

K. Metaalteelepel - 5ml gelykvol ; 7ml hoogvol

Elke item sal agterop gemerk wees en u kan net die letter as verwysing byskryf in u notas vir duidelikheid.

Kontroleer ALLE gaarmaakmetodes noukeurig - veral ten opsigte van die byvoeging van vet/ olie/ margarien/ suiker.

Moenie dink dat jy weet wat 'n persoon bedoel nie. Maak altyd doodseker dat jy reg verstaan het.

Skryf ALLES neer wat jy uitvind (Ek moet tot presies dieselfde gevolgtrekking kan kom as jy)

Moenie woorde in die respondent se mond lê nie - laat sy self bepaal hoeveel die kind eet of drink. Gebruik die huishoudelike meeteenhede vir hierdie doel.

Indien die respondent nog 'n baie klein babatjie is wat nog nie eet nie - skryf dit dan so op die vorm neer en probeer om vas te stel hoeveel melk die baba inneem (borsvoeding : aantal kere per dag asook die lengte van voeding ; bottelvoeding : die aantal bottels asook die volume melk asook die tipe en aanmaakmetodes ter sprake)

METODE

1. Eet of drink u kind enigiets vandat hy/sy opstaan in die oggend tot 09:00 in die oggend ?
   Kontroleer:
   - dranke byvoorbeeld koffie/tee : tipe melk/verromer, suiker/tablette
   - melk/Nesquick/vrugtesap/koeldrank : spesifiseer tipes en aanmaakmetodes
   - beskuit/koekies
   - tipe pap (veral tov konsistensie van gekookte pap) of gebruik van babapap

- bepaal hoedat die pap aangemaak word tipe melk en suiker of margarien in pap
- tipe brood en dikte daarvan
- tipe margarien of konfyt op brood
- vrugte (let op na konsistensie)
- proteïengeregte en gaarmaakmetode
- Purity vir die babas

2. Eet of drink u kind enigiets tussen 09:00 en 12:00 ?

Kontroleer:

- dranke byvoorbeeld koffie/tee (byvoegings)
- koeldrank / vrugtesap (tipe)
- melk (tipe)
- koekies/beskuit
- toebroodjies : - tipe brood en dikte
  - margarien of smere
  - vulsel
- lekkergoed : sjokolade/suiglekkers
- vrugte

3. Wat eet en drink u kind alle tussen 12:00 en 14:00 ?

Kontroleer:

- dranke (soos voorheen)
- toebroodjies (soos voorheen)
- pap (soos voorheen - let op na babapap)
- Purity vir babas
- gekookte etes : gaarmaakmetodes, byvoegings in geregte/groente en souse by pap of vleis
- vrugte
- nagereg/lekkergoed

4. Wat eet of drink u kind alles tussen 14:00 en 17:00 ?

Kontroleer:

- dranke - spesifiseer tipe (tee/koffie/koeldranke/vrugtesap/melk)
- vrugte
- koekies/beskuit
- vrugte

5. Eet of drink u kind enigiets tussen 17:00 en 20:00 ?

Kontroleer :

- dranke (soos voorheen)
- toebroodjies (soos voorheen)
- pap (soos voorheen - let op na babapap)

- Purity vir babas
- gekookte etes : gaarmaakmetodes, byvoegings in geregte/groente souse by pap of vleis
- vrugte
- nagereg/lekkergoed
- kombinasiegeregte (alle bestanddele)

(Bepaal watter ete die hoofete is en gebruik dan 'n tweede voorbeeld om sodoende 'n gemiddelde inname te kan vasstel)

6. Wat eet of drink u kind vanaf 20:00 totdat hy/sy gaan slaap ?

Kontroleer:

- koffie/tee
- koeldrank/vrugtesap
- warm dranke soos Milo/Nesquick
- melk
- beskuit/koekies/koek
- toebroodjies
- vrugte
- lekkergoed

ONTHOU OM TE VRA WAT EN HOEVEEL BABAS GEDURENDE DIE NAG INNEEM EN SPESIFISEER TELKENS DIE TYD VAN INNAME

KRUISKONTROLE

(Skryf neer op die volgende bladsy vir kantoorgebruik en merk KK)

1. Hoeveel koppies koffie drink u kind elke dag ?
2. Hoeveel koppies tee drink u kind elke dag ?
3. Hoeveel melk drink u kind op 'n dag ?
4. Gebruik u ooit kaas of joghurt vir u kind se etes ?
5. Hoeveel lekkergoed eet u kind daagliks ?
   (sjokolade, suiglekkers, aartappelskyfies)
6. Hoeveel vrugte eet u kind elke dag ?
7. Hoeveel koeldrank drink u kind elke dag ?

