



INTEGRATION AND APPLICATION

7.1 INTRODUCTION

The research aim of this study was to develop a food product concept formulation framework for low-income consumers in urbanised informal settlements in Gauteng, South Africa. The unique contribution of this approach is based on the depiction of the food product attribute needs perceived as most important by these respondents during purchasing choice of their staple food product, maize meal. The intention was to enhance the possibility of the skilful integration of knowledge of consumer needs, as portrayed by the need for specific food product attributes, with food product design and development (on industry level) for low-income consumers.

In order to achieve this aim, five sub-objectives were formulated, which were to:

- Identify concepts (food product attributes) of importance in food products purchased by low-income consumers;
- Select, organise (screen) and identify concepts applicable to low-income consumers;
- Formulate and develop design parameters for food products purchased by low-income consumers;
- Verify the design parameters through a test market evaluation of an established product and the description of the identified concepts;
- Formulate the process and modelling of a food product concept framework for the development of food products for low-income consumers.

These five sub-objectives were executed consecutively in three phases. The purpose of sub-objectives 1, 2 and 3 was to formulate and develop design parameters for the food product concept framework, as was reported in Chapter 4 of this study. Subsequently in Sub-objective 4, for verification, a quantitative-qualitative approach was applied in parallel initiatives. In Chapter 5 the developed design parameters were evaluated against an established product category and in Chapter 6 the description of the identified food product attributes are presented. Finally, a verified concept formulation framework was derived for food products to meet the

needs of low-income consumers (Sub-objective 5) as based on the foregoing processes (Sub-objectives 1 to 4), and is presented in this chapter.

The contributions made by the three consecutive phases are as follows:

7.2 PHASE 1: FORMULATION AND DEVELOPMENT OF DESIGN PARAMETERS

In order to develop a reference framework identifying the concepts (food product attributes) of importance in food products purchased by low-income consumers, an empirical and exploratory study approach was followed. This baseline investigation included two surveys in different populations to obtain a broader perspective of the reality of the situation. The viewpoints from both the food environment and low-income consumers were obtained.

The investigation conducted in collaboration with role players in the South African food environment (academics (n = 8), health practitioners (n = 11) and nationally established food producers and retailers (n = 17)), provided a holistic overview regarding existing policy guidelines, the range of products produced/retailed and food product attributes receiving attention during food product development/formulation. Further attention was devoted to the perceptions of the role players regarding food product attributes needed by low-income consumers, characteristics of and food intake by low-income households and the benefits low-income consumers expect from food products purchased.

Results revealed that very few of the food industries focussed on meeting the needs of low-income consumers in their research and development policy. At the time of the survey, no company policies had been formalised to address this specific issue. It came as no surprise that only six percent of the companies mentioned starch staple-type foods as being of importance in this regard. In contrast, the identification of this food category as the industry's main product range in food product development for low-income consumers is relevant.

Based on the reality of the low-income consumer and the importance of starch staple-type food products in food product development for this target population (Chapter 4 Figure 2), the focus of the remainder of the study was allocated to maize meal. The external validity of this study is strengthened by this approach (Bless, Higson-Smith & Kagee, 2007:93), anchoring it to the situation in the real world with a product familiar to the respondents.

In an attempt to identify the perceptions of the role players in the food environment (academics, health practitioners and nationally established food producers and retailers) regarding the characteristics of low-income consumers, no clear indicators could be identified on average from the data. Of importance is the fact that the most successful food industries in South Africa indicated substantial knowledge and understanding in this regard, but owing to confidentiality, results were not reported separately. While the perceptions of the academics and the health practitioners are of interest, it does not form part of the current research argument, and were therefore not further pursued as part of this study.

It is, however, of interest to note that the food product attributes that the food industry perceive as important for inclusion in food products for low-income consumers (Chapter 4 Figure 3) are different from what is at this stage provided by industry in developed food products available for purchasing by the target population. The food industry perceives satiety value and nutrient content (65 percent respectively) as the food product attributes most needed by the target population, followed by affordability, taste and meeting of aspirations through benchmarking (at 59 percent respectively) and product safety/ shelf life (47 percent).

Following, a survey was conducted to identify the level of importance low-income consumers perceived for food product attributes (concepts) during purchasing choice of maize meal. Information was sourced from the main food purchasers in households from the Eatonside informal settlement where poverty, malnutrition and chronic food insecurity were indicated as major problems (Oldewage-Theron, Dicks & Napier, 2006:798).

Rating was applied to select, organise (screen), and identify the concepts of importance. The derived results indicated satiety value, affordability, packaging size, value for money and taste, in the stated sequence, as the food product attributes perceived as most important by the target population. In contrast, affordability, nutrient content, taste and product quality, in that order, were indicated by the food industry as the food product attributes of most importance in food products currently produced for purchasing by low-income consumers (Chapter 4 Table 2). These findings report the design parameters for the formulation of the food product concept framework applicable to starch staple-type food products for low-income consumers.

