Contribution of the local and home-food environments on the food practices of black adults in Gauteng

Thulisile Dlamini

DISSERTATION

Masters of Consumer Science (General)

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Contribution of the local and home-food environments on the food practices of black adults in Gauteng

by

THULISILE DLAMINI

Dissertation submitted in partial fulfilment of the requirement for the degree

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Co-supervisor: Dr H Fisher

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Declaration

I, **Thulisile Patience Dlamini**, declare that the dissertation which I hereby submit for the Master's in Consumer Science (General) in the Faculty of Natural and Agricultural Sciences of the University of Pretoria is my own original work and has not been submitted at any other university.

I further declare that all sources cited are acknowledged in a comprehensive list of references.

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THULISILE PATIENCE DLAMINI

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DATE

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Abstract

Contribution of the local and home food environments on the food practices of black adults in Gauteng

by

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Degree: Master's in Consumer Science (General)

This study explored and described the contribution of the local and home-food environments of urban black adults residing in Gauteng Province, to ascertain how these environments influence their food practices. The food consumption patterns of South Africans have developed and changed due to socio-structural changes such as rapid urbanisation, modernisation, globalisation, acculturation, and economic advancement. As a result of these broader systemic changes, food systems and environments simultaneously changed to adapt to technological developments and to match consumers' lifestyle changes. Motivated by concerns about the rising number of urban black South African adults who are overweight or obese, there is a need to explore how existing food environments contribute to their food practices. This study attempts to fill a gap in the available information and literature on the food environments and food practices of urban black adults in South Africa.

A quantitative research approach was followed in this exploratory, descriptive, and cross-sectional study. A convenience sample of 265 urban black adults, residing in the Gauteng Province, participated in the study. A pretested, self-administered questionnaire was developed to collect data on respondents' socio-demographic background, and their usual eating and food shopping patterns. Descriptive statistics (percentages, means and frequencies) summarised as tables and graphs were used to interpret and present the data.

The findings of this study confirm an on-going transition in the food practices of urban black adults in Gauteng. The majority of respondents reported consuming three meals a day and food

intake results indicate a satisfactory diversity of food consumed. Many respondents, however, do not adhere to some of the Food Based Dietary Guidelines for South Africa in terms of the quantities of legumes, fruits, vegetables, milk, and dairy products they consume daily. Food consumption results, considered in conjunction with those on food access dimensions, confirm that these urban consumers have easy and adequate access to a wide variety of food in the urban food environment.

From the findings on where certain food groups are purchased, it can be concluded that urban black adults primarily do their shopping at supermarkets and are satisfied with the range of food outlets they have access to in their neighbourhoods. The findings further support the opinion that most respondents felt that their local food environment provides good quality fruits and vegetables, and compares well with food stores in other areas of Gauteng. Food items recommended as part of healthy eating patterns are further available in most households, and appear to be prepared in a healthy manner.

The conclusion drawn is that affordable, good quality, healthy food is available and accessible to consumers in the food environments of Gauteng. It is recommended that consumer educators and facilitators take this research into account when educating consumers on the Food-based Dietary Guidelines for South Africa, by placing more emphasis on the daily quantities of legumes, fruits, vegetables, milk, and dairy products to be consumed.

Keywords

Food practices, urban food environment, food shopping patterns, black adults, home-food environment

Abstrak

Bydrae van die plaaslike en tuisomgewings tot die voedselpraktyke van swart volwassenes in Gauteng

deur

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Hierdie studie verken en beskryf die bydrae van die plaaslike en tuisomgewings tot die voedselpraktyke van stedelike swart volwassenes in Gauteng, ten einde te bepaal hoe hierde omgewings voedselpraktyke beïnvloed. Sosio-strukturele veranderinge soos vinnige verstedeliking, modernisering, globalisering, akkulturasie en ekonomiese vooruitgang veroorsaak dat die voedselverbruikspatrone van Suid-Afrikaners ontwikkel en verander. As gevolg hiervan verander voedselsisteme en -omgewings deurlopend om aan te pas by die voortdurende tegnologiese ontwikkeling en lewenstyl verandering van verbruikers. Die gevolglike toename in die aantal stedelike swart Suid-Afrikaanse volwassenes wat oorgewig of vetsugtig is, noodsaak dat die bydrae van die voedselomgewings tot bestaande voedselpraktyke verken en ondersoek word. Hierdie studie vul die leemte met betrekking tot die beskikbare inligting en literatuur oor die voedselomgewings en voedselpraktyke van stedelike swart volwassenes in Suid-Afrika.

'n Kwantitatiewe navorsingsbenadering is gevolg in hierdie verkennende, beskrywende, deursnee studie. 'n Geriefsteekproef van 265 stedelike swart volwassenes, woonagtig in Gauteng, het aan die studie deelgeneem. 'n Elektroniese vraelys is gebruik om data in te samel oor respondente se sosio-demografiese inligting, eetpatrone en voedselaankooppatrone. Beskrywende statistiek is gebruik om die data te interpreteer en in tabelle en grafieke aan te bied. Die resultate bevestig dat die voedselpraktyke van stedelike swart volwassenes in Gauteng steeds verandering ondergaan. Die meerderheid respondente nuttig drie maaltye per dag en alhoewel die voedselinname op 'n diverse voedselverbruik dui, is daar respondente wat

sommige van die Voedselbaseerde Dieetriglyne vir Suid-Afrika nie navolg nie. Die aanbevole hoeveelhede vir peulgroente, groente en vrugte, asook melk en suiwelprodukte word nie deur almal ingeneem nie. Wanneer die voedselverbruik resultate in samehang met die toeganklikheid tot voedselwinkels beoordeel word, is daar bevestiging dat hierdie stedelike verbruikers voldoende en gerieflike toegang geniet tot ‘n wye verskeidenheid van voedselsoorte wat beskikbaar is in die stedelike voedselomgewing.

Die resultate bevestig dat stedelike swart volwassenes gebruik maak van supermarkte vir voedselaankope, en tevrede is met die toeganklikheid en verskeidenheid van voedselwinkels in hulle woongebiede. Hierdie resultate bevestig die mening van die meerderheid van respondente dat die plaaslike voedselwinkels goeie kwaliteit voedselprodukte te koop aanbied en goed vergelyk met voedselwinkels in ander areas van Gauteng. Voedselitems wat aanbeveel word as deel van ‘n gesonde eetpatroon, is dus beskikbaar in die meerderheid van huishoudings en word op ‘n gesonde wyse voorberei.

Bekostigbare, goeie kwaliteit, gesonde voedsel is dus beskikbaar en toeganklik vir verbruikers in die voedselomgewings in Gauteng. Uit die resultate van hierdie studie word daar aanbeveel dat hierdie inligting gebruik word wanneer verbruikersfasilitering en –onderrig met betrekking tot die Voedselgebaseerde Dieetriglyne vir Suid-Afrika onderneem word. Meer klem moet geplaas word op die aanbevole hoeveelhede peulgroente, groente en vrugte, melk en suiwelprodukte wat verbruik behoort te word.

Sleutelwoorde

Voedselpraktyke, stedelike voedselomgewing, voedsel aankooppatrone, swart volwassenes, tuis voedselomgewing

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Chapter 1: The study in perspective

1.1 INTRODUCTION AND BACKGROUND

Since the 1950's, when cities became the centres of economic power and trade, there was a noticeable increase in urban populations around the world (Tutino & Melosi, 2019; Gu, 2019; Fox, Feng & Asal, 2019). Africa and Asia are regarded as the fastest urbanising regions in the world, and it is estimated that by the year 2050 approximately 56% to 64% of the population in these regions would have become urbanised (Sulemana, Nketiah-Amponsah, Codjoe & Andoh, 2019; Tutino & Melosi, 2019). The South African population, similar to other developing and sub-Saharan countries, is also undergoing rapid urbanisation (Oranje, van Huyssteen & Maritz, 2020; United Nations, 2019; Turok & Borel-Saladin, 2014). It is estimated that 62% of the South African population now reside in urban areas with a notable percentage of the population residing in Gauteng Province (Statistics SA 2018). Although urbanisation is a feature of the broader South African society, it is the black population group who most actively participates in this process of moving to urban areas, a tendency which accelerated markedly after the dismantling of apartheid and abolishing of influx control legislation after 1990 (Bakker, Robert, Ferdinand & Rauch, 2020; Statistics SA 2017; Turok &, Borel -Saladin, 2014).

Exposure to and interaction with other people and groups in the urban environment and the workplace ultimately leads to the adoption of an urban lifestyle (Cockx, Colen, De Weerdt & Paloma, 2019; Bakker, Robert, Ferdinand & Rauch, 2019). People living in urban areas are away from home for longer periods of time, working longer hours or spending longer time to travel between home and their workplace, resulting in changes to their lifestyle and usual food practices due to the limited time available to prepare food. As food practices are closely associated with lifestyle, changes in lifestyle in turn thus also influence people's food practices. (Cannuscio, Tappe, Hillier, Buttenheim, Karpyn & Glanz, 2013). Food practices are defined as how chosen foods are used and consumed, and further encompass the food-related behaviour of an individual or group (Popkin, 2017; MacIntyre, Venter, Kruger & Serfontein, 2012; Viljoen, 2009:3). Changing food practices are not only attributed to urbanisation but are also strongly associated with a number of social structural changes such as globalisation, migration, acculturation, modernisation, education as well as economic and technological advancement. These social structural changes in turn influence changes in the urban food environment and home-food environment (Popkin, 2017; Dlamini, 2016:16; Cannuscio *et al.*, 2013; Vorster, Kruger & Margetts, 2011; Kittler, Sucher & Nelms, 2011:11). Simultaneous to these major changes in the recent past, mainly due to technological advancements, food policies and

lifestyle changes in families have also been observed (Cannuscio, Tapper, Hillier, Buttenheim, Karpyn & Glanz, 2013; Kaphingst, Robinson-O'Brien & Glanz, 2008).

Technological advancement refers to man-made objects that were developed to increase the availability and accessibility of food for consumption. The development of food technologies have accelerated exponentially during the past century. Food technology encompasses increasingly efficient ways to prepare, preserve and store food (i.e. canning, refrigeration, freezing, radiation treatment, and advanced packaging methods). These have allowed greater access and availability of processed, ready-prepared and convenience food items to consumers (Ghaani, Cozzolino, Castelli & Farris, 2016; Guerrero, Claret, Verbeke, Vanhonacker, Enderli, Sulmont-Rossé, Hersleth & Guàrdia, 2012). Technological advancement also include the use of social media, mass media, and advertising of food products to consumers that lure them to make use of more processed and convenience foods (Corvalán, Reyes, Garmendia & Uauy, 2019; Bryant, Dewalt, Courtney & Schwartz, 2003:12). Technological advancements in transportation and preservation techniques, for example, have further made it possible for consumers to access fresh produce from different parts of the world in their local food stores (Joardder & Masud, 2019; Mercier, Villeneuve, Mondor & Uysal, 2017). Food policies refer to governmental legislation and control that not only impact on the production, processing, and distribution of food but also on where and what types of food outlets are located within certain urban areas and neighbourhoods (Cannuscio, Hillier, Karpyn & Glanz, 2014). These food policies in turn affect the local and home-food environments through laws, regulations and by-laws that govern the sale of certain kinds of food. These then affect food practices, because people have to make food choices based on what is available through the food trade and that is accessible in a certain area (Elliott & Scime, 2019; Ronquest-Ross, Vink & Sigge, 2015; Bryant *et al.*, 2003:14).

A discernible shift in the food practices of black South Africans has been observed over the past four decades (Phillips, Comeau, Pisa, Stein & Norris, 2016; Sartorius, Veerman, Manyema, Chola, Hofman & Zeeb, 2015; Nnyepi, Gwisai, Lekgoa & Seru, 2015a; Pretorius & Sliwa, 2011). In the past, people mainly consumed home-cooked meals prepared from scratch, using basic food commodities such as fresh fruit, vegetables, tubers, grains, and cereals. This practice changed remarkably; home-cooking from scratch has diminished in many households as food preparation and consumption patterns have shifted towards an increased reliance on convenience, ready-prepared and processed foods because of their convenience, availability, and affordability. Convenience food products have become increasingly popular as urban people adopted ever busier lifestyles. The consumption of fast foods and highly processed foods has also escalated rapidly (Nnyepi *et al.*, 2015a; Puoane, Matwa, Hughes & Bradley, 2006). Eating away from home more often, specifically from fast food restaurants, also seems to have become a major part of some people's lives in recent times (Popkin, 2017; Nnyepi *et al.*,

2015a).

Because of urbanisation, people tend to rely more on food retailers for their supply of food. However, due to high food prices, people tend to resort to affordable food options which are often higher in energy, sugar and fat, resulting in unhealthy food choices and poor nutrition that often leads to an increased risk of being overweight and obese (Pradeilles, Baye & Holdsworth, 2018; Sedibe, Pisa, Feeley, Pedro, Kahn & Norris, 2018; Qaim, 2017; Nnyepi *et al.*, 2015a). The negative effects of these changes only began to be recognised in the early 1990s, primarily in low and middle-income populations, but did not become clearly acknowledged until chronic lifestyle diseases such as diabetes, hypertension, certain cancers and obesity began to dominate the globe (Okop, Mukumbang, Mathole, Levitt & Puoane, 2016; Popkin, Adair & Ng, 2012)

The above-mentioned exposure and interaction with a Western-oriented diet, that could be broadly defined as a high intake of refined carbohydrates, added sugars, fats and animal-sourced foods (Popkin, Adair & Ng, 2012) have resulted in what is termed a nutrition transition, defined as a shift in food and food consumption patterns associated with social, cultural and economic changes, usually at community or population level (Nnyepi *et al.*, 2015a; Steyn & Mchiza, 2014). Food and dietary shifts thus occur almost concurrently with demographic and epidemiological shifts associated with urbanisation and industrialisation. It is therefore useful to understand how the food environment changed due to urbanisation, modernisation and technological advancement. (Nnyepi *et al.*, 2015a; Steyn & Mchiza, 2014).

The concept of food environment includes not only the physical urban food retail environment but also encompasses environmental influences from the economic, political and socio-cultural environments. The food environment is thus an important determinant of food practices as it provides both opportunities and constraints to individual food choices (Herforth & Ahmed, 2015; Caspi, Sorensen, Subramanian & Kawachi, 2012). Food practices include how foods are chosen and used. Food choices involve how people consider, select, and consume food and beverages. The concept “food practices” thus includes a wide scope of activities, including the acquisition, preparation, and consumption of food (Blake, Bisogni, Sobal, Jastran & Devine, 2008). Food environments are therefore regarded as important contributors to food practices and in shaping the health outcomes of individuals, families, and communities, as they may promote or undermine healthy eating behaviours (Cannuscio *et al.*, 2013).

The local urban food environment consists of a variety of food store types or food outlets where consumers purchase their food items. These include supermarkets, fresh fruit and vegetable markets, butchers, convenience stores, fast food outlets, street vendors, spaza shops (informal convenience shops), shopping malls and open community markets. These food outlets

influence the food practices and health of individuals, as they could offer both fresh and processed foods that could either contribute to healthy or less healthy food choices (Aparecida Borges, Cabral-Miranda & Constante Jaime, 2018; Dean & Sharkey, 2011; Sharkey, Horel, Han & Huber, 2009; Ligthelm, 2005). The local urban food environment thus has a large effect on the food choices people make, as well as their resulting long-term health. When individuals shop for food, they are continually faced with the decision to purchase healthy food items while at the same time being tempted to buy food items high in kilojoules, fat or sugars that do not contribute to healthy eating (Black, Moon & Baird, 2014; Gustafson, Christian, Lewis, Moore & Jilcott, 2013; Caspi *et al.*, 2012).

Another important consideration is the home-food environment as it provides the link between the local urban food environment and individual food consumption. It plays a significant role in shaping the food practices of individuals and households and includes aspects such as the availability, accessibility, and visibility of healthy and unhealthy foods in the home and the frequency and quality of family meals (Watts, Barr, Hanning, Lovato & Mâsse, 2018; Nepper & Chai, 2015). These aspects of the home-food environment are largely determined by family food rules, role modelling, meal time routines and nutrition education (Watts *et al.*, 2018). The family food purchaser and preparer plays a central role in shaping the food habits and practices of the household's members. The task of food purchasing and preparation is usually the responsibility of a senior female in the household. In urban areas women are still mostly responsible for food decisions, although the task of food purchasing and preparation is gradually embraced jointly by both male and female household members (Burton, Reid, Worsley & Mavondo, 2017; Hibbs-Shipp, Johnson, Boles, Nelson, Wdowik & Bellows, 2017; Pradhan, Taylor, Agrawal, Prabhakaran & Ebrahim, 2013a).

The family is still the primary social unit with whom most people eat their main meals (Takeda, Melby & Ishikawa, 2018; Sedibe, Feeley, Voorend, Griffiths, Doak & Norris, 2014). The family members are important socio-demographic influences on individual food intake as they may either support or sabotage healthy eating behaviours (Vepsäläinen, Korkalo, Mikkilä, Lehto, Ray, Nissinen, Skaffari, Fogelholm, Koivusilta & Roos, 2018; Santiago-Torres, Adams, Carrel, LaRowe & Schoeller, 2014). Enjoying regular family meals is regarded as a proven strategy to help ensure that family members consume nutritious balanced meals and help develop healthy eating patterns. It also encourages unity by providing time for communication and interaction with other family members, which helps to build better relationships and family bonds (Sedibe *et al.*, 2018; Ngozika & Ifeanyi, 2018; Thompson, Cummins, Brown & Kyle, 2016; Martin-Biggers, Spaccarotella, Berhaupt-Glickstein, Hongu, Worobey & Byrd-Bredbenner, 2014).

1.2 THE RESEARCH PROBLEM

Over the past two decades, changes in food consumption patterns such as higher intakes of animal proteins, saturated fats, salt, and refined sugars; and lower intakes of fresh vegetables, fruit and fibre appear to have accelerated (Kroll, Swart, Annan, Thow, Neves, Apprey, Aduku, Agyapong, Moubarac & Toit, 2019; Pries, Huffman, Champeny, Adhikary, Benjamin, Coly, Diop, Mengkheang, Sy & Dhungel, 2017). These changes in food consumption patterns, together with lower physical activity levels, are increasingly viewed as contributing to the threat of overweight and obesity in urban areas (Otang-Mbeng, Otunola & Afolayan, 2017; Berlin, Kamody, Thurston, Banks, Rybak & Ferry Jr, 2017). More and more urban black South Africans fall into the overweight and obese categories, probably due to changing food environments and lifestyle (Statistics SA 2018; Nojilana, Bradshaw, Pillay-van Wyk, Msemburi, Somdyala, Joubert, Groenewald, Laubscher & Dorrington, 2016; Steyn & Mchiza, 2014; Shisana, Labadarios, Rehle, Simbayi, Zuma & Dhansay, 2013).

The local and the home food environments thus seem to be important influencing factors on the food practices of individuals and households. What is chosen and consumed determines the health status of individuals and households. The lifestyle changes due to urbanisation have contributed to the changes in local and home-food environment of urban black adults. As more females join the work force time constraints create an increasing reliance on processed, convenience and fast food which in turn could influence their food practices (Wang, Naidoo, Ferzacca, Reddy & Van Dam, 2014; Lhuissier, Tichit, Caillavet, Cardon, Masullo, Martin-Fernandez, Parizot & Chauvin, 2013).

1.3 JUSTIFICATION OF THE STUDY

Recently, many international studies started to give more attention to the role and contribution of the home and local food environments on the food practices of consumers (Turner, Aggarwal, Walls, Herforth, Drewnowski, Coates, Kalamatianou & Kadiyala, 2018; Ruff, Akhund & Adjoian, 2016; Cannuscio, Hillier, Karpyn & Glanz, 2014). Although there is a growing body of international research that examine the contribution of food environments to food, nutrition and health, this study area has not received much attention in South Africa. As far as the researcher could establish, only two studies on this topic have been conducted in South Africa. The one by Temple, Steyn, Fourie and de Villiers (2011) was conducted in 21 food stores and 14 rural towns of the Western Cape Province and the other study by Roos, Ruthven, Lombard & McLaclan (2013) was conducted in Avian park in the Breede Valley also in the Western Cape.

Over the past 30 years there has unfortunately been a marked decrease in the number of food intake studies in South African population groups. The limited studies that do report on the food intake of the black South African population increasingly concentrate on children living in poor socio-economic conditions, while limited attention is given to the black adult population. This study will add to the limited body of knowledge that exists about the contribution of local and home-food environments to the food practices of urban black adults in Gauteng. As far as the researcher could establish, no recent studies have been reported on the food practices of the urban black adult population in Gauteng.

The information obtained can be used in nutrition and consumer facilitation and education, by contributing to the body of knowledge on the local and home food environments and the food practices of the urban black South African population. Furthermore, the information obtained will fill the gap on how the local and home-food environments contribute to the food practices of black adults in Gauteng.[1]

1.4 STUDY AREA

The study was conducted in the Gauteng Province. Although the Gauteng Province is the smallest by land area (18 176 km^2), it is home to the largest share of the South African population approximately 14.3 million people (Statistics SA, 2017) mostly residing in an urban environment. For these reasons, Gauteng was chosen as the most suitable area to gather data from the study population of urban black adults.

[1]This Master's study made use of data collected as part of a National Research foundation grant (Grant no.93743). The NRF project initially aimed to explore and describe how the urban food environments contribute to the food and dietary intakes of adults in various areas of the Tshwane metropolis. One of the objectives of this project addressed the food practices of black adults. The services of a data collection company that specialises in consumer-related research assisted with the data collection procedure. Respondents residing in Tshwane on the data collection company's data base were invited to participate in the study via e-mail with a link to give information on the study and a consent form. The self-administered electronic survey questionnaire was distributed to those respondents who gave their informed consent to participate in the study. In order to ensure that specifically a large enough sample of urban black middle-class adults participated in the study, the data collection was not only limited to the Tshwane area, but was later expanded to include the whole of Gauteng, as only 89 African respondents indicated they reside in Tshwane. This Masters study on the black adults will therefore have Gauteng Province as study area, because it is imperative to report on the food practices of this population group as very limited information is available on the food practices of the urbanised black middle-class.

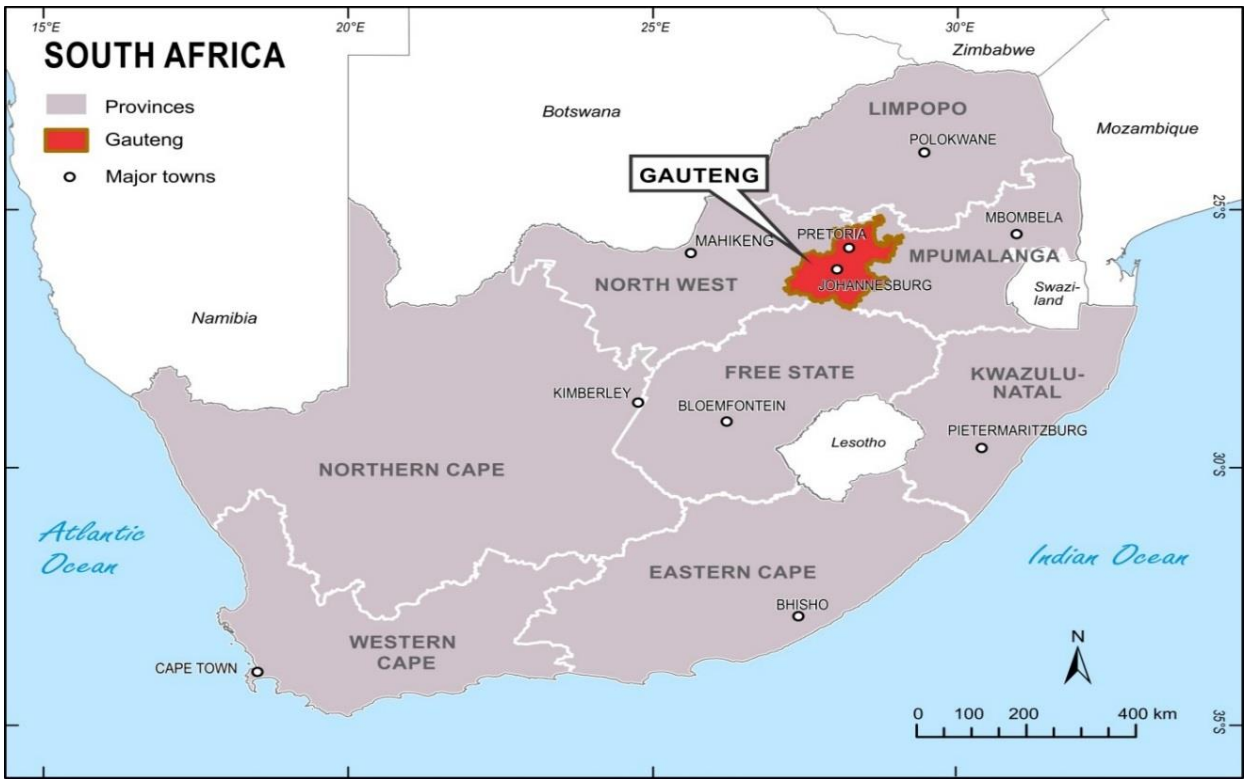


FIGURE 1.1: ORIENTATION MAP: STUDY AREA IN GAUTENG AND SOUTH AFRICA PROVINCES

1.5 RESEARCH AIM AND OBJECTIVES

The aim of the study was to explore and describe how the local and the home-food environment contribute to the food practices of black adults in the Gauteng province.

The following main objectives were derived from this aim.

Objective 1

To explore and describe the local food environment of black adults in Gauteng.

Objective 2

To determine and describe the home-food environment of black adults in Gauteng.

Objective 3

To determine and describe the food practices of black adults in Gauteng.

Objective 4

To identify and describe how the local and home-food environments contribute to the food practises of black adults in Gauteng.

1.6 RESEARCH DESIGN AND METHODOLOGY

A quantitative research approach was followed in this explorative, descriptive, cross- sectional study. Data was collected by means of a structured, self-administered, electronic survey questionnaire.

1.6.1 Data collection

Convenience sampling as a non-probability sampling technique was used in the larger study of which this study is a part. Consulta Research (Pty) Ltd, a consumer marketing research company specialising in consumer behaviour, assisted with the data collection procedure. An electronic survey questionnaire was used in this quantitative study. The questionnaire consisted of three sections that measured the socio-demographic characteristics of the respondents, together with their usual food shopping and eating patterns. The data for this project was collected in 2016 and a total sample of 788 usable questionnaires was collected from respondents residing in Gauteng Province. Of the total number of respondents who completed questionnaires, 265 individuals belonged to the African population groups. A link that contained a consent form and a questionnaire was emailed to potential respondents on Consulta's database. The questionnaire contained a cover letter from the principal researcher stating the purpose and procedures of the research study. The aspects of confidentiality and anonymity were also explained.

1.7 DATA ANALYSIS

The Statistical Analysis Software package (SPSS Version 23) was used to analyse the data by means of descriptive statistics (percentages and frequencies) and to produce tables and graphs as summaries. The raw data was received in an Excel spread sheet from Consulta Research (Pty) Ltd. The data was checked and cleaned to ensure that the data was correctly captured. The data obtained from the research was analysed according to the objectives that were set for this study (De Vos, 2011:252). Descriptive statistical analysis techniques were used to analyse the results. Descriptive statistics involve either identifying the characteristics of a phenomenon,

or exploring correlations between two or more phenomena. This was done by means of tables and Figures to display results (Leedy & Ormrod, 2013:184).

1.8 DELIMITATIONS OF THE STUDY

The study only used data collected from urban black adults residing in the Gauteng Province.

1.9 OUTLINE OF THE REPORT

Chapter 1: The study in perspective

The introductory chapter gives the background and introduction of the study, the problem statement, and the justification for carrying out the research. It also states the aim and formulated objectives that guided the study. The research design and methodology were also highlighted. A summary of the chapters that reflect the structure of this dissertation follows.

Chapter 2: Literature review

The second chapter presents an overview of the literature that justifies the theoretical perspective of the study. It further presents the theoretical framework in terms of the various environmental factors that influence food practices. The external and internal environmental factors that influence food practices are discussed and an overview of the current food practices of urban black adults in South Africa are given.

Chapter 3: Research methodology

The research methodology is presented and described in this chapter, providing information on the research design, the research aim, and objectives. The conceptual framework and the conceptualisation of the main concepts of the study, together with the operationalisation, development, structure of the measuring instrument, are explained. The study area and population, together with the sample and sampling method followed, are described. The data collection, data analysis and measures to ensure data quality by means of combating possible errors in this research process, are also dealt with in this chapter. Ethical considerations and measures to ensure anonymity and confidentiality are explained.

Chapter 4: Results and discussion

This chapter presents the demographic characteristics of the sample, followed by the results and the discussion thereof, according to the objectives of the study.

Chapter 5: Conclusions, evaluation, and recommendations of the study

The final chapter of this dissertation offers the conclusions drawn from the reported findings of the study on the contribution of the local urban and home-food environments to the food practices of urban black adults. The research conducted is evaluated, recommendations and suggestions for future research are made, and the implications of the findings are documented for academic interest.

1.10 CHAPTER CONCLUSION

This introductory presented the introduction and the background of the study, the problem statement and justification for the study. It included the research objectives, research methodology followed, delimitations of the study and the outline of the structure of the research report. The next chapter the literature review deals with the theoretical perspective of the study and the different environmental factors, both external and internal, that influence the food choices and food practices of urban black adults.

Chapter 2: Literature review

2.1 INTRODUCTION

This chapter provides the theoretical perspective and a review of the literature relating to the main concepts of the research study. This includes a discussion of the factors influencing the food choice process and explains the construct 'food environment', and provides the background of South African urban black adults' food practices.

2.2 THEORETICAL PERSPECTIVE

A theoretical perspective is a point of view or a framework for organising knowledge and guiding an inquiry. This study explores the contribution of the local and home-food environments on the food practices of urban black adults. The human ecological perspective was chosen for this study as it provides an opportunity to include all contributing factors from different environments that influence food practices (Bryant et al., 2003:2; Sobal, Khan & Bisogni, 1998).

2.2.1 Human ecological perspective

The human ecological perspective recognises humans as both biological and social beings, and appreciates the way human food choices are influenced by the biological, socio-cultural and physical environmental factors (Larson & Story, 2009; Bryant *et al.*, 2003:2). Human beings have the ability to interact with various environments from both the macro and micro environmental levels and are capable of adapting to each of these environmental levels (Viljoen, 2009:21; Story, Neumark-Sztainer & French, 2002; Bubolz & Sontag, 1993:419). This implies reciprocity between humans and their physical and social environments (Bryant *et al.*, 2003:11; Bubolz & Sontag, 1993:432). Bubolz and Sontag (1993:432), conceptualise environments as "the totality of the physical, biological, social, economic, political, aesthetics, and structural surrounding for human beings and the context for their behaviour and development". They listed several assumptions as the basic premise for this perspective (Bubolz & Sontag, 1993:426).

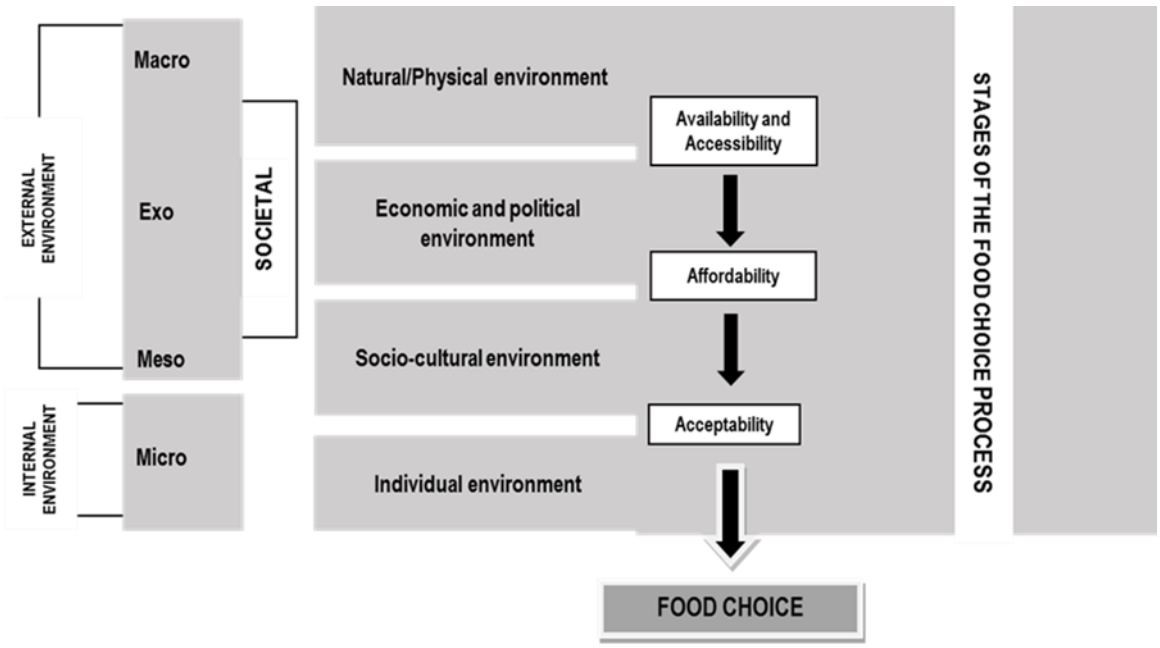


FIGURE 2.1: ENVIRONMENTAL LEVELS CONTRIBUTING TO THE FOOD CHOICE PROCESS (Viljoen, 2009:23).

The applicable assumptions derived from this premise that apply to this study follow, together with examples of how each relates to or is interpreted in terms of food choice and food practices.

- All parts of the environment are interrelated, and they influence each other

The natural and/or physical environments provide essential resources as the basis for all life. Changes in one environment will simultaneously result in changes in other interrelated environments.

Example: The natural environment, which includes the climatic and geographical characteristics of a region, determines the kind of food that can be cultivated. It affects food production because when climatic conditions are favourable, the soil fertile, and water is available, farmers are able to cultivate and harvest larger crop yields. Technological developments, as part of the socio-cultural environment, further enable people to produce, process, preserve and distribute the food they produce, which in turn affects the type of food that will be available in that region. Improved transportation systems also contribute to the availability of food products. The economic status of consumers, as part of the economic and political environment, determines the extent to which they will have access to food in the physical environment and how much food they can afford to purchase. The socio-cultural environment, in turn, guides people on what can be used as food from what is available in the physical environment (Bryant *et al.*, 2003:10-

13). Not everything that is produced and available as food is acceptable or regarded as food by all consumers, due to different social and cultural beliefs, attitudes and values.

- Human interactions with multiple environments

The external environmental levels that humans interact with include those from the natural or physical environment, the economic and political environment, and the socio-cultural environment. The food choice process in the external environment is guided by the availability, accessibility, affordability and acceptability of food (Larson & Story, 2009).

Example: The example given above also applies to the various external environments that humans interact with during the food choice process.

- Humans respond to change, develop, act on, and modify their environment

Adaptation is a continuous process in the ecosystem. The ability to adapt to different environments is a characteristic of human beings which they developed for survival. Humans respond to the environment by changing, developing, acting on and modifying it to obtain the desired outcomes (Bubolz & Sontag, 1993:433). According to Bubolz and Sontag (1993:433), learning is an essential part of this process. This implies that things do not remain the same and that humans are able to alter or change their environments, since a failure to adapt may lead to human extinction.

Example: Technological developments as part of the socio-cultural environment provide certain resources to the modern time-constrained female consumer. Although many females nowadays are employed outside the home, they remain mainly responsible for many household tasks such as food provisioning. Given limitations on time available for food procurement and preparation, the food and household appliance industries responded to this social problem by developing certain technological innovations and developments such as microwave ovens and improved storage facilities such as refrigerators and deep freezers to prolong the shelf-life of food products. These examples of technological developments and innovations not only increased the availability of food, but also contributed to the increased shelf-life and keeping quality of food and saved on the preparation time of meals. Other developments that contributed to reduce food preparation time is the continuous development and improvement of ready-prepared and convenience foods. These foods are now more readily accessible and available to consumers at any time to suit their busy lifestyles and save time and effort (Guerrero *et al.*, 2012; Popkin, 2006).

- Interactions between humans and their environments are guided by two sets of rules, the physical and biological laws of nature, and human derived rules

The human ecological perspective requires that both sets of rules be considered (Bubolz & Sontag, 1993:426).

Example: The law of nature dictates that humans and all living organisms require food for energy and survival. This law of nature guides humans to interact with the natural/ physical environment, in order to cultivate and produce enough food for human consumption to ensure survival. There are also several human-derived rules, such as the social norms that relate to the use and allocation of resources, distribution of power and expectations, to consider. For example, in the Swazi culture a recently married bride is not allowed to eat emasi (sour milk) prepared from milk obtained from her in-law's herd. Instead, she is only allowed to eat emasi after her own family presented a cow to her husband's family (Kgaphola & Viljoen, 2004; Bubolz & Sontag, 1993:426).

- Environments do not determine human behaviour but pose constraints as well as possibilities and opportunities to humans

Environments could either restrict or enhance the well-being of individuals. Bubolz and Sontag (1993:433) point out two important aspects about the environment that must be kept in mind. First, the adequacy of the environment and the choices exercised by individuals depend on the resources available, individual needs and values, and management plans to ensure the sustainability of environmental resources. Second, legislation and policies can determine access to opportunities for employment, education, goods, and services.

Example: In urban areas the supply of indigenous green leafy vegetables is often limited, preventing people who habitually collect and consume indigenous green leafy vegetables. The limited supply of indigenous green leafy vegetables has given local supermarkets an opportunity to sell more readily available spinach to consumers.

The next section describes the factors contributing to the food choice process, and how influences from each environmental level contribute to the overall process.