D. HONGERSKAAL

Voltooi deur telkens slegs die vraag te vra en dan een van die drie responsmoontlikhede te merk.
Spesifiseer telkens vir die respondent dat :

* die eerste groep vrae oor haar huishouding vir haar hele gesin gaan,
* dat die tweede groep vrae oor haarself gaan
* dat die derde groep vrae oor haar kind/ers gaan.

LET GEDURIG OP NA:

- die tyd wat dit neem om elke deel van die vraelys te voltooi, asook totale tyd :

TYD	1	2	3	4	5	6	7	8	9	10
VRAELYS										
ANTROPO-METRIE										
DIEETGESK.										
HONGER-SKAAL										
TOTALE TYD										

A. Vraelys - .....

B. Antropometrie - .....

C. Dieetgeskiedenis - .....

D. Hongerskaal - .....

E. Totale tyd - .....

- die gemak waarmee die vrae gevra en voltooi kan word .....

  .....

- die verstaanbaarheid van die vrae .....

  .....

  .....

- merk die vrae duidelik waarmee u enigsins probleme ten opsigte van voltooiing het. Dui ook telkens aan hoedat u dit sou verander om dit te verbeter en te laat werk .....

  .....

  .....

. . . . . .

. . . . . .

- beskryf enige probleme of frustrasies wat u gedurende die hele proses ervaar neer en poog ook om alternatiewe voorstelle te maak . . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

- al die gedeeltes wat met kantoorgebruik gemerk is kan u bloot ignoreer - dit is vir gebruik deur die navorser.

ADDENDUM D: TRAINING INSTRUCTIONS FOR INTERVIEWERS — INDIVIDUAL INTERVIEWS

HAMMANSKRAAL PROJECT

GUIDELINES FOR INTERVIEWERS

A. QUESTIONNAIRE (demographic-, environmental- and health factors).

Take down the information in the questionnaire carefully in the order as it appears in the questionnaire.

Draw crosses in the blocks left open at each question.

Fill in the necessary information in the open spaces provided at each question and please write anything you think is useful information down. We can always decide later to use it or not.

At all times leave open the blocks on the LEFT SIDE of the page at each question or where it indicates "kantoorgebruik". These spaces are for office use only.

At the questions where there appears an "OTHER" option, and the mother/caretaker uses it, please give a detailed description of the specific other answer she supplies.

At question 5 both the ages of the mother and the child must be given separately in the columns supplied.

At question 10, use the examples of milk containers to identify the exact type of milk that the child is using. If it is not one of the examples, try to find out exactly what milk is used.

With question 11 only one of the two tables on the page should be filled in. Start at the top and first ask the age of the child when he first received solid food to accompany the milk feeds. If the age cannot be given, continue rather to the physical indicators of age.

At question 12 more than one answer given may be applicable to the situation of the mother. Please try to find out what the MAIN or MOST IMPORTANT reason for starting to give solid food to the baby was.

At question 15 you will also have to write in the answers in two columns on the right hand side of the page. First ask the people as named in the column, one after the other - if the mother / caretaker answers yes, mark the column **X** with a cross next to the name, then ask how many people of that kind is living there, and then write in the answer next to the cross you made.

	FOR EXAMPLE :	X	NUMBER
	Other children	x	5

At question 21 please let them describe each of the number of rooms that they specified and write it down in the space allowed, e.g. 4 rooms which are a kitchen and dining room in one, a family/sitting room, two bedrooms.

Pages 15, 17, 19 and 21 can be skipped as they are for OFFICE USE ONLY, and you don't have to fill it in.

B. ANTHROPOMETRIC INFORMATION (measurements)

Get the child's "Road to Health" card from the mother and use it to fill in the necessary information for questions 1-3 on page 14 of the questionnaire. If the child has no card, try to get as much information as possible from the mother.

For question 3b (current information) you will have to measure the child yourself and get the exact age either from the child's card or from the mother herself :

length - measuring mat (Nestlé)
make sure that the child lies flat, no shoes on, and with the heel right down to the floor. If the child kicks a lot, let the mother help to hold the baby's head and you hold down the child's foot while rolling back the mat to the base of the foot - then let her take the baby away while you read the measurement.

weight - use the electronic scale, first measure the mother, zero the scale, and then put the baby in the mothers arms to determine the child's weight.

head circumference - use the special headband to measure the child's head. If the child has a headband/ribbon in the hair, it should be taken out, and the hair should be flattened.