These formulated design parameters confirm a discrepancy between the food product attributes currently provided by the food industry in food products available for purchasing by low-income consumers, and the food product attributes that the target population perceive as important in meeting their needs. These findings highlighted the difference between the needs of the modern consumers (SU-LSM 4 – 10) as reflected by the food product attributes provided by the

industry, and the marginalised consumers (SU-LSM 1 – 3), echoing the duality of the South African consumer market (Schwabe, 2005:2; BFAP, 2007:47, 52, 54).

7.3 PHASE 2: EVALUATION OF THE DEVELOPED DESIGN PARAMETERS AGAINST AN ESTABLISHED PRODUCT

During this phase a two-pronged approach was followed, comprising the test market evaluation of the identified food product concept framework against an established product and the description of terminology through the clarification of the meaning of food product attributes (concepts). The objective was to verify the design parameters derived by the baseline study, and to confirm that target consumers would most probably perform in the manner predicted by the developed research findings.

The extended project included respondents from three informal urbanised settlements, namely Boipatong (n = 140), Eatonside (130) and Alexandra (131), and the formal urbanised settlement adjacent to Alexandra, Tsutsumani (n = 101) which was included for comparison purposes. All settlements are situated within the broader Johannesburg – Vaal geographical area.

The approximate income/ capita/ month for the settlements were indicated as less than ZAR200 (US\$20) for 51 percent (Boipatong), 58 percent (Eatonside), 33 percent (Alexandra) and 22 percent (Tsutsumani) respectively (Statistics South Africa (SSA), 2005), or approximately ZAR7 (US\$0.70)/ capita/ day to meet all needs (Chapter 5 Table 3). When viewing these facts against the international poverty line indicator of ZAR10.22 (US\$1)/ capita/ day, the exceptionally marginalised conditions of the two informal settlements of lower income, Boipatong and Eatonside, is highlighted.

The possible relationship between the observations for household income and the importance attached to the need for specific food product attributes is integrated within the following discussions.

7.3.1 Test market evaluation

For the purpose of the test market evaluation, an extended survey was conducted (Chapter 5), including only the 14 food product attributes (concepts) identified as representing the design parameters (Phase 1) (Chapter 4). Due to the risk of jeopardising the identification of a trend during analysis, a lenient 10 percent level of significance was applied. Confirmation of the

findings through the incorporating of different groups and the critical evaluation of data generated, was therefore important.

The level of importance allocated to the different food product attributes during the test market evaluation is reported in Chapter 5 Table 4 of this thesis. When ranking the results proven not significantly different (Chapter 5 Annexure 1; Chapter 7 Annexure 1) in sequence of importance, an interesting trend is revealed (Chapter 7 Annexure 2; Chapter 7 Annexure 3).

In overview, no significant difference was revealed for the importance perceived for satiety value, product acceptability, convenience and household influence between the four groups of different income (Chapter 7 Annexure 2; Chapter 7 Annexure 3). Although all of these attributes suggest economic links, the assumption can be made that no external factors e.g., geographical location, level of low-income or the availability of shops in the direct area, influenced the level of importance of these attributes to the different respondent groups.

However, a different trend manifested for the rest of the food product attributes. No significant differences were indicated for appearance, value for money, product quality, texture, product safety/ shelf life, brand loyalty and nutrient content between the two informal settlements of lower income (Chapter 7 Annexure 2). The findings for the informal settlement of highest income, Alexandra, and the formal settlement Tsutsumani, of highest income, indicated a similar significance (Chapter 7 Annexure 3). These findings also imply that the health-related (nutrient content and product safety/ shelf life) and status (product quality, brand loyalty) attributes are of far less importance to the low-income consumers than to those with a slightly higher income. It can, however, not be inferred that the low-income consumers do not care about these food product attributes, but that, in severely constrained economic conditions, 'nice to have' attributes become secondary in importance to the food product attributes linked to survival.

Satiety value was indicated as the most important food product attribute to the three informal settlements (Boipatong, Eatonside and Alexandra) (of lower income) (Chapter 7 Annexure 2). In contrast, taste was indicated as the food product attribute of primary importance (91 percent) by the formal settlement, Tsutsumani (higher income), with satiety value very closely matched (90 percent) in the second place (Chapter 7 Annexure 3). The importance of taste was reported as higher and significantly different for this group in comparison with the three informal settlements. This implies a direct relationship between the level of income and the "luxury" of perceiving taste as of overriding importance during starch staple-type food choice, as is typical in consumer preferences (Shepherd, 1999:810).

The impact of the difference in (the lack of) household income is clearly indicated by the trend identified for the level of importance attached to the need for specific food product attributes by the three informal settlements and one formal settlement. Although it is not possible to calculate, from the available data, the critical point in (lack of) household income beyond which survival needs override “nice to haves”, a certain level of deprivation is suggested beyond which survival needs become of utmost importance. In the true sense, these households can be perceived as “survival households”. These low-income consumers, relying almost entirely on maize meal for survival, are aptly indicated as “survival users” of staple food (Makwetla International Communications & Fleishman-Hillard, 2002). The struggle to merely meet physiological needs, designated as the lowest level in the model for human motivation developed by Maslow, is supportive of this perception (Hughes, 2002:10).