2.3 FACTORS INFLUENCING FOOD PRACTICES

Food practices are defined as how chosen foods are used and consumed, and further encompass the food-related behaviour of an individual or a group (Popkin, 2017; MacIntyre *et al.*, 2012; Viljoen, 2009:3). Food choice as part of the food practices is defined as a complex process in which an individual make a decision on what food and beverages are to be consumed it includes a wide scope of activities such as the acquisition, preparation, and consumption of food (Viljoen, 2009:15; Blake *et al.*, 2008). Food choices are influenced by various environments. These environments are grouped into two groups, the external and internal environments (Holsten, Deatrick, Kumanyika, Pinto-Martin & Compher, 2012; Contento, Williams, Michela & Franklin, 2006; Sobal, Bisogni, Devine & Jastran, 2006). The model by Viljoen (2009:23), given in Figure 2.1, will be used to structure the discussion and to explain the external (macro, exo, and meso) environments, as well as the internal (micro) environment. The contribution of each of these environments to the food practices is then discussed.

2.3.1 External environmental factors

The external environment consists of the natural and physical environment (macro-), the economic and political environment (exo-) as well as the socio-cultural environment (meso-) (Story, Kaphingst, Robinson-O'Brien & Glanz, 2008).

2.3.1.1 Natural and physical environment

The natural environment refers to climate, water resources and soil conditions, which determine what food can be produced. The physical environment includes the human built environment: infrastructure such as roads, houses, supermarkets, restaurants, convenience stores and fast food outlets, as well as the technological developments for processing, storing and distribution of food (Story *et al.*, 2008; Eertmans, Baeyens & Van Den Bergh, 2001). The natural and physical environment is conceived as one of the external environments that influence the food choices and decisions of households and individuals (Story *et al.*, 2008; Popkin, Duffey & Gordon-Larsen, 2005). The natural and physical environments determine what food is available and accessible for consumption, and they create opportunities or constraints for what people can eat. For example, the physical environment in which urban people operate give them easy access to food through the high presence of supermarkets, fast food outlets, restaurants, fruit and vegetable markets, convenience stores and spaza shops.

2.3.1.2 The economic and political environment

The economic and political environment refers to the political and economic system that determines the production, distribution, exchange, and consumption of goods. They influence people's access to food and other resources as well as their ability to exploit these resources (Bryant *et al.*, 2003:13). The economic system includes aspects such as income, the price of food, marketing strategies and consumer demand, as well as the ability of people to purchase food (Bryant *et al.*, 2003:13). Economic studies on food choice have shown that household income directly influences food selection and often overrides considerations such as healthfulness, social desirability, and even the taste of the food. Individuals not only choose food based on availability, but their choice is influenced by affordability (Jastran, Bisogni, Sobal, Blake & Devine, 2009; Messer, 2007). The political system refers to governmental legislation, policies, and controls that impact on the production, processing, and distribution of food. The political environment also affects food consumption through laws and regulations that govern the sale of certain kinds of food. These laws affect food choices because people have to make food choices based on what is available through food trade (Bryant *et al.*, 2003:14).

2.3.1.3 Socio-cultural environmental factors

The term socio-cultural refers to the interdependence and inseparability of man and his culture. The social environment refers to the way social groups organise their members into families, social strata, communities and other groups (Bryant *et al.*, 2003:12). Culture refers to the pattern of behaviour, while the word society refers to the people who participate in culture (Kittler *et al.*, 2011:6). According to Tylor (1871) in Fieldhouse (1995:2) "culture is that complex hole which includes knowledge, beliefs, art, moral laws, customs and other capabilities and habits acquired by a man as a member of the society". Culture refers to a shared understanding amongst individuals or a group which makes them unique or different from others (Kittler *et al.*, 2011:6; Bryant *et al.*, 2003:12). Humans acquire culture through the process of learning and interaction with other people within their social environment. For this reason, members of a social group are able to share norms, beliefs, attitudes and values about food in an identifiable social manner (Kittler *et al.*, 2011:6; Larson & Story, 2009; Bryant *et al.*, 2003:190-209). However, culture is dynamic and can change over time through social structural changes such as migration, urbanisation, and modernisation (Kittler *et al.*, 2011:11). Culture is thus also a forceful phenomenon that continues to evolve and change over time (Larson & Story, 2009), and to changing circumstances. For instance, when people migrate to urban areas, their food practices may change if they adopt particular food habits of the local culture. Culture as a construct includes three further factors, namely technology, social organisation and ideology (Bryant *et al.*, 2003:12). Each of these factors will be discussed next.

Technology

Technology is a critical tool in the arsenal of survival strategies that humans use to obtain food. Technology in this context describes the development of techniques and strategies to obtain food, which includes knowledge, practice and physical tools a group may use to negotiate the physical environment in order to meet their basic biological needs (Kittler *et al.*, 2011:12; Bryant *et al.*, 2003:87). Technology refers to man-made objects that were developed to cope not only with environmental challenges, but also to increase the availability and accessibility of food for consumption. The evolution of household technologies has accelerated exponentially during the past century. Food preparation technology encompasses increasingly efficient ways to prepare, preserve and store food (i.e. canning, refrigeration, freezing, radiation treatment, and packaging). Technological innovations such as microwave ovens, preservation and storage facilities such as refrigerators and deep freezers that prolong the shelf-life of food products, have allowed greater access and availability of processed and convenience foods to consumers (Guerrero *et al.*, 2012; Popkin, 2006; Popkin, 2001).

As more females join the working class, the constraints on their time create an increasing reliance on convenience food, which in turn influences their food practices and food choices (Wang *et al.*, 2014; Lhuissier *et al.*, 2013). Technological advancements in transportation and preservation techniques have made it possible for consumers to access fresh farm produce from different parts of the world in their own neighbourhoods (Hammond, Brown, Burger, Flanagan, Fristoe, Mercado-Silva, Nekola & Okie, 2015; Rozin, 2007:128; Bryant *et al.*, 2003:87).

Social organisation

Social organisation refers to the way in which a social group organises its members into families, communities, social groups and other groupings. Social organisation is further defined as a complex set of rules, norms, beliefs, values and other conventional understandings that regulate relationships and provides templates for organising work within households, thus influencing how each family's day is organised. Food practices are closely linked to social organisation. As people cooperate to produce food or share a meal, the social organisation is reinforced (Bryant, 2003:190). Food brings people together, thus helping to build and maintain human relationships. Parents influence their children's food practices through role modelling and making certain foods readily available and accessible in the home; selecting places to eat outside the home; transmitting beliefs, norms, and values that guide food selection; and rewarding desired behaviour or punishing undesirable behaviour (Scaglioni, De Cosmi, Ciappolino, Parazzini, Brambilla & Agostoni, 2018; Yee, Lwin & Ho, 2017; Bryant *et al.*, 2003:194).

Ideology

Ideology is an integral part of culture and has a profound effect on human food choices. Fieldhouse (1995:30) defines ideology as "the sum of attitudes, beliefs and customs and taboos affecting the diet of a given group". Furthermore, Bryant *et al.*, (2003:221) define food ideology as "the values, preferences, symbolic expressions of meanings and beliefs that groups of people share with respect to food". Moreover, ideology also includes symbolic meanings, associated with the values that a group of people share about specific foods (Bryant, 2003:13). Ideology is therefore a collective term for the values, attitudes, and beliefs that can influence an individual's food choices and eating patterns, since it is an integral part of a culture. Each of these components of ideology are briefly explained.

Values

A value is an enduring belief that a specific code of conduct is personally or socially preferable to an opposite mode of conduct (Rokeach, 1973:5). Values can also be defined as enduring beliefs which guide and motivate a behaviour. They are therefore important in self-definition and in food choices (Hauser, Jonas & Riemann, 2011; Connors, Bisogni, Sobal & Devine, 2001). Personal values are the main guiding principles in people's lives; they influence attitude formation and behaviour. Food values are learned through the process of socialisation and these values determine what is socially acceptable and desirable as food. Food can further be used to promote interpersonal acceptance, friendship and to display social status (Botonaki & Mattas, 2010; Bryant *et al.*, 2003:92; Fieldhouse, 1995; Parraga, 1990).

Attitude

An attitude is "a relatively enduring organisation of beliefs around an object or a situation influencing one to behave in some preferential manner" (Shepherd & Raats, 2006:112). Attitude is related to a person's behaviour and it helps to evaluate any concrete object positively or negatively (Hauser *et al.*, 2011; Eagly & Chaiken, 1995). Parraga (1990) suggests that an attitude stems from individual beliefs about an object, and is often defined as an effective orientation to objects. Furthermore, attitudes are reflected in a complex individual evaluation based on beliefs about the outcome of behaviours and evaluation of the outcomes (Franchi, 2012). People's attitudes towards certain foods may change due to a specific change in the foods' sensory attributes, nutritional value or price (McCrickerd & Forde, 2016; Dreezens, Martijn, Tenbült, Kok & de Vries, 2005).

Beliefs

Beliefs are conceptions of reality and propositions about how the universe works (Bryant *et al.*, 2003:93). A belief about food represents an interpretation of food values, and serves as a cognitive reflection of attitudes in choosing certain food (Hauser *et al.*, 2011; Parraga, 1990).

Each society has a set of beliefs about food and have fixed conceptions on how it affects the human body. The beliefs people hold about food influence their food choices and their acceptance of certain foods (Chakona & Shackleton, 2019; Dolman, Stonehouse, van't Riet, Badham & Jerling, 2008).

2.3.2 Internal environmental factors

The internal environment also referred to as the individual or personal environment are the unique characteristics of an individual that affect their food choices and preferences. These include the psychological, biological and physiological characteristics of an individual (Rozin, 2007:25-28; Messer, 2007; Bryant *et al.*, 2003:13). Humans learn about their culture through their interaction with other members of society and through the process of enculturation and socialisation. These processes teach people how to negotiate the dynamics of their culture, and how to acquire values and norms appropriate to their specific culture. This happens either through direct teaching (socialisation) through incidental learning or imitation (enculturation) (Viljoen, 2009:15). Food choices are also learned through people's interaction with other members of society and social groups as part of enculturation. People consume food based on what they have learned is socially and culturally acceptable (Falk, Bisogni, & Sobal, 1996:257). A variety of influences shape individuals' particular food choices (Jastran *et al.*, 2009:24; Viljoen, 2009:24). Apart from these influences, each person's food choices are guided by their own personal food system where their own food values and preferences are weighted, negotiated or traded off against each other in the last step of the food choice process (Jastran *et al.*, 2009).

The food choice process model in Figure 2.2, by Sobal *et al.* (2009), illustrates the interrelationship of influences within the individual's personal food system grouped into five sub-groups, namely: ideals, personal factors, resources, social factors, and food context. Each of the influences interacts with other influences when they become active (Jastran *et al.*, 2009). The personal food system represents the cognitive process that an individual employ in the food choice process. The five major influences on food choices are explained and discussed next.

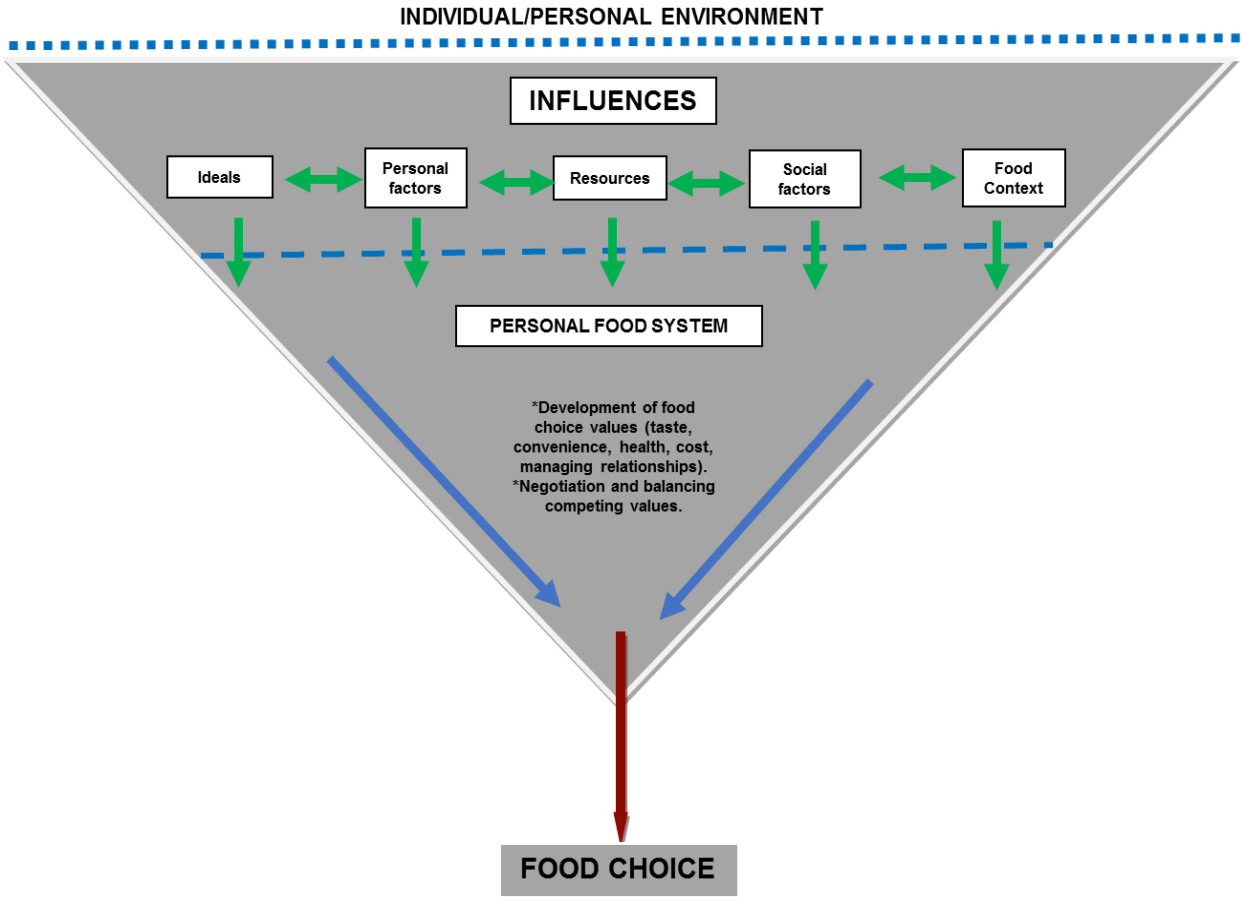


FIGURE 2.2: THE FOOD CHOICE PROCESS MODEL (Adapted from Sobal *et al.*, 2006:3)

2.3.2.1 Influences

Sobal *et al.* (2006:5) grouped influences into cultural ideals, personal factors, resources, social factors and present context (Jastran *et al.*, 2009; Sobal *et al.*, 2006:5). Each of these interrelated influences are discussed below.

Ideals

Cultural ideals include the learned system of rules, expectations, and beliefs shared by a group of people. They provide standards against which individuals can judge their own food behaviour (Jastran *et al.*, 2009; Sobal *et al.*, 2006:5). Ideals are closely related to the values people learn through socialisation and enculturation about how and what one should eat in a specific context, framed by the standards or norms that guide behaviour. Ideals could also pertain to the symbolic meaning of food, such as social status or wealth. Food can be avoided or refused if the symbolic meaning is unacceptable to the eater. On the other hand, it could be chosen if it has a positive and acceptable significance to the eater (Bisogni, Bostic & Sobal, 2016; Sobal *et al.*, 2006:5).

Personal factors

Personal factors are the individual characteristics that influence food choice decisions and behaviours. Personal factors include physiological factors such as hunger, allergic responses to food and sensory sensitivity to certain food tastes that may affect the food choice process (Jastran *et al.*, 2009:42; Furst, Connors, Bisogni, Sobal & Falk, 1996). Psychological factors refer to individual food preferences, mood, and personality. Other social factors such as lifestyle, education, and gender are also important in food choice. Personal factors are thus learned and developed over time to serve as unique individual food choice guides (Jastran *et al.*, 2009:42; Sobal *et al.*, 2006:6; Furst *et al.*, 1996).

Resources

When making food choices, individuals also consider their resources (Jastran *et al.*, 2009; Sobal *et al.*, 2006:6). Both tangible and intangible resources affect food choice. Tangible resources include physical resources such as money, equipment, transportation, and storage space. Intangible resources refer to time, skills and knowledge, and can include social resources such as help from others, advice and emotional support (Gama, Adhikari & Hoisington, 2018; Sobal & Bisogni, 2009). Resources such as money may provide access to a broad array of foods, whereas limited money may restrict food selection to only those foods that are affordable. Food choices are mostly determined by the money, time and skills people have. Time for food preparation is often limited since people have busy lives. Food preparation skills also play an important role in food choice as working adults mainly depend on food that requires limited preparation time and skills. Knowledge is another intangible resource required to make sound food choices, as the health consequences of food choices are currently receiving much attention (Gama *et al.*, 2018; Sobal & Bisogni, 2009).

Social factors

Social factors refer to the relationships that people have with others, which could either constrain or facilitate food choice decisions. Some relationships provide opportunities for making sound food choice decisions. For example, a supportive family encourages individuals to make healthy food choices as most eating occurs in the presence of other people (this could extend beyond family to include a network of friends, organisations, and communities). Relationships provide opportunities to make particular food choice decisions, whereas other relationships may constrain them (Jastran *et al.*, 2009; Sobal *et al.*, 2006). Since eating is a social behaviour, observing the eating behaviour of others could have a positive or negative effect on the other person who emulates it. For example, young adults' eating patterns can be influenced by the food choices of their peers. People also tend to eat more in the company of others compared to when they are eating alone. This may be viewed as an example of social facilitation, which is defined as the enhancement of a certain behaviour inspired by the

presence of others. The presence of other people during meals has a direct influence on the portion size of the food they eat. For example, during social gatherings, there is relatively more food available and the subjects have a larger feeling of hunger due to the sociable atmosphere (Sharkey, Johnson, Dean & Horel, 2011; Story *et al.*, 2008; Feunekes, de Graaf & Van Staveren, 1995).

Food context

Food contexts are the broader environments influencing individual food choice decisions. Food contexts are defined by both the physical and social environments where food choice decisions are made, and as such facilitate or constrain these decisions (Jastran *et al.*, 2009; Furst *et al.*, 1996; Winter Falk, Bisogni & Sobal, 1996). Although the home and the workplace are the key contexts where people make their food choice decisions, specific situational factors such as the presence of other people, time of consumption, the aroma and colour of the food or physical setting might also influence food choice. As people eat in a wide range of environments, the social process affecting food choice becomes more complex (Jastran *et al.*, 2009).

The personal food system will be discussed in the next section.

2.3.2.2 Personal food system

Personal food systems refer to the cognitive processes that guide an individual to interpret and negotiate influences when making food choices in a particular setting or context (Sobal & Bisogni, 2009; Sobal *et al.*, 2006:7; Furst *et al.*, 1996). The personal food system includes the development of food choice values, the negotiation and balancing of these food choice values, the classification of foods and the specific food situation or content. It also includes the development of strategies for food selection and eating in different situations (De Brauw, Brouwer, Snoek, Vignola, Melesse, Lochetti, Van Wagenberg, Lundy, Maître d'Hôtel & Ruben, 2019:10). Food choice values are dynamic as they could change over time and during the life course of a person. Lived experiences shape food choice values and this may evolve or develop into new or modified food choice values (Sobal *et al.*, 2006:7). Studies indicate that people consider five types of food choice values when making food choice decisions. These include taste, health, cost, convenience and relationships (Figure 2.2), and people also attach meanings or feelings to these considerations (Sobal & Bisogni, 2009; Shepherd & Raats, 2006; Connors *et al.*, 2001).

Taste

Taste is a food choice value that represents the sensory preferences regarding food and beverages people consider in making their food choices (Kourouniotis, Keast, Riddell, Lacy,

Thorpe & Cicerale, 2016; Sobal *et al.*, 2006:7). The word 'taste' is used in different contexts; some use the word taste to describe the different sensory attributes of food and beverages that influence their food enjoyment, such as appearance, odour, flavour, and texture. These qualities are described as sensations, and are referred to as sensory attributes (Molnar, 2009; Sobal *et al.*, 2006; Vorster, Bourne, Venter & Oosthuizen, 1999). Taste is the primary consideration for food choice, and it is therefore important to recognise that individual taste preferences may change over time. Taste is used as the minimum criterion to determine whether a food or beverage will be consumed.

The acceptability of food is based on qualities that an individual define and perceive with their senses (Popkin, 2006; Sobal *et al.*, 2006). Since our senses of sight, hearing, touch, smell, and taste play critical roles in food choice, it is important to discuss the sensory attributes of food appearance and colour, texture, taste, flavour and smell together, as these attributes individually and in combination influence food choice (Boesveldt & de Graaf, 2017).

Colour and other appearance attributes of food create the first impression encountered by consumers (Van der Laan, De Ridder, Viergever & Smeets, 2012). Appearance is therefore the first sensory attribute that influences food choice. It refers to the basic sensory attributes of food such as its colour, shape, size, and surface texture. Past experiences about the taste of food, such as having a sweet, sour, bitter, or salty taste, are stored in a person's memory. When a person sees a food product that they tasted before, a pleasant or unpleasant memory is triggered that guides them to select that particular food, or not. The flavour of food is important in food choice as well as in the consumption of food. Consumers' preferences for a savoury or sweet flavour will influence their food choices. The smell of food come through deliberate inhaling to ascertain whether it is pleasant or unpleasant. Foods with an unpleasant smell are usually rejected, since the smell could indicate that food is spoiled or may have an unpleasant taste (Guido, Perna, Carrai, Barale, Grassi & Rondanelli, 2016; Spence, 2016).

The texture of food is also important in food choice. The textural characteristics that influence food choice include attributes such as crispiness, tenderness, smoothness, creaminess, firmness, juiciness, graininess and toughness (Nederkoorn, Theiβen, Tummers & Roefs, 2018; Werthmann, Jansen, Havermans, Nederkoorn, Kremers & Roefs, 2015).

Convenience

Convenience is another value that influences food choice. Convenience relates to the time, physical ability and the mental or psychological ability of a person to acquire, prepare, and consume food, and cleaning up after eating or drinking (Connors *et al.*, 2001; Furst *et al.*, 1996). Time is a primary aspect related to convenience for people who are employed. Urbanisation has

led to an increase in the consumption of convenience foods, due to the time pressure people generally experience because of professional activities. As eating environments and patterns change, more people rely on snack, fast and convenience foods that could result in overweight and obesity. Lack of the skills and competence to prepare and cook food at home could also influence food choice (Wahlen, van der Horst & Pothoff, 2016; Hartmann, Dohle & Siegrist, 2013; Vorster *et al.*, 2011).

Cost

Cost is an important food choice value that people consider when making food choices (Sobal *et al.*, 2006:8). Most of the food in urban societies is purchased rather than self-produced hence price is an important consideration in the food choice process. The consideration of cost includes the concept of worth, i.e. whether the cost of food represents value for money. Even people with unlimited disposable income may still be sensitive to price increases because they might feel the price is too high and not worth the cost. Although it is possible that people with financial constraints consume lower quality diets with higher ratios of fats and added sugars because they provide dietary energy at a relatively low cost, it is also possible that people with a low income may buy more expensive food because they believe that the food is essential to their well-being (Hartmann *et al.*, 2013; Sobal *et al.*, 2006:9).

Health

Health relates to the physical well-being of the individual or group when making food choices. The desire for healthier yet tasty food is another personal value that is considered in the food choice process (Sobal *et al.*, 2006:9). Health includes considerations that pertain to the effect of food on the human body. These include aspects such as digestive discomfort, allergic reactions, energy levels, as well as longer-term consequences of food intake such as growth, weight control, managing illness or chronic disease prevention (Jastran *et al.*, 2009; Sobal *et al.*, 2006:9).

Managing relationships

Managing relationships is a food choice value that represents how a person considers the interest and well-being of other people involved in their immediate social world (Sobal *et al.*, 2006:9; Furst *et al.*, 1996). This refers to how people's food choice decisions take into consideration the needs and preferences of significant other people in their lives, such as a spouse, partner, or children. Since food is central to family harmony, it is important that the food preferences and eating patterns of others in the household should be taken into consideration when choosing food for the family (Devine, Connors, Sobal & Bisogni, 2003). This food value choice is concerned with building, maintaining and repairing relationships in the family or household, as individuals do not live in isolation but are social beings that interact with others by

anticipating, addressing and accommodating the food preferences of significant others, potential conflict over issues of food choice can be avoided (Furst *et al.*, 1996).

This completes the discussion of the food choice process that illustrated the influences from the different environments. The food environment as an external environment will be discussed in the next section.

2.4 THE FOOD ENVIRONMENT AS CONCEPT

Food environments are regarded as the collective physical, economic, policy and socio-cultural surroundings, opportunities and conditions that influence people's food choices (Herforth & Ahmed, 2015; Caspi *et al.*, 2012). These four dimensions of the food environment (physical, economic, policy and socio-cultural) are interrelated with and influenced by four other groups of factors namely: the food industry, government, society, and consumers' individual or personal factors. The food industry produces food supplies, promotes the consumption thereof and responds to social values norms and trends about food. Government policies and regulations provide a frame within which the food industry must operate. Society establishes cultural norms and standards through traditional and cultural practices within which individuals then make their food choices. The food environment therefore provides a platform whereupon individuals exercise their food choices (Swinburn, Sacks, Vandevijvere, Kumanyika & Lobstein, 2013a).

In the context of this study, food environments include the local and the home-food environment, which will be discussed.

2.4.1 Local food environment

The local urban food environment plays an important role in influencing the availability of food. The local food environment consists of a variety of food store types or food outlets where consumers purchase their food items. These include supermarkets, fresh fruit and vegetable markets, butchers, convenience stores, fast food outlets, street vendors, spaza shops (informal convenience shops), shopping malls and open community markets. These food outlets influence the food practices and health of individuals, as they offer healthy food varieties as well as unhealthy food varieties (Aparecida Borges *et al.*, 2018). The local urban food environment has a large effect on the food choices and food practices, as well as their resulting long-term health. When individuals shop for food, they are continually faced with the decision to purchase healthy food items while at the same time being tempted to buy unhealthy food items (Black *et al.*, 2014; Gustafson *et al.*, 2013; Caspi *et al.*, 2012). The diversity and proximity of the retail

food outlets and product promotion, placement and prices within the food retail stores have influence on the home food environment and the food practices of families and individuals (Cannuscio *et al.*, 2013).

The retail store food environment will be discussed in the next section.

2.4.1.1 Retail store Food environment

The retail store food environment in South Africa consists of formal and informal sectors. The formal food retail sector includes supermarkets, fresh fruits and vegetable food market convenience stores, speciality stores, wholesale and fast food retail outlets (Claasen, Van der Hoeven & Covic, 2016; Stroebel & van Schalkwyk, 2012). The food retail industry has changed largely in the past decade due to the growing number of supermarkets. The supermarkets present the largest share of the food industry, generating more than half (55.6%) of the food industry value in 2007 (Stroebel & van Schalkwyk, 2012; Igumbor, Sanders, Puoane, Tsolekile & Schwarz, 2012). Initially supermarkets served a small niche in cities for rich and middle-income households but currently supermarkets are penetrating into poor neighbourhoods and rural areas. The supermarket industry exploded after the end of apartheid in 1994, when various supermarkets such as hypermarkets and convenience stores started replacing informal retailers (Battersby & Peyton, 2014; Igumbor *et al.*, 2012). The supermarket industry is dominated by four large chain stores: Pick n Pay, Shoprite, Spar and Woolworths. Supermarkets are large stores that usually offer lower prices compared to other food stores, they also offer a variety of high-quality products including deli, bakery, and butchery. Supermarkets are characterised by offering highest access to healthy foods in comparison to convenience stores and local markets (Odunitan-Wayas, Okop, Dover, Alaba, Micklesfield & Puoane, 2018; Igumbor *et al.*, 2012). Urbanisation and changing consumer demographics drove the demand for supermarket services. The increasing number of women participating in the labour force, individual health consciousness and food safety concerns have consequently increased the dependency on supermarkets due to less cooking time and higher demand for convenience food. It is reported that most consumers do their primary food shopping at local supermarkets due to the variety and healthy food options provided by supermarkets (Cannuscio *et al.*, 2014; Cannuscio *et al.*, 2013; Stroebel & van Schalkwyk, 2012).

Convenience stores continue to grow in the South African retail market due to the growing working middle class' demand for convenience purchases. Convenience stores are characterised by the limited selection of groceries, ready-to eat foods and non-food items such as magazines, toiletries and other essentials, due to limited shelf space. The convenience stores in South Africa are usually Express stores and Quick Shops commonly found in filling

stations (Battersby & Marshak, 2017; Larson & Story, 2009). The products sold in convenience stores are usually sold in smaller packages (quantities) and priced higher compared to supermarkets (Cannuscio *et al.*, 2014). Informal food retail consists of street vendors, spaza shops and community markets. These are the most common food outlets within the informal food sectors and they are mostly available in neighbourhoods with middle and low-income populations (Stroebel & van Schalkwyk, 2012).

2.4.1.2 Food access dimensions

The local urban food environment, which encompasses five food access dimensions as found in urban areas, namely: availability, accessibility, affordability, acceptability, and accommodation, is thought to be important in shaping the health of individuals, families, and communities (Cannuscio *et al.*, 2013; Swinburn, Vandevijvere, Kraak, Sacks, Snowdon, Hawkes, Barquera, Friel, Kelly & Kumanyika, 2013b). Each of these dimensions of the local food environment significantly affects the food choices made by individuals within a specific local urban food environment (Herforth & Ahmed, 2015; Kegler, Alcantara, Haardörfer, Gazmararian, Ballard & Sabbs, 2014; Caspi *et al.*, 2012).

Food availability

Food availability refers to how easily the supply of food produced can reach consumers and includes the geographical density and distance between food retailers and consumers (Martin, Ghosh, Page, Wolff, McMinimee & Zhang, 2014; Jones, Ngure, Pelto & Young, 2013; Caspi *et al.*, 2012; Azuma, Gilliland, Vallianatos & Gottlieb, 2010; FAO, 2008). In South Africa, the food retail industry consists of both a formal and informal sector. The formal sector includes convenience stores, speciality stores, supermarkets, and food wholesalers. The informal food retail sector consists of street vendors, tuck shops, street corner stalls and spaza shops (Stroebel & van Schalkwyk, 2012). In urban areas people rely mainly on food retail stores for food purchases, as people's busy lifestyles and lack of space to grow food limit their opportunities to consume home grown food products (Minaker, Raine, Wild, Nykiforuk, Thompson & Frank, 2013). Furthermore, most urban supermarkets stock a large variety of different food items and are located in relative close proximity to one another, as opposed to supermarkets in rural areas, which are located further apart and generally offer only a limited selection of food products (Battersby & Peyton, 2014; Minaker *et al.*, 2013; Battersby, 2012).

Food access

Food access refers to the geographic accessibility of different types of food stores and restaurants when using convenient modes of transportation. There are various ways to measure

geographic access. For example, one can measure the proximity of homes to specific outlet types, such as grocery stores or fast food outlets. Another measure is to count the number of convenience stores or fast food outlets within a given geographic area. Travel time and distance are key measures of accessibility (Minaker, 2013; Caspi *et al.*, 2012).

Food accessibility also takes into consideration the income, expenditure, and buying capacity of households, and whether a household or individual has the monetary resources to access and acquire enough good quality food (Minaker *et al.*, 2013). In addition, Feeley *et al.,* (2009) states that individuals who do not have their own form of transport will not have easy access to food retailers that are located in an urban environment which is at a distance from their home. For example, lower-income South Africans residing in townships choose to purchase food from local spaza shops despite their consistently higher prices, because they are located conveniently, easy to access, and provide credit. The spaza shops generally stock a large variety of processed foods with a long shelf life, which is the most affordable choice for the consumer, and only stock limited fresh produce that is sold at higher prices (Battersby, 2012).

Affordability

Affordability relates to the cost of food, the consumer's willingness to pay and the ability of households and individuals to purchase food from a financial perspective. This factor has a direct influence on consumers' food choices (Caspi *et al.*, 2012). According to Battersby (2012), affordability is a very important factor that affects the food choices made by consumers, who are particularly vulnerable to market fluctuations, inflation, and the overall affordability of food due to their limited food budgets and disposable incomes. Affordability can be measured by means of determining the monetary cost of a nutritious food basket, by asking the question: "How much does it cost a family of four to eat a healthy diet in Gauteng?" It can also be measured by using a relative or comparative method, such as: "How much does whole grain bread cost compared to white bread in grocery stores in Gauteng?" (Minaker, 2013; Caspi *et al.*, 2012).

Strategic management and effective procurement policies by large supermarkets, as well as their relationship with large food manufacturers, often allow retailers to offer food products at reduced prices (Pereira, 2014; Caspi *et al.*, 2012).

Acceptability

The access dimension of acceptability describes consumers' attitude towards attributes of the local food environment, and more specifically if the supply of food products meet their personal standards (Usher, 2015; Caspi *et al.*, 2012). Food acceptability is a personal food choice value guided by the quality, freshness, and price of the food. Food quality is thus a predictor of food acceptability, as poor food quality such as bruised or spoiled fruits and vegetables would limit

food acceptability (Dean & Sharkey, 2011). Price is simultaneously perceived to influence food acceptability, as the worth or value for money of the purchased food is also considered. Larger chain food stores in urban areas are understood to often have lower food prices in comparison to smaller convenience stores (Mushi-Brunt, Haire-Joshu & Elliott, 2007).

Accommodation

Accommodation refers to how well-equipped local food stores are to meet the food and associated consumer needs of local households and individuals (Usher, 2015; Caspi *et al.*, 2012). The ability of the local food sources to meet the needs of consumers in terms of hours of operation, type of payment accepted, credit facilities and accommodating these factors also influence food choices. The consumer's perception of the appropriateness of these services may lead to the opportunity to make better food choices (Pereira, 2014).

The home-food environment is another important determinant that influences the food practices of urban black adults. The home-food environment forms part of the individual environment. In the next section the home-food environment, including the household socio-demographics, the procurement and preparation of food as well as the importance of family meals will be highlighted.

2.5 THE HOME-FOOD ENVIRONMENT

The home-food environment forms part of the individual and socio-cultural environments. It plays a significant role in shaping the food practices of individuals and households. The home-food environment further provides a link between the food retail environment and individual food consumption. It includes aspects such as the availability, accessibility, and visibility of healthy and unhealthy foods in the home and the frequency and quality of family meals (Watts *et al.*, 2018; Nepper & Chai, 2015). These aspects of the home-food environment are largely determined by family food rules, role modelling, meal time routines and nutrition education (Watts *et al.*, 2018). Home food availability refers to the actual presence of food in the home, which includes food on countertops or in refrigerators and cupboards. If healthy food is not available at home, it cannot be consumed (Boles, Johnson, Burdell, Davies, Gavin & Bellows, 2019; Santiago-Torres *et al.*, 2014). The quality and nutritional value of food available in the home is largely influenced by the food shopping behaviour of the household's food purchaser, as it influences what type of food enters the household; the use of non-home food sources (i.e. takeaways) for family meals and the food preparation methods followed in the household (Couch, Glanz, Zhou, Sallis & Saelens, 2014b). The food preferences of individual family members are important socio-demographic influences regarding food intake of other family

members as they may either support or sabotage healthy eating behaviours (Vepsäläinen *et al.*, 2018; Santiago-Torres *et al.*, 2014). Food accessibility in this context represents food that is retrievable, ready to eat, and in a location that allows easy consumption (Ding, Sallis, Norman, Saelens, Harris, Kerr, Rosenberg, Durant & Glanz, 2012). Studies have shown that regular family meals in addition to the availability and accessibility of home foods, food visibility and storage practices could either promote healthy or unhealthy eating behaviours in the family (Couch *et al.*, 2014b; Ding *et al.*, 2012).

The various factors which influence the home-food environment will be discussed in the next section.

2.5.1 Household socio-demographics

Societal changes have been noted over the past decades. Changes in family structure, roles and decision-making in the family have contributed to changes in food practices. More females have joined the labour force to follow careers, and marry and have children at a later stage in life. Changes in living arrangements have also been observed, as more young adults seem to establish their own households only at a later age (Madhavan, Myroniuk, Kuhn & Collinson, 2017).

2.5.1.1 Family life stage

Family life stages include: bachelorhood, honeymooners, parenthood, post parenthood and solitary survivor (Schiffman & Kanuk, 2010 :332). Schiffman and Kanuk (2010: 332) give a classification of the different family life-stages that individuals might experience throughout their lives. Table 2.1 presents the classification:

TABLE 2.1: FAMILY LIFE-STAGE CONCEPTUALIZATION (Schiffman & Kanuk, 2010 :332)

Stage	Name	Description	Household
Stage I	Bachelorhood	Independent Young person living without their parents	Single person household
Stage II	Honeymooners	Young married couple without children	Nuclear household
Stage III	Parenthood	Married couple living at home with at least one child “full nest”	Nuclear family
Stage IV	Post parenthood	Older married couple with no children living at home“ empty-nest”	Nuclear household variation
Stage V	Solitary survivor	Widow or widower (only one spouse remain)	Single person household

Different family life stages have different effects on household food practices. The bachelorhood stage is characterised by sufficient disposable income. This group represents a great value for marketers, and they are targeted with several products and services. Most of their money is

spent on fashion items, restaurant meals, alcohol, recreation, and entertainment. Bachelorhood presents an ideal period to explore food practices, and as such also provides an opportunity to establish food-related behaviours. Some of the behaviours developed by young adults at this stage include irregular meal patterns, skipping of meals and frequent snacking. At this stage young adults may rely on ready-made meals or may frequently eat out at restaurants (Kobayashi, Asakura, Suga & Sasaki, 2017). A person in the bachelorhood life-stage have different procurement and preparation demands, as they only have to cater for one, whereas those in the parenthood life-stage would buy more food and prepare bigger meals, enough for the whole family. This also implies taking longer to purchase and prepare food for families (Maree G Thorpe, Mark Kestin, Lynn J Riddell & Keast, 2012).