C. 24 HOUR RECALL OF USUAL FOOD INTAKE (diet history)

This form is to take a diet history from the child's eating habits and NOT from the mother / caretaker's eating habits.

Ask first if the previous day was a typical/normal day. If so, ask them to tell you about that. If not you must discuss with her what a typical intake usually is.

A diet history is just another way to find out what the usual eating pattern of a person is. It works this way:

The mother must tell you exactly and in detail everything that the child eats or drinks from the first time that he/she opens his/her eyes in the morning, until he goes to bed at night. Even that which the child will drink during the night should be written down. Sometimes the mother will not tell you everything at once, so lead her through each timeslot of the day and find out in detail what is ingested.

It is very important to check ALL THE AMOUNTS carefully. Use the given cutlery and crockery to determine how much is eaten :

A. Tin plate - 600mL level to the rim of the plate

B. Tin mug - 400mL level

C. Plastic glass - 300mL level; 210mL up to first rim

D. Plastic porridge dish - 600mL level; 290mL half full

E. Glass dish - 400mL level; 175mL half full

F. Porcelain plate - 500mL level to coloured ring

G. Porcelain cup and saucer - 225mL level; 200mL as for coffee

H. Plastic tablespoon - 10mL level; 20mL high full

I. Plastic teaspoon - 5mL level; 7mL high full

J. Metal tablespoon - 10mL level; 20mL high full

K. Metal teaspoon - 5mL level; 7mL high full

Each item shall be marked at the back and you can only write the letter at the back down to indicate which was used.

Control ALL cookingmethods carefully - especially the additions of fat/ oil/ margarine/ sugar.

Do not think that you know what the lady meant, check to see if you understood her correctly.

Write down EVERYTHING that you find out (I must come to the same conclusion as you)

Do not lead the mother - let her say for herself exactly what she meant how much the child eats and drinks. Use the measuring units supplied to help her to indicate how much is eaten by the child.

If the child is still a very small baby that does not eat yet - write it down like that and try to determine how much milk the child drinks (breastfeeding : amount of times per day as well as the duration of the feed ; bottle feeding : the amount of bottles as well as the volume of milk and the type and mixing methods used)

METHOD

1. Eat or drink your child anything from when he/she gets up in the morning till 09:00 in die morning?

   Control:

   - drinks for example coffee/tea : type milk/creamer, sugar/tablets
   - milk/Nesquick/fruit juice/cooldrink : specify types and mixing methods
   - biscuits/cookies
   - type of pap (consistency of cooked pap) or if baby cereal is used - how is it made, type milk and sugar or margarine in cereal
   - type of bread and thickness
   - type of margarine or jam on bread
   - fruit (check the consistency)
   - protein dishes and cooking methods
   - Purity

2. Does the child eat or drink anything between 09:00 and 12:00 ?

   Control:

   - drinks like coffee/tea (check additions)
   - cooldrink / fruit juice (type)
   - milk (type)
   - cookies/biscuits
   - sandwiches : type of bread and thickness, margarine or spreads or fillings
   - sweets : chocolates/glucose sweets
   - fruit

3. What does your child eats or drinks between 12:00 and 14:00 ?

   Control:

   - drinks (as previously)
   - sandwiches (as previously)
   - pap (as previously)
   - Purity for babies
   - cooked meals : cookingmethods, additions in dishes/vegetables and sauces with pap or meat
   - fruit
   - dessert/sweets

4. What does your child eat or drink between 14:00 and 17:00 ?

   Control:

   - drinks (as above) (tea/coffee/cooldrinks/fruit juice/milk)
   - fruit
   - cookies/biscuit

5. Eat or drink your child anything between 17:00 and 20:00 ?

Control:

- drinks (as above)
- sandwiched (as above)
- pap (as above - check baby cereal)
- Purity for babies
- cooked meals : check cooking methods, additions in dishes and vegetables, sauces with meat and pap
- fruit
- dessert/sweets
- combination dishes (all ingredients)

(Determine which meal is the main meal and get a second example of a menu as eaten previously)

6. What does your child eat or drink from 20:00 till he/she goes to bed ?

Control:

- coffee/tea
- cooldrink/juice
- warm drinks like Milo/Nesquick
- milk
- biscuits/cookies/cake
- sandwiches
- fruit
- sweets

REMEMBER TO ASK WHAT AND HOW MUCH BABIES DRINK DURING THE NIGHT AND SPECIFY THE TIME OF INTAKE

CROSS CONTROL

(You can write at the bottom of the page marked "kantoorgebruik")

1. How many cups of coffee does your child drink every day ?
2. How many cups of tea does your child drink every day ?
3. How much milk does your child drink in a day ?
4. Do you ever use cheese or yoghurt for your child's meals ?
5. How much sweets does your child eat during the day ? (chocolates, sweets, chips)
6. How much fruit does your child eat every day ?
7. How much cooldrinks does your child drink every day ?