In further application of this concept, Kinsey developed a consumer demand pyramid indicating a hierarchy for food preferences within the consumer choice process (Painter, 2007:15). At the lowest level, the quest to satisfy physiological needs to maintain life includes a struggle for sufficient kilojoules, lower-priced foods and foods that are not spoiled (Hughes, 2002:10; Kinsey as quoted by Farm Foundation (FF), 2006:4). These facts match very closely the realities of the survival households.

The food product concept formulation framework developed for low-income informal settlement dwellers, therefore, reports the concepts of satiety value, affordability, taste, product acceptability, convenience/ ease of preparation, household influence, appearance, value for money, product quality, packaging size, texture, product safety/ shelf life, brand loyalty and nutrient content, in order of importance, in meeting the needs of the indicated target population (Chapter 7 Annexure 2).

7.3.2 Description of terminology

A comparative study was conducted to describe the meaning of the identified attributes as perceived by the respective groups of the target population. Focus group discussions were applied as method to develop an understanding of the concepts being tested from the view point of the low-income consumers (Chapter 6) (Marumo, 2008).

The analysis disclosed the imbedded themes (concept elements) describing the respective concepts (Chapter 6 Table 1 to Table 11), highlighting comparison of similarities and differences between the different respondent groups (Corbin & Stauss, 2008:57; Gaede, 2008). So doing earlier findings indicating that the level of (lack of) household income impacts on the

level of importance perceived for the need of specific food product attributes (Chapter 5 Table 3; Chapter 5 Figure 1), were validated. This procedure was conducted independently by two participants (Duvenage and Marumo) to support analysis and interpretation (Taylor-Powell & Renner, 2003:9).

An operational understanding of the meaning of the different food product attributes that guide purchasing choice by low- income consumers was derived (Chapter 6 §6.3.1 to §6.3.12), correlating the interpretation provided by literature with the findings of the textual data. This process contributed to content validity and applicability of the findings in the real world (Babbie & Mouton, 2002:275; Bless *et al.*, 2007:157).

It is clear from Chapter 6 (§6.3.12) that the combined food product attributes (concepts), including product acceptability (§6.3.12.1), value for money (§6.3.12.2) and product quality (§6.3.12.3), were not described as such. It is of interest that this behaviour correlates with the application of the lexicographic decision rule (Hawkins, Best & Coney, 1998:562-3; Todd & Dieckmann, 2004:1) stipulating that certain groups of consumers rank criteria in order of importance. Brand choice is consequently determined by selecting the brand that performs best on the most important attribute. Only if a tie is experienced between brands on the most important attribute, will the second most important attribute come in to play. This process is applied until one brand outperforms another.

The indication of satiety value, affordability and taste as core concepts of most importance to low-income consumers in urbanised informal settlements, were confirmed (Chapter 6 Table 12; Chapter 6 Table 13). This implies that maize meal, as the starch staple- type food most often consumed by these respondent groups, needs to at least equal or exceed the performance of competitor products in the field on the most important criteria, namely satiety value, affordability and taste according to the perceptions of the target population.

The findings of the qualitative approach strongly support those of the quantitative approach, as regards both the focus on and level of importance allocated to satiety value, affordability and taste, but also for the difference observed in the perceptions of the two settlements of lower income and the two settlements of higher income (Chapter 6 Table 1 to Table 11; Chapter 7 Annexure 2; Chapter 7 Annexure 3).

Following, a collage is presented depicting scenes in each of the three urbanised informal settlements (Boipatong, Eatonside and Alexandra) and the formal urbanised settlement (Tsutsumani).



Figure 1: Collage of the Boipatong informal settlement indicating the different types of housing. Please take note of the spaza shops

Eatonside



Figure 2: Collage of the Eatonside informal settlement indicating the informal housing conditions