The honeymoon life-stage is formed by young married couples. They usually have dual incomes and live a more lavish lifestyle. Individuals entering the honeymoon stage merge their personal food practices to create joint spousal food practices. At this phase the couple prepare food according to their likes and preferences (Bove, Sobal & Rauschenbach, 2003). The parenthood stage consists of parents living with at least one child. Food practices are also influenced by the presence or absence of children in a household, parents are expected to role model best eating behaviours (Nepper & Chai, 2015). The frequency of eating out tends to decline once children are born compared to young childless couples. It is apparent that the more children are in the household, the more money is spent on food with the increased likelihood of low quality food products. (Claasen *et al.*, 2016). During the post parenthood stage, the couple once again live on their own without children and they only need to provide food for themselves. At this stage, sound food practices are needed to combat the effects of aging. In the last life stage, there is often only one solitary survivor that needs to provide food for themselves. The person lives on their own and prepare single meals or live in a retirement village, where food would be provided.

2.5.1.2 Socio-economic status of household

The socio-economic status of a household and the composition of the family (the number and age of children and adults in the household) are some of the characteristics that influence the type of food purchased and prepared in the home (Odunitan-Wayas et al., 2018; Yoo, Baranowski, Missaghian, Baranowski & Cullen, 2006). Household income is a crucial determinant for food selection. Studies have shown that additional income does not only increase the amount spent on food but also affects dietary diversity which result in diet diversification and improved quality and convenience. Although this does not directly result in improved nutritional status and healthy diet (Regmi & Meade, 2013; Popkin et al., 2012) the level of education is perceived to have an influence on food consumption in the home-food environment. Studies found that a higher level of education is also associated with healthier

dietary habits such as purchasing better quality food and more fruits and vegetables (Watts et al., 2018; Vogel, Lewis, Ntani, Cummins, Cooper, Moon & Baird, 2017; Averett, Stacey & Wang, 2014). The employment status and time spent away from home by family members also have an influence on the home-food environment in terms of time spent on food purchasing and preparation. Household members who spend most of their time away from home tend to consume more food items with a shorter preparation time or take-away foods (Bauer, Hearst, Escoto, Berge & Neumark-Sztainer, 2012).

2.5.2 Gender roles in food procurement and preparation of food in the home

The family food purchaser and preparer play a central role in shaping the food habits of the household's members. These tasks are usually the responsibility of a senior female in the household. In urban areas women are still mostly responsible for food decisions, although the task of food purchasing and preparation is gradually embraced jointly by both male and female household members (Burton et al., 2017; Hibbs-Shipp et al., 2017).

Food purchasers and preparers thus act as gatekeepers in terms of the food that are accessible in the household as they determine what type of foods will enter the home and be available in the home, the quantities in which they are stored, as well as how, when and what is prepared for specific meals (Burton et al., 2017). A gatekeeper influences most of the household food choice decisions by performing most of the household's food purchasing and preparation (Burton et al., 2017; Hibbs-Shipp et al., 2017). Although the family food purchaser often assumes the primary responsibility for managing the food available in the home environment, their food-purchasing decisions may be influenced by interactions with other members in the household (Burton et al., 2017; Berge, Arikian, Doherty, Neumark-Sztainer & Community Health, 2012a). Studies have shown that with more women joining the labour force, gender roles in food procurement and preparation are gradually changing as more men appear to be involved in household food purchasing and preparation than before. However, although these changes are noted, these tasks are still mainly the responsibility of a senior female in the household (Burton et al., 2017; Shisana, Labadarios, Rehle, Simbayi, Zuma, Dhansay, Reddy, Parker, Hoosain & Naidoo, 2014).

2.5.3 The role and importance of family meals

The family is still the primary social unit with whom most people eat their main meals. Although some meals can be eaten with friends, work colleagues and neighbours (Takeda *et al.*, 2018; Sedibe *et al.*, 2014). Enjoying regular family meals is regarded as a proven strategy to help ensure that individual family members consume nutritious balanced meals and help develop

healthy eating patterns. Frequent family meals are associated with higher intakes of fruit, vegetables, calcium-rich foods, protein, fibre, and several essential micronutrients. In addition, having more frequent family meals has been related to lower intakes of soft drinks, fried foods, and saturated fat (Chae, Ju, Shin, Jang & Park, 2018; Martin-Biggers *et al.*, 2014; Woodruff & Hanning, 2013). Parental role modelling of healthy eating habits mainly occurs during family meals, which provide an opportunity to set a good example for children to adopt sound and healthy eating habits (Scaglioni *et al.*, 2018; Moore, 2018; Pearson, Griffiths, Biddle, Johnston & Haycraft, 2017).

Among the well-documented benefits of enjoying meals together as a family are that family meals encourage unity by providing time for communication and interaction with other family members, which helps to build better relationships and family bonds. Family meals are also perceived to provide an opportunity to teach manners, social skills and responsibility to children (Sedibe *et al.*, 2018; Ngozika & Ifeanyi, 2018; Martin-Biggers *et al.*, 2014). Regular family meals during adolescence have been proven to protect against overweight and obesity in young adulthood (Watts *et al.*, 2018; Sedibe *et al.*, 2014). The food preferences of family members also influence family food practices and the dietary intake of family members (Thompson *et al.*, 2016).

However, studies have also shown that many families in urban areas do not sit down for regular family meals due to various reasons which may include busy work schedules, stress, lack of financial resources and lack of suitable space in households to sit down and eat together as a family (Watts, Loth, Berge, Larson & Neumark-Sztainer, 2017). Parents from single headed households reported the cost of family meals was a major barrier to having family meals that included healthy food options, whilst parents from dual-headed households identified busy schedules and lack of time as a major barrier to having frequent family meals (Berge, MacLehose, Loth, Eisenberg, Fulkerson & Neumark-Sztainer, 2012b).

The foods served at meals, the accessibility of food at the table, the size of dinnerware and utensils, have all been related to the types or amount of food individuals consume (Sharp, Sobal & Wethington, 2019; Lorenz & Langen, 2018). In some families watching television while eating is a common practice and might aid in helping family members to engage in conversation while watching their favourite television programmes. However, the tradition of eating meals in different age groups is still followed in some families, where adults enjoy their meals in one room while children eat theirs in another room (Sedibe *et al.*, 2018; Trofholz, Tate, Miner & Berge, 2017; Martin-Biggers *et al.*, 2014).

2.6 BLACK URBAN ADULTS

The black South African population group represents 80.8% of the South African population, of whom 25.3% reside in the Gauteng Province (Statistics SA, 2017). The Gauteng Province is the smallest South African province by land surface but has the fastest growing population. The increase in the percentage of black people residing in the urban areas of Gauteng since the removal of apartheid influx controls in the early 1990's has been well documented (Baffi, Turok & Vacchiani-Marcuzzo, 2018; Lemon, 2017; Turok & Borel-Saladin, 2014; Donaldson, Mehlomakhulu, Darkey, Dyssel & Siyongwana, 2013). The Gauteng province has the highest urbanised population level of 99.6%.(Baffi *et al.*, 2018).

As a symbol of increased social status, the black middle class (so called "black diamonds") started moving from urban townships (historically disadvantaged areas near cities in South Africa) which are usually underdeveloped areas known for having small houses without reliable electricity and water connections, to residential areas of the city termed as "suburbs" (Turok, 2012). The advantages of living in urban suburbs are that the suburbs are usually closer to residents' workplaces, and they provide easy access to good schools and shopping centres or shopping malls (Kara, 2014; Turok, 2012). People residing in urban suburbs also feel more secure as many have improved security systems installed at their homes, compared to the situation in urban townships (Ballard, 2015). The South African black middle class is distinguished by their relatively high level of education. They usually have a post-secondary or tertiary education and are employed in non-manual white-collar jobs, and earn incomes ranging between R 21 000 and R 67 500 per month (Mkhwanazi, 2016; Mattes, 2015; Donaldson *et al.*, 2013).

With urbanisation, the extended family system of indigenous South African black people seems to be evolving into a nuclear family structure like that of their white counterparts (Etieyibo, 2020). The fertility rate of black urban South Africans also appeared to decline over the past six decades, from an average of six to seven children per woman to the current figure of two to three births per woman (Statistics SA, 2017).

2.6.1 The food practices of urban black adults

The South African black population represents the largest population group in South Africa and is the most impoverished of all the groups (Statistics SA, 2017). The South African black population follows two distinctive types of eating patterns. The rural population follows a very traditional eating pattern of two meals a day, one meal at noon and one meal in the evening. The urban population increasingly has three meals a day accompanied by snacking in between

meals (Dlamini, 2016:34; Steyn & Mchiza, 2014). The urban meal pattern includes breakfast, which usually consists of bread, tea, milk, soft porridge, cereals (cornflakes, Weet-Bix, or Rice Krispies) and sometimes a fruit. Due to urban adults' busy lifestyles, convenient food options are preferred and are usually consumed for lunch. They consist of bread (sandwich), chicken, savoury snacks, soft drinks, and fruits. Food consumed for supper include pap, rice, or pasta; an animal protein which is usually chicken or boerewors; vegetables and fruits (Vogel, 2018:81; Dlamini, 2016:59). A modern trend which has been observed in urban areas is that individuals tend to skip meals which results in poor eating habits such as eating mostly takeaway foods, snacking on fatty foods that are fried and salty, accompanied by beverages with a lot of sugar such as soft drinks, energy drinks, coffee, tea and alcoholic beverages. These kinds of meals generally are of lower dietary quality, thus resulting in weight gain. (Pot, 2018; St-Onge, Ard, Baskin, Chiuve, Johnson, Kris-Etherton & Varady, 2017; Kunene & Taukobong, 2017). A study by Dlamini (2016) indicated that skipping of meals – especially breakfast during weekends – is more common as opposed to week days (Dlamini, 2016:56). Fast foods or takeaways were mostly consumed on Saturdays, while a home cooked midday meal is enjoyed on Sundays (Viljoen, van der Spuy & du Rand, 2018; Dlamini, 2016:66).

The South African black population residing in urban areas appears to have abandoned their traditional food practices for Western-oriented food practices upon exposure to the urban environment (Phillips *et al.*, 2016; Sartorius *et al.*, 2015; Nnyepi *et al.*, 2015a; Sedibe *et al.*, 2014). Although they have a positive attitude towards the consumption of traditional foods as they regard them to be healthy and taste good, studies have shown that black urban adults mainly consume traditional foods on special occasions. Concerns regarding the consumption of traditional food occasionally are that they take longer to cook. Therefore, urban black South Africans tend to resort to food which take less time to cook. For example, starchy staples like samp and maize meal are not frequently consumed as compared to rice and pasta (Dlamini, 2016:67). The shift to a more Western-oriented food intake is characterised by an increased consumption of processed foods that are often high in sugars and saturated fats and low in fibre content, whereas traditional meals consisted of high fibre foods, complex carbohydrates and were low in fats and sugars. The changes in the food and meal patterns of urban black adults are associated with the increased access to food outlets selling affordable, energy-dense and processed food (Ronquest-Ross *et al.*, 2015; Nnyepi, Gwisai, Lekgoa & Seru, 2015b).

Due to urbanisation in most developing countries, urban residents tend to have access to a wider range of food products that inevitably leads to diets being modified to accommodate their urban lifestyle. This manifests by including more foods from fast food outlets as well as processed and convenience food products in their meals. This tendency contributes to what is termed a nutrition transition (Dlamini, 2016:120) . Eating away from home is a common practice among urban black adults as most urban adults are employed and spend substantial amounts

of their time at work (Steyn & Mchiza, 2014; Burgoine & Monsivais, 2013). Working longer hours and being away from home for longer periods, have also led to changes in the food practices of urban black people, who increasingly consume convenient food products (Caswell, Yaktine & Council, 2013). The central role of women in the domestic task of food provisioning continues to affect a household's members' food choices and ultimately their food practices. As more women in the urban environment join the labour force, convenience and processed food products help to save time and effort associated with food preparation and cooking (Barska, 2018; Popkin, 2017).

To help consumers to adopt adequate diets through better informed food choices that meet all their nutrient needs and to help prevent the development of deficiencies and reduce nutrition-related non-communicable diseases, South Africa also followed the FAO/WHO strategy to promote appropriate food choices through a set of recommendations of optimal dietary patterns and healthy lifestyles (Vorster, Badham & Venter, 2013). In the next section the Food Based Dietary Guidelines for South Africa are discussed.

2.7 FOOD BASED DIETARY GUIDELINES FOR SOUTH AFRICA

The Food Based Dietary Guidelines for South Africa were revised in 2013, based on science-based evidence on what is eaten and how it influences health. Nutritional recommendations were translated into food or dietary patterns in order to guide the general population to consume a healthy and optimal diet. Food Based Dietary Guidelines are thus regarded as a tool that can be used to improve optimal nutrition and health in populations (Vorster, Badham & Venter, 2013). The Food Based Dietary Guidelines for South Africa were developed by taking into consideration the prevailing eating patterns that exists in the country as documented in the South African scientific literature. These current patterns are used to help change food behaviours so that South Africans can make the best possible food choices to contribute to their well-being. The guidelines thus consist of foods which are locally available and affordable and are necessary for healthy eating (Vorster *et al.*, 2013).The Food Based Dietary Guidelines for South Africa convey brief positive dietary recommendations that aim to guide consumers to make better food choices, based on local food and eating patterns (Vorster *et al.*, 2013). The Food Based Dietary Guidelines for South Africa recommend food groups that are to be eaten regularly. These food groups are starchy foods; vegetables and fruits; dry beans, peas, lentils, and soya; chicken, fish, meat and eggs; milk, maas, and yoghurt; fat and oil; and water. (See Addendum D for the complete Food-Based Dietary Guidelines for South Africa regarding these food groups).

The Food Based Dietary Guidelines for South Africa recommend and encourage the consumption of a diverse diet. In the next section the concept of dietary diversity will be discussed.

2.8 DIETARY DIVERSITY

Dietary diversity is a measure of food consumption that reflects a household's access to a variety of food. Dietary diversity is best calculated by means of calculating the number of different food groups consumed over a specified period of time. The food groups represented in the dietary diversity score are usually based on the traditional eating patterns of a specific study group. Dietary diversity can thus be measured by the dietary diversity score which sums the number of food groups consumed over a given period of time usually over the past 24 hours (Martin-Prével, Allemand, Wiesmann, Arimond, Ballard, Deitchler, Dop, Kennedy, Lee & Mousi, 2017 ; FAO, 2014). The Dietary Diversity Score (DDS) is meant to reflect the nutritional adequacy of a households' diet, and the household's access to a variety of foods. It consists of a count of food groups that were consumed over the preceding 24 hours (Chakona & Shackleton, 2017; Vasileska & Rechkoska, 2012; Kennedy, Ballard & Dop, 2011:23). The dietary diversity of food intake could be measured by using a varied number of food groups (usually between four and 16 food groups depending on the group under investigation and the aim of the study. See Addendum E for the nine food groups used in this study). The food groups included starchy staples, orange-fleshed vegetables, dark green leafy vegetables, other fruits and vegetables, legumes and nuts, fats and oils, meat, poultry and fish, milk and dairy products, and eggs (Chakona & Shackleton, 2017; Steyn, 2013; Kennedy *et al.*, 2011:23). The South African National Health and Nutrition Examination Survey (SANHANES-1) reported a national dietary diversity score for South Africa of 4.2, which is very close to the cut-off level of 4.0 for dietary adequacy (Cordero-Ahiman, Santellano-Estrada & Garrido, 2017; Ronquest-Ross *et al.*, 2015; Taruvinga, Muchenje & Mushunje, 2013; Shisana *et al.*, 2013).

2.9 CONCLUDING SUMMARY

The review of literature that guided the study was provided in this chapter, and the human ecological perspective was explained. It was chosen for this study as it provides an opportunity to include all contributing factors from different environments that influence food practices (Bryant *et al.*, 2003:2; Sobal *et al.*, 1998). The literature review also indicated the importance of understanding the internal and external food environmental factors of the urban consumer and how they influence their food practices. This was followed by a review of food access

dimensions which were considered to influence food practices. The urban environment and the household demographics of urban consumers were discussed as they are considered to be major determinants that influence food practices.

The next chapter addresses the methodology followed to collect data for the study.

Chapter 3: Research methodology

3.1 INTRODUCTION

This chapter presents a detailed description of the research methodology applied in this study. The research design and methodology that were used to achieve the research objectives are given and justified. The conceptual framework, and the conceptualisation and operationalisation of the main concepts are presented. The study population, sampling, as well as the data collection and analysis are explained. Measures to ensure the quality of the data and ethical conduct of the study are also given in the last section of this chapter.

3.2 RESEARCH DESIGN

This study aims to explore and describe how the local and home-food environments contribute to the food practices of black adults in Gauteng Province. A research design is the master plan that describes the methods and procedures that are used to execute the study. Proper planning is essential for a successful study. It enables the researcher to carry out and implement the research project (Creswell, 2013:50). In this cross-sectional, explorative, and descriptive study a quantitative research approach was followed as quantitative measurements and numbers were allocated to the measured variables in order to describe them. The study could further be described as exploratory, descriptive, and cross-sectional.

- **Explorative research** Explorative research is conducted when a researcher wishes to gain insight into a situation, a community or an individual when investigating a relatively unknown area of research inorder to facilitate a better understanding of a particular situation (De Vos, 2011:95; Blanche, Blanche, Durrheim & Painter, 2008:44). In this study, explorative research was used to explore the food practices of urban black adults in Gauteng Province , because the researcher wanted to gain a basic understanding of the contribution of the local and home food environments on the food practices of urban black adults.

- **Descriptive research** deals with specific details of a situation or the characteristics of an existing phenomenon, and is applicable when a researcher is trying to understand events occurring at present and their relationship to other factors (De Vos, 2011:96; Blanche *et al.*, 2008:44). It emphasises the current state of affairs at the time of the study. In

the case of this study the aim was to describe how the local and home food environments of the study group contribute to the food practices of black adults in Gauteng.

- **Cross-sectional studies** are typically descriptive and explorative studies conducted in a population at a given point in time (De Vos, 2011:102). This study is cross-sectional as it studied a group of black adults at a single time interval, namely May to June 2016.

3.3 RESEARCH AIM AND OBJECTIVES

The aim of this study was to explore and describe how the local and home-food environments contribute to the food practices of urban black adults in the Gauteng Province.
The following objectives and sub-objectives were derived from this aim:

Objective 1
To explore and describe the local food environment of black adults in Gauteng (henceforth referred to as the study group) in terms of the food access dimensions.

1.1 To determine and describe the availability and accessibility of food in the local food environment of the study group.
1.2 To determine and describe the location and frequency of food purchased from selected food outlets by the study group.
1.3 To determine and describe the affordability and acceptability of food in the local food environment of the study group.
1.4 To determine and describe how the study group's consumers' needs were accommodated.
1.5 To determine and describe the study group's perception of the food access dimensions of the local food environment.

Objective 2
To determine and describe the home-food environment of black adults in Gauteng.

2.1 To determine and describe the person who is mainly responsible for food purchasing and preparation of food in the homes of the study group.
2.2 To determine and describe the availability of selected food groups in the homes of the study group.
2.3 To determine the frequency and attitude of the study group towards family meals at home

Objective 3

To determine and describe the food practices of black adults in Gauteng:

3.1 To determine and describe the eating patterns (meal patterns and meal composition) of the study group.

3.2 To determine and describe the dietary diversity of the study group's food intake.

3.3 To determine and describe the number of servings of selected food groups consumed by the study group per day.

3.4 To determine and describe the frequency of consumption of selected food groups consumed by the study group.

Objective 4

To identify and describe how the local and home-food environment contribute to the food practices of the study group.

3.4 CONCEPTUAL FRAMEWORK

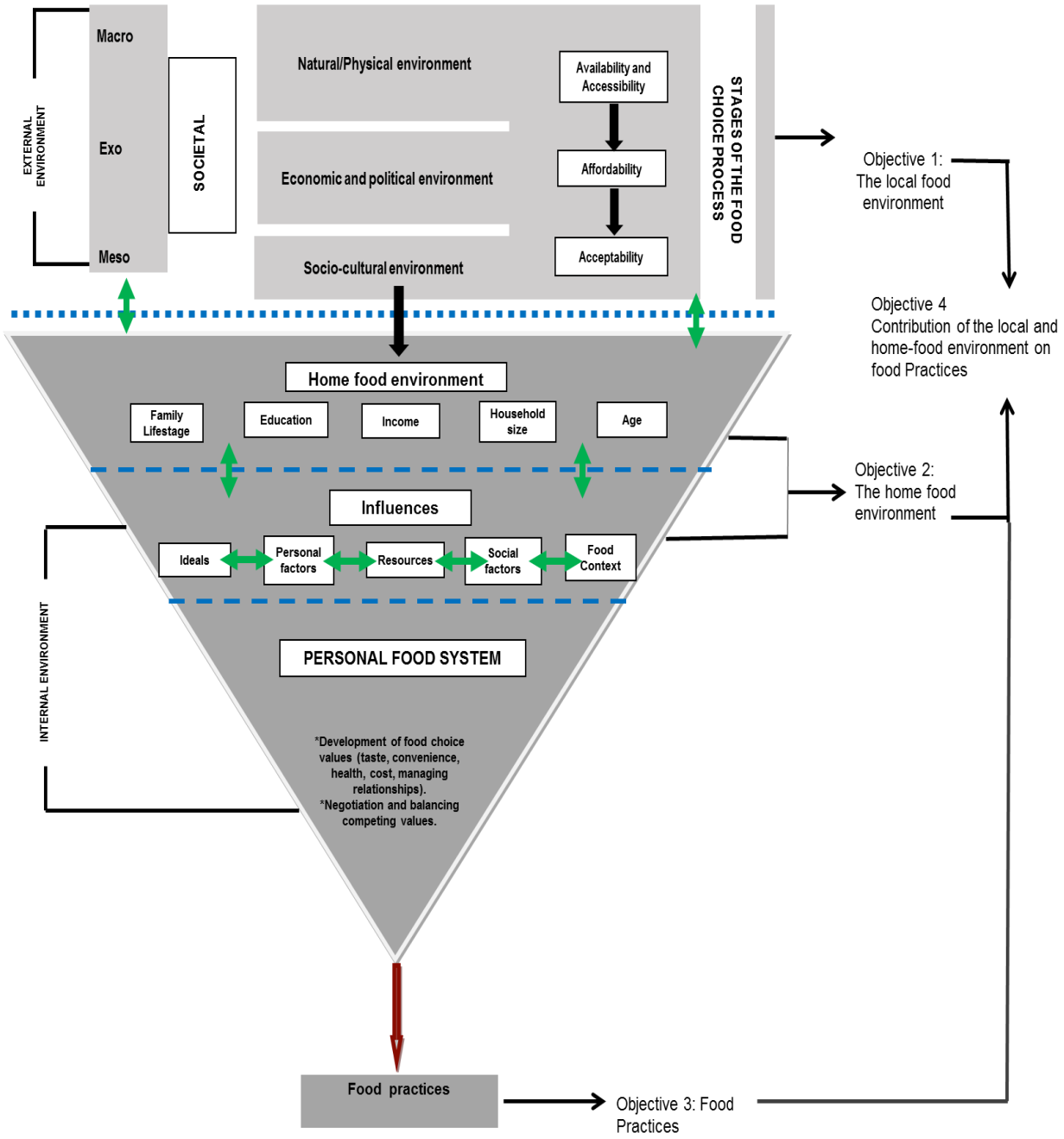


FIGURE 3.1: CONCEPTUAL FRAMEWORK (Adapted from Sobal, 2006:3; Viljoen, 2009:23)

Food practices are influenced by many interrelated external and internal environmental influences as explained in chapter two (see Figure 2.1). In Figure 3.1, the conceptual framework for the study is presented. The two groups of environmental levels (external and internal), as well as the interrelatedness between the different environmental levels are clearly shown by the arrows linking the external environment to the internal environment that consist of the home-food environment, influences and personal food system. External environmental

factors that have an influence on the food choice process relate to the natural/physical, economic, political, and socio-cultural factors and are indicated in the upper section of Figure 3.1. The internal environmental factors consist of the home-food environment, influences and personal food system, as shown in the bottom section of Figure 3.1. The first objective of the study deals with the local food environment of the study group and is indicated by the factors in the external environment of natural, physical economic and socio-cultural environment. The second objective relates to the home-food environment, influences and personal food system, and how these internal environmental factors interrelate. Objective three of the study deals with the food practices of the black adults that are influenced by the interrelated factors from both the internal and external environments. Objective four identifies and describes how the local and home-food environments together contribute to the food practices of the study group.

3.5 CONCEPTUALISATION OF THE MAIN CONCEPTS

The main concepts of the study are conceptualised as follows:

- **Accommodation of consumer's needs** refers to how well-equipped local food stores are to meet the food and associated consumer needs, such as hours of operation, type of payment accepted, variety and quality of food items on offer to consumers (Caspi *et al.*, 2012).

- **Dietary diversity** or the diversity of food intake refers to the average number of food groups consumed over a given period without regarding the frequency of consumption. Dietary diversity is a qualitative measure of food consumption that it reflects a household's variety of food. It also serves as a proxy for nutrient adequacy (Kennedy *et al.*, 2011).

- **Eating patterns** are the recurring patterns that individuals or groups use to choose, prepare and consume food during a specific time period depending on what is available and acceptable at that particular point of time. Eating patterns encompass meal patterns and meal composition including the distribution and frequency of meals and snacks during a specific time period (Raulio, 2011; Maleka, 2000).

- **Food acceptability** describes a consumer's personal attitude towards attributes of the local food environment and more specifically if the supply of food products meets their personal standards in terms of quality, freshness, and price (Caspi *et al.*, 2012).

- **Food accessibility** refers to the geographic accessibility of different types of food stores,

restaurants and other food outlets when using convenient modes of transportation, travel time and distance are key measures of accessibility (Minaker, 2013; Caspi *et al.*, 2012; Azuma *et al.*, 2010).

- **Food affordability** relates to the cost of food, the willingness of the consumers to pay and the ability of households and individuals to purchase food from a financial perspective It also refers to the consumers ability to obtain food according to the amount of money they have available to purchase the required food and is usually measured by store audits of specific food (Caspi *et al.*, 2012; Azuma *et al.*, 2010; Morland, Wing & Roux, 2002).

- **Food availability** refers to the adequacy how easily the produced supply of food can be reached by consumers and includes the density and geographical distance and the proximity that food retailers are from consumers (Martin, Ghosh, Page, Wolff, McMinimee & Zhang, 2014; Jones, Ngure, Pelto & Young, 2013; Caspi *et al.*, 2012; Azuma, Gilliland, Vallianatos & Gottlieb, 2010; FAO, 2008).

- **Food choice** is a processes by which people consider, select, use and consume food and beverages that are available to them. Food choice behaviours thus represent a wide scope of activities including the acquisition, preparation, and consumption of food (Blake *et al.*, 2008; Story *et al.*, 2008). Food choice is further guided by five food access dimensions namely the availability, accessibility, affordability, acceptability and accommodation of food (Leroy, Ruel, Frongillo, Harris & Ballard, 2015; Swinburn, Dominick & Vandevijvere, 2014; Cannuscio *et al.*, 2013; Caspi *et al.*, 2012).

- **Food environment** refers to the collective physical environmental factors of the, economic, political and socio-cultural surroundings including the opportunities and conditions that influence people's food and beverage choices (Herforth & Ahmed, 2015; Caspi *et al.*, 2012).

- **Food practices** as a concept relate to how the chosen food is used and has embedded in it the food-related behaviours that is typical of an individual or a group. It determines what food will be consumed from the available, accessible and acceptable food (Viljoen, 2009:15).

- **Frequency of consumption** refers to how often a food item or food group is consumed during a specific period without regarding the frequency of consumption (Liese, Crandell, Tooze, Fangman & Couch, 2015; Shim, Oh & Kim, 2014).

- **Home-food environment** refers to the physical environment at home, such as how available and accessible food and beverages are in the home. Family food practices include the socio-cultural environment, such as the practice and frequency of eating together as a family (Nepper & Chai, 2015; Couch, Glanz, Zhou, Sallis & Saelens, 2014a; Larson & Story, 2009). The home-food environment thus also includes role-modelling, family eating styles and food rules (Van Ansem, Schrijvers, Rodenburg & Van de Mheen, 2013).

- **Meal composition** refers to the food components served at an eating occasion or event, i.e. it describes what the meal consists of (Raulio, 2011; Meiselman, 2008).

- **Meal patterns** refer to the repeated regular arrangement and frequency of meals consumed per day (Meiselman, 2008; Viljoen, Botha & Boonzaaier, 2005).

3.6 OPERATIONALISATION

Operationalisation describes how the researcher measured the concepts or variables used in a study. Table 3.1 Indicates how the concepts applicable to this study were measured. It also indicates the main concepts of the study, together with their dimensions and indicators related to each objective and the related sub-objectives. The relevant sections and question numbers of the survey questionnaire (See addendum C) applicable to the measurement of each concept are also included.

TABLE 3.1: OPERATIONALISATION TABLE

OBJECTIVES /SUB- OBJECTIVES	CONCEPTS	DIMENSIONS	INDICATORS	MEASURING INSTRUMENT (Questionnaire)
1. To explore and describe the local food environment of black adults in Gauteng in terms of the food access dimensions.				
1.1 To determine and describe the availability and accessibility of food in the local food environment of the study group	Availability and Accessibility of food	Access Dimensions	• Availability • Accessibility	B3.1, B3.2, B3.3 B3.1, B3.4, B3.5, B3,8
1.2 To determine and describe the location and frequency of food purchased from selected food outlets by the study group	Location of food purchasing	Location	• Supermarket • Fresh Fruit and vegetable • Butcher • Convinience store • Fast fod outlet • Street vendor	B1, B4, B5
	Frequency of food purchasing	Frequency	• Daily • 3-4 times a week • 1-2 times a week • More than 3 times per month • Special occasion • Never	B1
1.3 To determine and describe the affordability and acceptability of food in the local food environment of the study group	Affordability and Acceptability of food	Access Dimensions	• Affordability • Acceptability	B3.7 B3.1, B3.2, B3,6
1.4 To determine and describe the accommodation of the consumer's needs of the study group	Accommodation of consumer's needs	Access dimensions	• Accommodation	B3.5, B3.9
1.5 To determine and describe the study group's perception of the food access dimensions of the local food environment	Perception of the food access dimensions	Access dimensions	• Strongly agree • Agree • Undecided • Disagree • Strongly disagree	B3
2 To determine and describe the home-food environment of black adults in Gauteng in terms of				
2.1 To determine and describe the person who is mainly responsible for food purchasing and preparation of food in the homes of the study group		Person responsible	• Food purchasing • Food preparation	A13, A14
2.2 To determine and describe the availability of the selected food types in the homes of the study groups	Availability of food	• Fruits and vegetables • Dairy products • Snack foods	• Always • Usually • Sometimes • Never	Section C C15

OBJECTIVES /SUB- OBJECTIVES	CONCEPTS	DIMENSIONS	INDICATORS	MEASURING INSTRUMENT (Questionnaire)
	Attitude towards healthy eating	• Eating healthy	• Not at all • A little bit • Some what • Very much	C12 C13 C14
2.3 To determine and describe the frequency and attitude of the study group towards family meals at home	Family meals	• Frequency	• Daily • 3-4 times per week • 1-2 times per week • Never	Section C C6 C9
		• Attitude	• Daily • 3-4 times a week • 1-2 times a week • Seldom / Never	Section C C10 C11 C14
3. To determine and describe the food practices of the black adults in Gauteng in terms of:				
3.1 To determine and describe the eating patterns (meal patterns and meal composition) of the study group	Eating patterns	• Meal patterns • Meal composition • Food groups consumed	• Never • 1-2 Days • 3-4 Days • 5-6 Days • Everyday	Section C C1-C5, C7-C8
3.2 To determine and describe the dietary diversity of the study group's food intake	Dietary diversity	• Starchy food • Vegetables • Fruits • Legumes • Fats and oils • Meat, poultry, or fish • Milk and dairy products, • Eggs • Sweets: sugar. honey, chocolates, candies, cookies • Spices: Salt, pepper, condiments • Beverages: coffee, tea, herbal tea	• Yes • No	Section C C16
3.3 To determine and describe the number of servings of selected food groups consumed by the study group	Number of servings	• Starchy food, vegetables, fruits meat, milk, beverages, snack foods	• Number of servings consumed a day	Section C C17

OBJECTIVES /SUB- OBJECTIVES	CONCEPTS	DIMENSIONS	INDICATORS	MEASURING INSTRUMENT (Questionnaire)
3.4 To determine and describe the frequency of the consumption of selected food groups consumed by the study group	Frequency of consumption	Frequency of consumption of: • Protein-rich food • Milk and dairy products • Fruits and vegetables • Fats and oils • Bread and cereals • Legumes and nuts • Beverages • Takeaways and fast food • Snack foods	• Daily • 3-4 times a week • 1-2 times a week • Seldom / Never	Section C C18
4. To identify and describe how the local urban and home-food environment contribute to the food practices of the study group.				
	Socio demographics	Access dimensions	• Household income • Educational level • Generation group • Gender • Age	A1-A12
	Local urban environment		• Availability • Accessibility • Affordability • Acceptability • Accommodation	B3.1-B3.3 B3.1, B3.4, B3.5, B3.8 B3.1, B3.6, B3.2, B3.8, B3.5, B3.9

3.7 MEASURING INSTRUMENT

A structured, self-administered electronic survey questionnaire was used as a measuring instrument to collect primary data to explore the food environments and food practices of the respondents in accordance with the study objectives. The questionnaire (See Addendum C) was based on questions used in previous studies (Viljoen *et al.*, 2018), as well as standardised scales such as the Dietary Diversity measuring scale. Questions were asked on the dietary diversity to calculate the dietary diversity score (Kennedy *et al*, 2011). Questions used to measure the food environment and food practices of urban black adults were included and adapted for South African circumstances (Lytle & Sokol, 2017; Claasen *et al.*, 2016; Caspi *et al.*, 2012). Both open- and closed-ended questions were used to measure the identified variables. The questionnaire consisted of three sections namely:

Section A: Socio-demographic information

Section B: Usual food shopping patterns

Section C: Usual eating patterns

Section A: Socio-demographic information

Closed-ended questions were used to collect the respondents' demographic information. Respondents were asked questions about their age, gender, place of residence, level of education and their home language. In order to gain information about their households, respondents were asked questions about the number of people living in the household, how many dependent children are part of the household, who purchases food and who is responsible for most of the household's food preparation tasks. Two optional questions were further asked on the approximate monthly household income and the approximate monthly household food budget.

Section B: Usual food shopping patterns

In this section of the questionnaire, questions focused on the usual food shopping patterns of the respondents. Questions asked how often food is purchased from listed food outlets, and the following time intervals were given: daily, 3-4 times per week, 1-2 times per week, more than 3 times per month, special occasions or never and respondents also had to indicate what they purchased from the listed outlets. The food items purchased were grouped into ten store groups, namely: supermarkets, fruit and vegetable markets, butchers, convenience stores, fast food outlets, spaza shops and street vendors. A 5-point Likert-type scale was used to measure

the respondents' level of agreement to statements about food outlets from which they purchase food products. The scale categories ranged from strongly agreed, agreed, undecided, disagreed to strongly disagreed.

Section C: Usual eating patterns

Both open and close ended questions were included in this section. The questions focused on the number of meals consumed per day including breakfast, lunch, dinner, and snacks. Questions on, where most meals are eaten and the number of servings that were eaten and how much was eaten were posed. Respondents were asked questions about their meal patterns and asked to respond in terms of the following time intervals: never, 1-2 days, 3-4 days, 5-6 days, or every day. The respondents had to indicate their previous day's food intake by indicating food items which were included as part of their meals or snacks in order to calculate the respondent's Dietary Diversity Score (Kennedy *et al.*, 2011). The frequency of family meals and how the meals were eaten, as well as respondents' attitude towards family meals were measured on a 5-point Likert-type scale (Nuvoli, 2015; Neumark-Sztainer, Hannan, Story, Croll & Perry, 2003).

3.8 PRE-TESTING OF QUESTIONNAIRE

The questionnaire was pre-tested before the actual data collection commenced to determine comprehension and readability, and also to ascertain the time taken to complete the questionnaire as recommended by De Vos (2011:237). Eight adults with characteristics similar to the study group participated in the pre-study (see 1.3). Based on the feedback received, corrections and improvements were made to the questionnaire. Questions in the questionnaire that were not clear or ambiguous were rephrased or simplified according to the recommendations received by the pre-test participants. Pre-testing of the questionnaire gave the researcher the opportunity to make necessary changes to avoid problems during the research (Strydom, 2011:246).