D. HUNGER SCALE

Complete by asking the questions and marking only the most appropriate answer.

ADDENDUM E: TRAINING INSTRUCTIONS FOR MODERATORS / INTERVIEWERS — FOCUS GROUP INTERVIEWS

HAMMANSKRAAL PROJECT

INSTRUCTIONS FOR FOCUS GROUP INTERVIEWS

You should practice supportive leadership while being the leader of a focus group. This means showing concern for the well-being and personal needs of the group members.

Be friendly,
approachable,
considerate,
create a friendly atmosphere,
treat group members as equals.

They should NOT feel threatened or like they are being evaluated at all.

Rather they should feel like they are free to express themselves openly and without concern - if others are agreeing or disagreeing.

They should also feel free to talk.

It is important to also remember that everybody does not have to give the same / different answer. It is good if everybody just give their own opinion - even if it is different to the next person's opinion. Everyone therefore just says what she feels or what she thinks is correct. There are NO correct or wrong answers to the questions asked.

If participants are not involved enough, you must involve them all by asking each one directly what they think about the current question. Ask the question to the group and let them than discuss it between themselves and give their own opinions.

You may NOT help them give an answer, or give them your opinion. You must rather probe and question them more so that they could answer in detail.

Listen carefully to what is said, and if it becomes totally irrelevant, stop the discussion. There is no time for social discussions.

Please avoid putting friends together, they influence each other too much.

PROCEDURE:

1. Get seven chairs around a table in a closed room (if possible or a quiet place).
   The tape recorder will be on the table/

2. Try to organize the group in a circle - you will get a better conversation that way.

3. Get the list of names from the group so that you can address each member on his/her name.

4. Introduce the observer (Mrs Kruger) to the group.
   Tell them she will only observe what is happening and will not be involved at all.

5. Tell them that the discussion will be tape recorded but that all the information will stay confidential and that only us (researchers) will hear it.
   The recording is necessary so that you (interviewer) could write a decent report after the discussion.

6. If anybody is not happy with the situation, they may leave now (but would not receive a food parcel).

7. Please create an atmosphere of trust and openness.
   Do not laugh about the questions or say that this is funny / stupid. Rather take it seriously and tell them that this is going to be fun, especially to hear what everyone thinks.

8. Tell them what the study is all about:
   we are trying to determine how the people living in Hammanskraal are feeding their children, aged 0-36 months, and what they know about nutrition and how they feel about it.
   This is necessary because nothing is known about the people in Hammanskraal, and if we know more about what, how and why mothers are feeding their children, we can plan something to help the people.

9. Tell the group the order of the proceedings:

   ☞ Introduction -
   everyone gets a chance to say her name, her child's name and how she is feeding her child.

   ☞ Explain the order of the subjects to be discussed -
   - general knowledge on infant feeding and health,
   - breast feeding
   - bottle feeding
   - weaning
   - nutrition knowledge
   - attitudes towards nutrition.

☞ Method:
I (moderator) will ask a question to you (the group) and you will respond by discussing the issue or by giving your opinion about the subject. Please don not only give yes / no replies.

☞ Everybody will get a chance to say what she thinks.

According to Stewart & Shamdasani (1990:92-93), typical opening may take the following form:

Before we begin our discussion it will be helpful for us to get acquainted with one another. Let's begin with some introductory comments about ourselves. X, why don't you start and we'll go around the table and give our names and a little about what we do for a living.

Today we're going to discuss an issue that affects all of you. Before we get into our discussion, let me make a few requests to you. First, you should know that we are tape recording the session so that I can refer back to the discussion when I write my report. If anyone is uncomfortable with being recorded please say so and, of course, you are free to leave. Do speak up and let's try to have just one person speak at a time. I will play traffic cop and try to assure everyone gets a turn. Finally, please say exactly what you think. Don't worry about what I think or what your neighbour thinks. We're here to exchange opinions and have fun while we do it. Why don't we begin by introducing ourselves?