Alexandra

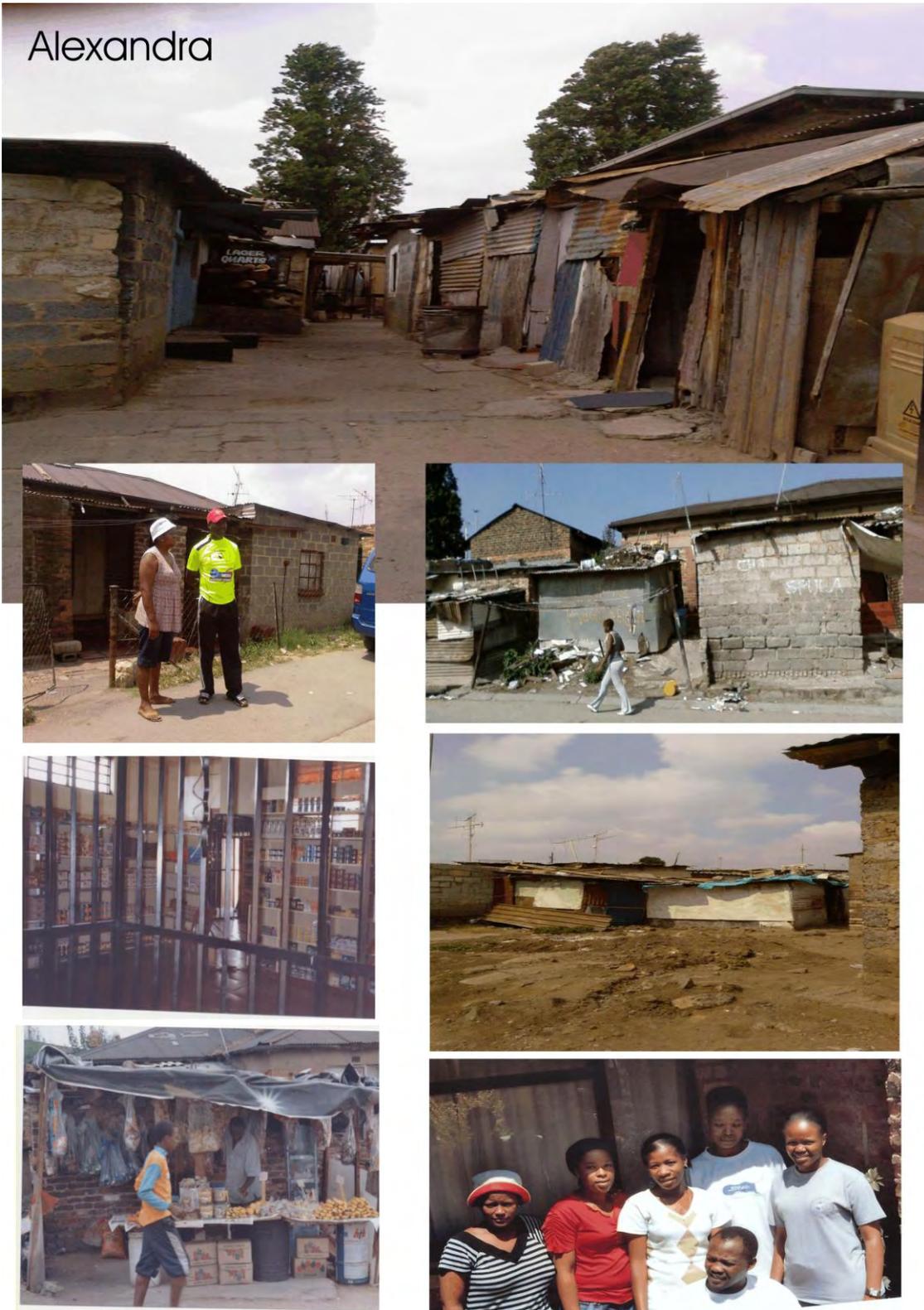


Figure 3: Collage of the Alexandra informal settlement, showing the hosts for the focus group (left), the fieldworkers (right) (ms Kuda Marumo far right), housing conditions and spaza shops



Figure 4: Collage of the Tsutsumani formal settlement, showing the researcher, the co-researcher (ms Kuda Marumo), the community representative and the field workers. Please note the difference in housing conditions.

7.4 PHASE 3: DEVELOPMENT OF A FOOD PRODUCT CONCEPT FORMULATION FRAMEWORK FOR LOW-INCOME CONSUMERS IN URBANISED INFORMAL SETTLEMENTS IN GAUTENG SOUTH AFRICA

The final phase of this study is based on the integration of the results generated in the prior two phases. In this process the external validity of the study is supported as indicated by the extent to which the results of the baseline study can be generalised (Bless *et al.*, 2007:93) to the broader population and the realities of the world, within the limitations of the social research context.

During this phase the integration of findings takes place from a triangular point of view, including two different quantitative surveys (baseline and test market evaluation, involving the food industry, three different informal settlements and a formal settlement) (Chapter 4 Table 1; Chapter 4 Table 2; Chapter 5 Table 4; Chapter 5 Figure 3; Chapter 7 Annexure 2; Chapter 7 Annexure 3; Chapter 7 Table 1). The qualitative findings from the focus group discussions in the respective settlements have already been indicated as relevant to the test market evaluation results, and are not discussed further.

7.4.1 Comparison of ranked importance of food product attributes

Due to the difference in the tools used for gathering data from the role players in the food industry and the low-income consumers, a comparison based on percentages will not suffice to indicate differences between the perceptions of the studied populations. The comparison is therefore based on the ranked level of importance perceived for the different food product attributes reported by the baseline investigation (food industry) (Chapter 4 Table 3), the test market evaluation (informal settlements) (Chapter 5 Table 4; Chapter 7 Annexure 2) as summarised in Chapter 7 Table 1.