3.9 STUDY AREA AND POPULATION

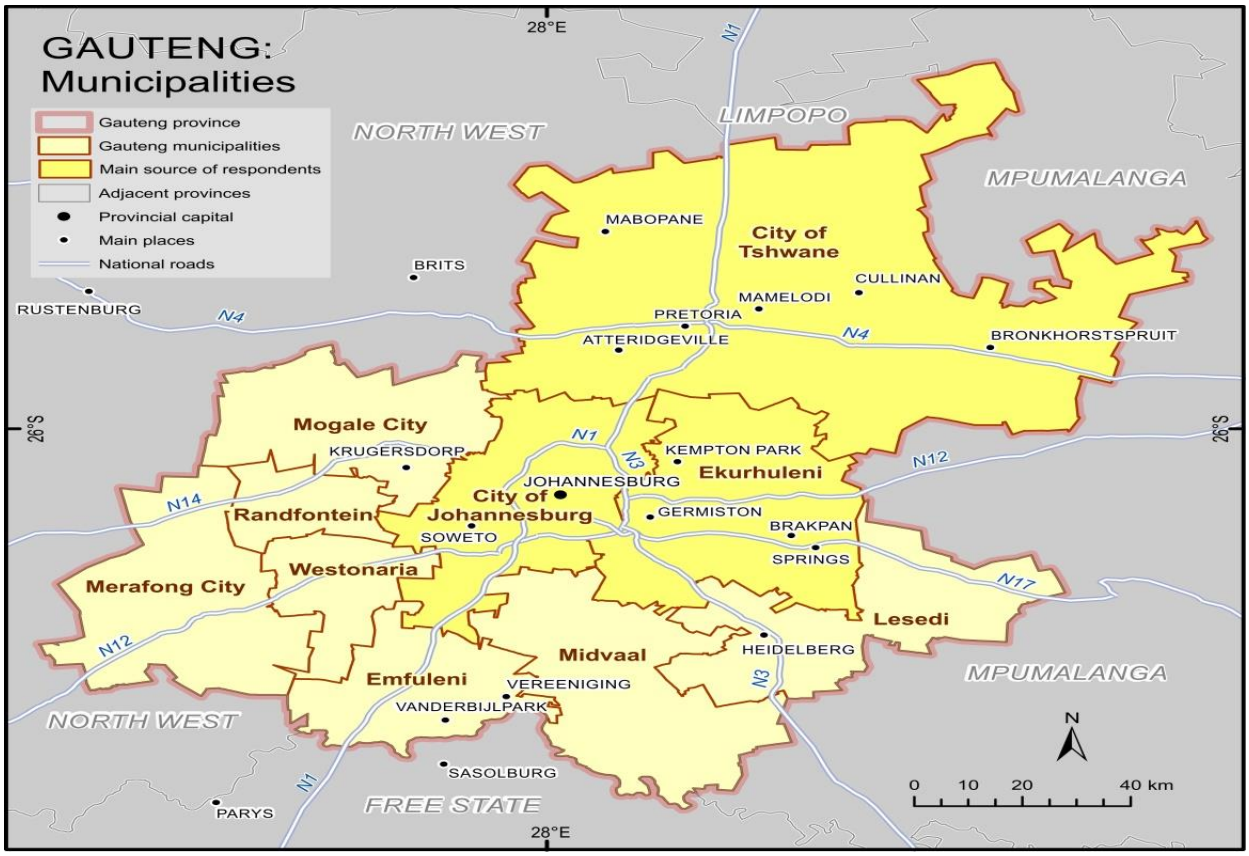


FIGURE 3.2: GAUTENG MUNICIPALITIES

The study was conducted in the Gauteng Province. Figure 3.2 shows municipalities in the Gauteng province. This province is home to approximately 14.3 million people, which is the largest share of the South African population (Statistics SA, 2017). Prospective respondents had to be able to understand English and have access to the internet and be computer literate, as the electronic questionnaire used as data collection instrument was presented in English.

3.10 UNIT OF ANALYSIS

The unit of analysis for this study were black adults (both genders) residing in Gauteng Province, South Africa.

3.11 SAMPLE AND SAMPLING TECHNIQUE

Convenience sampling as a non-probability sampling technique was used in the larger study of which this study is part of. This method is used where the population elements are conveniently

available and is useful in exploratory research and where the researcher usually has budget constraints and needs to obtain data in most cost-effective manner (Maree & Pieterson, 2007:177). Although this sampling technique was chosen due to time and financial limitations, it was however deemed appropriate to use in this explorative research study (De Vos, 2011:232). Respondents who were eligible and complied with other criteria such as age and area of residence, and who gave their informed consent, participated in the study.

3.12 DATA COLLECTION

For the larger project of which this study forms part of, data was collected from adults from all population groups. The data collection was conducted by Consulta Research (Pty) Ltd, an independent research company specialising in consumer related research. Data was collected during May to June 2016. Consulta emailed an invitation to consumers on their database that met the criterion for this study. Respondents who responded to the invitation were provided with information on the study and a consent form. Aspects on confidentiality and anonymity were also explained. After giving consent a link to the questionnaire was given to the respondents. The questionnaire contained a cover letter from the principal researcher stating the purpose and procedures to be followed in the research study. Respondents thus had an option to participate in the study or not and they were informed that they could also withdraw at any given time.

3.13 DATA ANALYSIS

After completion of data collection, the raw data was received of all fully completed questionnaires in an Excel spread sheet from Consulta Research (Pty) Ltd. The data was checked and cleaned to ensure that the data was correctly captured. A social science package (SPSS) Version 23 was used to analyse the data. Descriptive statistics (percentages, means and frequencies) summarised as tables and graphs were used to interpret and present the data. The data obtained from the research was analysed according to the objectives that were set for this study. Suitable techniques for analysis are dictated by the nature of the gathered data. The research design characteristics and researcher's information requirements were applied (De Vos, 2011:252). Descriptive statistical analysis techniques were used to analyse the results. Descriptive statistics involve either identifying the characteristics of a phenomenon, or exploring correlations between two or more phenomena. This was done by means of Tables and Figures to display results (Leedy & Ormrod, 2013:184).

3.14 DATA QUALITY

The aim of any research is to provide valid and reliable data. In order to ensure that the findings of the study can be considered as facts that could be used in future literature in the academic community, it is important to attend to the quality of the research study. To obtain valid and reliable data the researcher must ensure that the measuring procedures and the measuring instruments used had acceptable levels of reliability and validity (De Vos, 2011:172).

3.14.1 Validity

Validity refers to the extent that an instrument used successfully measures what is intended to be measured (Salkind, 2012:123; De Vos, 2011:172). For the purpose of this study construct validity, content validity and face validity were applied.

- **Construct validity** involves determining the degree to which an instrument successfully measures a theoretical construct (De Vos, 2011:174). To ensure construct validity, the operationalisation and conceptualisation of constructs were clearly outlined. An extensive review of the literature, including the theory on the factors influencing food practices, was conducted to ensure construct validity.

- **Content validity** focuses on whether the full content of a conceptual definition and comprehensive review of literature is represented in the measure (De Vos, 2011:173). Content validity is concerned with sampling the adequacy of the content of the measuring instrument. A pretested questionnaire, developed from existing standardised scales, was used in order to ensure content validity, and eliminate any uncertainties from the data collected.

- **Face validity** refers to whether the questionnaire measures what it is supposed to measure in the opinion of an expert, at face value. It also tests whether the questionnaire is relevant to the target population that will be asked to complete it (De Vos, 2011:174). The questionnaire was pre-tested in order to ensure face validity. Eight adults with characteristics similar to the study group participated in the pilot study to test the questionnaire for readability and comprehension.

3.14.2 Reliability

Reliability occurs when the same technique is repeated more than once, and the same results are obtained consistently. In order to increase reliability in this study, the researcher increased

the sample size (the greater the sample, the greater the chances that the study would be representative and reliable). During pre-testing of the questionnaire, unclear indicators were removed to increase the reliability of the measuring instrument (Leedy & Ormrod, 2013:91; Salkind, 2012:115; De Vos, 2011:177).

3.15 ETHICS

Ethics refer to the values of an individual, a society or an organization and what they believe to be right or wrong with regard to moral standards and rules of conduct towards experimental subjects and respondents, employers, sponsors and other researchers (Berndt, Petzer, Kotzé & Higgs, 2011; De Vos, 2011:115). The study adhered to the guidelines for ethical conduct as it engaged with human subjects as a source of data. The respondents were given the freedom of choice to participate in the study. They received a consent form beforehand which clearly explained the aim of the study, the expected duration of their involvement, the procedures that were followed during the investigation, noticing advantages and disadvantages of participation and potential harm to which it might be exposed. Respondents signed the consent form before participating in the study. Respondents had a right to withdraw from the study at any time for any reason and to only complete questions which they were comfortable with. They were further reminded prior to completing the questionnaire that participation in the study was voluntary and that the data would be handled in a confidential and anonymous manner (Creswell, 2014:97). The research proposal of the project was submitted to the Ethics Committee of the Faculty of Natural and Agricultural Sciences before data collection began and ethical approval was granted. The ethics reference number for the study is EC160318-09.

3.16 CHAPTER SUMMARY

The methodology followed to achieve the aims and objectives of this study were given in this chapter. This chapter included the research design, the research aim and the objectives and sub-objectives, as well as the conceptual framework that guided the study. Conceptualisation and operationalisation of the main concept, including the sample and sampling, data collection and data analysis were discussed. All the suitable methods and techniques applied to obtain the research goal were explained. Measures to combat error and ethical conduct adhered to in the research process were also addressed. In the next chapter the results of the study are presented and discussed according to the research aim and objectives of the study.

Chapter 4: Results and discussion

4.1 INTRODUCTION

In this chapter the results of the study – to determine and describe the contribution of the local and home-food environments on the food practices of urban black adults in Gauteng Province – are presented and discussed according to the research objectives.

4.2 DEMOGRAPHIC PROFILE OF THE SAMPLE

The results of the study are based on the responses of a sample of 265 urban black adults residing in the Gauteng Province. Information about the respondents was obtained from both close and open-ended questions (See Addendum C Section A).

4.2.1 Demographic information

The demographic information requested from respondents included age, gender, area of residence, level of education, monthly income, monthly food budget, home language, population group and household structure. Table 4.1 gives these results.

Age Respondents had to specify their age in an open-ended question in the demographic section of the questionnaire. The ages of the respondents were then grouped into generation groups, to indicate the generational categories of respondents who participated in the study as shown in Table 4.1. The results confirm that younger people are more likely to participate in studies than older people (SA Statistics, 2015; Shisana *et al.*, 2013; Moore & Tarnai, 2002; Goyder, 1986). Nearly half (47.7%, n=126) of the respondents were from generation Y (those between 22-39 years old). Generation X, (those between 40 and 51 years old) was represented by a third (33.7%, n=89) of the respondents, followed by 17.4% (n=46) of the Baby Boomers generation, and one mature (over 70 years old).

TABLE 4.1: DEMOGRAPHIC PROFILE OF RESPONDENTS (N=265)

Characteristics	N	%
Age		
Generation Z (20-21 years)	2	0.8
Generation Y (22-39 years)	126	47.7
Generation X (40-51 years)	89	33.7
Baby Boomers (52-70 years)	46	17.4
Matures (≥71 years)	1	0.4
Gender		
Male	147	55.5
Female	118	44.5
Area of residence		
Johannesburg	121	45.7
Tshwane	89	33.6
Ekurhuleni (East Rand)	36	13.6
Other towns	19	7.2
Level of education		
Lower than grade 12	2	0.8
Grade 12	38	14.4
Grade 12 plus a diploma/degree	154	58.3
Postgraduate degree	62	23.5
Not answered	8	3
Monthly household income		
R1-R25 000 (low and emerging middle class)	132	50.8
R25 001-R40 000 (realised middle class)	64	24.2
R40 001-R100 000 (emerging affluent)	46	17.3
>R100 001 (affluent)	6	2.3
Prefer not to answer	17	6.4
Monthly household food budget		
R500-R1 500	83	36.7
R1 501-R2 500	71	31.4
R2 501-R3 500	36	16
R3 501-R4 500	15	6.6
R4 501-R6 000	17	7.5
R6 001-R10 000	4	1.8
Monthly food budget as percentage of the household income		
1%-5%	55	21.3
5.1%-10%	102	34.8
10.1%-15%	30	11.6
15.1%-20%	16	6.2
20.1%-25%	9	3.6
>25%	11	4.4
Home language		
English	79	29.9
Northern. Sotho/Sotho/Tswana	93	35.2
Tsonga	11	4.1
Xhosa	13	4.9
Zulu	46	17.4
Other	23	8.5

Gender A good representation of both male and female respondents participated in the study. The majority (55.5%, n=147) of respondents were males, while 44.5 % (n=118) of respondents were females. The results of this study are in contrast with other studies which indicate that females are usually more inclined to participate in surveys compared to males (Keusch, 2015).

Area of residence As the study was confined to residents in the Gauteng Province, respondents had to indicate their area of residence. Most (45.7%, n=121) of the respondents were from Johannesburg, while a third (33.6%, n=89) were from Tshwane. The other 20.8% resided in either Ekurhuleni (13.6%, n=36) or other towns (7.2%, n=19).

Level of education Respondents indicated their highest level of education in response to a closed-ended question. Studies have shown that more educated people are more likely to participate in surveys than less educated people (Kurt, Kincaid, Curtis, Semler, Meyers, Johnson, Careyva, Stello, Friel & Knouse, 2017). This survey concurs with these studies as more than three quarters (81.8%, n=216) of the respondents had a tertiary education. The majority (58.3%, n=154) of the respondents had a first diploma or degree qualification, followed by nearly a quarter (23.5%, n=62) of respondents who had a postgraduate qualification.

Monthly household income The income levels presented in the questionnaire were grouped into four categories – low and emerging middle class, realised middle class, emerging affluent and affluent – based on research reported in the Bureau for Market Research Annual Report (Mkhwanazi, 2016). This report classifies a household's financial situation based on the entire household's combined annual income. In this study the categories are presented per monthly income (as given in the questionnaire). The majority (50.8%, n=132) of the respondents were in the low and emerging middle class, earning an income between R1- R25, 000 per month. This group was followed by nearly a quarter (24.2%, n=64) of the respondents who fell in the realised middle class, earning an income of R25, 001-R40, 000 per month. Another 19.6% (n=52) of the respondents fell in the emerging affluent and affluent class, earning a monthly household income of more than R40, 001. A small number (6.4%, n=17) of the respondents chose not to disclose their income, as this was an optional question.

Monthly household food budget Over one-third (36.7%, n=83) of respondents indicated that their monthly household food budget was between R 500 – R 1 500, followed by nearly another third (31.4%, n=71) of respondents who indicated a monthly household food budget between R 1, 501 - R 2,500. Another 31.9% (n=72) indicated that they spend between R 2, 501 and R 10, 000 a month on food. It was also of interest to calculate what percentage of the monthly household income was spent on food.

TABLE 4.2: HOUSEHOLD FOOD BUDGET AS A PERCENTAGE OF MONTHLY HOUSEHOLD INCOME (N=265)

Monthly household food budget as a percentage of monthly household income	n	Minimum	Maximum	Mean	SD
	223	1	85.7	9.8	8.7

Monthly household food budget as a percentage of monthly household income Just over a third (34.8%, n=102) of the respondents indicated that they spent between 5.1% and 10% of their monthly household income on their food budget. Another 21.3% (n=55) of the respondents spent between 1% and 5% of the monthly household income on their food budget. Although another 21.4% (n=55) of the respondents spent between 10.1% and 25% of their monthly household income on food, only a few (4.4%, n=11) of the respondents indicated they spent more than 25% of the monthly household income on their monthly food budget. As shown in Table 4.2 the results show that the mean percentage of the monthly household income spent on food was 9.8%, with a standard deviation of 8.7%. South African statistics show that on average South Africans spend 12.9% of their monthly household income on food (SA Statistics, 2015).

Home language As could be expected, over a third of the respondents (35.2% n=93) cited Northern Sotho, Sotho, and Tswana as their home languages. This was followed by 29.9% (n=79) of respondents who use English as their home language, and 17.4% (n=46) who indicated Zulu as their home language. Less than ten per cent (8.5%, n=23) of the respondents spoke other languages, which included Swazi, Afrikaans, Xhosa, Shona, Ndebele, and Swahili.

Respondents were asked further questions on the household composition and Table 4.3 presents the results.

Household composition and family structure Respondents had to specify the number of people residing in their households in response to an open-ended question. They were also requested to indicate the number of children in their households, and their age groups. Table 4.3 summarises these results. Most (42.6%, n=113) of the households consisted of three to four members, while just over a third (34%, n=90) of households consisted of five or more members. These results concur with South African statistics on household composition which confirms that most South African households have between one and four members (SA Statistics, 2015). A third of the respondents were nuclear families (32.8%, n=87), consisting of an adult couple and their children (Bryant *et al.*, 2003:191).

TABLE 4.3: HOUSEHOLD COMPOSITION (N=265)

Characteristics	%	n
Number of people in the household		
1-2 members	23.4	62
3-4 members	42.6	113
5 or more members	34	90
Family structure		
Single (living on my own)	13.2	35
Married (without children)	14.0	37
Nuclear family (both parents and children)	32.8	87
Extended family (parents, children, and other family members)	10.6	28
Single parent family (father/mother and children)	12.5	33
Living with other family members (not parents or children)	6.8	18
Living with partner/friend or others	10.2	27
Number of children in the household		
No children	30.9	82
1	24.9	66
2	26.8	71
3	11.3	30
4	4.9	13
5 or more children	1.2	3
Number of children aged 0-2 years (Infants)		
No children	84.2	223
1	14.3	38
2	1.5	4
Number of children aged 3-6 years (Toddlers and pre-schoolers)		
No children	67.9	180
1	26.4	70
2	5.4	14
3	0.4	1
Number of children aged 7-12 years (Primary schoolers)		
No children	62.6	166
1	27.5	73
2	8.7	23
3 or more children	1.2	3
Number of children aged 13-18 (Secondary schoolers)		
No children	64.9	172
1	29.1	77
2	5.3	14
3 or more children	0.5	2
Number of adults (Older than 18 years)		
1	22.3	59
2	34.7	92
3	19.6	52
4	8.3	22
5	2.3	6
6 or more	2.8	7
Did not specify	10.2	27

Furthermore, nearly a third (30.9%, n=82) of the respondents indicated that there were no children in their households, while just over a quarter (26.8%, n=71) of the respondents indicated that they had two children in their households. The extended family system of the indigenous South African people seems to be evolving into a nuclear family structure similar to their white counterparts (Amoateng, Heaton & Kalule-Sabiti, 2007:47). The fertility rate in South Africa has also reportedly been declining over the past six decades, dropping from an average of six to seven children per woman to the current rate of two to three births per woman

(Statistics SA, 2017). This was confirmed by the results of this study as the majority (63%, n=167) of the respondents reported having between one to three children and less than ten per cent (6.1%, n=16) of the respondents reported having four children, or more.

Those respondents with children in their households gave the following information on the ages of the children in their households.

Infants (0-2 years) The majority (84.2%, n=223) of the respondents indicated that they did not have infants in their households. 14.3% (n=38) of respondents reported having at least one infant in their household.

Toddlers and pre-schoolers (3-6 years) The majority (67.9%, n=180) of respondents indicated that there were no toddlers or pre-schoolers (3-6 years) in their households. Just over a quarter (26.4%, n=70) of respondents indicated that they have one toddler or pre- schooler in their household as shown in Table 4.2.

Primary schoolers (7-12 years) More than half (62.6%, n=166) of respondents indicated that there were no primary schoolers (7-12 years) in their households. Just over a quarter (27.5%, n=73) of respondents indicated that there was at least one primary schooler in their households.

Secondary schoolers (13-18 years) The majority (64.9%, n=172) of respondents indicated that there were no secondary schoolers in their households. 29.1%, (n=77) of respondents reported having at least one child who is a secondary schooler.

Adults (older than 18 years) Just over a third (34.7% n=92) of respondents were part of two-adult households. Nearly a quarter (22.3%, n=59) of the respondents indicated that they were the only adult in the household, followed by 19.6%, (n=52) of respondents who indicated at least three adults in their household. Another 13.4%, (n=35) of the households have four or more adults. Changes in living arrangements have been observed over the past decade, as more young adults seem to establish their own households only at a later age. This could probably be caused by changes in the present economic climate in South Africa, as this could have contributed to more young adults staying in their parents' households longer because they could not afford to live on their own (Madhavan *et al.*, 2017).

In the next section, the results of the first objective dealing with the local food environment of black adults in Gauteng are presented and discussed. This will be given in the order of the formulated sub-objectives.

4.3 THE LOCAL URBAN FOOD ENVIRONMENT

The local urban food environment consists of various food store types or food outlets where consumers purchase their food items. These include supermarkets, fresh fruit and vegetable markets, butchers, convenience stores, fast food outlets, street vendors, spaza shops and open community markets (Claasen, Van der Hoeven & Covic, 2016; Stroebel & van Schalkwyk, 2012). These various food store types make food easily accessible to consumers in the local urban food environment when using convenient modes of transport. Therefore the local food environment allows consumers to access food by providing a well-developed infrastructure that not only makes food available and accessible, but also affordable and acceptable, thus accommodating all the consumer's needs (Herforth & Ahmed, 2015; Wilke, Carola, Rodenburg & Mheen, 2012).

The first sub-objective on the local food environment of the study group was to determine and describe the availability and accessibility of food in the local food environment of the study group. This was determined by means of a five-point Likert-type scale (See Addendum C Section B3 of the Questionnaire).

4.3.1 Food availability and accessibility in the local food environment

Food availability refers to the supply of food produced, which is influenced by the density and geographical distance of food retailers to consumers (Martin *et al.*, 2014; Jones *et al.*, 2013; Caspi *et al.*, 2012; Azuma *et al.*, 2010; FAO, 2008). Food access on the other hand not only refers to the geographic accessibility of different types of food stores and restaurants for consumers if they relied on convenient modes of transportation, but also to how obtainable food is to the consumer (Minaker, 2013; Caspi *et al.*, 2012; Azuma *et al.*, 2010).

TABLE 4.4: THE AVAILABILITY AND ACCESSIBILITY OF FOOD (N=265)

Statement regarding food access dimension	Strongly agree		Agree		Undecided		Disagree		Strongly disagree	
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
Availability										
I am satisfied with the range of food outlets I have access to in my neighbourhood	39.2	104	45.3	120	5.3	14	6.4	17	3.8	10
Good quality fruits and vegetables are available in the food outlets I normally shop at	40.0	106	49.4	131	4.2	11	4.2	11	2.3	6
Healthy foods are available in the food outlets where I normally shop	40.0	106	47.9	127	4.9	13	4.2	11	3.0	8
Accessibility										
I am satisfied with the range of food outlets I have access to in my neighbourhood	39.2	104	45.3	120	5.3	14	6.4	17	3.8	10
I usually buy food at the food outlets closest to where I live	45.3	120	38.5	102	3.4	9	10.2	27	2.6	7
I am satisfied with the types (variety) of food I have regular access to	32.5	86	49.8	132	7.5	20	6.4	17	3.8	10
I have to travel some distance to buy good quality food	16.2	43	18.5	49	7.2	19	38.5	102	19.6	52

From the above table it is clear that food is available and accessible. More than three quarters (84.5%, n=224) of respondents either strongly agree or agree that they are satisfied with the range of food outlets that they have access to in their neighbourhood. Although 5.3% (n=14) of the respondents were undecided on this, while 6.4% (n=17) and 3.8 % (n=10) disagreed and strongly disagreed that they are satisfied with the range of food outlets they have access to in their neighbourhood. A high percentage (89.4%, n=237) of respondents indicated that good quality fruits and vegetables are available in the food outlets where they normally shop, although less than seven per cent (6.5%, n=17) of the respondents strongly disagreed or disagreed with the statement that good quality fruits and vegetables are available in the food outlets where they normally shop. Most respondents (87.9%, n=233) further confirmed that healthy foods are available from the food outlets where they normally shop. A small percentage (4.9%, n=13) were undecided and 4.2% (n=11) disagreed that healthy food is available in the food outlets where they normally shop.

Most (84.5%, n=224) respondents either strongly agreed or agreed that they are satisfied with the range of food outlets that they have access to in their neighbourhood. While 5.3% (n=14) of respondents were undecided, 6.4% (n=17) and 3.8 %, (n=10) disagreed and strongly disagreed that they are not satisfied with the range of food outlets they have access to in their

neighbourhood. More than three quarters (83.8%, n=222) of respondents buy food at food outlets closest to where they live, and most (82.3%, n=218) are satisfied with the types of food they have regular access to. More than half (58.1%, n=154) of respondents indicated that they do not have to travel some distance in order to buy good quality food. These results confirm that most respondents buy food from shops in their neighbourhood, although just over a third (34.7%, n=92) of respondents indicated that they must travel some distance to buy good quality food.

In this study, the location of food retailers and how frequently food is purchased were also of importance. The second sub-objective on the local food environment of black adults in Gauteng deals with where (the location) and how often (the frequency) food is purchased by the study group.

4.3.2 The location and frequency of purchasing from selected food outlets

Respondents were asked if they made use of on-line or internet shopping for food (See Addendum C, Section B4). The majority (94.7%, n=251) of respondents indicated that they do not make use of online or internet shopping for food. It can thus be assumed that the study group predominantly purchase their food from brick-and-mortar stores.

The results showing where (location) certain food categories were purchased during the previous seven days are presented in the next section. The food outlets listed included supermarkets, fruit and vegetable markets, butchers, convenience stores, fast food outlets, spaza shops and street vendors. Respondents could mark more than one food outlet per food group category.

TABLE 4.5: WHERE FRUITS AND VEGETABLES ARE PURCHASED

Item	Did not purchase item		Supermarket		Fruit and vegetable market		Butcher		Convenience store		Fast food outlet		Spaza shop		Street vendor	
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
Fruit (fresh, frozen, canned or in a jar)																
Citrus fruits (oranges, lemons, naartjies)	13.6	46	35.1	119	29.8	101	1.8	6	3.2	11	0.9	3	2.4	8	13.3	45
Orange coloured fruits (yellow peaches, mangoes, pawpaw, spanspek)	32.1	99	26.3	81	28.9	89	-	-	2.9	9	0.6	2	1.6	5	7.5	23
Other fruits (apples, bananas, grapes, pears, litchis)	8.7	28	39.9	128	29.9	96	0.3	1	4.7	15	0.6	2	2.2	7	13.7	44
Vegetables (fresh, frozen, or boxed)																
White roots and tubers (potatoes, white sweet potatoes)	19.3	59	27.5	84	34.0	104	1.0	3	2.0	6	0.3	1	1.0	3	15.0	46
Orange-fleshed vegetables (pumpkin, carrot, butternut, orange-fleshed sweet potato)	14.5	46	33.6	107	32.7	104	0.3	1	2.5	8	0.6	2	2.5	8	13.2	42
Dark green leafy vegetables (spinach, kale, indigenous green leafy vegetables)	14.6	45	33.4	103	34.1	105	0.3	1	2.6	8	1.3	4	1.6	5	12	37
Other vegetables (tomatoes, onion, green beans, cabbage, gem squash, peas, beetroot)	4.6	15	39.5	128	32.7	106	0.6	2	2.2	7	0.6	2	3.4	11	16.4	53

Fruit (fresh, frozen, canned, or in a jar) The majority of respondents purchased fruits and vegetables from either a supermarket or fruit and vegetable market. Over a third (35.1%, n=119) of respondents indicated that they purchased citrus fruits (oranges, lemon, naartjies) from a supermarket, followed by 29.8% (n=101) who indicated that they purchased citrus fruits from a fruit and vegetable market. Just over ten per cent (13.3%, n=45) of respondents indicated that they purchased citrus fruits from a street vendor. Nearly a third (32.1%, n=99) of respondents indicated that although they did not purchase orange-coloured fruits (yellow peaches, mangoes, paw-paws) during the previous week, 28.9% (n=89) of respondents purchased orange-coloured fruits from a fruit and vegetable market. The other 12.6% (n=39) of respondents purchased orange-coloured fruits from a convenience store, fast food outlet, spaza shop or a street vendor. Most (39.9%, n=128) of the respondents purchased other fruits (apples, bananas, grapes, pears) from a supermarket, followed by 29.9% (n=96) of respondents who purchased other fruits from a fruit and vegetable market. Almost an equal number of respondents purchased citrus fruits (13.3%, n=45) or other fruits (13.7%, n=44) from a street vendor.

Vegetables (fresh, frozen, or boxed) Over a third (34%, n=104) of respondents purchased white roots and tubers (potatoes, white sweet potatoes) from a fruit and vegetable market followed by more than a quarter (27.5%, n=84) who indicated that they purchased white roots and tubers from a supermarket. The results further show that nearly 20% (19.3%, n=59) of

respondents did not purchase white roots and tubers. A third (33.6%, n=107) of respondents purchased orange-fleshed vegetables (pumpkin, carrot, and butternut, orange-fleshed sweet potato) from a supermarket, followed by another third (32.7%, n=104) of respondents who indicated that they purchased orange-fleshed vegetables from a fruit and vegetable market. Almost an equal representation of respondents purchased dark green leafy vegetables (spinach, kale, indigenous green leafy vegetables) from a supermarket (33.4%, n=103) or from a fruit and vegetable market (34.1%, n=105). Almost an equal distribution of respondents did not purchase orange-fleshed vegetables (14.5%, n=46) or dark green leafy vegetables (14.6%, n=45) Furthermore the results show that most respondents purchased other vegetables (tomatoes onion, green beans, cabbage, gem squash, peas and beetroot) either from a supermarket (39.5%, n=128) or fruit and vegetable market (32.7% n=106). The results show that 16.4% (n= 53) of respondents purchased other vegetables (tomatoes, onion, green beans, cabbage, gem squash, peas beetroot) from a street vendor. Less than five per cent (4.6%, n=15) of respondents did not purchase other vegetables (tomatoes onion, green beans, cabbage, gem squash, peas, and beetroot).

Table 4.6 presents results on where milk and dairy products are purchased.

TABLE 4.6: WHERE MILK AND DAIRY PRODUCTS ARE PURCHASED (N=265)

Item	Did not purchase item		Supermarket		Fruit and vegetable market		Butcher		Convenience store		Fast food outlet		Spaza shop	
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
Milk and dairy products														
Milk (fresh, powdered, UHT, maas)	11.5	34	69.5	205	3.7	11	-	-	6.8	20	1.4	4	7.1	21
Cheese and cottage cheese	32.9	92	56.8	159	4.3	12	0.4	0.4	4.3	12	1.1	3	0.4	1
Yoghurt	27.5	77	60.7	170	3.9	11	-	-	6.1	17	1.4	4	0.4	1
Dairy beverages (Yogi Sip, dairy fruit beverages)	41	119	43.4	126	4.5	13	-	-	7.9	23	1.4	4	1.7	5

Milk and dairy products The milk and dairy products group included milk (fresh, powdered, ultra-heat treatment milk, maas), cheese and cottage cheese, yoghurt, and dairy beverages. The majority (69.5%, n=205) of respondents purchased milk (fresh, powdered, UHT, Maas) from a supermarket. Just over ten per cent (11.5%, n=34) of respondents indicated that they did not purchase milk.

More than half (56.8%, n=159) of respondents purchased cheese and cottage cheese from a supermarket followed by nearly a third (32.9%, n=92) who indicated that they did not purchase cheese or cottage cheese during the previous seven days. Although 60.7% (n=170) of

respondents purchased yoghurt from a supermarket, more than a quarter (27.5%, n=77) of respondents indicated that they did not purchase yoghurt during the previous seven days. A fair proportion (43.4%, n=126) of respondents purchased dairy beverages from a supermarket, followed by an almost equal percentage (41%, n=119) who indicated that they did not purchase dairy beverages during the previous week.

Respondents were further asked to indicate where they purchased beverages, the results are presented in Table 4.7.

TABLE 4.7: WHERE BEVERAGES ARE PURCHASED (N=265)

Item	Did not purchase item		Supermarket		Fruit and vegetable market		Butcher		Convenience store		Fast food outlet		Spaza shop		Street vendor	
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
Beverages																
Fruit juice	23.1	68	54.2	160	9.5	28	-	-	7.8	23	2.4	7	3.1	9	-	-
Cordials and concentrates (Oros, Wild Island, Caribbean)	47.1	128	44.1	120	2.6	7	0.4	1	5.1	14	0.4	1	0.4	1	-	-
Soft drinks (fizzy and energy drinks	24.4	79	42	136	1.9	6	0.9	3	13.6	44	5.6	18	10.5	34	1.2	4

Beverages Beverages were grouped into fruit juice, cordials and soft drinks as shown in Table 4.7. More than half (54.2%, n=160) of respondents indicated that they purchased fruit juice from a supermarket, while nearly a quarter (23.1%, n=68) indicated that they did not purchase fruit juices during the previous seven days. Although most (47.1%, n=128) respondents indicated that they did not purchase cordials and concentrates the previous week, a fair proportion (44%, n=120) of respondents purchased cordials and concentrates from a supermarket. Less than ten per cent (8.9%, n= 24) of respondents indicated that they purchased cordials and concentrates from a fruit and vegetable market, butcher, convenience store, fast food outlet or a spaza shop. A fair proportion (42%, n=136) of respondents also purchased soft drinks (fizzy and energy drinks) from a supermarket, while nearly a quarter (24.4%, n=79) of respondents indicated that they have not purchased soft drinks the previous seven days.

Table 4.8 gives the results on where protein-rich foods are purchased.

TABLE 4.8: WHERE PROTEIN-RICH FOODS ARE PURCHASED (N=265)

Item	Did not purchase item		Supermarket		Fruit and vegetable market		Butcher		Convenience store		Fast food outlet		Spaza shop		Street vendor	
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
Meat																
Beef	25.7	76	31.1	92	5.4	16	33.8	100	2.4	7	1.4	4	0.3	1	-	-
Mutton/Lamb	46.6	136	21.5	63	3.4	10	25.6	75	1.4	4	1.4	4	0.3	1	-	-
Goat meat	83.6	225	3.3	9	0.7	2	10	27	1.1	3	0.7	2	0.4	1	-	-
Chicken	17.1	51	52.5	157	3.3	10	19.4	58	2.3	7	3.7	11	0.7	2	1.0	3
Pork	57.3	64	17.8	51	3.1	9	19.2	55	0.7	2	1.0	3	0.3	1	0.3	1
Boerewors	34.9	103	29.2	86	5.1	15	28.5	84	1.0	3	1.4	4	-	-	-	-
Offal cuts	69.5	189	7.4	20	1.5	4	16.5	45	0.7	2	1.8	5	0.4	1	2.2	6
Bacon	60.3	170	25.2	71	2.5	7	7.4	21	2.1	6	1.8	5	0.4	1	0.4	1
Processed meat	39.9	112	43.8	123	1.8	5	8.5	24	3.6	10	1.8	5	0.4	1	0.4	1
Biltong	56.9	165	15.9	46	3.4	10	15.5	45	5.5	16	1.4	4	0.3	1	1.0	3
Eggs	24.2	71	54.6	160	2.0	6	3.1	9	4.8	14	1.4	4	7.2	21	2.7	8

Protein-rich foods The protein-rich food group included, beef, mutton, lamb, goat meat, chicken, pork, boerewors, offal cuts, bacon, processed meat, biltong, and eggs. A third (33.8%, n=100) of respondents purchased beef from a butcher, while almost another third (31.1%, n=92) of respondents purchased beef from a supermarket. Just over a quarter (25.7%, n=76) of respondents did not purchase beef in the previous seven days.

Although a fair proportion (46.6%, n=136) of respondents indicated that they did not purchase mutton or lamb, a quarter (25.6%, n=75) of respondents purchased mutton or lamb from a butcher, and nearly another quarter (21.5%, n=63) purchased mutton or lamb from a supermarket.

A remarkable percentage (83.6%, n=225) of respondents indicated that they have not purchased goat meat, and if goat meat was purchased it was either procured from a butcher (10%, n=27) or a supermarket (3.3%, n=9).

More than half (52.5%, n=157) of respondents purchased chicken from a supermarket, and another 19.4% (n=58) purchased chicken from a butcher. A relatively low percentage (17.1%, n=51) of respondents indicated that they never purchase chicken.

The majority (57.3%, n=164) of respondents indicated that they did not purchase pork the previous seven days. Those respondents who purchased pork did so either from a butcher (19.2%, n=55) or a supermarket (17.8%, n=51).

A third (34.9% n= 103) of respondents indicated they have not purchased boerewors the previous week, and almost an equal distribution of respondents purchased boerewors either from a supermarket (29.2%, n=86) or a butcher (28.5% n= 84).

The majority (69.5%, n=189) of respondents indicated did not purchase offal cuts the previous week. Those respondents who did so (16.5%, n=45) purchased offal cuts from a butcher.

The majority (60.3%, n=160) of respondents did not purchase bacon during the previous week, while respondents who did purchase bacon did so from a supermarket (25.2%, n=71).

A sizeable proportion (43.8%, n=123) of respondents purchased processed meat from a supermarket. More than half (56.9% n=165) of respondents did not purchase biltong the previous week, while almost an equal distribution of respondents purchased biltong either from a supermarket (15.9%, n= 46) or a butcher (15.5%, n=45).

The majority (54.6%, n=160) of respondents purchased eggs from a supermarket followed by nearly a quarter (24.2%, n= 71) who did not purchase eggs during the previous week. The results further show that eggs were the protein-rich food most often purchased from a spaza shop (7.2%, n=21) or a street vendor (2.7%, n= 8).

Table 4.9 presents results on where bread and bread-like products are purchased.

TABLE 4.9: WHERE BREAD AND BREAD-LIKE PRODUCTS ARE PURCHASED (N=265)

Item	Did not purchase item		Supermarket		Fruit and vegetable market		Butcher		Convenience store		Fast food outlet		Spaza shop		Street vendor	
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
Bread and bread-like products																
Bread (white, brown)	3.8	13	54.8	189	2.3	8	-	-	15.4	53	0.6	2	22.6	78	0.6	2
Buns, bread rolls	35.8	102	48.8	139	3.2	9	0.4	1	7.7	22	1.4	4	2.8	8	-	-
Sweet buns	61.1	168	27.6	76	2.9	8	0.7	2	4.4	12	1.8	12	1.1	3	0.4	1
Scones	58.4	164	24.6	69	1.8	5	0.4	1	5.0	14	0.7	2	2.1	6	7.1	20
Fat cakes	51.1	145	11.3	32	1.1	3	0.7	2	2.8	8	3.5	10	9.9	28	19.7	56
Crisp bread/crackers	63.7	172	27.4	74	1.5	4	0.4	1	2.2	6	1.1	3	1.5	4	2.2	6
Rusks	62	171	31.2	86	1.1	3	0.7	2	2.9	8	0.4	1	1.4	4	0.4	1

Bread and bread-like products This group included bread (brown, white), buns, bread rolls, sweet buns, scones, fat cakes, crisp bread crackers and rusks. Just over half (54.8%, n=189) of respondents purchased bread (white, brown) from a supermarket, followed by nearly a quarter (22.6%, n=78) of respondents who purchased bread from a spaza shop. The results further

show that of all the bread and bread-like products, white and brown bread were the products most likely to be purchased from a convenience store (15.4%, n= 53). Nearly half (48.8%, n=139) of respondents indicated that they purchased buns and bread rolls from a supermarket, whereas more than a third (35.8%, n=102) of respondents indicated that they did not purchase buns or bread rolls the previous week. The majority (61.1%, n=168) of respondents did not purchase sweet buns during the previous week, and respondents who did purchase sweet buns did so from a supermarket (27.6%, n=76).