ADDENDUM F: VISUAL AIDS AND EQUIPMENT USED DURING THE FOCUS GROUP INTERVIEWS

Visual aids that was used for the interview process included the following :

Food samples: - bread, 30-60 g thick slices
- weighed apples and oranges to use for the sizes of fruits

Empty containers: - yoghurt jars
- coffee creamer sachets (Ellis Brown)
- milk powder sachets (Nespray)
- fresh milk sachets (empty)
- Purity jars
- peanut butter jars
- Empty formula milk containers of all the easily available brands (Nan, SMA, S26, Lactogen), and a baby bottle and one tin of expired formula milk to use to make samples of formula feeds during the focus groups.
- Nestum containers and dry cereal to use for the demonstration of the mixing method

Cutlery and crockery: - used to obtain household measures / volumes and to determine portion sizes. Each item was marked on the back (with the appropriate alphabet number and the volume) for the interviewer to use for the ease of recording all the volumes and weights:

A. Tin plate - 600 ml level to the rim of the plate
B. Tin mug - 400 ml level full
C. Plastic glass - 300 ml level full; 210 ml up tot the first rim
D. Large plastic bowl - 600 ml level full; 290 ml half full
E. Glass bowl - 400 ml level full; 175 ml half full
F. Porcelain plate - 500 ml level full to the coloured rim
G. Porcelain cup and saucer - 225 ml level full; 200 ml full as for coffee
H. Plastic dessertspoon - 10 ml level full; 20 ml high full
I. Plastic tea spoon - 5 ml level full; 7 ml high full
J. Metal dessertspoon - 10 ml level full; 20 ml high full
K. Metal tea spoon - 5 ml level full; 7 ml high full
L. Small plastic bowl - 150 ml half full; 250 ml level full

Refreshments were also provided during the focus group interviews. This was necessary to make the interview as acceptable as possible for the respondents as it was expected to last between one to two hours, during the hottest time of the year!. Furthermore it was important to keep the children happy during the time that their mothers were busy with the group. The following items were prepared and taken along for each of the focus groups:

- One large bag of cheese curls for the children to eat,
- One packet of Smarties and Fruit pastils / biscuits for the children ,
- Bags with approximately three chocolates per person from boxes of Quality Street and Black Magic chocolates for the mothers,
- Different flavours of Lecol Squeeze 'n Drink cold drink,
- Plastic litre bottles with previously frozen water to mix the cold drinks with. By the time the interviews started, the water was defrosted but still very cold. This was very important considering the circumstances in which the groups were taking place - very cramped, extremely hot and stuffy, and very uncomfortable. The cold drinks were always very welcome,
- Polystyrene cups.

The **food hampers** that the mothers received, contained the following items :

1 x 2.5 kg maize meal
1 x 500 g Nestum (soya type - add water for reconstitution) / or Knorrox soya product
2 x 100 g Nespray milk powder
2 x packets instant noodles
4 x or more packets instant soup

These items were prepacked in a white plastic bag and tied with a red or green ribbon. Each respondent received one food hamper after completion of the interview and the focus group.

ADDENDUM G: STANDARD CONVERSIONS AND FOOD CODES USED IN THE ANALYSIS OF DIETARY INTAKES (MRC food composition and food quantities tables)(85,105)

CODES	FOOD	PORTION SIZE
0002	Milk, condensed, whole, sweetened	5mL=8g 1LTsp=6g
0004	Custard, whole milk, custard powder	5mL=40g 1LDsp=13g 1LTbsp=40g 125mL=125g
0006	Milk, whole, fresh	mL=g
0009	Milk, whole, powder eg Nespray	5mL=2g 7mL=3g 1HTsp=4g 1HTbsp=15g 125mL=50g
0011	Cheese - sliced - grated	1 slice, 85x25x2=8g 1HTsp=5g 1HDsp=12g 1HTbsp=15g 125mL=45g
0018	Cheese spread	mL=g
0020	Joghurt, low fat, fruit, sweetened	1 small container=175mL
0028	Lactogen, no2	1 scoop=4g
0030	S26	1 scoop=4g
0039	Cremora	1HDsp=8g 1HTbsp=15g 125mL=60g
0053	Isomil	1 scoop=4g
0054	Nan	1 scoop=4g
0059	Lactogen, no1	1 scoop=4g
0085	Maas (Amasi, sour milk, inkomazi)	mL=g
0094	Isomil, reconstituted	mL=g
0095	Similac, reconstituted	mL=g
0096	Similac	1 scoop=4g
0104	S26, reconstituted	mL=g
0107	S26 - Infagro, follow-up	1 scoop=4g
0108	S26 - Infagro, reconstituted	mL=g
0111	SMA	1 scoop=4g