Satiety value and affordability were confirmed as the food product attributes of utmost importance in meeting the needs of the low-income consumers during purchase choice of their staple food, maize meal. These economic-linked indicators correlate with the stringent financial realities of the target population. It therefore makes perfect sense that taste was identified as the most important hedonic food product attribute, but was perceived to be of lesser importance than the economic-related indicators.

Table 1: Comparison of the ranked importance for food product attributes according to the perceptions of low-income consumers and the food industry

Food product attributes	Perceptions of low-income consumers		Perceptions of food industry	
	Baseline ¹	Test market evaluation ²	Currently applied during food product development ¹	Needed by low-income consumers ³
Satiety value	1	1		1
Affordability	2	2	1	3
Value for money	4	6		
Taste	5	3	3	3
Product acceptability	6	4		
Convenience/ ease of preparation	8	5		6
Appearance	7	8		
Packaging size	3	10		
Product quality	8	9	4	
Texture	11	11		
Nutrient content	10	14	2	1
Product safety/ shelf life	12	12	5	5
Brand loyalty	13	12		
Household influence		6		

¹Based on data in Chapter 4 Table 1 & 2

²Based on raw data from which Chapter 5 Table 4 was calculated

³Based on data from which Chapter 4 Figure 3 was derived

On average, the food industries indicated a good understanding of the food product attributes needed by the low-income consumers. The three food product attributes indicated as priorities by the aggregated results of the low-income consumers, namely, satiety value, affordability and taste, as well as the food product attribute of concern, nutrient content, are reported within the scope of the five attributes perceived as needed by the target population (Chapter 7 Table 1). Two more food product attributes/ descriptors, food product safety/ shelf life and benchmarking (not listed) were also indicated. This viewpoint was strongly advocated by the marketing sections of the most successful food industries in South Africa.

However, the food product attributes provided in the starch staple-type food products available for purchasing by the low-income consumers are related to but quite different from the specific needs reported for food product attributes by the three respondent groups from the informal

settlements. Satiety value was indicated as the food product attribute of highest priority by the target population but was not perceived to be of any importance during food product development by the food industry. The implication is that the main needs of the target population are not prioritised by the South African food manufacturing industry during food product formulation and development. This difference confirms the need for this study to develop a food product concept framework to guide (starch staple-type) food product formulation to best meet the needs for food product attributes for low-income urbanised consumers living in informal settlements.

7.4.2 Reality of the low-income consumers

The full implication of these findings becomes clear only when seen within the context of the reality of the low-income consumers' existence. Currently, South Africa is experiencing an urbanisation growth rate unprecedented in the history of this country – culminating in urbanised mega-city growth rates that are amongst the highest in the world. The level of urbanisation in South Africa (57 percent) is representative of the situation in a third world country, and is expected to increase to a level of 73 percent by 2010. In Gauteng alone, the population is expected to double to approximately 14 million by 2011 (Pretoria News as quoted by Jenkins, 1997:4).

A significant proportion of the urban poor appear to be very poor (Mitlin, 2005:6), experiencing some of the worst poverty levels (Higgs, 2007:1). The situation is aggravated by poor food production and availability (Kruger, Schönfeldt & Owen, 2008:3), which pose an increasing challenge to food and nutrition security. Owing to poverty and, consequently, the importance of price to low-income consumers, the increased food demand is mainly for staple-type foods (Den Hartog, Van Staveren & Brouwer, 1995:25; Ellaway & Macintyre, 2000:55).

The European Food Information Council (EUFIC) (2005:2) poses the cost of food as the primary determinant of food choice, in direct relation to the income and socio-economic status of consumers. Food-secure households typically spend more on food in real terms than do food-insecure households (Nord, Andrews & Carlson, 2007:24; Donkin, Dowler, Stevenson & Turner, 2000:31). Therefore, the lower the income per capita, the higher the share of the average consumer budget allocated to necessities (Alwitt & Donley, 1996:72), and the greater the portion of the budget that is spent on staple-type starch food products such as cereals (Regmi, 2001:iii; ACNielsen, 2005:2). This culminates in an increasingly less diverse diet (Golden, 2000:502; FF, 2006:1-2), indicative of a market more vulnerable to food price and income changes (Regmi, 2001:iii).

The impact of the heightened level of food price inflation relates to a “silent Tsunami” of hunger (Markets and Economic Research Centre (MERC), 2008:1). As the household income of more than half of the South African households amounts to less than R2000 per month, with a reported median of R1083 (US\$106) for the lower 23 percent of the South African population, food security is threatened by the diminishing ability of marginalised households to meet food needs (MERC, 2008:5-6). The international maize price increased by 87 percent over the 2005 - 2007 period. As the net buyers of food, specifically of cereals, include various countries in Africa and millions of poor and food-insecure in our own country, the population most vulnerable to huge price increases will be adversely affected (MERC, 2008:83).

Within this context of chronic hunger, the importance of a high level of satiety value and affordability in the staple food mainly consumed, receives new meaning.