More than half of respondents indicated that they did not purchase scones (58.4%, n=164) and those who did, purchased them either from a supermarket (24.6%, n=69) or a street vendor (7.1%, n=20). The majority (51.1%, n=145) of respondents did not purchase fat cakes the previous week. Those who did so purchased them from a street vendor (19.7%, n= 56) or a supermarket (11.3%, n=32). Nearly two thirds of respondents indicated that they did not purchase crisp bread or crackers (63.7% n=172,) and rusks (62%, n=171) the previous week. Those who did purchase crisp bread or crackers (27.4%, n=74) and rusks (31.2 %, n=86), did so from a supermarket.

The results on where cereal products are purchased are presented in Table 4.10

TABLE 4.10: WHERE CEREAL PRODUCTS ARE PURCHASED (N=265)

Item	Did not purchase item		Supermarket		Fruit and vegetable market		Butcher		Convenience store		Fast food outlet		Spaza shop		Street vendor	
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
Cereal product																
Maize meal	35.6	100	53.7	151	0.7	2	0.7	2	3.9	11	1.1	3	3.6	10	0.7	2
Rice	34.4	95	56	160	0.7	2	-	-	4.3	12	0.7	2	1.8	5	-	-
Flour (cake, bread)	54.0	148	39.4	108	0.4	1	-	-	3.3	9	1.8	5	1.1	3	-	-
Sorghum	75.6	204	18.5	50	0.7	2	-	-	2.2	6	-	-	1.9	5	11	3
Pasta (macaroni, spaghetti, noodles)	39.5	109	52.9	146	1.4	4	0.4	1	2.9	8	0.7	2	1.8	5	0.4	1

Cereal products Results show that most respondents did not purchase some of the cereal products the previous seven days. It can be assumed that respondents purchased cereal products in bulk monthly or fortnightly, and that those who purchased cereal products did so from a supermarket.

More than half of the respondents indicated they purchased maize meal (53.7%, n=151) and rice (58%, n=160) from a supermarket. More than half (54%, n=148) of respondents indicated that they have not purchased flour (cake, bread) during the previous seven days, while a fair

proportion (39.4%, n=108) of respondents who purchased flour (cake, bread) purchased it from a supermarket. Less than five per cent (3.3%, n=9) of respondents purchased flour (cake, bread) from a convenience store. Just over three quarters (75.6%, n=204) of respondents indicated that they did not purchase sorghum, while those respondents who did so purchased sorghum from a supermarket (18.5%, n=50). Just over half (52.9%, n=146) of respondents indicated that they purchased pasta products (macaroni, spaghetti, noodles) from a supermarket, followed by more than a third (39.5%, n=109) who did not purchase pasta the previous week.

Table 4.11 presents the results on where the oils and fat are purchased.

TABLE 4.11: WHERE OILS AND FAT ARE PURCHASED (N=265)

Item	Did not purchase item		Supermarket		Fruit and vegetable market		Butcher		Convenience store		Fast food outlet		Spaza shop		Street vendor	
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
Oils and fat																
Oil (sunflower, olive, canola)	34.3	95	54.9	152	3.2	9	-	-	4.0	11	0.4	1	2.5	7	0.7	2
Margarine (brick)	55.6	153	35.6	98	1.8	5	0.4	1	3.3	9	0.4	1	1.8	5	1.1	3
Margarine (tub)	50.7	137	43	116	2.2	6	0.7	2	1.9	5	0.4	1	0.4	1	0.7	2
Butter	59.2	157	35.8	95	1.1	3	0.8	2	1.9	5	0.8	2	1.1	3	0.8	2
Lard	83.3	222	12.1	32	1.9	5	0.8	2	1.9	5	-	-	-	-	1.1	3

Oils and fat The oils and fat group included oil (sunflower, olive, and canola), tub and brick margarine, butter, and lard. Table 4.11 shows that most respondents did not purchase oils and fats during the previous week, but that most respondents would purchase it from a supermarket when needed.

More than half (54.9%, n=152) of respondents indicated that they purchased oil (sunflower, olive, canola) from a supermarket. Most respondents indicated they did not purchase brick margarine (55.6%, n=153) or tub margarine (50.7%, n=137). If they did so, they purchased brick margarine (35.6 %, n=98) and tub margarine (43%, n=116) from a supermarket. More than half (59.2%, n=157) of the respondents indicated that they did not purchase butter the previous seven days. A high percentage (83.3%, n=222) of respondents did not purchase lard. Most (12.1%, n=32) respondents who did so purchased lard from a supermarket.

Table 4.12 gives the results on where legumes and nuts are purchased.

TABLE 4.12: WHERE LEGUMES AND NUTS ARE PURCHASED (N=265)

Item	Did not purchase item		Supermarket		Fruit and vegetable market		Butcher		Convenience store		Fast food outlet		Spaza shop		Street vendor	
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
Legumes and nuts																
Dry beans (sugar, butter), split peas	51.8	142	39.8	109	3.3	9	0.7	2	1.8	5	0.4	1	0.7	2	1.5	4
Lentils	63.6	173	29.4	80	2.6	7	1.1	3	1.8	5	-	-	0.4	1	1.1	3
Nuts (peanuts, pecans, walnuts, macadamias)	35.1	100	46.8	132	7.4	21	0.4	1	3.5	10	0.4	1	2.8	8	3.2	9

Legumes and nuts Table 4.12 shows where legumes and nuts were purchased. This group consisted of dry beans (sugar, butter), split peas, lentils, and nuts (peanuts, pecans, walnuts, macadamias).

More than half (51.8%, n=142) of respondents did not purchase dry beans (sugar beans, butter beans or split peas) the previous seven days, those respondents who did so (39.8%, n=109) purchased dry beans (sugar beans, butter beans or split peas) from a supermarket. Nearly two thirds (63.6%, n=173) of respondents did not purchase lentils during the previous seven days, followed by nearly one third (29.4%, n=80) of respondents who purchased lentils from a supermarket. A fair proportion (46.8%, n=132) of respondents purchased nuts (peanuts, pecans, walnuts, and macadamias) from a supermarket, while just over a third (35.1%, n=100) of respondents did not purchase nuts (peanuts, pecans, walnuts and macadamias) the previous week.

In addition to where food is purchased, the frequency of food purchases served as a further measure to indicate how accessible food is in the urban environment. The results on the frequency of purchasing from selected food outlets by the study group are presented in the next section.

4.3.2.1 Frequency of purchasing from selected food outlets

Respondents were asked to indicate their purchasing frequency from selected food outlets (See Addendum C, Section B1). The food outlets included supermarkets, fresh fruit and vegetable markets, butchers, convenience stores, fast food outlets, street vendors, spaza shops and open or community markets. The frequency scale had the following time intervals: daily, 3-4 times per week, 1-2 times per week, more than 3 times a month, special occasions and never. The results are presented in Figure 4.1.

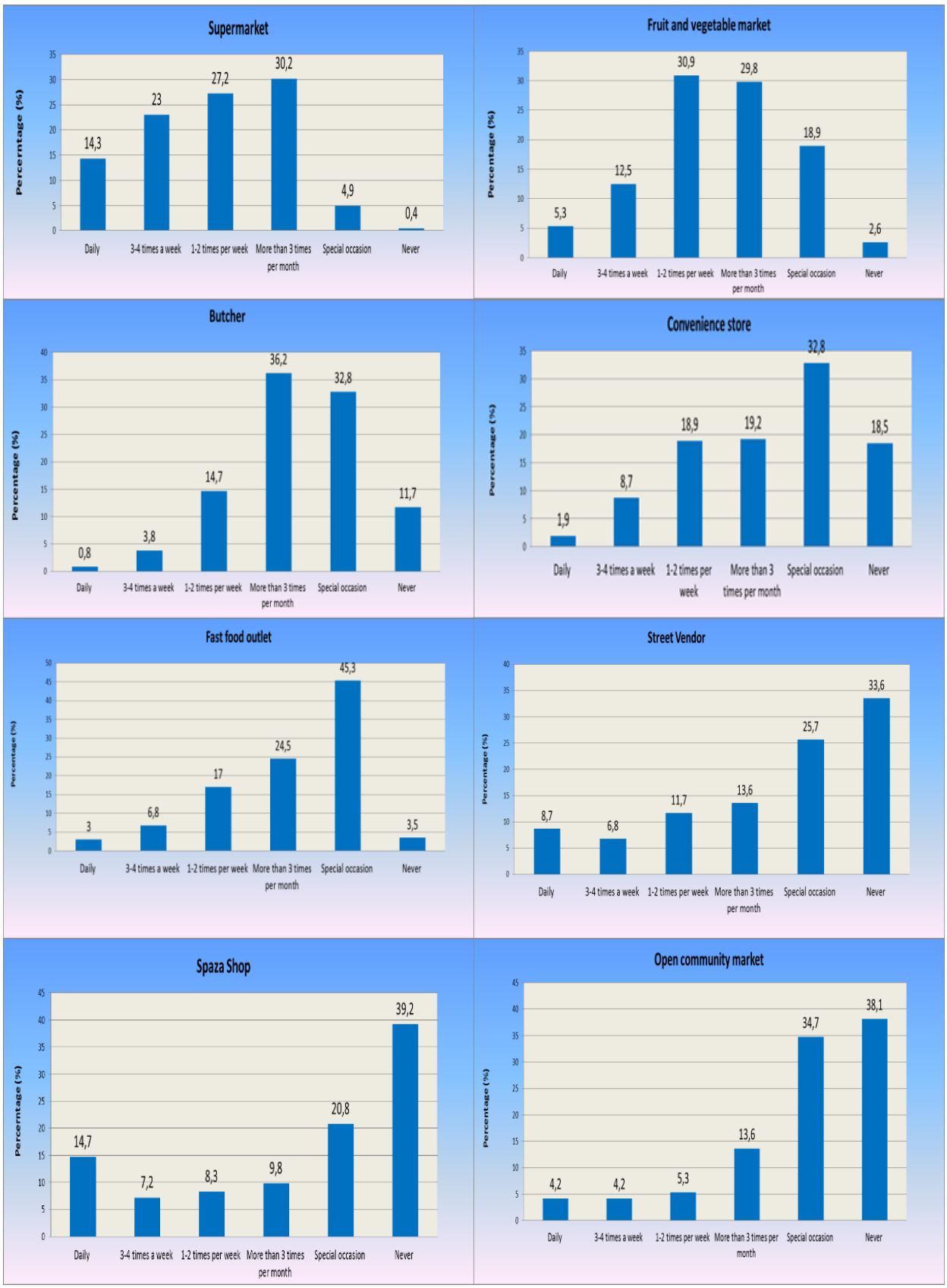


FIGURE 4.1: FREQUENCY OF PURCHASING FROM SELECTED FOOD OUTLETS (N=265)

Supermarket The majority (64.5%, n=171) of respondents purchased from a supermarket at least once a week while 30.2%, (n=80) of respondents purchased from a supermarket more than three times a month.

Fruit and vegetable market Nearly half (48.7%, n=129) of respondents indicated that they purchased from a fruit and vegetable market at least once a week. Another 29.8% (n=79) purchased from a fruit and vegetable market more than three times a month. This was followed by 18.9% (n=50) of respondents who only purchased from a fruit and vegetable market on special occasions.

Butcher Just over a third (36.2%, n=96) of the respondents purchased from a butcher more than three times a month, while nearly another third (32.8%, n=87) of respondents indicated that they purchased from a butcher only on special occasions. Although 19.3% (n=51) of respondents purchased at least once a week from a butcher, 11.7% (n=31) indicated that they never purchased from a butcher.

Convenience store A third (32.8%, n=87) of respondents indicated that they purchased from convenience stores only on special occasions, whereas 29.5%, (n=78) of respondents indicated that they purchased from a convenience store at least once a week. 18.5% (n=49) of respondents indicated that they never purchased from a convenience store.

Fast food outlet The results show that 45.3%, (n=120) of respondents purchased from fast food outlets only on special occasions. 26.8% (n=71) of respondents indicated that they purchase from fast food outlets at least once a week. Less than five per cent (3.4%, n=9) of respondents indicated that they never purchase from a fast food outlet.

Street vendor A third (33.6%, n=89) of respondents never purchase from a street vendor. Just over a quarter (27.2%, n= 72) of respondents purchase from a street vendor at least once a week, while another quarter (25.7%, n=68) of respondents purchase from a street vendor only on special occasions.

Spaza shop A fair proportion (39.2%, n=104) of respondents never purchase from a spaza shop, whereas nearly a third (30.2%, n=80) indicated that they purchase from a spaza shop at least once a week. 20.8% (n=55) indicated that they purchase from a spaza shop only on special occasions. This tendency is understandable as spaza shops are mostly found in townships and most respondents were not living in townships (Steyn & Mchiza, 2014; Vorster *et al.*, 2011).

Open community markets The results show that a fair proportion (38.1%, n=101) of respondents never purchase from an open community market. This was followed by just over a third (34.7%, n=92) who indicated that they purchase from open community markets only on special occasions. Less than five per cent (4.2%, n=11) indicated that they purchase from an open community market daily.

As part of accessibility of food in the local food environment, how the purchased food was transported home was also measured.

4.3.2.2 How purchased food is transported Home

Respondents were further asked to indicate how they transported their purchased food home (See Addendum C, Section B5). They had to choose one of four given statements: "I walk and carry it myself"; "somebody helps me carry my food"; "I take a taxi or a bus"; and "I use a car". Figure 4.2 presents the results.

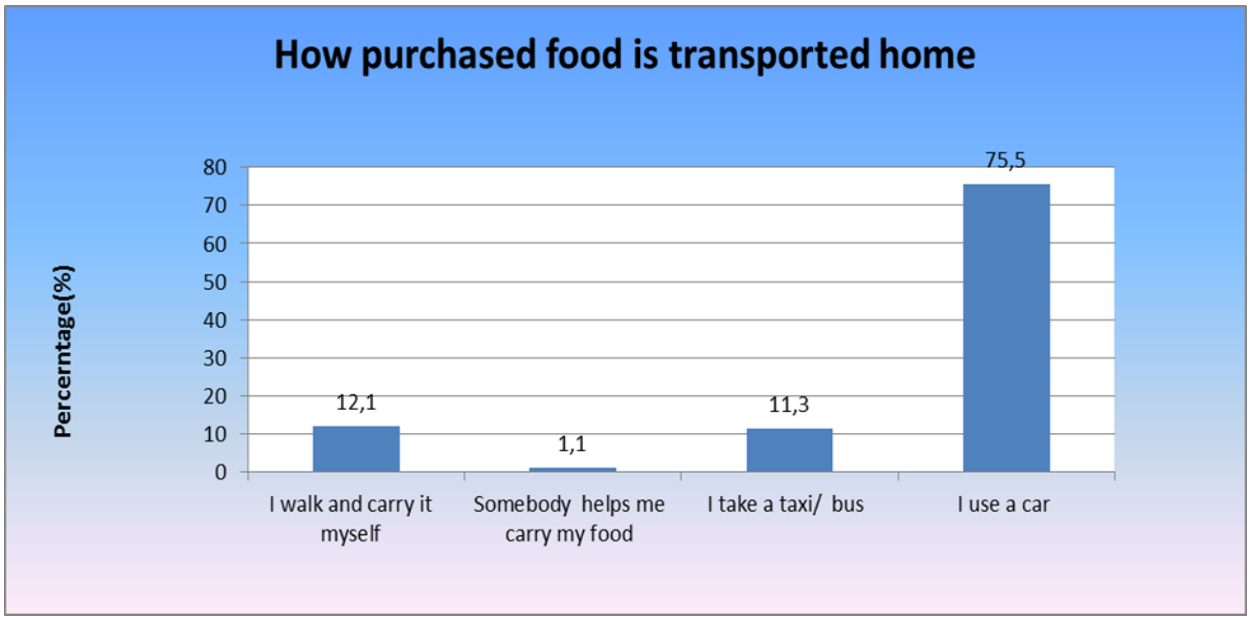


FIGURE 4.2: HOW PURCHASED FOOD IS TRANSPORTED HOME (N=265)

The majority (75.5%, n=200) of respondents used a vehicle to transport purchased food home, followed by 12.1% (n=32) of respondents who use a taxi or a bus. This further confirms that the respondents physically go to food retail stores to purchase food.

4.3.3 The Affordability and acceptability of food in the local food environment

Affordability involves the cost of food, their willingness to pay and the financial ability of households and individuals to purchase food. This factor is therefore an important influence on people's food intake (Caspi *et al.*, 2012; Azuma *et al.*, 2010; Morland, Wing & Roux, 2002). Only

one statement related to the affordability of fruits and vegetables in food outlets where the respondents buy food from. The respondents had to indicate to what extent they agree or disagree with a statement on the affordability of food at food outlets.

TABLE 4.13: THE AFFORDABILITYAND ACCEPTABILITY OF FOOD IN THE LOCAL URBAN FOOD ENVIRONMENT (n=265)

Statement regarding food access dimension food	Strongly agree		Agree		Undecided		Disagree		Strongly disagree	
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
Affordability										
Fruit and vegetables are affordable (reasonably priced) in the food outlets I normally buy from	22.3	59	38.9	103	11.7	31	18.5	49	8.7	23
Acceptability										
I am satisfied with the range of food outlets I have access to in my neighbourhood	39.2	104	45.3	120	5.3	14	6.4	17	3.8	10
Good quality fruits and vegetable products are available in the food outlets I normally shop at	40	106	49.4	131	4.2	11	4.2	11	2.3	6
The food stores in my neighbourhood compare well with food stores in other areas of Gauteng	30.2	80	38.1	101	14.0	37	11.3	30	6.4	17

The results show that nearly two thirds (61.2%, n=162) of respondents either strongly agree or agree that fruits and vegetables at the food outlets they normally buy from are affordable. Almost twenty per cent (18.5%, n= 49) disagreed that fruits and vegetables are affordable at the food outlets they normally buy from.

The access dimension of acceptability describes the consumer's attitude about attributes of the local food environment and whether the supply of food products meet their personal standards (Caspi *et al.*, 2012). The respondents had to indicate to what extent they agree or disagree with statements on the acceptability of food outlets they have access to, including the quality standards of fruits and vegetables that are available in these food outlets. The results on Table 4.13 show that almost fifty per cent (45.3%, n= 120) of respondents agree that they are satisfied with the range of food outlets they have access to in their neighbourhood, followed by just over a third (39.2%, n=104) who strongly agreed with the statement. A high percentage (89.4%, n=237) of respondents agree or strongly agree that good quality fruits and vegetables products are available in the food outlets they normally shop from. Less than ten per cent (6.5%, n= 17)

of respondents disagree or strongly disagree that good quality fruits and vegetables products are available in the food outlets they normally shop from. Just over two thirds (68.3%, n=181) of respondents indicated that the food stores in their neighbourhoods compare well with food stores in other areas of Gauteng, while 14%, (n= 37) of respondents indicated that they are undecided whether the food stores in their neighbourhood compare well with food stores in other areas of Gauteng.

As part of the food access dimensions the accommodation of consumers' needs, and how equipped local food outlets are to meet consumers' needs, will be discussed in the following section.

4.3.4 Accommodation of consumer needs in the local food environment

The access dimension of accommodation describes how well-equipped the local food outlets are to meet the food and associated consumer needs of local households and individual consumers (Caspi *et al.*, 2012). The respondents had to indicate to what extent they agree or disagree with statements about the accommodation of their needs and the types of food in food outlets where food is purchased.

The accommodation of consumers' food needs in the local urban food environment is presented in Table 4.14.

TABLE 4.14: THE ACCOMMODATION OF CONSUMER NEEDS IN THE LOCAL URBAN FOOD ENVIRONMENT (n=265)

Statement about food outlets they buy from	Strongly agree		Agree		Undecided		Disagree		Strongly disagree	
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
I am satisfied with the types (variety) of food I have regular access to	32.5	86	49.8	132	7.5	20	6.4	17	3.8	10
These outlets accommodate my needs (i.e. credit options, extended hours	29.8	79	42.3	112	9.1	24	11.3	30	7.5	20

The results show that the majority (82.3%, n=218) of respondents either strongly agree or agree that they are satisfied with the types (variety) of food they have regular access to. A small percentage of respondents (7.5%, n=20) indicated that they are undecided whether they are satisfied with the types of food they have regular access to. Almost three quarters (72.1%, n=191) of respondents indicated that they either strongly agree or agree that the food outlets accommodate their needs. Just under twenty per cent (18.8%, n=50) of the respondents

indicated that they either strongly disagree or disagree that the food outlets accommodate their needs.

The results on food affordability, acceptability and accommodation confirm that the local food environment of the study group meet their needs. They are satisfied with the range of food outlets they have access to in their neighbourhoods, they are of the opinion that these food outlets sell good quality fruits and vegetables, and compare well with food stores in other areas of Gauteng. They therefore do not need to travel long distances to purchase good quality fruits and vegetables. The results further indicate that the respondents are satisfied with the range of food outlets they have regular access to, although some feel their needs are not accommodated in terms of operating hours and available credit options.

The perception of the urban black adults regarding the food access dimensions of availability, accessibility, affordability, acceptability and accommodation in the local food environment is of importance, when exploring and describing how the local food environment contribute to their food practices. The next section will present results on the study group's perception of the food access dimensions.

4.3.5 The perceptions of the food access dimensions

In order to determine consumers' perceptions about the food access dimensions, respondents had to indicate to what extent they agree or disagree with given statements about the food outlets from which they buy. Respondents had to indicate their level of agreement with statements on access to food in the local urban food environment. The scale values ranged from strongly agree, agree, undecided, disagree or strongly disagree (See Addendum C Section B3 of the Questionnaire). The results are presented in Table 4.15.

TABLE 4.15: PERCEPTION REGARDING THE FOOD ACCESS DIMENSIONS (N=265)

Statement regarding food access dimension	Strongly agree		Agree		Undecided		Disagree		Strongly disagree	
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
Availability										
I am satisfied with the range of food outlets I have access to in my neighbourhood	39.2	104	45.3	120	5.3	14	6.4	17	3.8	10
Good quality fruits and vegetables are available in the food outlets I normally shop at	40.0	106	49.4	131	4.2	11	4.2	11	2.3	6
Healthy foods are available in the food outlets where I normally shop	40.0	106	47.9	127	4.9	13	4.2	11	3.0	8
Accessibility										
I am satisfied with the range of food outlets I have access to in my neighbourhood	39.2	104	45.3	120	5.3	14	6.4	17	3.8	10
I usually buy food at the food outlets closest to where I live	45.3	120	38.5	102	3.4	9	10.2	27	2.6	7
I am satisfied with the types (variety) of food I have regular access to	32.5	86	49.8	132	7.5	20	6.4	17	3.8	10
I have to travel some distance to buy good quality food	16.2	43	18.5	49	7.2	19	38.5	102	19.6	52
Affordability										
Fruit and vegetables are affordable (reasonably priced) in the food outlets I normally buy from	22.3	59	38.9	103	11.7	31	18.5	49	8.7	23
Acceptability										
I am satisfied with the range of food outlets I have access to in my neighbourhood	39.2	104	45.3	120	5.3	14	6.4	17	3.8	10
Good quality fruits and vegetable products are available in the food outlets I normally shop at	40.0	106	49.4	131	4.2	11	4.2	11	2.3	6
The food stores in my neighbourhood compare well with food stores in other areas of Gauteng	30.2	80	38.1	101	14.0	37	11.3	30	6.4	17
Accommodation										
These outlets accommodate my needs (i.e. credit options, extended hours)	29.8	79	42.3	112	9.1	24	11.3	30	7.5	20

Availability The majority (84.5%, n=224) of respondents either strongly agree or agree that they are satisfied with the range of food outlets that they have access to in their neighbourhood. Although 5.3% (n=14) of the respondents were undecided on this, while 6.4% (n=17) and 3.8 % (n=10) disagreed and strongly disagreed that they are satisfied with the range of food outlets they have access to in their neighbourhood. A high percentage (89.4%, n=237) of respondents indicated that good quality fruits and vegetables are available in the food outlets where they normally shop, although less than seven per cent (6.5%, n=17) of the respondents strongly disagreed or disagreed with the statement that good quality fruits and vegetables are available

in the food outlets where they normally shop. Most respondents (87.9%, n=233) further confirmed that healthy foods are available from the food outlets where they normally shop. Almost five percentage (4.9%, n=13) were undecided and 4.2% (n=11) disagreed that healthy food is available in the food outlets where they normally shop.

Accessibility Most (84.5%, n=224) respondents either strongly agreed or agreed that they are satisfied with the range of food outlets that they have access to in their neighbourhood. While 5.3% (n=14) of respondents were undecided, 6.4% (n=17) and 3.8 %,(n=10) disagreed and strongly disagreed that they are not satisfied with the range of food outlets they have access to in their neighbourhood. More than three quarters (83.8%, n=222) of respondents buy food at food outlets closest to where they live, and most (82.3%, n=218) are satisfied with the types of food they have regular access to. More than half (58.1%, n=154) of respondents indicated that they do not have to travel some distance in order to buy good quality food. These results confirm that most respondents buy food at outlets closest to where they live, although just over a third (34.7%, n=92) of respondents indicated that they must travel some distance to buy good quality food.

Affordability Nearly two thirds (61.2%, n=162) of respondents agree or strongly agree that fruits and vegetables are affordable (reasonably priced) in the food outlets they normally shop from. Just over a quarter of respondents (27.2%, n=72) disagreed or strongly disagreed that fruits and vegetables are affordable (reasonably priced) in the food outlets they normally shop from. Just over ten per cent (11.7%, n=31) were undecided whether the food in their local urban food environment is affordable or not. These results are in contrast with other studies which reveal that local food stores are generally not as affordable as supermarkets (Munoz-Plaza, Morland, Pierre, Spark, Filomena & Noyes, 2013:326).

Acceptability The results show that the majority (84.5%, n=224) of respondents either strongly agreed or agreed that they are satisfied with the range of food outlets that they have access to in their neighbourhood. Although 5.3% (n=14) of respondents were undecided on this, 6.4% (n=17) and 3.8 %, (n=10) disagreed and strongly disagreed that they are satisfied with the range of food outlets they have access to in their neighbourhood. The majority (89.4%, n=237) of respondents felt that good quality fruits and vegetables products are available in the food outlets they normally shop from. Less than ten per cent (6.5%, n=17) of respondents strongly disagreed or disagreed with the statement that good quality fruits and vegetables are available in the food outlets they normally shop from. The majority (87.9%, n=233) of respondents agreed that healthy foods are available in the food outlets where they normally shop from. Just over two-thirds 68.3% (n=181) of respondents indicated that they agreed or strongly agreed that the food outlets in their neighbourhood compared well with food stores in other areas of Gauteng.

On the other hand, 17.7%, (n=47) of respondents indicated that they strongly disagree or disagree with the statement that the food outlets in their neighbourhood compare well with food stores in other areas of Gauteng. 14% (n=37) of respondents indicated that they are undecided whether the food stores in their neighbourhood compare well with food stores in other areas of Gauteng.

Accommodation Almost three quarters (72.1%, n=191) of respondents either strongly agreed or agreed that food outlets in their neighbourhood accommodate their needs (i.e. credit options and extended hours). Nearly twenty per cent (18.8%, n=50) of respondents disagreed or strongly disagreed with this statement while 9.1% (n=24) of respondents indicated that they are undecided whether the food outlets in their neighbourhood accommodate their needs.

The perception regarding the food access dimension shows that respondents are quite satisfied with the local urban food environment. Most of the respondents agreed or strongly agreed that they are satisfied with the range of food outlets they have access to in their neighbourhood. They also indicated that healthy foods and good quality fruits and vegetables are available in the food outlets they normally shop from. The respondents also indicated that they usually buy food at food outlets closest to where they live because they are satisfied with the types (variety) of food they have regular access to, which means that they do not have to travel any distance to buy good quality food. Although most respondents agreed or strongly agreed that fruits and vegetables are affordable (reasonably priced) in the food outlets they normally shop from, some were undecided. The respondents further indicated that the food stores in their local urban food environment compare well with food stores in other areas of Gauteng and the food outlets accommodate their needs in terms of credit options and extended shopping hours.

4.3.6 Concluding summary on the local food environment

The local food environment together with the food access dimensions of availability, accessibility, affordability, acceptability, and accommodation contribute to the food practices of the black adults in Gauteng Province. The results on the local food environment of the black adults in Gauteng show that respondents regard their food environment as accessible as measured by the five food access dimensions. They are satisfied with the availability, accessibility, affordability, acceptability, and accommodation of food in their local food environment. They do not use internet or online shopping for food, but instead physically go to food outlets to shop for food. Most of the respondents have access to vehicles, which allows them to do their food shopping more than once a week at supermarkets closest to where they live. These findings concur with other South African and international studies which revealed that most people in urban areas purchase their food items in supermarkets (Odunitan-Wayas *et*

al., 2018; Liese, Ma, Hutto, Sharpe, Bell & Wilcox, 2017; Gustat, O'Malley, Luckett & Johnson, 2015). Only a few respondents do some food shopping at speciality shops such as the butcher, convenience stores, fast food outlets, street vendors, spaza shops or open community markets, and most do so on special occasions.

The home-food environment plays a significant role in shaping the food practices of individuals and households. The next section reports on results of the second objective and its sub-objective, which concerns the contribution of the home-food environment to the food practices of the study group.

4.4 THE HOME-FOOD ENVIRONMENT

Studies have shown that the home-food environment has a potentially positive influence on good food practices and healthy food choices (Watts *et al.*, 2018; Fisher, Erasmus & Viljoen, 2016; Amuta, Jacobs, Idoko, Barry & McKyer, 2015). The important aspects of the home-food environment include the availability, accessibility, and visibility of healthy and unhealthy foods in the home, as well as the frequency of and attitude towards family meals (Nepper & Chai, 2015; Larson & Story, 2009).

The first sub-objective on the home-food environment presents the results on who is mainly responsible for the household's food purchases and food preparation.

4.4.1 Household food purchasing and preparation

Studies have confirmed that family food purchasers and preparers play central roles in shaping the food habits of household members (Wood, McNamara, Kowalewska & Ludgate, 2018; Wijayaratne, Reid, Westberg, Worsley & Mavondo, 2018). They act as nutritional gatekeepers by deciding what foods are available in the home, the quantities in which they are purchased, and how they are prepared. This task is usually attributed to a female member of the household, which is probably determined by factors such as the availability of time, and perceived skills in identifying quality food items and food preparation skills (Wijayaratne *et al.*, 2018; Pradhan, Taylor, Agrawal, Prabhakaran & Ebrahim, 2013b; Larson & Story, 2009).

In this study, questions were asked on who is mainly responsible for most of the household food purchasing and preparation. The possible answers included husband, wife, partner, domestic worker, children, or any other person in the household (See Addendum C, Section A 13-14 of the Questionnaire). Table 4.16 gives these results.

TABLE 4.16: HOUSEHOLD FOOD PURCHASING AND PREPARATION

Person responsible for household food purchasing	(%)	(n)
Yourself	65.7	174
Spouse or partner	29.8	79
Another person in the household	5.5	12
Person responsible for household food preparation	**(%)**	**(n)**
Yourself	49.1	130
Spouse or partner	39.2	104
Children	1.9	5
Domestic worker or helper	2.6	7
Another person in the household	7.2	19

Household food purchasing The majority (65.7%, n=174) of respondents indicated that they themselves were responsible for household food purchasing. This was followed by 29.8% (n=79) who indicated that their spouses or partner were responsible for household food purchasing. Just over five per cent (5.5%, n=12) indicated that another person in the household was responsible for food purchasing. The results were further analysed based on the gender of the person completing the questionnaire (See Table 4.17). The results revealed that the majority (61.9%, n=164) of persons responsible for food purchasing were female and that only a third (33.6%, n=12) of people who performed this task were males. These results concur with other South African studies which confirm that the task of household food purchasing is still mostly entrusted to a female member of the household although it is gradually being embraced by both genders (Monsivais, Aggarwal & Drewnowski, 2014; Pradhan *et al.*, 2013b; Shisana *et al.*, 2013).

Household food preparation Nearly half (49.1%, n=130) of respondents indicated that they themselves were responsible for household food preparation, followed by 39.2% (n=104) who indicated that their spouse or partners were responsible for food preparation. Nearly ten per cent (7.2%, n=19) of respondents indicated that household food preparation was done by any other person in the household. Less than five per cent (4.5%, n=12) of respondents indicated that food preparation was performed by children in the household or a domestic helper.

Table 4.17 presents the gender of the person responsible for household food purchasing and preparation.

TABLE 4.17: GENDER OF PERSON RESPONSIBLE FOR HOUSEHOLD FOOD PURCHASING AND PREPARATION

Statement	Missing	Male		Female	
	(n)	(%)	(n)	(%)	(n)
Person responsible for household food purchasing	12	33.6	89	61.9	164
Person responsible for household food preparation	31	15.5	41	72.8	193

The results show that more males are responsible for food purchasing (33.6%, n=89) as compared to food preparation (15.5%, n=41). The number of males responsible for food preparation is half the number of males responsible for food purchasing. Further analysis on the gender of the person responsible for household food purchasing and preparation shows that the majority (61.9%, n=164) of respondents indicated that females were responsible for food purchasing in their households, and as expected a large number of females were responsible for food preparation (72.8%, n=193). These results concur with other studies which show that the traditional role of food purchasing and preparation is still entrusted to female members in the household, though a shift has been observed due to urbanisation and modernisation as more males are now sharing the food purchasing and preparation task (Monsivais *et al.*, 2014; Pradhan *et al.*, 2013b; Shisana *et al.*, 2013).

The next section will present results on the second sub-objective that concerns the availability of selected food types in the household.

4.4.2 The availability of selected food types in the home

Respondents were asked to indicate how often certain foods are available in their homes. The foods listed included fruits and vegetables, milk, 100% fruit juice, potato chips and other salty snacks, chocolates and other sweets, fizzy drinks, and junk food. The respondents had to mark how often certain foods were available in their homes using various time frames (i.e. always, usually, sometimes, never). Apart from having healthy food and beverages, such as fruits, vegetables, milk and fruit juice, other food and beverages that is not required as part of healthy eating were also included. Table 4.18 portrays the results.

TABLE 4.18: AVAILABILITY OF CERTAIN FOODS IN THE HOUSEHOLD (N=265)

Statement regarding food access dimension	Always		Usually		Sometimes		Never	
	%	(n)	%	(n)	%	(n)	%	(n)
Fruits and vegetables are available in my home	55.5	147	27.2	72	16.2	16.2	1.1	3
Vegetables are served with main meals in my home	50.2	133	29.1	77	19.2	51	1.5	4
Milk is available in my home	59.4	184	18.5	49	10.6	28	1.5	4
100% fruit juice is available in my home	25.7	68	27.2	72	39.6	105	7.5	20
Food is prepared in a healthy manner in my home	52.8	140	33.6	89	12.5	33	1.1	3
Potato chips and other salty snacks are available in my home	17.7	47	19.6	52	52.8	140	9.8	26
Chocolates and other sweets are available in my home	5.7	15	14.3	38	66.4	176	13.6	36
Soft/fizzy drinks (Coke, Sprite, Fanta) are available in my home	18.5	49	20.4	54	50.2	133	10.9	29
We have junk food in my home	5.7	15	10.9	29	60.4	160	23	61

The availability of certain types of food at home is one of the elements of the home food environment that signifies how healthy the food consumption of the members of the household will be. The availability of certain food in the household influence the consumption of these foods in the household (Ong, Ullah, Magarey, Miller & Leslie, 2016; Wilke *et al.*, 2012).

Availability of fruits and vegetables More than half (55.5%, n=147) of respondents indicated that fruits and vegetables were always available in their homes, followed by more than a quarter (27.2%, n=72) who indicated that fruits and vegetables were generally available in their households. Furthermore half (50.2%, n=133) of respondents indicated that vegetables are always served with main meals in their households, while 29.1% (n=77) usually serve vegetables with main meals. These results confirm that when vegetables are available in the household they are consumed.

Availability of milk The majority (69.4%, n=184) of respondents indicated that they always had milk available in their households, whereas 18.5% (n=49) usually had milk. Less than two per cent (1.5%, n=4) of respondents indicated that they never have milk in their households.

Availability of fruit juice More than a third (39.6%, n=105) of respondents indicated that they sometimes have 100% fruit juice available in their households followed by a quarter (25.7%, n=68) who indicated that they always have 100% fruit juice available in their household.

Food is prepared in a healthy More than half (52.8%, n=140) of respondents indicated that they always prepare food in a healthy manner, followed by a third (33.6%, n=89) who indicated

that they usually prepare food in a healthy manner. These results show that the respondents care about eating healthy food.

Availability of potato chips and other salty snacks More than half (52.8%, n=140) of respondents revealed that they sometimes have potato chips and other salty snacks available in their households. Less than ten per cent (9.8%, n=26) of respondents indicated that they never have potato chips and other salty snacks available in their households.

Availability of chocolates and other sweets Two thirds (66.4%, n=176) of respondents indicated that they sometimes have chocolates and sweets available in their households. Nearly six per cent (n=15) of the respondents never had chocolates and sweets available in their households.

Availability of soft or fizzy drinks Half (50.2%, n=133) of respondents indicated that they sometimes have soft or fizzy drinks available in their households, followed by 20.4% (n=54) of the respondents who indicated they usually have soft or fizzy drinks available in their households. Another 18.5% (n=45) of respondents indicated that soft or fizzy drinks are always available in their households.

Availability of junk food The majority (60.4%, n=160) of respondents sometimes have junk food in their households, while less than ten per cent (5.7%, n=15) of respondents indicated that they always have junk food available in their households.

Respondents were further asked questions on their attitude towards healthy eating. The next section gives the results on the respondents' attitude towards healthy eating.

4.4.2.1 Attitude towards healthy eating

To measure the respondents' attitude towards eating healthy food, they had to indicate to what extent three statements regarding eating healthy food were applicable to them. They had to indicate how much they, their friends, and the people they lived with cared about eating healthy food, using a 4-point scale ranging from "not at all" to "very much". Table 4.19 gives the results.