CODES	FOOD	PORTION SIZE
0112	SMA, reconstituted	mL=g
0115	Similac 60/40, reconstituted	mL=g
0117	Nan, reconstituted	mL=g
0119	Lactogen, no1, reconstituted	mL=g
0120	Lactogen, no2, reconstituted	mL=g
0128	Nesquick, powder	1HTsp=6g 1HDsp=14g
0129	Milk, whole, powder, reconstituted	mL=g
0501	Baby cereal, wheat, dry (Nestum 1)	4 H Dsp make 125mL 1HDsp=5g 1HTbsp=8g 1LTbsp=5g 1HTsp=2g 125mL=25g
0503	Baby cereal, wheat, dry (Nestum 2)	4 H Dsp make 125mL 1HDsp=5g 1HTbsp=8g 1LTbsp=5g 1HTsp=2g 125mL=25g
0505	Baby cereal, containing milk, dry (Cerelac)	1HTbsp=10g 1LTbsp=5g one unit, 15mL=5g
0518	Purity - mixed vegetables	large bottle = 200mL small bottle = 125mL 1HTsp=11g 1LTsp=5g
0528	Purity - vanilla custard	large bottle = 200mL small bottle = 125mL 1HTsp=11g 1LTsp=5g
0529	Purity fruit juice, strained	Jar = 125mL/g
0532	Purity - fruit	large bottle = 200mL small bottle = 125mL 1HTsp=11g 1LTsp=5g
0535	Fruit juice, average - baby foods	mL=g
1001	Egg, boiled	1 large=50g 1 yolk=20g
1003	Egg, fried in sun oil	50g+2goil=52g 1HDsp=20g
1036	Egg, raw, whole	1 large=50g

CODES	FOOD	PORTION SIZE
1505	Beef, minced, panfried regular	1HTsp=10g 1HDsp=25g 1HTbsp=40g 125mL=100g
1515	Beef, liver, fried	110x60x10=80g
1521	Chicken, boiled, light and dark meat and skin	1 drumstick=40g 1 wing=30g
1585	Beef, minced, savoury (regular),(tomato+onion)	1HDsp=30g 1HTbsp=40g 125mL=115g
1609	Chicken feet	1=30g
1610	Chicken livers/giblets, cooked	liver=30g (1tbsp) heart=6g stomach=20g
1619	Beef, stew, cabbage (fat meat)	
2557	Fish - Pilchards in tomato sauce - mashed	1HTsp=12g 1HDsp=30g 1HTbsp=45g 125mL=130g
3008	Gravy, meat (50% fat, unthickened)	mL=g
3009	Gravy, meat (ff stock, vegetables, thickened)	mL=g
3049	Soup powder, veg and beef, commercial, reconstituted - prepared with water	mL=g
3054	Soup powder, average, reconstituted - prepared with water	mL=g
3506	Peas - legumes (split), cooked	1HTsp=7g 1HDsp=15g 125mL=85g
3518	Soya, dried, cooked	1HDsp=20g 1HTbsp=35g 125mL=80g
3527	Toppers, cooked	1HTsp=12g 1HDsp=25g 1HTbsp=25g 125mL=120g
3542	Beans, sugar, dried, cooked	1HDsp=35g 1HTbsp=50g 125mL=100g

CODES	FOOD	PORTION SIZE
4001	Bread, white	1 slice, 1cm=30g 1,8cm=40g
4002	Bread, brown	1 slice, 1cm=30g 1,8cm=40g
4007	Cookies, commercial, plain	one=10g
4032	Rolled oats/oatmeal, cooked	mL=g 1HTsp=9g
4034	Maltabella, cooked	mL=g
4040	Rice, white, cooked	1HDsp=20g 1HTbsp=25g 125mL=65g
4043	Mealies - mealierice - samp	1HDsp=15g 125mL=65g 1HDsp=30g 125mL=125g
4067	Cheese curls	1 small pack=30g 125mL=11g 150mL=13g
4254	Maize porridge, cooked - soft	mL=g 1HDsp=25g 1HTbsp=40g
4255	Maize porridge, cooked - stiff	mL=g 1HDsp=40g 1HTbsp=75g
4275	Simba chips	1 small pack=30g
6508	Margarine, brick	mL=g
6509	Peanutbutter	mL=g 1HTsp=12g 1HDsp=25g
6513	Mayonnaise	1HTsp=10g 1HDsp=28g
6536	Oil	1Tsp=4g 1Dsp=8g 1Tbsp=12g 125mL=110g
7001	Apple, raw	small=80g medium=150g large=220g
7003	Apricot,raw	small, 42x40=35g