7.4.3 Food product attributes perceived as quality indicators

The derived set of key criteria (concepts) to provide a product perceived as quality by the target population, according to priority value, includes satiety value, affordability, taste, product acceptability, convenience/ ease of preparation, household influence, appearance, value for money, product quality, packaging size, texture, product safety/ shelf life, brand loyalty and nutrient content (Chapter 7 Annexure 2).

The interrelatedness of the concept elements describing satiety value and affordability, as well as the integration thereof within the rest of the food product attributes (concepts) (§6.3.13; Chapter 6 Table 12), in the derived context, confirms the importance and relevance of these concepts to the formulation of food products for the target population. It can therefore be deducted that satiety value and affordability, in combination with taste (as confirmed by product acceptability) (Chapter 6 Table 13), most probably represent the core food product attributes providing impetus for purchasing decisions by the low-income consumers.

The food product concept formulation framework therefore reports the tactical combination of the food product attributes (concepts) perceived as most important by the target population to meet their specific needs. The interrelatedness of these criteria is of further interest, as depicted by the respective describing concept elements for the core food product attributes (Chapter 7 Table 2):

Table 2: Food product concept formulation framework for starch-type staple foods for low-income consumers in urbanised informal settlements in Gauteng South Africa

Concepts	Ranked concepts		Low-income consumers in urbanised informal settlements			
	Industry ¹	Low-income consumers ²	Description of concepts through concept elements ³	Satiety	Affordability	Taste
Satiety value		1	<ul style="list-style-type: none"> Provision of energy Feeling of fullness Absence of hunger for a longer period of time Feeling of well-being 	←	←	←
Affordability	1	2	<ul style="list-style-type: none"> Availability of enough money Price determines packaging size (quantity more important than quality) Prevention of waste 	←	←	←
Taste	3	3	<ul style="list-style-type: none"> Familiarity/ acceptability Versatility of use Willingness to pay 	←	←	←
Product acceptability		4		←	←	←
Convenience/ ease of preparation		5	<ul style="list-style-type: none"> Preparation time Usability of leftovers 	←	←	←
Household influence		6	<ul style="list-style-type: none"> Preferences of household members Money available 	←	←	←
Appearance		7	<ul style="list-style-type: none"> Whiteness Colour infers quality 	←	←	←



Value for money	8		
Product quality	4	9	←
Packaging size	10		<ul style="list-style-type: none"> • Provisioning for a specific period ← • Household size ← • Affordability ←
Texture	11		<ul style="list-style-type: none"> • Texture quality ← • Quick thickening ability ← • Good thickening ability ← • Satiety value ← • Versatility of texture ← • Affordability (smaller quantities) ← • Convenience ←
Product safety/ shelf life	12		<ul style="list-style-type: none"> • Sensory attribute indicators • Expiry date/ freshness ← • Package size limited ←
Brand loyalty	13		<ul style="list-style-type: none"> • Strength of brand loyalty ← • Set of preferred brands ← • Buy most affordable (in set) ← • Willingness to pay for brand ←
Nutrient content	2	14	<ul style="list-style-type: none"> • Energy ← • Nutrients ← <p>Additional benefits</p>

¹ Chapter 4 Figure 1

² Chapter 7 Table 1

³ Chapter 6 Table 1 to Table 11

The portrayed framework revealed the complex and integrated nature of the illustrated food product attributes (concepts), confirming satiety value and affordability as closely related but separate in nature to taste. It is therefore recommended that satiety value (imbedding texture), affordability and taste, is applied as core food product attributes to ensure target consumer satisfaction. When these core food product attributes are satisfied, the remaining attributes can be perceived as additional benefits (as based on the concept of Painter, 2007:14).

By understanding the depth of meaning for each of the concepts, as well as the related nature between the concepts, product prototypes/ new products can be developed (formulated and tested) to possess specific levels of these characteristics. Existing products can also be adapted to meet the criteria for this target population. For example convenience/ ease of preparation are described by the two concept elements preparation time and usability of leftovers. The former is specified by the ability of the maize meal to thicken quickly using a short cooking time, while the latter is typified by affordability, taste and colour (Chapter 6 Table 4). If a food product developer understands what the terminology implies in the context of the target population, these characteristics can be “build into” a product to enhance to possibility to meet the needs of this specific target group.

The developed framework therefore facilitates the application of the insights derived by this study in the food industry through translation of the derived quality descriptors into product characteristics to meet the perceived needs of the low-income consumer for food product attributes during purchasing choice for maize meal. Following a similar approach, frameworks can be developed to derive formulation parameters for other food categories for a specific target population.

7.5 VALUE OF THE STUDY

Consumer research is complex, and food product formulation to meet consumer needs, even more so. The myriad of methods and procedures reported in literature is indicative of this dilemma. This study made a scientific contribution to the understanding of the specific needs for food product attributes during the purchasing choice of the starch staple-type food mostly consumed, maize meal by low-income consumers in urbanised informal settlements in Gauteng South Africa.