TABLE 4.19: ATTITUDE TOWARDS HEALTHY EATING (N=265)

Statement regarding food access dimension	Not at all		A little bit		Somewhat		Very much	
	%	(n)	%	(n)	%	(n)	%	(n)
I care about eating healthy food	0.8	2	4.9	13	24.9	66	69.4	184
Many of my friends care about eating healthy food	7.2	19	20.4	54	41.9	111	30.6	81
The people I live with care about eating healthy food	3.7	9	14.1	34	32.4	78	49.8	120

The majority (69.4%, n=184) of respondents indicated they cared very much about eating healthy food. Only two people (0.8%, n=2) did not care at all about eating healthy food. More than a third (41.9%, n=111) of the respondents indicated that their friends somewhat care about eating healthy food, followed by nearly a third (30.6%, n=81) who indicated their friends cared very much about eating healthy food. The results show that nearly half (49.8%, n=120) of the respondents indicated that they live with people who care very much about eating healthy food and a further 32.4% (n=78) of respondents indicated that they live with people who care about eating healthy food. Studies have shown that people with supportive friends and family who care about healthy eating are more likely to make healthy food choices (Hardcastle & Blake, 2016; Jastran *et al.*, 2009; Sobal *et al.*, 2006).

The frequency of family meals and the respondents' attitudes towards family meals are also of importance in the home food environment and were measured.

4.4.3 Frequency and attitude towards family meals

The family is still the primary social unit with whom most people eat their main meals. (Takeda *et al.*, 2018; Sedibe *et al.*, 2014). Enjoying regular family meals is regarded as a proven strategy to help ensure that individual family members consume nutritious balanced meals and help develop healthy eating patterns (Chae *et al.*, 2018; Martin-Biggers *et al.*, 2014; Woodruff & Hanning, 2013). The respondents were asked to indicate the frequency of eating meals together as a family (See Questionnaire Addendum C Section C). The results are presented in Figure 4.3.

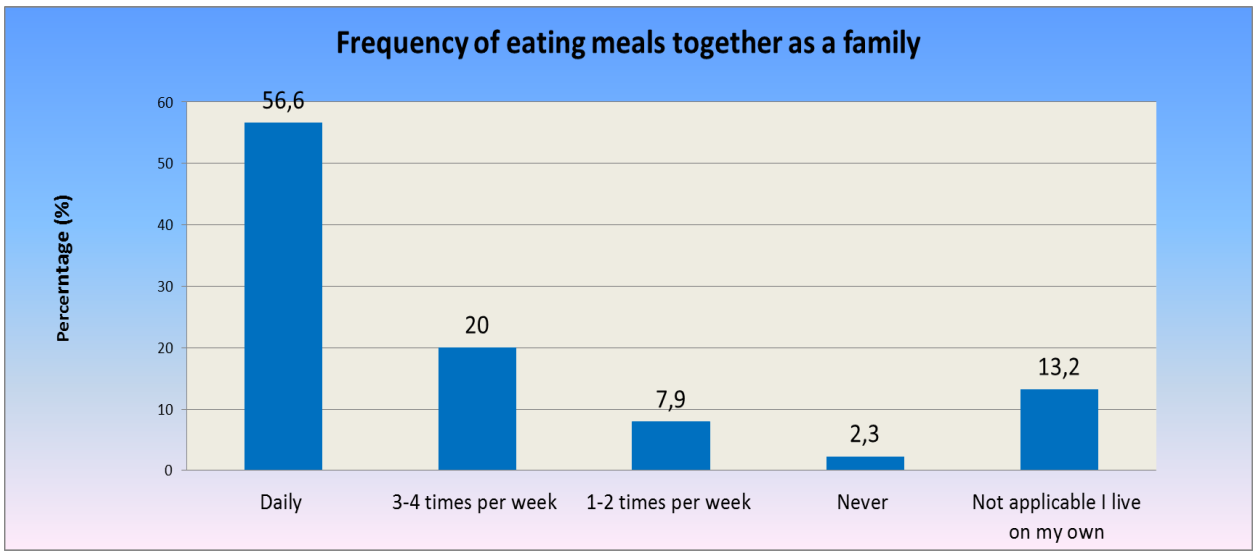


FIGURE 4.3: FREQUENCY OF EATING MEALS TOGETHER AS A FAMILY

The majority (56.6%, n=150) of respondents indicated that they eat meals together as a family daily, while another 20% (n=53) of respondents indicated that they eat meals together as a family at least 3-4 times a week. Those respondents who never eat meals together as a family comprised less than three per cent of the sample (2.3%, n=6).

Respondents were also asked to indicate how most family meals are eaten. The results on how family meals are eaten are presented in Figure 4.4.

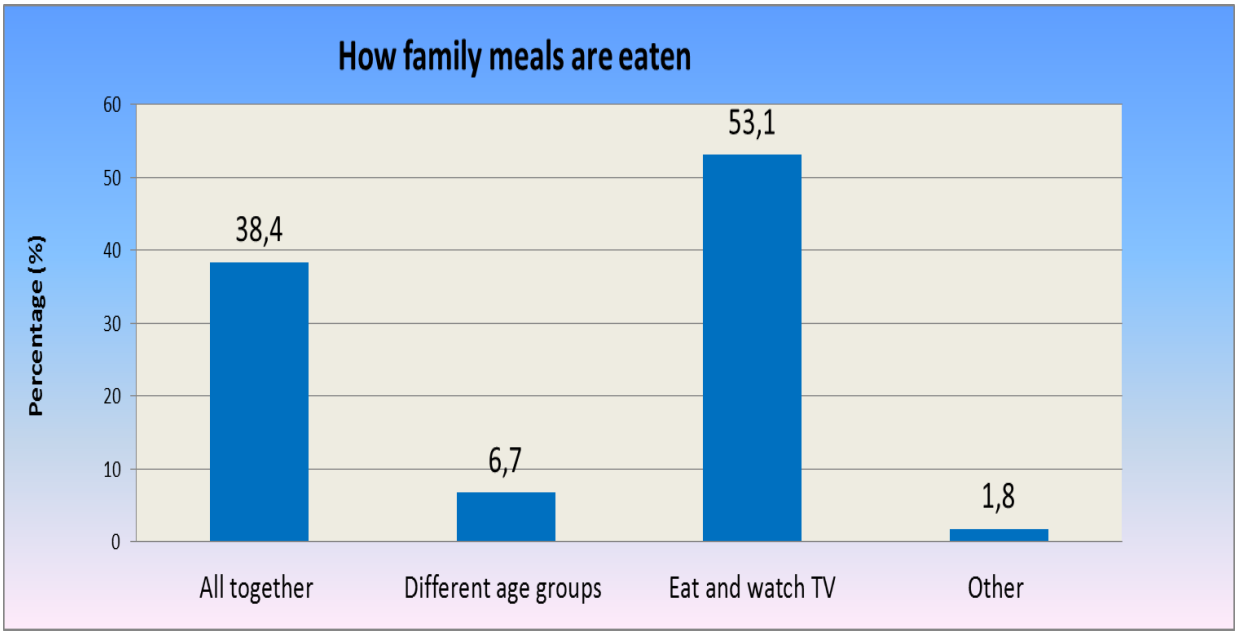


FIGURE 4.4: HOW FAMILY MEALS ARE EATEN (N=265)

The majority (53.1%, n=119) of respondents eat while watching television. These results concur with other South African and international studies which confirmed that most households eat

their meals while watching television (Sedibe *et al.*, 2018; Sedibe *et al.*, 2014; Kegler *et al.*, 2014). More than a third (38.4%, n=86) of respondents indicated that all members of the household eat together at the table. Only a few respondents still follow the tradition where different age groups enjoyed their meals separately (Martin-Biggers *et al.*, 2014; Viljoen *et al.*, 2005).

Respondents also had to indicate their level of agreement to statements concerning their attitude towards family meals. This was measured on a five-point Likert-type scale, where, 1 indicates strongly agree, and 5 strongly disagree. Table 4.20 gives the results on the attitudes towards family meals.

TABLE 4.20: ATTITUDE TOWARDS FAMILY MEALS (N=265)

Statement regarding food access dimension	Strongly agree		Agree		Undecided		Disagree		Strongly disagree	
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
I enjoy eating meals with my family	63.4	168	29.1	77	6.8	18	-	-	0.8	2
In my family eating brings people together in an enjoyable way	56.6	150	30.6	81	9.8	26	1.9	5	1.1	3
In my family mealtimes are for talking with other family members	40.4	107	30.9	82	14.3	38	11.3	30	3	8
In my family dinner time is about more than just getting food, we all talk to each other	40.0	106	35.1	93	12.1	32	10.6	28	2.3	6
In my family we often watch television while we eat dinner	40.4	104	29.1	77	11.7	31	12.5	33	6.4	17

Studies have shown that regular family meals are associated with improved dietary quality (Chae *et al.*, 2018; Fink, Racine, Mueffelmann, Dean & Herman-Smith, 2014; Feldman, Eisenberg, Neumark-Sztainer & Story, 2007). A high percentage (92.5%, n=245) of respondents indicated that they strongly agree or agree that they enjoy eating meals with their families. Only two (0.8%, n=2) respondents did not enjoy eating meals with their families. It is interesting to note that the majority (87.2%, n=231) of respondents either strongly agree or agree with the statement that eating brings people together in an enjoyable manner. This confirms that food brings people together, thus building and maintaining family relationships (Bryant, *et al.*, 2003:194). Almost three quarters of respondents either strongly agree or agree that family mealtimes are for talking with other family members (71.3%, n=189) and dinner time is about more than just getting food, but it is also time to talk with each other (75.1%, n=199). There were however some respondents who were undecided on the statements, as 14.3% (n=38) and 12.1% (n=32) respectively indicated that in some families watching television during meals is a common practice. The results show that more than two thirds (69.5%, n=184) of the families

enjoy their meals in front of television. This is confirmed by other South African and international studies which found that most families eat dinner together, especially while watching television (Feeley, Griffiths, Sedibe, Doak, Norris & Voorend, 2014; Feldman *et al.*, 2007).

4.4.4 Conclusion on the home-food environment

Regarding the home-food environment of black adults, the results of this study reveal the following interesting information. As expected, the household food purchasing and preparation is still mainly done by females, although males seem to increasingly take on their share of the food purchasing and preparation task (Monsivais *et al.*, 2014; Pradhan *et al.*, 2013b). The respondents and most of their friends cared about eating healthy food. Studies have shown that people with supportive friends and family who care about healthy eating are more likely to make healthy food choices (Jastran *et al.*, 2009; Sobal *et al.*, 2006). Food items that are recommended as part of healthy eating patterns are generally available in most of the households and these are also prepared in a healthy manner. Although some of the respondents indicated the presence of food that are not essential – potato chips and other salty snacks, chocolates, and other sweets, as well as soft drinks – some respondents included them as part of their eating patterns.

Eating together as a family is a common practice among the urban black adults. Most meals were eaten together as a family while watching television. These results concur with other South African and international studies which revealed that most households eat their meals while watching television (Sedibe *et al.*, 2014; Kegler *et al.*, 2014; Feldman *et al.*, 2007). Eating meals in places other than the home also appears to be a fairly common practice. This can be attributed to increasing urbanisation, as people spend at least half of their waking hours at work and they consume a substantial proportion of their meals at work (Sorensen, Linnan & Hunt, 2004). Most respondents indicated that they enjoyed eating family meals together, and perceived these shared meals to bring family together and make time available to talk with other family members.

The next section presents the results on the third objective of the study on the food practises of urban black adults.

4.5 FOOD PRACTICES OF THE URBAN BLACK ADULTS

Information was collected on the respondents' eating patterns (See questionnaire Addendum C, Section C 1-5). Eating patterns refer to the number of meals consumed, and include the

distribution of meals, the composition of meals, and snacks consumed during a specific time period (Raulio, 2011). Information on the diversity of food intake, number of servings a day and the frequency of consumption was also collected.

4.5.1 Eating patterns of the study group

The first sub-objective was to determine and describe the eating patterns of the study group. Respondents were first asked questions on how many meals they usually eat a day and how many days a week they eat breakfast, lunch, supper, and snacks. The results are given in Table 4.21 and Figure 4.5.

TABLE 4.21 THE NUMBER OF MEALS CONSUMED A DAY

Number of Meals	Frequency (n)	Percentage (%)
1	5	1.9
2	69	26.0
3	172	64.9
≥4	19	7.0

The majority (64.9% n=172) of respondents enjoyed three meals a day, followed by just over a quarter (26%, n=69) who had two meals a day. It seems as if some still followed the traditional meal pattern of two meals a day, where the first meal is consumed mid-morning and the second meal in the evening. In this study, it is however assumed that the busy lifestyle of urban black adults might also contribute to them having two meals a day. The first meal (breakfast) is consumed before they leave home for work or at work during the morning before midday, and the second meal (supper) in the evening at home as indicated in other South African studies (Sedibe *et al.*, 2018; Magadze, 2017). It can thus be deduced that the majority (71.9%, n=191) of respondents follow a Western-oriented meal pattern of having more than two meals a day, and that their meal patterns are becoming increasingly varied. Skipping meals and snacking between meals also appear to have become more prevalent (Viljoen *et al.*, 2018; St-Onge *et al.*, 2017; Kelishadi, Mozafarian, Qorbani, Motlagh, Safiri, Ardalan, Keikhah, Rezaei & Heshmat, 2017). Figure 4.5 presents results on the meal patterns of the study group.

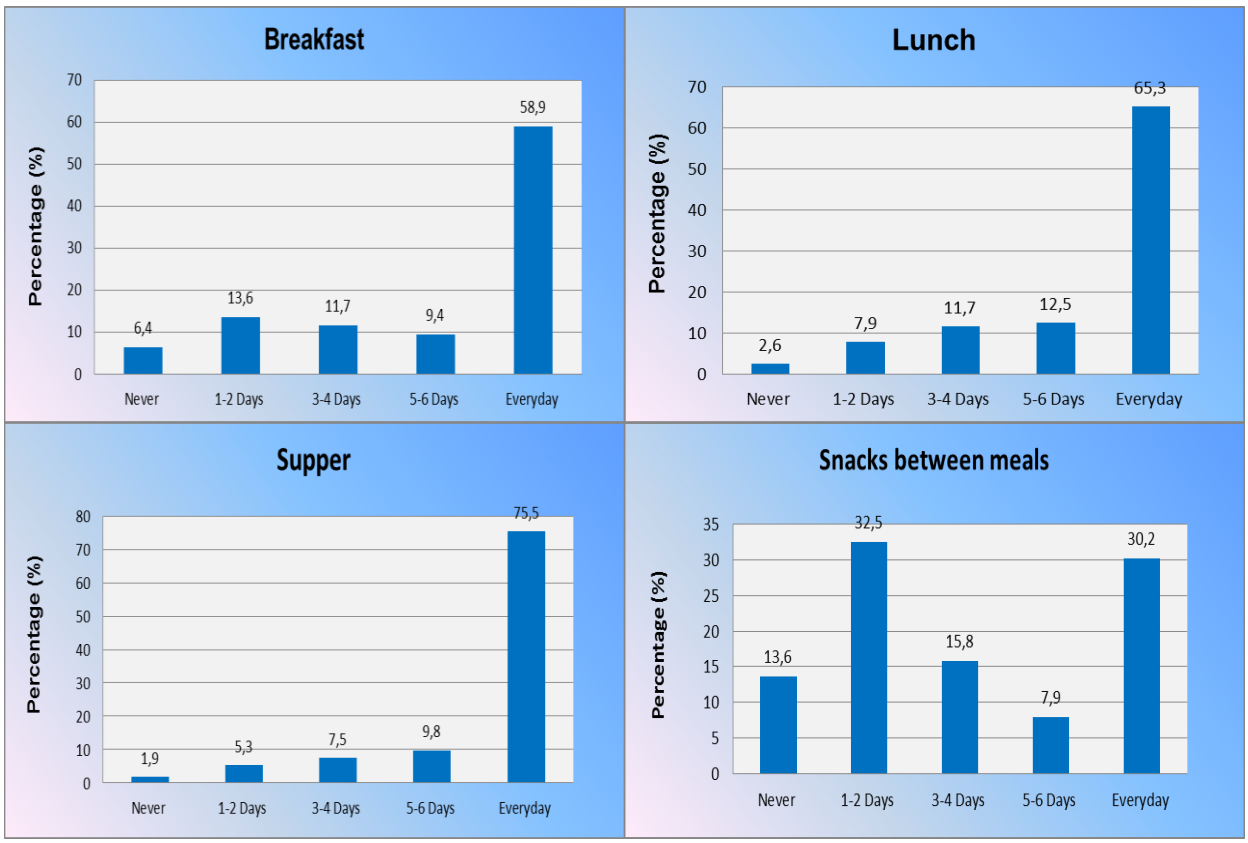


FIGURE 4.5: MEAL PATTERNS OF THE STUDY GROUP (N=265)

Breakfast The majority (58.9%, n=156) of respondents indicated that they eat breakfast every day. Compared to other meals (lunch and supper) the results show that breakfast is skipped more frequently. About 20%, (n=53) of the respondents never eat breakfast or only eat breakfast one to two days a week. These results concur with other studies which suggest that people skip meals due to time constraints associated with personal and social activities (Kelishadi *et al.*, 2017; Lazzeri, Ahluwalia, Niclasen, Pammolli, Vereecken, Rasmussen, Pedersen & Kelly, 2016; Pelletier & Laska, 2012).

Lunch The majority (63.5%, n=173) of respondents usually eat lunch every day, followed by 12.5% (n=33) of respondents who indicated they eat lunch three to four days a week. Less than five per cent (2.6%, n=7) of the respondents indicated they never eat lunch.

Supper The results reveal that supper is the most regularly eaten meal. Three quarters (75.5%, n=200) of respondents indicated that they eat supper every day. This was followed by 9.8% (n=26) of respondents who indicated that they eat supper five to six days a week. Only 1.9% (n=5) of respondents indicated they never eat supper.

Snacks between meals Most of the respondents snack regularly. More than a third (38.1%, n=101) snack more than five days a week, followed by nearly a third (32.5%, n=86) of

respondents who enjoyed snacks at least one to two days a week. Only 13.6% of the respondents indicated they never snack between meals.

Questions were also asked on where and how frequently meals were consumed at certain locations. The results are presented in Figure 4.6.

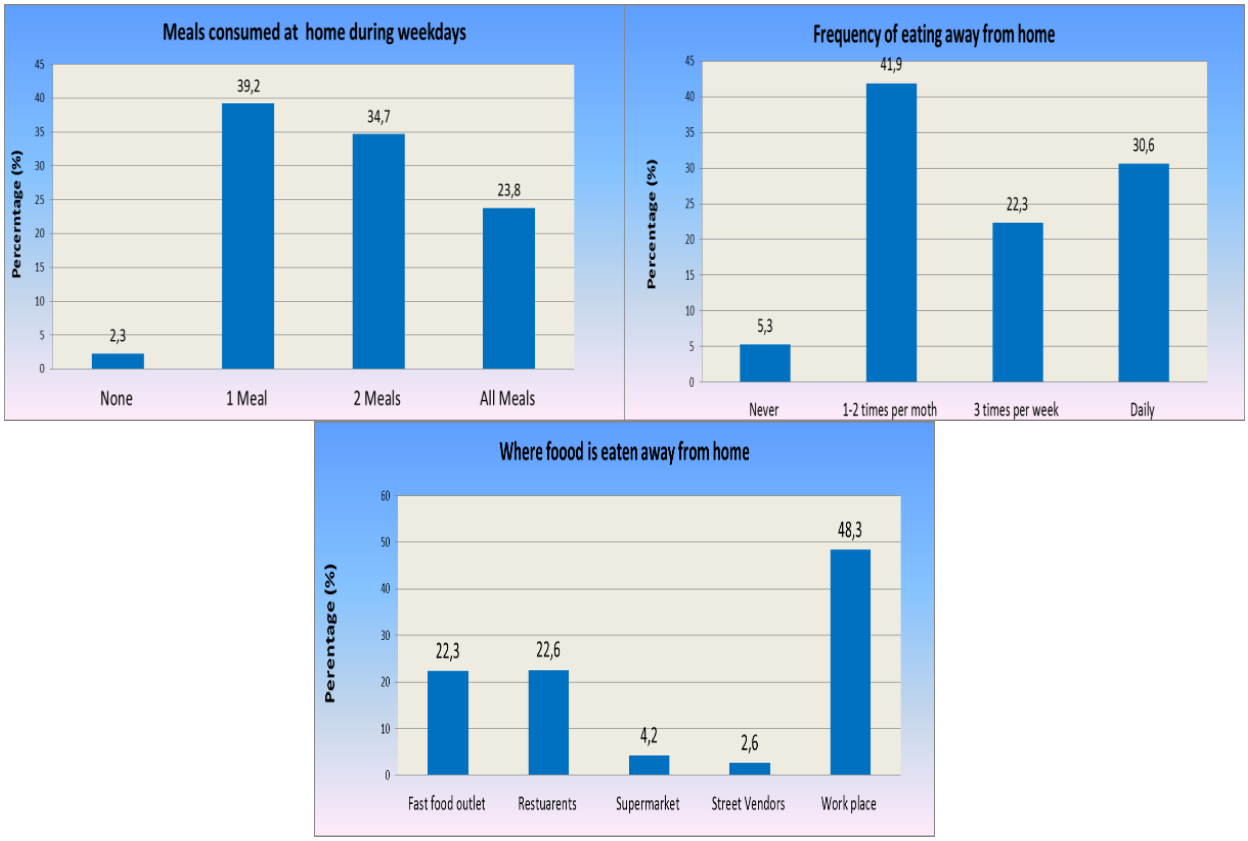


FIGURE 4.6: WHERE AND HOW FREQUENTLY MEALS WERE CONSUMED (N=265)

Meals consumed at home during weekdays The majority of respondents (58.5%, n=155) had at least two meals a day at home during weekdays. It is assumed that the busy lifestyle of urban black adults might contribute to them having two meals at home during weekdays. Most urban, employed people spend a substantial amount of their time at work, and it is assumed that one meal a day is consumed at work (Dolman *et al.*, 2008; Sorensen *et al.*, 2004; Vorster, 2002). More than a third (39.2%, n=104) of respondents had one meal at home during weekdays.

How often meals are eaten away from home Eating away from home has become common practice for urban black people. Studies have found that portion sizes of meals eaten away from home are relatively large compared with home prepared and consumed foods (Janssen, Davies, Richardson & Stevenson, 2017). Almost a third (30.6%, n=81) of respondents indicated eating away from home daily. 41.9% (n=11) of respondents indicated that they eat away from

home at least one to two times a month, and only a few (5.3%, n=14) of respondents indicated that they never eat away from home.

Where food is eaten away from home Nearly half (48.3%, n=128) of respondents indicated that most of their meals eaten away from home are eaten at their workplace, it assumed that persons who work full-time eat at least one meal at the workplace. Almost an equal representation of respondents who eat meals away from home at a restaurant (22.6%, n=60) or fast food outlets (22.3%, n= 59). Less than five per cent (4.2%, n=11) indicated that they purchase food from a supermarket when they eat away from home.

The next sub-objective deals with the diversity of food intake of urban black adults.

4.5.2 The diversity of food intake

As part of the food practices of respondents, what they consumed was also interrogated. The diversity of their food intake was measured using nine food groups, namely: starchy staples, orange-fleshed vegetables, dark green leafy vegetables, other fruits and vegetables, legumes and nuts, fats and oils, meat, poultry and fish, milk and dairy products and eggs, to measure the diversity of their diet (Kennedy *et al.*, 2011:23). The questions on dietary diversity also provided information on the meal composition of respondents. Respondents had to answer either Yes or No to indicate whether they consumed food from each of the listed food groups the previous day. The Dietary Diversity Score (DDS) is meant to reflect the nutritional adequacy of a respondent's diet, and the household's access to a variety of foods. It consists of a count of food groups that an individual has consumed over the preceding 24 hours (Vasileska & Rechkoska, 2012; Kennedy *et al.*, 2011:23). Table 4.22 shows the diversity of selected food groups that formed part of a respondent's meals or snacks the previous day.

TABLE 4.22: FOOD INTAKE DIVERSITY (N= 265)

Food group	Yes		No	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Starchy staples: Maize, rice, wheat, sorghum, bread, pasta and noodles, potatoes, and white sweet potatoes	248	93.6	17	16.4
Orange-fleshed vegetables and fruits: pumpkin, carrots, butternut, orange-fleshed sweet potatoes, yellow peaches, pawpaw, mangoes, plums, spanspek, apricots	173	65.3	92	34.7
Dark green leafy vegetables: spinach, kale, indigenous green leafy vegetables	154	58.1	111	41.9
Other fruits and vegetables: tomatoes, onion, green beans, lettuce, cabbage, broccoli, cauliflower, eggplant, gem squash, beetroot	246	92.8	19.2	7.2
Legumes and nuts: dried beans, dried peas, lentil, nuts, or food made from these items (i.e. peanut butter, hummus)	103	38.9	162	61.1
Fats and oils: oils, fat or butter added to food or used when cooking	201	77.0	61	23.0
Meat, poultry, and fish: beef, pork, mutton or lamb, goat, chicken, duck, fresh, frozen, tinned or dried fish or shellfish	236	89.1	29	10.9
Milk and dairy products: milk, maas, cheese, yoghurt, or any other milk product	211	79.6	54	20.4
Eggs: chicken, duck, or any other egg	145	54.7	120	45.3

Starchy staples Of the 265 respondents, the majority (93.6% n=248) consumed starchy staples (cereals, white roots, and tubers) as part of their meals or snacks the previous day.

Orange-fleshed vegetables and fruits Nearly two-thirds of the respondents (63.5%, n=173) indicated that they consumed orange-fleshed vegetables and fruits as part of their meals or snacks the previous day.

Dark green leafy vegetables More than half of the respondents (58.1%, n=154) indicated that they consumed dark green leafy vegetables as part of their meals or snacks the previous day.

Other fruits and vegetables The majority (92.8%, n=246) of respondents indicated that they included other fruits and vegetables as part of their meals or snacks the previous day.

Legumes and nuts More than half (61.1%, n=162) of the respondents indicated that they did not consume legumes and/ or nuts the previous day.

Fats and oils The majority (77%, n= 204) of respondents indicated that they included fats and oils as part of their meals and snacks the previous day.

Meat, poultry and fish The majority (89.1%, n=236) of respondents included meat, poultry or fish in their meals or snacks the previous day.

Milk and dairy products More than three quarters (79.6%, n=211) of respondents indicated that they consumed milk and dairy products the previous day.

Eggs More than half (54.7%, n=145) of the respondents indicated that they enjoyed eggs as part of their meals or snacks the previous day.

The Dietary Diversity Score was calculated by summing the average number of food groups consumed by the respondents the previous day. The dietary diversity score is a helpful tool that gives an indication of the ability of a household to access a variety of food. Food items consumed were counted only once and a Dietary Diversity Score of less than four indicates an inadequate diet (Ty & Krawinkel, 2016; Kennedy *et al.*, 2011). Table 4.23 shows the distribution of the diversity of food intake of the study group.

TABLE 4.23: FOOD INTAKE DIVERSITY DISTRIBUTION (N= 265)

Number of food groups consumed	Percentage (%)	Frequency (n)
3	2.6	7
4	7.9	21
5	16.6	44
6	23.8	63
7	18.9	50
8	20.0	53
9	10.2	27

Nearly a quarter (23.8%, n=63) of the respondents indicated that they consumed foods from six of the listed nine food groups, followed by 18.9% (n=50) and 20% (n=53) respectively, who consumed foods from seven and eight food groups the previous day. Just over ten per cent (10.2%, n=27) of the respondents indicated that they included all nine food groups, while only 10.5% (n=28) of the respondents indicated that they consumed four or fewer of the nine food groups the previous day. The results obtained reflect a satisfactory diversity of the nine food groups. The respondents' mean Dietary Diversity Score was 6.5, which is quite good compared to the most recent South African National Health and Nutrition Examination Survey (SANHANES-1) which reported a national Dietary Diversity Score of 4.2, which is very close to the cut-off level of 4 for dietary adequacy (Cordero-Ahiman *et al.*, 2017; Ronquest-Ross *et al.*, 2015; Taruvinga *et al.*, 2013; Shisana *et al.*, 2013).

Four other food groups were also included as part of the food groups to measure the diversity of food intake. Although they are not essentially part of the diversity of food intake, they contributed to give a complete account of what is eaten. These food groups included sweets (sugar, honey, sugary foods such as chocolates, candies, cookies, cakes and sugar sweetened beverages such as fizzy drinks and cordials), spices and condiments (spices, salt and pepper,

condiments i.e. tomato sauce, soya sauce and salad dressing), beverages (coffee, tea, herbal teas) and alcoholic beverages (beer, wine, whiskey, brandy, vodka). Table 4.24 shows four other food groups that were also included as part of the food groups.

TABLE 4.24: OTHER FOOD GROUPS (N= 265)

Food group	Yes		No	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Sweets: sugar, honey, sugary foods such as chocolates, candies, cookies, cakes and sugar, sweetened beverages such as fizzy drinks and cordials	148	55.8	117	44.2
Spices and condiments: spices, salt and pepper, condiments (i.e. tomato sauce, soy sauce, salad dressing)	222	83.8	43	16.2
Beverages: coffee, tea, herbal teas	244	92.1	21	7.9
Alcoholic beverages: beer, wine, whiskey, brandy, vodka	45	17.0	220	83.0

Sweets More than half (55.8%, n=148) of the respondents indicated that they enjoyed sweets the previous day, while the other group (44.2%, n=117) indicated that they did not consume sweets the previous day.

Spices and condiments The majority (83.2%, n=222) of respondents indicated that they used spices and condiments as part of their meals or snacks the previous day. 16.2% (n=43) did not consume spices and condiments with their meals or snacks the previous day.

Beverages A high percentage (92.1%, n=244) of respondents indicated that they did include beverages as part of meals and snacks the previous day. Only a few (7.9%, n=21) respondents indicated that they did not include beverages the previous day as part of meals and snacks.

Alcoholic beverages The majority (83%, n=220) of respondents indicated that they did not include alcoholic beverages as part of their meals and snacks the previous day. Only a few (17%, n=45) respondents indicated that they did consume alcoholic beverages as part of their meals or snacks the previous day. This study concurs with other South African studies which have also shown an under-reporting of alcohol consumption (Farham, 2018; Vellios & Van Walbeek, 2018; Boniface, Kneale & Shelton, 2014).

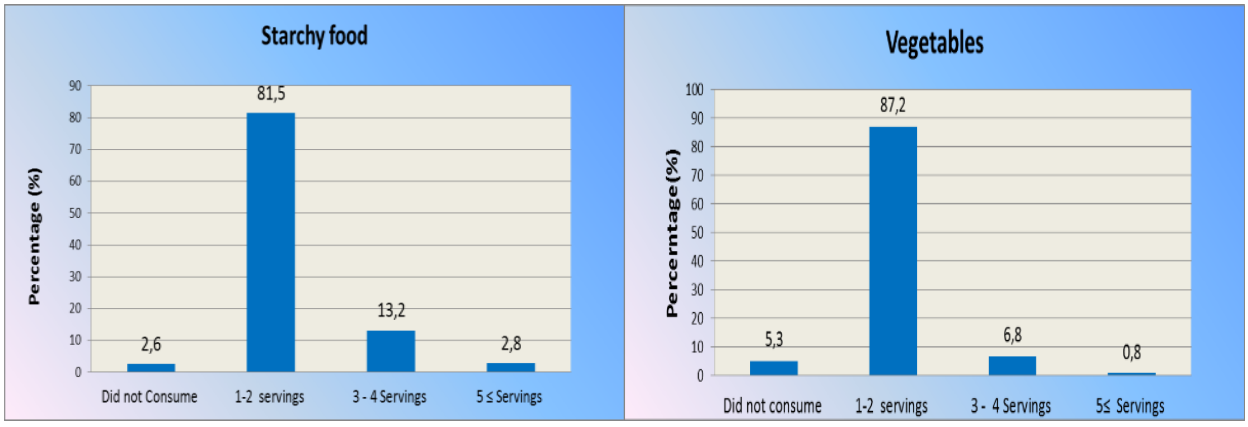
The next sub-objective dealt with the number of servings of food consumed a day. This was done to determine the number of servings from the different food groups consumed per day.

4.5.3 Number of servings of food consumed a day

The respondents were asked to indicate the number of servings of food they consumed each day, to determine the approximate number of servings they consumed of the various food groups (See Addendum C, Section C17 for questionnaire). A serving guide was provided for each item in the group to determine the approximate serving quantity the respondents consumed. The results are presented in Figures 4.7, 4.8 and 4.9.

Starchy food (1 slice of bread, ½ a cup of rice, pasta porridge) Although the majority (81.5%, n=216) of respondents consumed 1-2 servings of starchy food each day, only (16%, n=41) of respondents consumed three or more servings. Starchy food should be part of most meals, since they are the main source of energy and they also contribute to the micronutrient and dietary fibre intake (Vorster *et al.*, 2013).

Vegetables and fruits (½ cup cooked vegetables, ½ cup chopped fruit) The majority of respondents indicated that they had at least one to two servings (87.2%, n=231) of vegetables. Less than ten per cent (7.6%, n=20) of respondents had three or more servings of vegetables. The mean vegetable consumption was 1.5 servings a day. Three quarters (75.1%, n=199) of respondents indicated they had one to two servings of fruits, while 16.3% (n=43) indicated they had more than three servings of fruits. The mean consumption of fruits was 2.0 servings a day. The consumption of fruit and vegetables is low according to several international guidelines that recommend the consumption of two servings of fruits and three servings of vegetables a day (Miller, Yusuf, Chow & Dehghan, 2016 ; Vorster *et al.*, 2013).



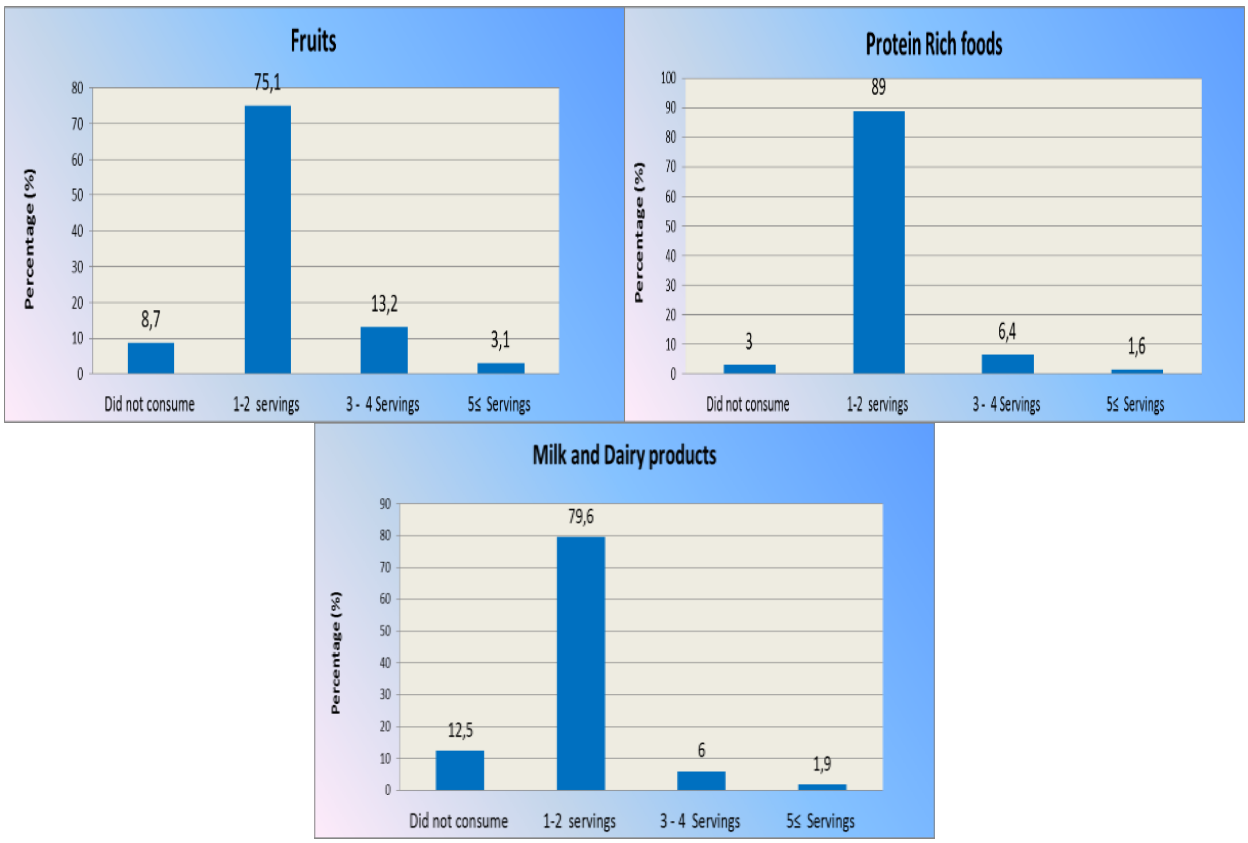


FIGURE 4.7: NUMBER OF DAILY SERVINGS OF ESSENTIAL FOODS (N=265)

Protein-rich food (palm size) The majority (89%, n=236) of respondents indicated that they had 1-2 servings of protein-rich food. However, less than ten per cent (8%, n=21) of the respondents indicated they consumed more than three servings of protein-rich food per day.

Milk and dairy products (1 cup milk, 1 cube of 30mmm cheese) The majority (79.6%, n=211) of the respondents indicated that they consumed at least 1-2 servings of milk and dairy products a day. 12.5% (n=33) of respondents indicated that they never consumed milk.