CODES	FOOD	PORTION SIZE
7009	Banana, raw	1 medium=120g unpeeled 75g peeled
7013	Fig, raw	small, 40x35=25g medium, 45x44=40g large, 45x52=55g
7020	Grapes, raw	1 grape - 22x16=4g 125mL=90g 1 bunch, 85x60=110g
7021	Guava, raw	small=50g medium, 60x55=95g large, 65x55=130g
7024	Guava juice, sweetened	mL=g
7026	Mango, raw	135x75=480g unpeeled 350g peeled
7028	Nartjie,raw	small, 52x40=50g medium, 55x44=75g large, 70x50=120g
7031	Orange, raw	small=100g unpeeled 80g peeled medium=150g unpeeled 120g peeled large=255g unpeeled 180g peeled
7032	Orange juice, fresh	mL=g
7033	Orange juice, canned, sweetened	Plactic container=350mL mL=g
7034	Paw-paw, fresh	wedge - 16x26x27=90g 125mL=70g 1HDsp=20g
7036	Peach, raw	1 med - 65x60=150g 1 small - 53x50=80g
7044	Strawberry, raw	1 medium, 32x28=12g
7047	Watermelon, raw	1 slice, 330x70=220g
7052	Pineapple, raw	whole=420g ring, 85x10=40g
7053	Pear, raw	1 med - 80x68=165g 1 small - 60x52=100g
7069	Prune, dried, raw	1 medium=8g
7107	Litchi, raw	25x20=8g
7126	Pomegranate, raw	90x90=200g, peeled 450g, unpeeled
7164	Liquifruit - peach and orange	mL=g

CODES	FOOD	PORTION SIZE
8002	Greenbeans, pieces 3cm long	1HDsp=15g 1HTbsp=20g 125mL=65g
8005	Beetroot, salad, grated	1HTsp=10g 1HDsp=20g 1HTbsp=25g 125mL=120g
8023	Cauliflower, cooked	1HTsp=10g 1HDsp=25g 125mL=80g
8025	Cucumber, grated sliced	1HTsp=8g 1HDsp=20g 125mL=90g 1 small slice=5g 1 medium slice=10g 1 large slice=15g
8026	Peas, fresh, cooked	1HTsp=8g 1HDsp=20g 125mL=85g
8033	Mealie, whole	13cm=120g 15cm=135g
8046	Potato, boiled	small=60g medium=80g large=150g
8067	Carrots, cooked	1HDsp=18g 1HTbsp=25g 125mL=75g
8069	Pumpkin, wintertype, cooked (Hubbard)	1HTsp=15g 1HDsp=30g 125mL=105g
8070	Gem squash, cooked (pumpkin, summer type)	1 half, 72mm=45g (med) 1HDsp=17g 125mL=105g
8071	Spinach, cooked	1LDsp=20g 1HDsp=25g 125mL=90g
8077	Tomato, fried in sun oil	1 slice, 75x10mm=35g
8122	Cabbage, sauteed in oil	1HDsp=20g 125mL=80g
8123	Cabbage, cooked - potato + onion, HM	1HDsp=25g 1HTbsp=35g 125mL=80g
8125	Cabbage, cooked (pot, onion, sun oil)	1HDsp=25g 1HTbsp=35g 125mL=80g

CODES	FOOD	PORTION SIZE
8187	Potato, mashed (WM,HM)	1HTsp=15g 1HDsp=30g 1HTbsp=50g 125mL=125g
8211	Spinach, cooked with oil	1HDsp=25g 125mL=90g
8229	Beetroot, leaves, cooked	1HDsp=25g 125mL=90g
8244	Tomato and onion, stewed, no sugar	1HDsp=25g 125mL=140g
9001	Cold drink eg Coke (carbonated beverage)	Can=340mL
9002	Oros/Squash	mL=g 1 small plastic mug=125mL
9008	Jam, smooth	1LTsp=8g 1HTsp=15g 1LDsp=15g 1HDsp=30g 125mL=160g
9009	Sweets, sucker	small=5g large=15g
9010	Sweets, chocolate, milk	one unit=5g 20 units=100g (1 slab)
9012	Sugar, white	5mL=4g 1HTsp=10g 1HTbsp=25g 125mL=100g
9032	Sugar, brown	1HTsp=10g
9513	Coffee, brewed/instant	mL=g
9514	Tea, brewed	mL=g
9560	Rooibos tea, brewed	mL=g

KEY:
TSP = 3 mL average ordinary household teaspoon
DSP = 7 mL average ordinary household dessertspoon
TBS = 12 mL average ordinary household tablespoon
LS = 30 mL ladle
L = level
H = heaped