The current study confirmed that the consumer trends reported for medium- and high-income consumers (complex quality, convenience, product safety and health) are often of low or no

relevance to low-income consumers in South Africa (Chapter 7 Table 1; BFAP, 2007:52; Regmi, 2001:iii-iv). Literature indicated the main concern of this group as the provisioning of basic food security through the availability of an adequate quantity (satiety value) of affordable food to satisfy nutritional requirements, with focus on good shelf life under natural climatic conditions, inexpensive packaging and complementation to the traditional diet (Bachman, 1986:247; BFAP, 2007:52). However, this study revealed satiety value and affordability as priority food product attributes to (very) low-income consumers with limited consideration of product safety/ shelf life and nutritional content of food. The need for this study to develop a food product formulation framework for low-income consumers in urbanised informal settlements in Gauteng, South Africa, is therefore substantiated.

Through the development of the food product concept formulation framework, a set of food product attributes have been identified based on an understanding of the specific target population. So doing the product characteristics perceived to be desirable to most of the target population, have been described.

Consumers purchase food for the characteristics the food possess in a quest to meet their own specific needs. When the needs of a specific target population are known and have been interpreted into tactile food product attributes, a basis is created to define food products better prior to the development phase, e.g. by describing food product prototypes according to the levels of the set attributes. By better meeting the needs of specific target consumers, a food product that is perceived to be of higher relative quality, can be delivered.

The possibility to skilfully integrate knowledge on the food product attribute needs of this target population with food product design and development on industry level during the sensitive early phases of food product development, has been enhanced. Such a framework facilitates a more attainable and sustainable focus on the needs and preferences of the intended users, which enhances more effective control of food product costs and ease of product use.

In application of the findings of this study, starch staple-type foods that are formulated to accommodate the identified concept design parameters prior to the development phase, will have a much higher probability of meeting the perceptions for product quality by the specific target market. This focus on the needs of the target consumer allows the feasibility to develop products superior to that of competitors, with different and unique benefits, enhancing the probability of product success and market share substantially.

7.6 LIMITATIONS OF THE STUDY

- Consumer behaviour, within the milieu of social research, involves various influences which make it near impossible to account for all variables that may impact on a study, in spite of great care taken to support internal and external validity and reliability, as applicable in this study.
- Within this study an attempt was made to ensure population samples that were representative of the respective groups in the study in order to facilitate the applicability of the findings to the broader population. Possible influences on the validity of the study (number of respondents were limited to at least 100 respondents to each group for the quantitative surveys) were counteracted through the inclusion of four respondent groups.
- Due to the scope of this study, only one focus group discussion was conducted in each of the respondent groups which were sufficient for the purpose of this study as a process of triangulation was applied to support validity, but not conclusive on its own. Further supportive work can therefore be done in this regard to develop a more involved description of the food product attributes perceived as needed during the purchasing choice of maize meal.
- Although the developed design parameters stipulated by the food product concept formulation framework were verified against an existing product in the target market, the development of a new food product/ reformulation of an existing product according to the derived parameters did not form part of this study.

7.7 RECOMMENDATIONS

- The lack of priority guidelines in research and development for the formulation of food products for low-income consumers (Chapter 4 Figure 1) by food producers needs to be addressed and appropriate guidelines implemented. It seems that the marketing sections of major food producers have a good understanding of the need for food product attributes required by the low-income consumers, but this knowledge is not implemented during food product formulation and production. An ethical dilemma comes into play at this stage: if products with a high satiety value and more affordable prices are marketed, will company market share decrease, owing to the purchasing of fewer items by the target population as its need for satiety value is better met? Further work is recommended in this regard.
- The high priority assigned by the industry to addressing nutrient content (the attribute perceived as second most important during food product development), is commendable. This food product attribute was indicated as of very little importance by the low-income

consumers, aggravating an existing threat to food security. Whether the approach followed by the industry to enhance the nutrient content of the food is of a scientific nature and focussed on addressing the most stringent nutrient needs of the low-income consumer (in addition to the existing staple food fortification legislation), is not clear. Do the nutrients added to, or inherent in, the food product ingredients support food product quality (e.g., as an additive to maintain colour), without regard to the nutrient needs of the target population? If this aspect were to be approached with the necessary focus and dedication, a highly valued contribution could be made in addressing the dire need for specific nutrients in this marginalised sector of the community (Duvenage & Schönfeldt, 2007:694).