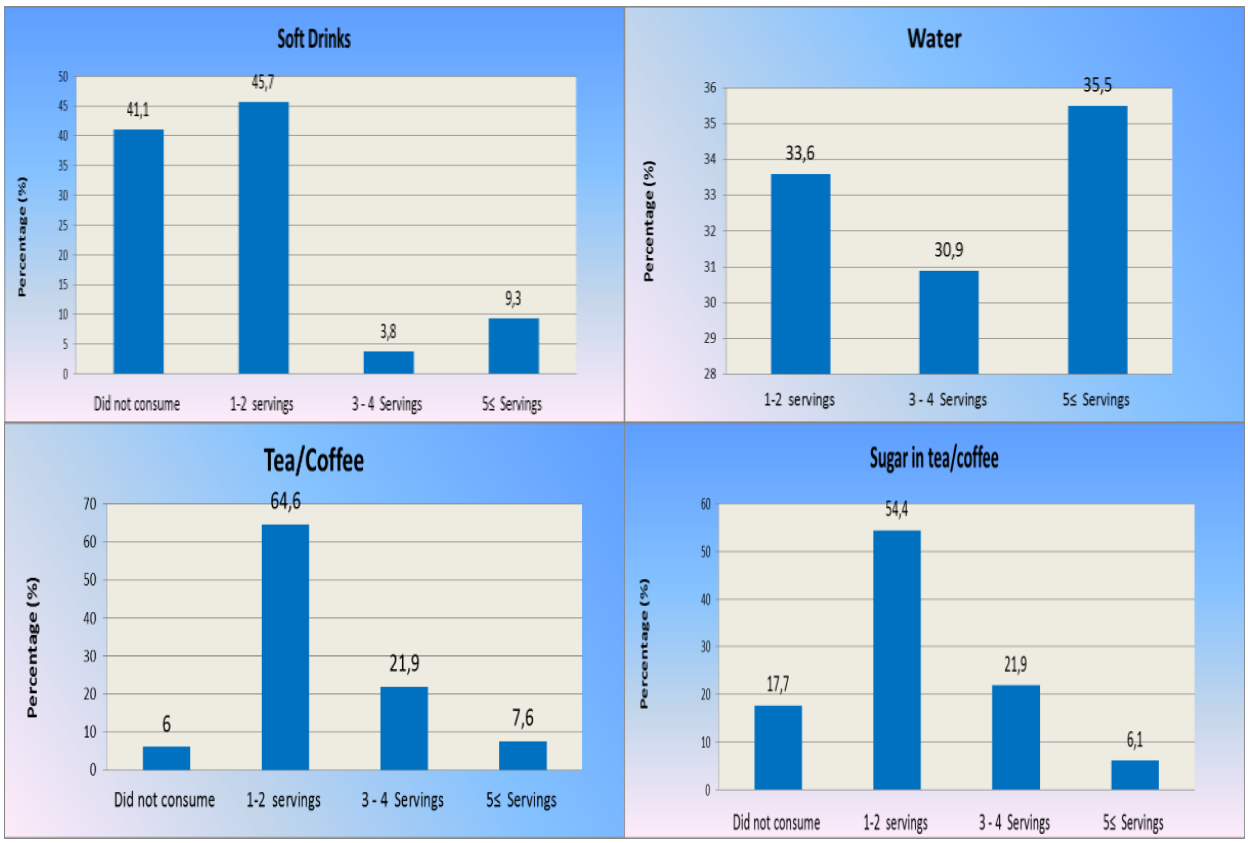


FIGURE 4.8: NUMBER OF DAILY SERVINGS OF BEVERAGES AND SUGAR IN TEA/ COFFEE (N=265)

Soft drinks (340 ml can) Nearly half (45.7%, n=121) of respondents consumed 1-2 servings of soft drinks each day. More than ten per cent (13.1%, n=35) of the respondents indicated they had three or more servings of soft drinks each day.

Water (1cup/ 1glass) The results show that only 35.5% (n=94) of respondents had five or more servings of water per day. The majority (64.5%n=171) of respondents consumed between 1-4 servings of water per day.

Tea or coffee (1 cup) The majority (64.6%, n=171) of the respondents consumed 1-2 servings of tea or coffee daily. Nearly a third (29.5%, n=78) indicated that they had three or more servings of tea or coffee per day.

Sugar in tea or coffee (**1 teaspoon)** The majority (54.4%, n=144) of the respondents indicated that they had 1-2 servings of sugar in their tea or coffee daily. Nearly a third (28%, n=74) of the respondents indicated that they had three or more servings of sugar in their tea or coffee per day.

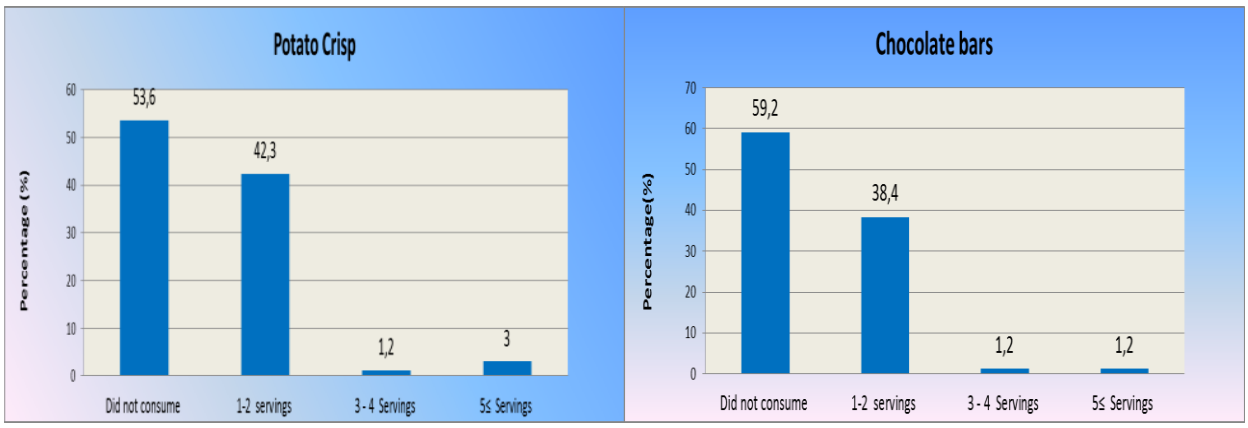


FIGURE 4.9: NUMBER OF DAILY SERVINGS OF POTATO CRISPS AND CHOCOLATE BARS (N=265)

Potato crisp (1 small packet 35g) A moderate percentage (42.3%, n=112) of the respondents indicated that they consumed 1-2 servings of potato crisps each day, while only 4.2% (n=11) indicated that they consume three or more servings of potato crisps per day.

Chocolate (1 bar) More than a third (38.4%, n=102) of the respondents consumed 1-2 servings of chocolate each day. About 2.4% (n=6) of the respondents had more than three servings of chocolate bars each day.

The next sub-objective related to the food practices of urban black adults dealt with the frequency of consumption of food.

4.5.4 Frequency of consumption of food

Consumption frequency of specific food items was ascertained by asking respondents how often they consumed food from selected food groups (See Addendum C, Section C18 of the questionnaire). This also served as a cross-check to determine the types of food consumed. The following frequency intervals were used: daily, 3-4 times per week, 1-2 times per week, seldom and never were used.

Figure 4.10 shows the frequency of consumption of protein-rich food. Meat has always been an important part of a diet and remains and remains central in most meals. The food based dietary guidelines South Africa recommend that Lean meat chicken fish or eggs can be eaten daily (Vorster *et al.*, 2013).

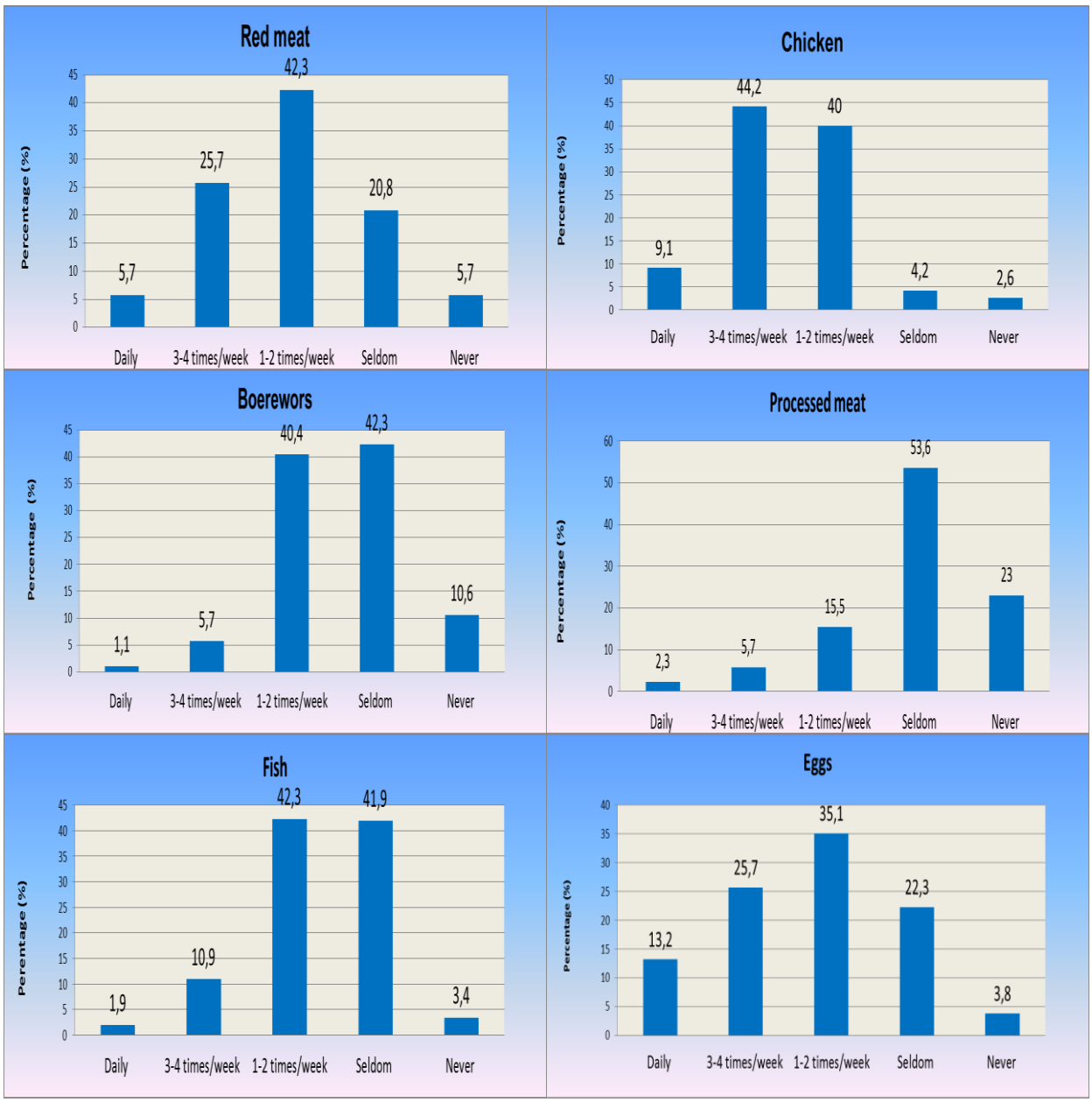


FIGURE 4.10: FREQUENCY OF CONSUMPTION OF PROTEIN-RICH FOODS (N=265)

Red meat The majority (73.7%, n=195) of respondents consumed red meat at least once a week. Most (42.3%, n=112) of the respondents consumed red meat 1-2 times a week, followed by a quarter (25.7%, n=68) of the respondents who consumed red meat 3-4 times a week. Just over five per cent (5.7%, n=15) of respondents indicated that they never consume red meat. The consumption of red meat has decreased in South Africa compared to the consumption of chicken. This may be due to the fact that red meat is more expensive when compared to chicken (Valentina, Borra, Verduna & Massaglia, 2017; Larsson & Orsini, 2014; Schönfeldt, Pretorius & Hall, 2013).

Chicken The results showed that chicken was more frequently consumed than other protein-rich foods. The majority (93.3%, n=247) of respondents indicated that they consume chicken at

least once a week. A moderate proportion (44.2%, n=117) of respondents consumed chicken 3-4 times a week, followed by 40% (n=106) of respondents who consumed chicken 1-2 times a week. Nearly ten per cent (9.1%, n=24) of respondents indicated that they consumed chicken daily. Chicken is the leading protein-rich food consumed in South Africa, which could be attributed to the fact that chicken is affordable and accessible compared to other protein-rich foods. The findings of this study concur with other studies conducted in South Africa which shows that chicken was the most frequently consumed protein-rich food in South Africa (Tydeman-Edwards, Van Rooyen & Walsh, 2018; Schönfeldt *et al.*, 2013; Vorster *et al.*, 2013).

Boerewors A moderate proportion (42.3%, n=112) of respondents indicated that they seldom consumed boerewors, followed by 40.4% (n=107) who indicated that they consumed it 1-2 times a week. Just over ten per cent (10.6%, n=28) of the respondents indicated that they never consumed boerewors.

Processed meat The study results indicated that processed meat was not frequently consumed. This could be due to the fact that processed meats are more expensive than fresh meat due to undergoing various preservation methods such as heating, air drying, salting or smoking (Schönfeldt *et al.*, 2013). Figure 4.10 further shows that a fair proportion (53.6%, n=142) of respondents seldom consumed processed meat, followed by 23% (n=61) of respondents who indicated they never consumed processed meat.

Fish Fish was not as frequently consumed in comparison to red meat and chicken. Nearly half (42.3%, n=112) of the respondents indicated that they consumed fish 1-2 times a week, while nearly the same percentage of respondents who seldom consumed fish (41.9%, n=111).

Eggs A sizeable proportion (38.9%, n=103) of the respondents indicated that they consumed eggs more than three times a week. More than a third (35.1%, n= 93) of the respondents indicated that they consumed eggs 1-2 times a week, only 3.8% (n=10) of respondents indicated they never consumed eggs.

Figure 4.11 illustrates responses about the frequency of consumption of milk and other dairy products.

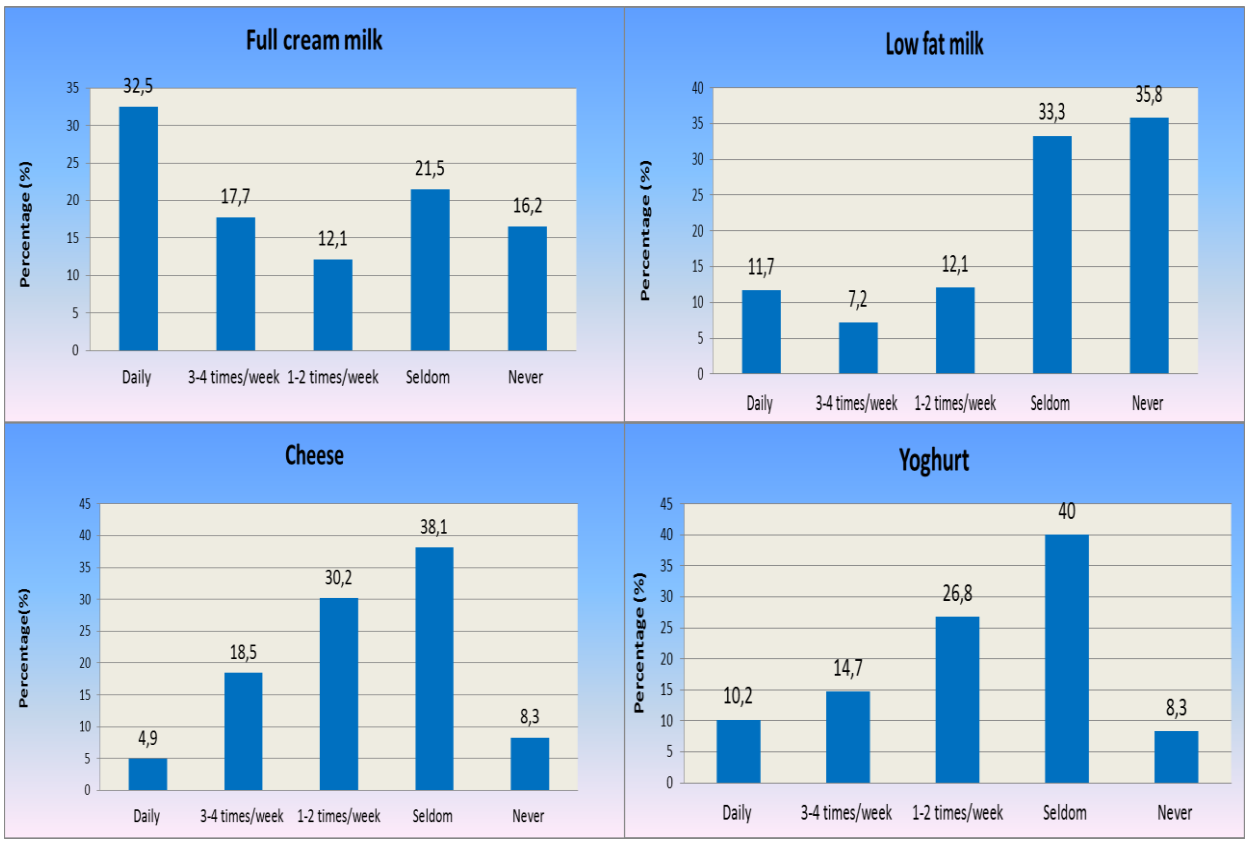


FIGURE 4.11: FREQUENCY OF CONSUMPTION OF MILK AND DAIRY PRODUCTS (N=265)

Milk and dairy products Full cream milk was more frequently consumed compared to low fat milk. 50.2% (n=133) of respondents indicated that they consumed full cream milk more than three times week, while 16.2% (n=43) of respondents indicated that they never consumed full cream milk. Nearly twenty per cent (18.9%, n=50) of the respondents indicated that they consumed low fat milk more than three times a week. Just over a third (35.8%, n=95) of the respondents indicated that they never consumed low fat milk.

Although 8.3% (n=22) never consumed cheese, and more than a third (38.1%, n=101) of respondents indicated that they seldom consumed cheese, nearly a quarter (23.4%, n=62) of respondents indicated that they consumed cheese more than three times a week. The results show that the majority (53.6%, n=142) of respondents consumed cheese at least once a week. More than a third (40%, n=106) of the respondents seldom consumed yoghurt, followed by just over a quarter (26.8%, n=71) of respondents who indicated that they consumed yoghurt 1-2 times a week, while another quarter (24.9%, n=66) of the respondents indicated that they consumed yoghurt more than three times a week.

The frequency of consumption of fruits and vegetables is given in Figure 4.12.

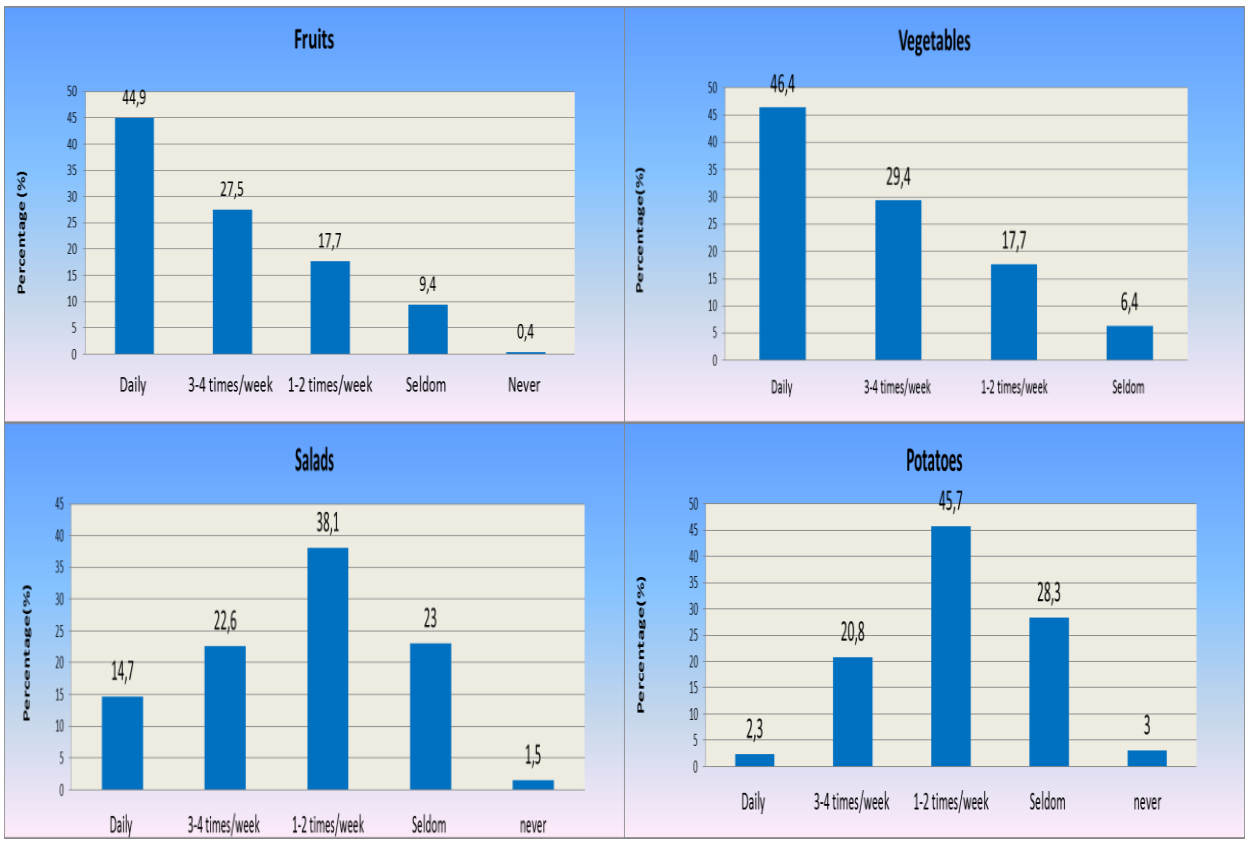


FIGURE 4.12: FREQUENCY OF CONSUMPION OF FRUITS AND VEGETABLES (N=265)

Fruits and vegetables Respondents had to indicate how frequently they consumed fruits, vegetables, and salad. The results show that less than half (44.9%, n=119) of respondents consumed fruits daily, while more than half of respondents indicated that they do not consume fruits (55%, n=146) and vegetables (53.5%, n=142) daily. Figure 4.12 further reveals that the majority (85.3%, n=226) of respondents also do not consume salads daily, and that only 14.7% (n=39) consumed salads daily. Just over two thirds (68.8%, n=182) of respondents consumed potatoes at least once a week, while 3% (n=8) indicated that they never consume potatoes.

Studies have shown that the adequate consumption of fruits and vegetables reduces the risk of cardiovascular diseases, stomach cancer and colorectal cancer (Darfour-Oduro, Buchner, Andrade & Grigsby-Toussaint, 2018; Menezes, Costa, Oliveira & Lopes, 2017). The results of this study correlate with other studies which indicate that people in urban areas appear to consume fruits and vegetables almost every day. This supports an assumption that urban food environments are generally characterised by more readily available fresh fruit and vegetables as a result of effective refrigeration and storage facilities, and easy access for consumers to supermarkets (Miller *et al.*, 2016 ; Ronquest-Ross *et al.*, 2015; Shisana *et al.*, 2014).

The frequency of consumption of fats and oil is presented in Figure 4.13.

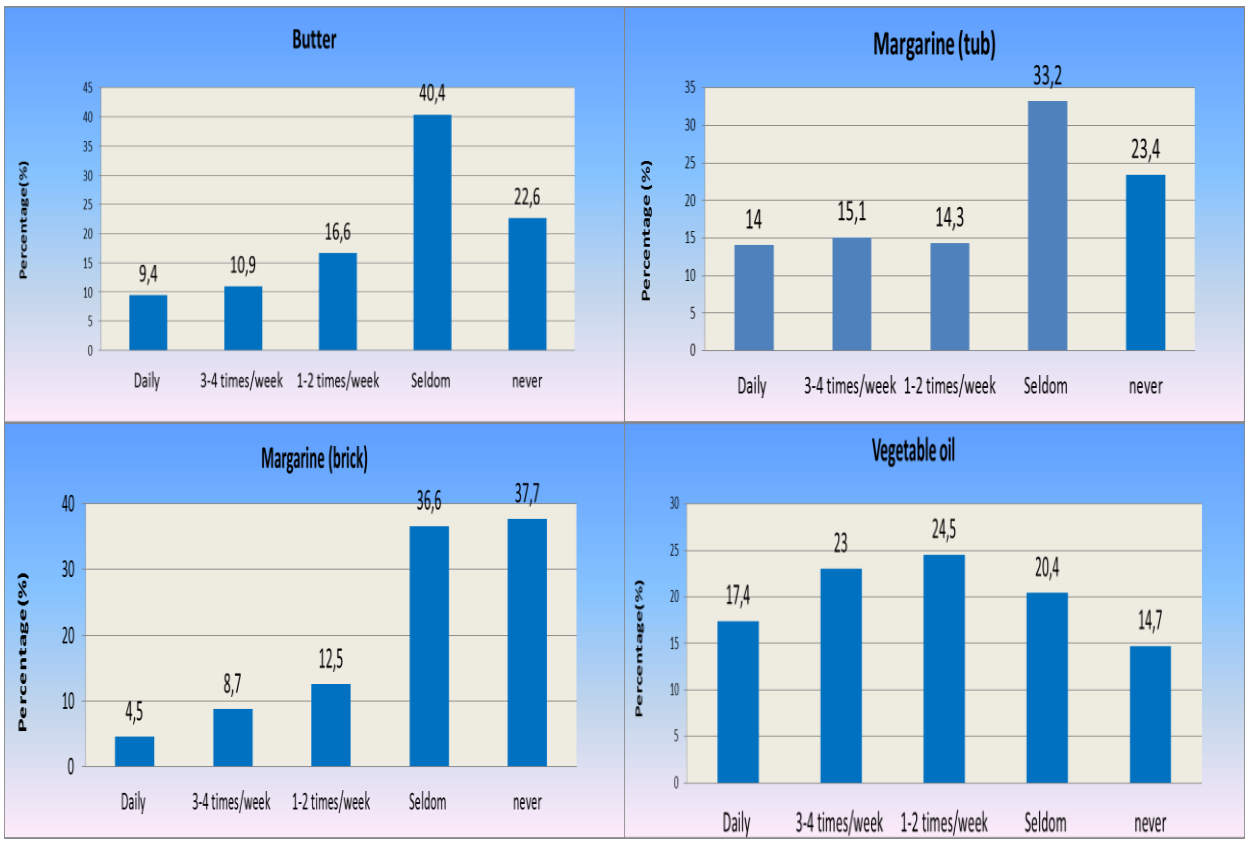


FIGURE 4.13: FREQUENCY OF CONSUMPTION OF FATS AND OIL (N=265)

Fats and oil The fats and oil food group includes butter, tub margarine, brick margarine and vegetable oil. Slightly more than one third (36.9%, n=98) of respondents indicated that they consume butter at least once a week, while 22.6% (n=60) indicated that they never consumed butter. The results further reveal that a fair proportion (43.4%, n=115) of respondents consumed tub margarine at least once a week, and that nearly a quarter (23.4%, n= 62) of respondents indicated that they never consumed tub margarine. The results show that slightly more than one third (37.7%, n=100) of respondents never consumed brick margarine, and that slightly more than a quarter (25.7%, n=68) consumed brick margarine at least once a week.

40.4% (n=107) of respondents indicated that they consumed vegetable oil more than three times a week, while a relatively small proportion 14.7% (n=39) indicated that they never consumed vegetable oil.

The results show that vegetable oil was consumed by a higher proportion of respondents than other fats, and more frequently. This corresponds with the Food Based Dietary Guidelines for South Africa (FBDG), which recommend more frequent consumption of vegetable oils rather than hard fats (Vorster *et al.*, 2013).

Figure 4.14 shows responses to questions about consumers' consumption of breads and cereals.

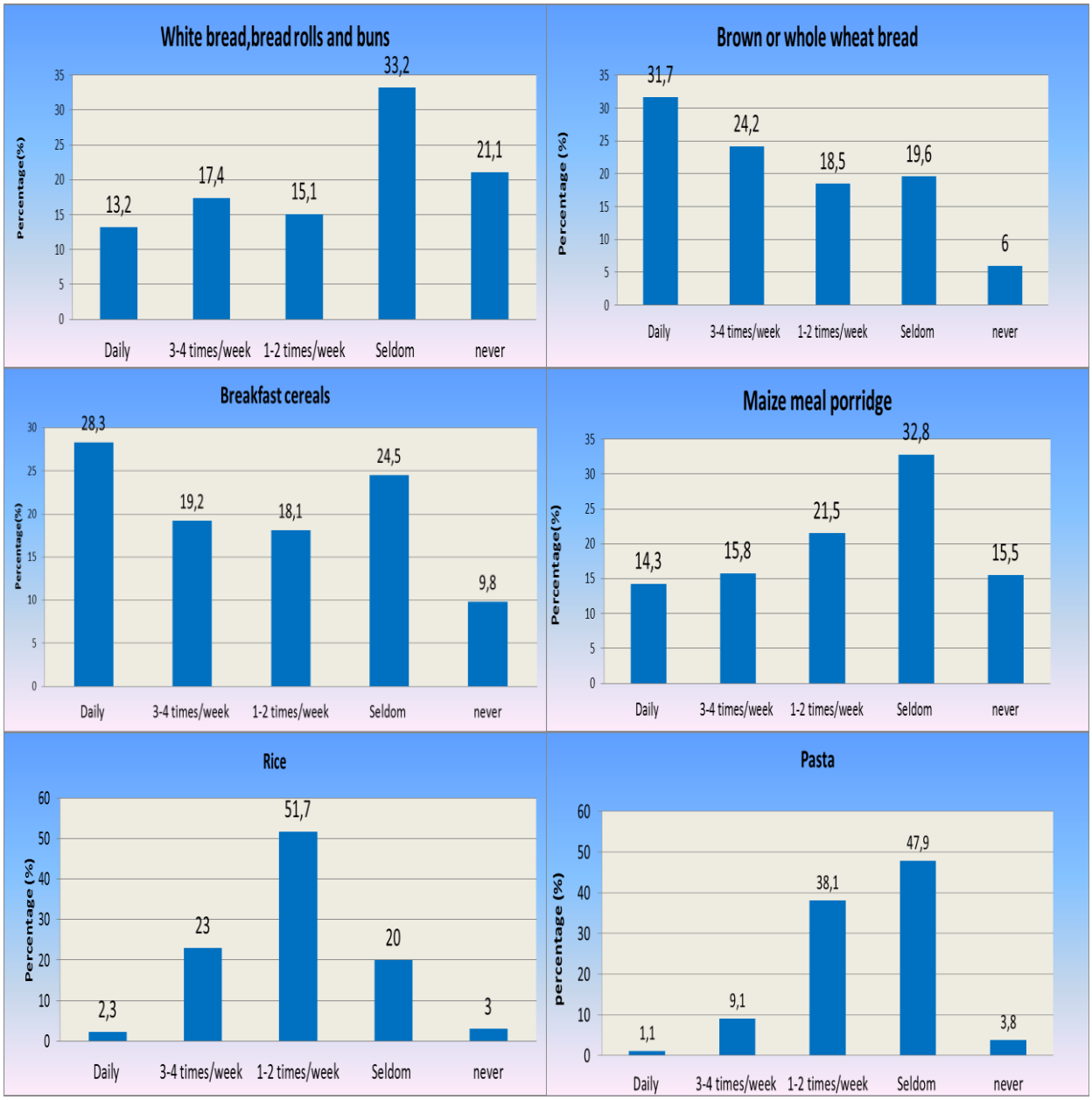


FIGURE 4.14: FREQUENCY OF CONSUMPTION OF BREADS AND CEREALS (N=265)

Breads and cereals This food group includes white bread, rolls, or buns, brown or whole wheat bread, breakfast cereals, maize meal, rice and pasta. Although nearly half (45.7%, n=121) of the respondents indicated that they consume white bread, rolls, or buns at least once a week, 21.1% (n=56) indicated that they never consume white bread, rolls or buns. More than half (55.9%, n=148) of respondents consume brown or whole wheat bread more than three times a week, while 6% (n=16) of respondents reported never consuming brown or whole wheat bread. The results show that white bread, rolls, or buns were not as frequently consumed as brown or whole wheat bread. This can be attributed to the fact that brown bread is cheaper and tastier compared to white bread (Helena, 2018; Viljoen *et al.*, 2005).

The results further reveal that nearly half (47.5%, n=126) of respondents consume breakfast cereals more than three times a week, while almost a quarter (24.5%, n=65) of respondents indicated that they seldom consume breakfast cereals. The frequent consumption of breakfast cereals can be attributed to the fact that they are quick and easy to prepare.

Although nearly a third (30.1%, n=80) of respondents consume maize meal porridge more than three times a week, a slightly higher proportion (32.8%, n=87) seldom consume maize meal porridge. Almost a quarter (21.5%, n= 57) consume maize meal porridge 1-2 times a week, while only 15.5% (n=41) of respondents never consume maize meal porridge. The results are consistent with other food consumption surveys conducted in South Africa, which show that the frequency of black South African consumers' maize meal consumption has decreased. This trend is expected to continue as these consumers will continue to favour convenient food items as their household incomes increase (Ronquest-Ross *et al.*, 2015; Shisana *et al.*, 2013; Viljoen *et al.*, 2005).

The results also show that more than three quarters (77%, n=204) of respondents consumed rice at least once a week. This observation concurs with other studies that identified an increase in the consumption of rice in urban black consumers' food practices. This may be because rice has a fairly short cooking time and require less active attention when cooking, compared to maize meal (Tydeman-Edwards *et al.*, 2018; Ronquest-Ross *et al.*, 2015). Only 3% (n=8) of respondents indicated that they never consume rice.

The consumption frequency of pasta is also noteworthy. An increase in the consumption of pasta is observed, probably because of its convenience, affordability and ease of preparation (Ronquest-Ross *et al.*, 2015; Shisana *et al.*, 2014; Krishnan & Prabhasankar, 2012). Nearly half (48.3%, n=128) of respondents indicated that they consumed pasta at least once a week, while only a few (3.8%, n=10) indicated that they never consumed pasta.

The results on the consumption of breads and cereals show a shift in the consumption of staple foods. While previously the staple food was maize meal, the consumption of rice and pasta now seems to be much more prominent (Popkin, 2017; Ronquest-Ross *et al.*, 2015).

The frequency of consumption of legumes and nuts is presented in Figure 4.15

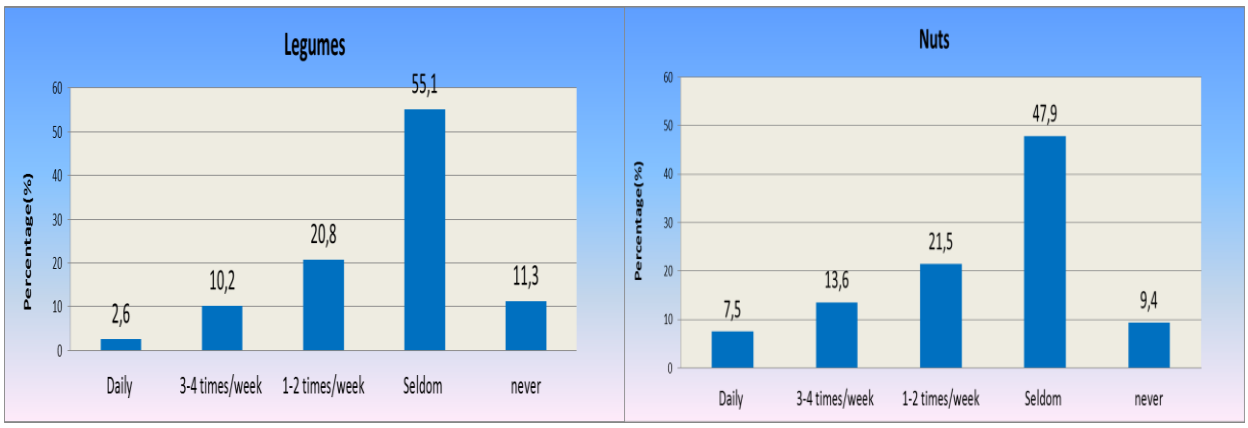


FIGURE 4.15: FREQUENCY OF CONSUMPTION OF LEGUMES AND NUTS (N=265)

Legumes and nuts The consumption of legumes and nuts seems to be declining. The majority (55.1%, n=146) of respondents seldom consume legumes, while a relatively small proportion (11.3%, n=30) of respondents indicated that they never consume legumes. Only a very small proportion (2.6%, n=7) consume legumes daily.

The results further show that nearly half (47.9%, n=127) of respondents seldom consume nuts. Only 21.1% of respondents consume nuts more than three times a week, while less than ten per cent (9.4%, n=25) of respondents indicated that they never consume nuts.

These results concur with other South African studies which show the same tendency of a decreasing consumption of plant protein foods such as legumes and nuts. This can be attributed to the long time required to prepare legumes, and the relatively high cost of nuts (Ronquest-Ross *et al.*, 2015; Micha, Khatibzadeh, Shi, Andrews, Engell & Mozaffarian, 2015).

Figure 4.16 gives the frequency of consumption of beverages.