ADDENDUM H: ANALYSIS CATEGORIES USED FOR THE DATA REDUCTION PHASE OF THE QUALITATIVE RESEARCH METHODOLOGY

FOCUS GROUP SCHEDULE - ANALYSIS CATEGORIES

INSTRUCTIONS FOR CATEGORISING THE DATA IN THE TRANSCRIPT:

1. Read through each question.
2. Read through all the identified categories (first column).
3. To clarify the categories, read through the definition or description given in the next column (column two).
4. Read through the responses in the transcript.
5. Choose the most suitable category for each response and write the response number in the column provided (column three).
6. An additional category of "Other" is provided if you feel that none of the specified categories apply. If you feel another category should be specified, please indicate this category under "Other" as well.

A. *GENERAL KNOWLEDGE ON INFANT FEEDING AND HEALTH*

1. Who told you about this clinic and the reason that it is here?

1.1 persons / objects mentioned:

CATEGORIES	DEFINED / DESCRIBED	RESPONSES
Micro environment	closest people to an individual like family	
Meso environment	people or objects in the community	
Other:		

1.2 reasons mentioned:

CATEGORIES	DEFINED / DESCRIBED	RESPONSES
Because of illness	seeking help when ill	
Growth monitoring	of babies and young children	
Immunization	of babies	
Advice	on aspects such as feeding or general care	
Other:		

2. Who taught you how to care for your baby ?
(meaning bathing, dressing, changing the nappy etc.)

CATEGORIES	DEFINED / DESCRIBED	RESPONSES
Micro environment	closest people to an individual like family	
Meso environment	people or objects in the community	
Other:		

4. How do you do you know that your baby is healthy and growing well?

CATEGORIES	DEFINED / DESCRIBED	RESPONSES
Clinical evaluation	physical appearance, good general health, no diseases present	
Anthropometrical evaluation	within applicable weight and height range	
Food intake behaviour	healthy appetite, child is eating properly	
Other:		

5. Who taught you how to feed your baby ?

CATEGORIES	DEFINED / DESCRIBED	RESPONSES
Micro environment	closest people to an individual like family	
Meso environment	people or objects in the community	
Other:		

2. Who taught you how to care for your baby ?
(meaning bathing, dressing, changing the nappy etc.)

CATEGORIES	DEFINED / DESCRIBED	RESPONSES
Micro environment	closest people to an individual like family	
Meso environment	people or objects in the community	
Other:		

4. How do you do you know that your baby is healthy and growing well?

CATEGORIES	DEFINED / DESCRIBED	RESPONSES
Clinical evaluation	physical appearance, good general health, no diseases present	
Anthropometrical evaluation	within applicable weight and height range	
Food intake behaviour	healthy appetite, child is eating properly	
Other:		

5. Who taught you how to feed your baby ?

CATEGORIES	DEFINED / DESCRIBED	RESPONSES
Micro environment	closest people to an individual like family	
Meso environment	people or objects in the community	
Other:		

6. What is the best kind of milk for a baby ?

CATEGORIES	DEFINED / DESCRIBED	RESPONSES
Breast feeding	in any capacity mentioned	
Formula milk	like Nan	
Other powder milks	like Nespray	
Cow's milk	fresh milk	
Other:		

6A Why is it the best?

CATEGORIES	DEFINED / DESCRIBED	RESPONSES
Physiologically more suitable	ideal for a human baby (ito of digestion)	
Nutritious	nutrient composition is ideal	
Healthy	improves general health and will promote growth	
Convenience	in terms of preparation, availability, temperature, etc.	
Psychological reasons	emotional bonding	
Immunological advantages	colostrum particles	
Financial advantages	cheaper	
Hygienic	bacteriologically safe	
Other:		

6B Why is the other option bad ?

CATEGORIES	DEFINED / DESCRIBED	RESPONSES
Physiologically more suitable	ideal for a human baby (ito of digestion)	
Nutritious	nutrient composition is ideal	
Healthy	improves general health and will promote growth	
Convenience	in terms of preparation, availability, temperature control	
Psychological reasons	emotional bonding not so explicit	
Immunological advantages	colostrum particles not present	
Financial reasons	more expensive	
Hygienic reasons	bacteriologically not always the safest method - handling techniques	
Other:		

7. How long can one continue to breast feed a baby without giving it anything else to eat or drink ?

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7A Why ?

CATEGORIES	DEFINED / DESCRIBED	RESPONSES
Physiologically readiness	ito of digestion, swallowing, stomach capacity etc.	
Health reasons	nutritionally balanced	
Immunological reasons	anti-infective factors protects the child	
Other:		