- The duality described for the South African market conveys the difference between the modern (SU-LSM 4 to 10) and marginalised (SU-LSM 1 to 3) market segments (ACNielsen, 2005:1; BFAB, 2007:47). From the findings of this study, however, it is clear that a further difference exists between the low-income and very low-income consumers in their perceptions of the depth of meaning for the concept elements describing the different concepts (food product attributes). The most deprived segment of the lowest income group (SU-LSM 1) focuses on the satisfaction of the direst, most immediate needs for survival (satiety value and affordability) and neglects the long-term consequences (as reflected in nutrient content), compromising the already precarious food security situation. It seems that a distinctive category, consisting of extremely low-income consumers with specific food product attribute needs, is emerging at the lower end of the income ladder, necessitating attention to specific food product attributes, including nutritional requirements. A rethinking of the current profile of the low-income consumer in South Africa is advisable. The division of the SU-LSM 1 group into two groups (very low-income and low-income), based on the (non-)availability of expendable household income, is suggested. Further research in this regard is advisable in order to substantiate this finding. It is most important that we do not turn our backs on the “survival” households of this world, but do whatever is possible to facilitate the meeting of their unique needs.
- With the world economy in a state of flux, food producers are facing huge challenges. Better knowledge regarding the unique needs of a target consumer group, the way in which these needs are changing and methods of addressing these needs timeously can contribute to success in maintaining a market niche.
- The way forward is to communicate the derived results to the role players in the food environment (including the National Department of Health) and the retail trade with the possibility of collaboration to implement the derived findings.

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ANNEXURE 1 Exploratory comparison of the significance of difference between perceptions of the importance for food product attributes to low-income consumers with different expendable incomes ($p < 0.1$). Supplement to Chapter 5 Annexure 1.

Food product attributes	Score of food product attribute importance ¹				Scores compared	Difference of scores vs norm %	Significance in difference
	Boipatong %	Eatonside %	Alexandra %	Tsutsumani %			
Affordability	86	78	76	82	Boipatong & Eatonside	8 > 7.657	Yes
					Eatonside & Alexandra	2 < 8.54	No
Packaging size	86	72	73	88	Boipatong & Eatonside	14 > 8.052	Yes
					Tsutsumani & Alexandra	15 > 8.282	Yes
Value for money	73	80	66	69	Tsutsumani & Alexandra	3 < 10.15	No
Taste	84	82	82	91	Tsutsumani & Alexandra	9 > 7.236	Yes
Appearance	80	76	90	89	Tsutsumani & Boipatong	9 > 7.537	Yes

¹ As reported in Chapter 5 Table 4

ANNEXURE 2 Importance of the need for food product attributes as perceived by the low-income consumers from informal settlements during the test market evaluation (weighted) ($p < 0.1$)

Attributes	Boipatong n=140	Eatonside n=130	Alexandra n=131	Differences of scores vs. norm %	Average* %
Satiety value	94*	92*	92*	2<5.094	93
Affordability ¹	86	78	76		86
Taste	84*	82*	82*	2<7.491	83
Product acceptability	81*	83*	78*	5<8.026	81
Convenience/ ease of preparation	80*	79*	81*	2<8.12	80
Household influence	76*	79*	83*	7<12.989	79
Appearance	80*	76*	90	4<9.028	78
Value for money	73*	80*	66	7<8.425	77
Product quality	73*	77*	86	4<8.631	75
Packaging size	86	72*	73*	1<9.066	73
Texture	69*	72*	89	3<9.1	71
Product safety/ shelf life	69*	62*	86	7<9.479	66
Brand loyalty	69*	61*	74	8<9.504	65
Nutrient content	59*	65*	81	6<9.671	62

* Only values not significantly different included from informal settlements

¹ See rationalisation in text.

ANNEXURE 3 Importance of the need for food product attributes as perceived by the low-income consumers of slightly higher affluence during the test market evaluation (weighted) ($p < 0.1$)

Attributes	Alexandra n=131	Tsutsumani n=101	Differences of scores vs. norm %	Average* %
Satiety value	92*	90*	2 < 6.252	91
Affordability	76*	82*	6 < 8.761	79
Taste	82	91	7 > 7.219	
Product acceptability	78*	86*	8 < 8.203	82
Convenience/ ease of preparation	81*	87*	6 < 9.856	84
Household influence	83*	82*	1 < 8.262	83
Appearance	90*	89*	1 < 6.675	90
Value for money	66*	69*	3 < 10.15	68
Product quality	86*	86*	0 < 7.536	86
Packaging size	73	88	15 > 8.282	
Texture	89*	83*	6 < 7.593	86
Product safety/ shelf life	86*	80*	6 < 8.205	83
Brand loyalty	74*	82*	8 < 8.877	78
Nutrient content	81*	87*	6 < 7.856	84

*Values not significantly different between Alexandra (informal settlement) and Tsutsumani (formal settlement)

ANNEXURE 4

Certification of editing for language accuracy

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To Whom It May Concern

This certifies that the following thesis has been edited for language accuracy.
I trust that the corrections made in the text have been applied after due consideration by the author of the document:

**DEVELOPMENT OF A
FOOD PRODUCT CONCEPT FORMULATION FRAMEWORK
FOR LOW-INCOME CONSUMERS
IN URBANISED INFORMAL SETTLEMENTS
IN GAUTENG SOUTH AFRICA**

by

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Thesis submitted in fulfilment of the requirements for the degree

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