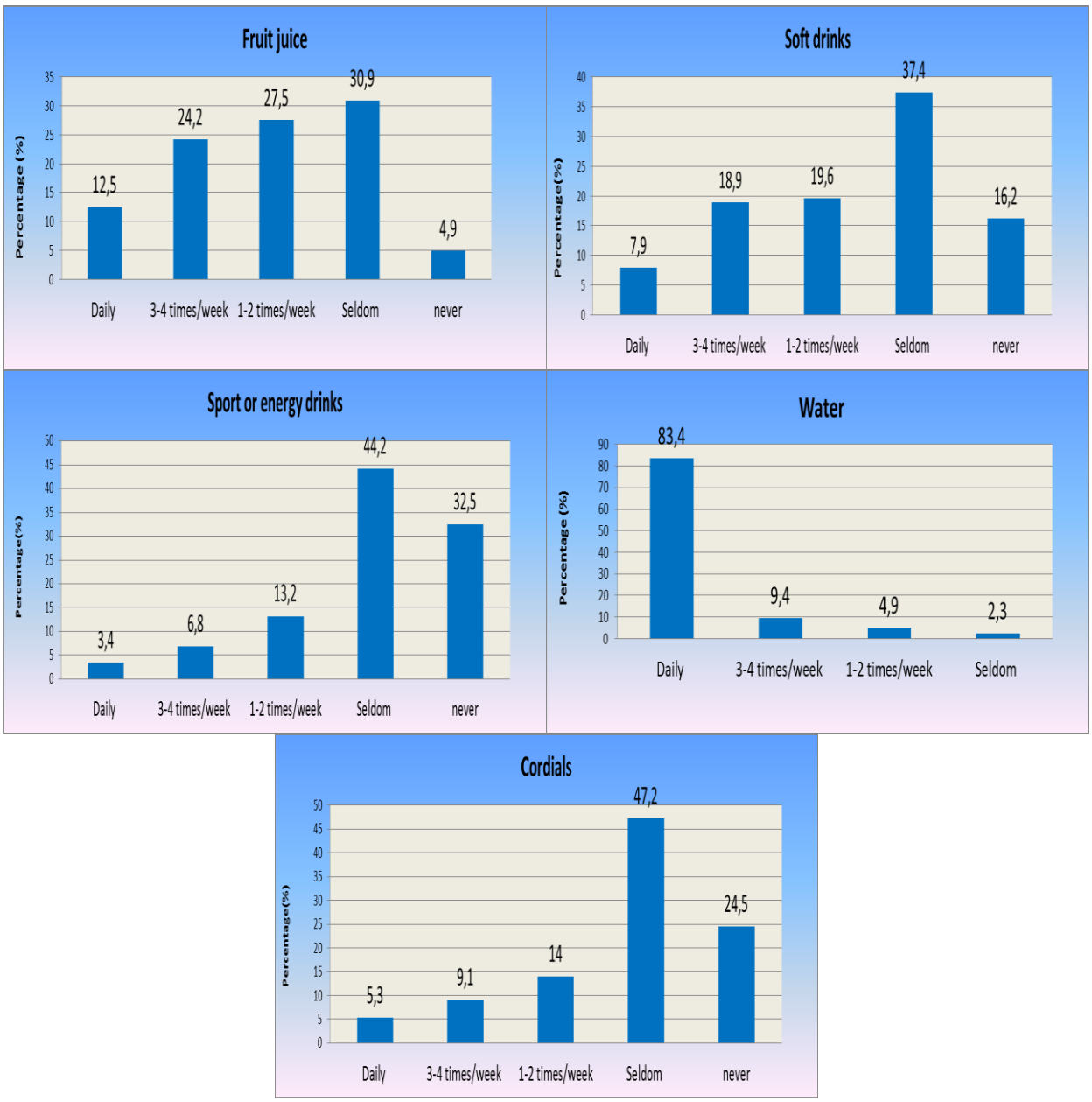


FIGURE 4.16: FREQUENCY OF CONSUMPTION OF BEVERAGES (N=265)

Beverages The beverages food group included fruit juice, soft drinks, sport or energy drinks, water, and cordials. The majority (64.2%, n= 170) of respondents indicated that they consume fruit juice at least once a week, while a relatively small percentage (4.9%, n=13) indicated that they never consume fruit juice. Almost half (46.6%, n=123) of respondents indicated that they consume soft drinks at least once a week, while 16.2 % (n= 43) of respondents indicated that they never consume soft drinks. Nearly half (44.2%, n=117) of respondents indicated that they seldom consume sport or energy drinks. Almost a quarter (23.4%, n=62) of respondents indicated that they consume sport or energy drinks at least once a week. The results further reveal that a third (32.5%, n=86) of respondents never consumed sport or energy drinks. It is possible that sport and energy drinks were not frequently consumed by the majority of

respondents because they are expensive. (Stacey, van Walbeek, Maboshe, Tugendhaft & Hofman, 2017; Ibrahim & Iftikhar, 2014)

The results show that water was consumed daily by the majority (83.4%, n=221) of respondents. This may be due to better consumer education about nutrition and healthier beverage options, such as bottled water (Shisana *et al.*, 2013). Only 14.3% (n=44) of respondents indicated that they did not consume water daily. Almost half (47.2%, n=125) of respondents seldom consume cordials, while nearly a third (28.4%, n=75%) consume cordials at least once a week. A quarter (24.5%, n=65) of respondents indicated that they never consume cordials.

The consumption frequency of takeaway and fast food is presented in Figure 4.17.

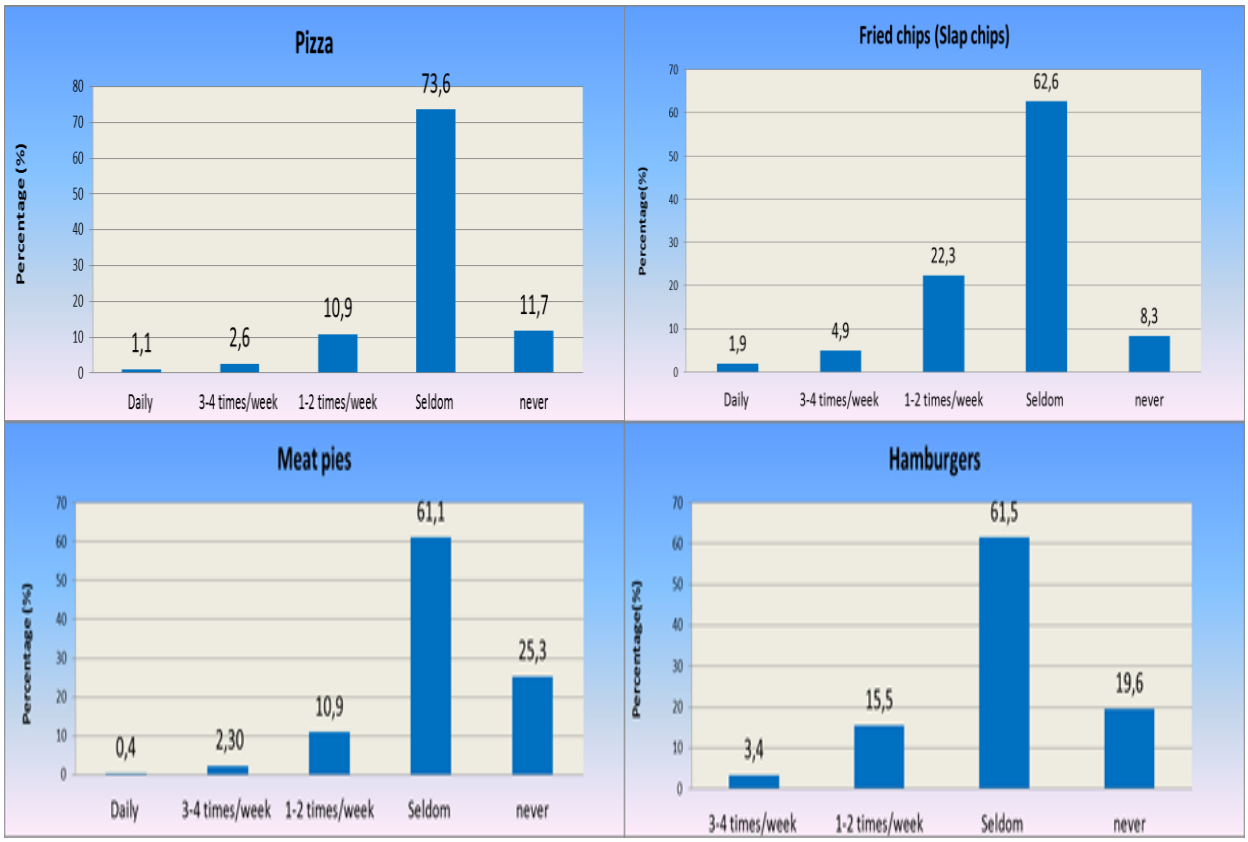


FIGURE 4.17: FREQUENCY OF CONSUMPTION OF TAKEAWAY AND FAST FOOD (N=265)

Takeaway and fast food The takeaway and fast food group included fried chips (slap chips), meat pies, pizza, and hamburgers. The results show that almost three quarters (73.6%, n=195) of respondents seldom consume pizza, 14.4% (n=39) of respondents indicated that they consume pizza at least once a week, and a further 11.7% (n=31) never consumed pizza.

Nearly a third (29.1%, n=77) of respondents consume fried chips (slap chips) at least once a week. Less than ten per cent (8.3%, n=22) of respondents indicated that they never consume fried chips (slap chips). The majority of respondents indicated that they seldom consume meat pies (61.1%, n=162) and hamburgers (61.5%, n=163). Only relatively small percentages of respondents indicated that they consume meat pies (13.6%, n=36) and hamburgers (18.9%, n=50) at least once a week.

South African studies have shown an increase in the consumption of takeaway and fast food. This increase can be ascribed to the increased prevalence of fast food outlets at convenient locations with extended operating hours and drive-through facilities, as well as increasingly convenient delivery options (Janssen, Davies, Richardson & Stevenson, 2018; Sedibe *et al.*, 2014). Figure 4.18 depicts the frequency of consumption of snack foods.

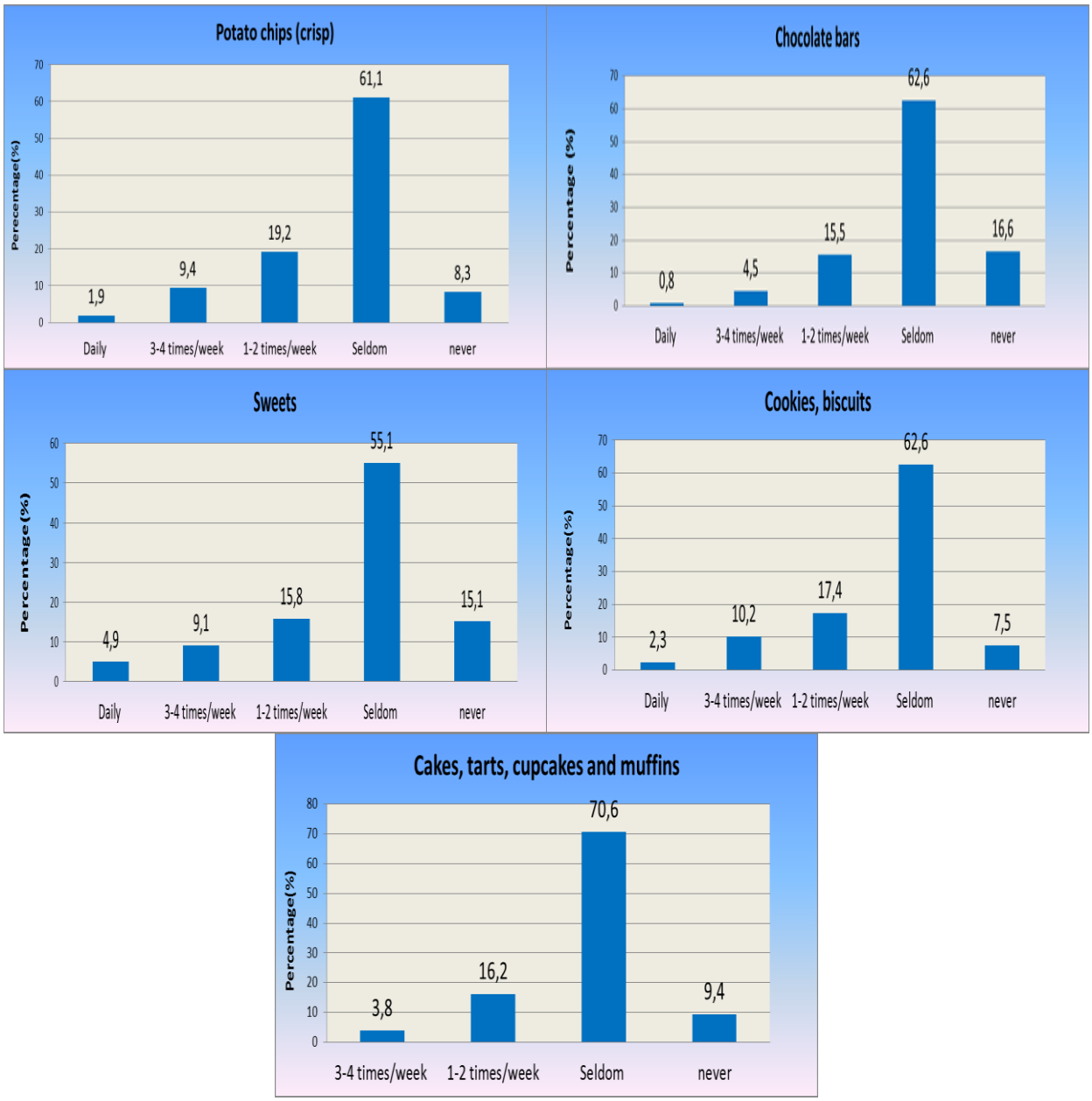


FIGURE 4.18: FREQUENCY OF CONSUMPTION OF SNACK FOODS (N=265)

Snack foods This food group incorporates potato chips (crisps), chocolate bars, sweets, cookies and biscuits, cakes, tarts, cupcakes, and muffins. Although the majority (61.1%, n=162) of respondents seldom consume potato chips (crisps), nearly a third (30.5%, n=81) indicated that they consume potato chips (crisps) at least once a week. Less than ten per cent (8.3%, n= 22) indicated that they never consume potato chips (crisps).

Nearly two thirds (62.6%, n=166) of respondents seldom consume a bar of chocolate, while 20.8% (n=55) of respondents indicated that they consume a chocolate bar at least once a week. More than half (55.1%, n= 146) of respondents indicated that they seldom consume sweets, and nearly a third (29.8%, n=79) consume sweets at least once a week. Only 15.1% (n=40) of respondents never consumed sweets.

The results further reveal that nearly two thirds (62.6%, n=166) of respondents seldom consume cookies or biscuits, while nearly a third (29.9%, n=79) of respondents consume cookies or biscuits at least once a week. The majority (70.6%, n=187) of respondents indicated that they seldom consume cakes, tarts, cupcakes, and muffins. Nearly a quarter (20%, n=53) of respondents indicated that they consume cakes, tarts, cupcakes, and muffins at least once a week. Only 9.4% (n=25) indicated that they never consume cakes, tarts, cupcakes, and muffins.

To determine adherence to the Food Based Dietary Guidelines for South Africa, a summary on adequacy of food consumption will be given in the next section.

4.5.4.1 Adequacy of food consumed

Table 4.25 summarises results on the adequacy of the study group's dietary diversity and their adherence to the Food Based Dietary Guidelines for South Africans, as measured through the Food Frequency Questionnaire (FFQ).

TABLE 4.25: SUMMARY ON ADEQUACY OF FOOD CONSUMPTION

Food Group	Consumed the previous day	Food Frequency Questionnaire	Notes
STARCHY FOODS	93.6%	Consumption varied but confirmed daily	
FRUITS, VEGETABLES AND SALADS Orange-fleshed vegetables and fruits: Dark green leafy vegetables Other fruits and vegetables	65.3% 58.1% 92.8%	46% of the respondents consumed fruits and vegetables daily. Most respondents consumed fruits and vegetables at least once a week, or even more seldom.	Fruits and vegetables should be consumed every day. Although more than half of the respondents consumed fruits and vegetables the previous day as shown by their dietary diversity responses, the majority did not consume these items daily.
FATS AND OILS	77.0%	Consumption varied	Vegetable oil was consumed frequently by most respondents.
LEGUMES AND NUTS	38.9%	51.5% of respondents seldom consumed legumes and nuts.	
FATS AND OILS	77.0%	Consumption varied	Vegetable oil was consumed frequently by most respondents.
PROTEIN-RICH FOODS Meat, fish, chicken	81.9%	Varied, but not daily	Chicken was the most frequently consumed protein-rich food.
Eggs	54.7%	74% of respondents consumed eggs at least once a week.	Eggs were frequently consumed by most respondents.
MILK AND DAIRY PRODUCTS	76.6%	Fairly frequently consumed by most respondents	Full cream milk was consumed by a third (35.5%, n=86) of respondents daily.

Most respondents included starchy food as part of their meals the previous day. Although starchy food was part of most respondents' meals the previous day, the number of servings was lower than the expected three to four servings a day.

Fruits and vegetables were included by most of the respondents the previous day. However, the low quantities of fruit and vegetables – one to two servings only – were of concern. It appears that most respondents were unaware of the Food Based Dietary Guidelines for South Africans, which encourage people to "eat plenty of fruits and vegetables every day". These guidelines also recommend that plant proteins such as legumes and nuts should be consumed regularly; the majority (55.1%, n=146) of respondents seldom consumed legumes and nuts. The majority of respondents reported frequently consuming fats and oils, which indicates that the guideline to "use fats sparingly" was not followed. The respondents did seem to follow the guideline which states that meat, fish, chicken, or eggs can be eaten daily. However, the consumption of eggs varied as just over half (54.7%, n=145) of respondents consumed eggs the previous day. The majority of respondents included milk and dairy products as part of meals and snacks the

previous day. It seems that the majority of respondents adhered to the guideline to “have milk, maas and yoghurt every day”.

The approximate number of servings of the various food groups consumed by respondents was also determined. A serving guide was provided for each item to determine the approximate serving quantity consumed by respondents.

Starchy food The Food Based Dietary Guidelines for South Africans recommend that starchy food should form part of every meal (Vorster *et al.*, 2013). The respondents indicated fewer servings of starchy food than expected. The majority (81.5%, n=216) reportedly consume only 1-2 servings of starchy food each day, while only 16% (n=41) consume three or more servings of these foods.

Vegetables and fruits Several dietary guidelines recommend the consumption of two servings of fruits and three servings of vegetables a day (Miller *et al.*, 2016 ; Peltzer & Phaswana-Mafuya, 2012). The Food Based Dietary Guidelines for South Africans recommend consumption of five servings of fruits and vegetables, including different colours and types of plant food (Vorster *et al.*, 2013). The results from this study revealed a lower intake of vegetables than the recommended minimum guideline of three servings of vegetables a day. The mean vegetable intake was 1.5 servings a day. However, the consumption of fruits seemed to be adequate as the mean consumption of fruits was 2.0 servings a day, which is in line with the recommended daily guidelines of two servings a day (World Health Organization, 2015).

Protein-rich food Most (89%, n=236) of respondents indicated having 1-2 servings of protein-rich food the previous day. Only 8% (n=21) of respondents indicated that they consumed more than three servings of protein-rich food. Although the Food Based Dietary Guidelines for South Africans recommend that at least one serving of protein-rich food should be consumed per day. The results show that very few (3%, n=8) respondents adhered to this recommendation, and in fact did not consume any protein-rich food the previous day (Vorster *et al.*, 2013).

Milk and dairy products The number of servings of milk and dairy products was lower than the recommended three servings a day (Vorster *et al.*, 2013). The majority (79.6%, n=211) of respondents indicated that they consumed only 1-2 servings of milk and dairy products per day.

Beverages Only a small proportion (13.1%, n=35) of respondents indicated that they consume three or more servings of soft drinks each day. A fair number (41.1%, n=109) of respondents did not consume soft drinks. More than a third (35.5%, n=94) of respondents consumed a satisfactory number of servings of water (5 or more servings), while the majority (64.5%, n=171)

of respondents indicated that they consume between 1 and 4 servings of water. The majority (64.6%, n=171) of respondents consumed 1-2 servings of tea or coffee a day. 54.4% (n=144) reported using sugar in their tea or coffee.

Snack foods (Potato crisps, chocolate bars) A fairly large percentage of respondents did not consume snack foods the previous day. However, those who did so had at least 1-2 servings a day. Only a few had three or more servings of snack foods a day.

4.5.5 Summary on the food practises of the black adults in Gauteng

In summary most of the respondents follow a Western-oriented meal pattern of having more than two meals a day, skipping meals and snacking between meals (Viljoen *et al.*, 2018; St-Onge *et al.*, 2017; Kelishadi *et al.*, 2017)**.** The findings on the number of food servings consumed per day revealed that respondents consumed less than the recommended serving quantities of some of the essential food groups such as starchy foods, vegetables and fruits, protein-rich food and milk and dairy products. The results show an increase in the consumption frequency of animal protein compared to plant proteins such as legumes. Literature also reports a decrease in the consumption of red meat and an increase in the consumption of chicken, which may be because red meat is more expensive than chicken (Valentina *et al.*, 2017; Vermeulen, Schönfeldt & Pretorius, 2015; Larsson & Orsini, 2014). The findings of this study concur with other South African studies, which confirmed that chicken was the most frequently consumed protein-rich food in South Africa (Schönfeldt *et al.*, 2013). The findings further indicated that processed meat was not frequently consumed by urban black consumers. This could also be because processed meats are more expensive than fresh meat, as they undergo preservation methods such as heating, air drying, salting or smoking (Schönfeldt *et al.*, 2013). The results of the study concur with other studies which indicated that people in urban areas appear to consume fruits and vegetables almost every day, which may be due to increased availability in the food-environment (Ronquest-Ross *et al.*, 2015; Shisana *et al.*, 2014). The results confirm frequent consumption of vegetable oil and a positive shift in the consumption frequency of breads and cereals. White bread, rolls or buns were not as frequently consumed compared to brown or whole wheat bread. Breakfast cereals are frequently consumed, which could be attributed to the fact that time constrained consumers find them easier and quicker to prepare. The consumption frequency of maize meal compared to rice has decreased, possibly also because it is easier and quicker to cook rice than maize meal. This tendency is expected to continue as consumers increasingly favour convenient food items (Ronquest-Ross *et al.*, 2015; Shisana *et al.*, 2013; Viljoen *et al.*, 2005). The consumption of staple foods rich in starch and fibre is decreasing, supporting findings of a broad-based nutrition transition in South Africa (Vorster *et al.*, 2011).

The fourth objective of the study deals with how the local and home-food environment contributes to the food practices of the study group.

4.6 HOW THE LOCAL AND HOME-FOOD ENVIRONMENT CONTRIBUTE TO THE FOOD PRACTISES OF THE STUDY GROUP

In the first objective regarding the local food environment, the five food access dimensions of availability, accessibility, affordability, acceptability, and accommodation were explored and described, as well as the foods that were frequently purchased due to their availability and accessibility in the local food environment. This objective measured easy access to various food stores that have a variety of good quality food at prices that are perceived to be affordable by the study group and satisfy their needs (see 4.3). With regard to the home-food environment, family meals were identified as important determents of the study group's food practices (see 4.4).

The local and the home-food environment both contribute to the study group's healthy and sound food practises. The findings of this study from both the local and home-food environments indicated that the study group cared about healthy eating, although they did not adhere to the guidelines of the Food Based Dietary Guidelines for South Africa in terms of the quantities of legumes, fruits and vegetables, and dairy products to be consumed daily. The Dietary Diversity Score reflected an adequate intake of the various food groups, although the number of servings of food consumed a day was less than the recommended servings recommended in the Food Based Dietary Guidelines for South Africa.

In conclusion the local and the home-food environment of the study group are both important contributing factors to the food practices of the study group. This is confirmed through the results and findings throughout the study.

Table 4.26 gives a summary on the aspects of the local urban and home-food environment of the study group and how they contribute to their food practices.

TABLE 4.26: THE CONTRIBUTION OF THE LOCAL AND HOME-FOOD ENVIRONMENT TO THE FOOD PRACTISES OF THE STUDY GROUP

Description	Indicator	Response (Yes/No)
Local Urban Environment		
Location and frequency of food purchasing	Various food outlets are available in the local food environment of the study group	Yes
Availability	Respondents are satisfied with the quality and variety of food available in food stores	Yes
Accessibility	The respondents have access to a range of supermarkets, and they purchase food from outlets closest to where they live	Yes
Affordability	Fruits and vegetable are reasonable priced	Yes
Acceptability	Respondents are satisfied with the rage of food outlets they have access to in the local food environment	Yes
Accommodation	The food stores in Gauteng accommodate the needs of the study group	Yes
Home- food environment		
Availability of healthy food in the home environment (see Table 4.19)	Fruits and vegetables are available at home Milk is available	Yes Yes
Family meals	Respondents enjoy family meals Respondents care about eating healthy food Food is prepared in a healthy manner	Yes Yes Yes

4.7 CONCLUSION

The results of the study were given to determine the contribution of the local and home food environment on the food practises of the study group This chapter provides the results of the study and the discussion of these results according to formulated objectives.

The following chapter provides the conclusion to the study and explores the significance of the study and its limitations, recommendations derived from the study, and some suggestions for future research.

Chapter 5: Conclusions and recommendations

5.1 INTRODUCTION

This chapter presents the conclusions of the study that focused on the contribution of the local and home food environment on the food practices of black adults. The significance of the study, its limitations, recommendations from the findings and suggestions for future research are given.

The nutrition transition of black South Africans has been attributed to rapid urbanisation, and their exposure to and interaction with Western-oriented food practices. Nutrition transition is defined as a shift in food and consumption patterns, associated with social, cultural and economic changes, usually at community or population level (Nnyepi *et al.*, 2015a; Steyn & Mchiza, 2014). It is useful to understand how food consumption patterns developed and changed due to urbanisation, modernisation, and technological advancement. Upon exposure to the urban environment the black South African population tends to abandon traditional food practices for Western-oriented food practices that are associated with a higher socio-economic status. Foods associated with a higher socio-economic status are meat, fast and convenience foods, confectionary, sugar sweetened and alcoholic beverages. These foods and beverages are also associated with a high fat, sugar or energy content (Nnyepi *et al.*, 2015a; Steyn & Mchiza, 2014; MacIntyre *et al.*, 2012). Evidence confirms that the consumption of fast food and highly processed foods increased more rapidly in recent times, as they are often convenient, available and affordable, which could have contributed to the change in consumption patterns of urban black adults (Nnyepi *et al.*, 2015a).

The local food environment has a large effect on the food choices people make, and in turn on their resulting long-term health. The local urban food environment is regarded as an important determinant of food consumption behaviour, since limited availability and lack of affordable healthy food options can sabotage healthy eating behaviours (Herforth & Ahmed, 2015; Black *et al.*, 2014; Swinburn *et al.*, 2013b; Popkin *et al.*, 2012). When shopping for food, individuals must remain focused to purchase healthy food items while at the same time being tempted by advertisements and promotions to buy unhealthy food items (Black *et al.*, 2014; Gustafson *et al.*, 2013; Caspi *et al.*, 2012). The local urban food environment is thus important in shaping the health of individuals, families, and communities (Cannuscio *et al.*, 2013; Swinburn *et al.*, 2013b).

The home-food environment does not only contribute to food access in terms of food availability, but also contributes to the social environment (Ball & Thornton, 2013). Family members play an important role in influencing other family member's food intake. Family food preparers play a central role in not only shaping the food habits of household members but also act as gatekeepers by determining what foods are available and accessible in the home, the quantities of foods available and how they are stored, and how they are prepared (Fulkerson, Friend, Horning, Flattum, Draxten, Neumark-Sztainer, Gurvich, Garwick, Story & Kubik, 2018). While the family food preparer often assumes primary responsibility for managing the availability of food at home, food-purchasing decisions are often influenced through interactions between family members (Berge *et al.*, 2012a; Burgess-Champoux, Larson, Neumark-Sztainer, Hannan, Story & Community Health, 2009). Enjoying and sharing regular family meals is another strategy to ensure that individuals consume nutritious meals and develop healthy eating patterns. Family meals are viewed as an effective platform to ensure sufficient intake of fruits and vegetables compared to other meals (Fulkerson *et al.*, 2018; Loth, MacLehose, Larson, Berge & Neumark-Sztainer, 2016; Lee, Ha, Seo, Sohn, Park & Kim, 2014).

Currently limited research is available on the contribution of the local and home-food environments on the food practices of South Africans (Claasen *et al.*, 2016) The purpose of this study was therefore to explore and describe the food practices of black adults in the Gauteng Province, and to determine how the local and home-food environments contribute to the study group's food practices. The main conclusions derived from the results on each of the formulated objectives for the study follows.

5.2 CONCLUSIONS ON THE OBJECTIVES OF THE STUDY

Conclusions on the objectives and sub-objectives of the study are presented in the order of the formulated objectives. The conclusions provide confirmation the study reached on the formulated aims and objectives.

5.2.1 Conclusions on the local food environment of black adults in Gauteng

The first objective of the study deals with the local food environment of the black adults in Gauteng. The respondents answered questions on the five food access dimensions of availability, accessibility, affordability, acceptability and accommodation of food in the local food environment. Further questions aimed to ascertain respondents' perceptions about the access dimensions and the frequency of purchasing from selected food outlets in the local food environment.

5.2.1.1 Availability and accessibility of food in the urban food environment

The first sub-objective deals with the availability and accessibility in food in the local urban food environment. Each of these dimensions of the local food environment has significant effects on the food choices made by individuals within a specific local urban food environment (Herforth & Ahmed, 2015; Kegler *et al.*, 2014; Caspi *et al.*, 2012). The study group predominately made use of brick-and-mortar stores which they physically visit to purchase their food. The majority (94.7%, n=251) of respondents indicated that they do not buy their food on-line. Most of the respondents owned vehicles that they used to transport the purchased food home.

Respondents had to indicate where they purchased certain food categories during the previous seven days. Conclusions on the frequency of purchasing from selected food outlets are given in the next section.

5.2.1.2 The location and frequency of purchasing food from selected food outlets

Fruits and vegetables (fresh, frozen, canned, or in a jar) Respondents reported that they purchased fruits and vegetables mainly from a supermarket (33.6%, n=107) or a fruit and vegetable market (31.7%, n= 101). Only a few (13.0%, n=41) indicated that they purchased fruit and vegetables from a street vendor. Studies have shown that urban adults generally access fruits and vegetables from formal markets which usually carry high quality produce and adhere to strict food safety standards. These formal markets include supermarkets and fruit and vegetable markets (Marumo & Mabuza, 2018; Roesel & Grace, 2015).

Milk and dairy products More than half (57.6%, n= 165) of respondents purchased milk and dairy products from a supermarket. 28.2%, (n-81) of respondents did not purchase milk and dairy products at all, and a small percentage (6.3%, n=18) indicated they purchased milk and dairy products from a convenience store.

Beverages Beverages included fruit juice, cordials, and soft drinks. Most respondents purchased beverages from a supermarket and a convenience store. The majority (54.2%, n=60) of respondents purchased fruit juice from a supermarket. Only soft drinks were purchased by a few (1.2%, n=4) from a street vendor.

Protein-rich foods The protein-rich food group included beef, mutton, lamb, goat, chicken, pork, boerewors, offal cuts, bacon, processed meat, biltong, and eggs. Protein-rich foods were purchased from a supermarket (27.5%, n=80) or a butcher (17%, n= 49). Although some of the respondents purchased eggs from a spaza shop (7.2%, n=21) or a street vendor (2.7%, n=8)

Bread and bread-like products This group included bread (brown, white), buns, bread rolls, sweet buns, scones, fat cakes, crisp bread crackers and rusks. Bread and bread-like products were mostly purchased from a supermarket. Less than a quarter (22.6%, n=78) of respondents purchased white and brown bread from a spaza shop, while 15.4%, (n=53) of respondents purchased these products from a convenience shop. Although half (51.1%, n=145) of respondents did not purchase fat cakes, 19.7% (n=56) of respondents who purchased fat cakes did so from a street a vendor.

Cereal products This group included maize meal, rice, flour (cake and bread), sorghum, and pasta (macaroni, spaghetti, noodles). The respondents purchased most of the cereal products from either a supermarket or convenience store. Although more than a third (35.6%, n=100) of respondents did not purchase maize meal, more than half (53.7%, n=151) of respondents purchased maize meal from a supermarket. The majority (58%, n=160) of respondents purchased rice from a supermarket, and only a few (4.3%, n=12) purchased rice from convenience stores. More than three quarters (75.6%, n=204) of respondents did not purchase sorghum and those who did (18.5%, n=50), purchased sorghum from a supermarket. More than half (52.9%, n=146) of respondents purchased pasta from a supermarket.

Oils and fat The oils and fat group included oil (sunflower, olive, and canola), tub and brick margarine, butter, and lard. Most respondents purchased oils and fat from a supermarket, followed by respondents who purchased oils and fat from a convenience store. More than half (54.9%, n=152) of respondents purchased oils (sunflower, olive, and canola) from a supermarket, followed by only a few (4.0% n=11) who did so from a convenience shop. Although more than half of respondents did not purchase brick margarine (55.6%, n= 153) or tub margarine (50.7% n=137), those who did so purchased these products from a supermarket. Most respondents did not purchase butter (59.2% n=157) and lard (83.3% n=222), but those who did so, purchased these products from a supermarket.

Legumes and nuts This group consisted of dry beans (sugar, butter), split peas, lentils, and nuts (peanuts, pecans, walnuts, macadamias). The results revealed that legumes were not frequently purchased and those who purchased legumes and nuts did so from a supermarket. Only a few respondents purchased legumes and nuts from fruit and vegetable markets.

From the findings on where certain food groups are purchased, it can be concluded that urban black adults primarily do their shopping at supermarkets as they are accessible and available and furthermore stock high quality produce that adhere to basic food safety standards (Marumo & Mabuza, 2018; Roesel & Grace, 2015). Food is thus not only accessible but also readily available.

5.2.1.4 Frequency of purchasing from selected food outlets

The respondents were also asked how frequently they purchased from selected food outlets which included supermarkets, fresh fruit and vegetable markets, butchers, convenience stores, fast food outlets, street vendors, spaza shops and open or community markets.

Supermarkets The majority (64.5%, n=171) of the respondents purchased at least once a week from a supermarket. The results revealed that respondents more frequently purchased from supermarkets compared to other food outlets.

Fruit and vegetable markets Nearly half (48.7%, n=129) of respondents indicated that they purchased from a fruit and vegetable market at least once a week.

Butcher Although respondents did not frequently purchase from a butcher – only 19.3% (n=51) of respondents purchased at least once a week from a butcher – nearly a third (32.8%, n=87) purchased from butcher on special occasions. 11.7% (n=31) of respondents indicated that they never purchase from a butcher.

Convenience store A third (32.8%, n=87) of respondents purchased from convenience stores only on special occasions. Almost twenty per cent (18.5%, n=49) of respondents did not purchase foods from a convenience store.

Fast food outlets Almost half (45.3 %, n=120) of respondents purchased from fast food outlets only on special occasions, while 26.8%, (n=71) of respondents indicated that they purchased from fast food outlet at least once a week. Less than five per cent (3.4%, n=9) of respondents indicated that they never purchase from a fast food outlet.

Street vendor Purchasing from a street vendor appears not to be common practice among urban black adults. A third (33.6%, n=89) of respondents never purchased from a street vendor, while a quarter (25.7%, n=68) of respondents indicated they purchased from a street vendor only on special occasions. These results contradict those of other South African studies which have shown that average black South Africans frequently purchase from street vendors since their products are relatively affordable (Steyn & Mchiza, 2014; Vorster *et al.*, 2011).

Spaza shop A fair proportion (39.2%, n=104) of respondents never purchase from a spaza shop. This is understandable as spaza shops are mostly found in townships and most of the study group respondents did not reside in townships.

Open community markets More than a third (38.1%, n=101) of respondents never purchase from an open community market. Just over a third (34.7%, n= 92) of respondents indicated that they purchased from open community markets only on special occasions. This could be because open community markets, although common in townships, mostly operate over weekends in the urban suburbs of Gauteng.

It can be concluded that the respondents more frequently purchased food items from supermarkets than other retail outlets. This is probably because supermarkets are close to residential areas in Gauteng, which increases convenient access to food retail outlets.

5.2.1.5 Affordability and acceptability of food in the local food environment

Each of these food access dimensions of the local food environment has significant effects on the food practises of individuals within a specific local urban food environment.

Affordability of food

Affordability involves the cost of food, the willingness to pay and the ability of households and individuals to purchase food from a financial perspective, factors that influence peoples food intake (Caspi *et al.*, 2012; Azuma *et al.*, 2010; Morland *et al.*, 2002). The study included several statements on the affordability of food and whether fruits and vegetables are affordable (reasonably priced) in the food outlets that respondents normally purchase from. Nearly two thirds (61.2%, n=162) of respondents either strongly agree or agree that fruits and vegetables are affordable in the food outlets they normally buy from. Some respondents (18.5%, n= 49) disagreed that fruits and vegetables are affordable in the food outlets they normally buy from. Further analysis on percentage income spent on food shows that just over a third (34.8%, n=102) of respondents spend between five and ten per cent of their income on food. South African statistics reported that the average monthly household food budget is 12.9% (SA Statistics, 2015) of income earned.

Acceptability of food

The dimension of acceptability describes consumers' attitude towards attributes of the local food environment and whether the supply of food products meet their personal standards (Caspi *et al.*, 2012). Respondents were satisfied with the range of food outlets they have access to in their neighbourhood. They felt that good quality fruits and vegetables were available in the food outlets they normally shopped from and the food outlets in their neighbourhood compared well with food stores in other areas of Gauteng.

5.2.1.6 Accommodation of consumer's needs

Based on the results on the food outlets where the respondents usually purchase their food products, it can be concluded that respondents are satisfied with the types (variety) of food available and that they have regular access to. These outlets accommodate the needs of the respondents in terms of the available credit options and extended hours of operation. Food outlets open as early as seven o'clock in the morning and close at eight o'clock in the evenings, and many food outlets also trade on Sundays and public holidays to accommodate the needs and lifestyles of urban consumers.

5.2.1.7 Perceptions of the food access dimension

Consumers' perceptions of the food access dimensions were also explored. Respondents had to indicate to what extent they agreed or disagreed with given statements related to each of the five access dimensions regarding the food outlets which they buy from.

Availability From the results it can be concluded that the respondents are satisfied with the range of food outlets they have access to in their neighbourhood. The majority (89.4%, n=237) of respondents indicated that healthy and good quality fruits and vegetables are available in food outlets where they normally shop.

Accessibility Respondents indicated satisfaction with the range of food outlets they have access to in their neighbourhood. The majority (84.5%, n=224) of respondents either strongly agreed or agreed that they are satisfied with the range of food outlets which they have access to in their neighbourhood, while only 5.3% (n=14) of respondents were undecided on this aspect. More than three quarters (83.8%, n=222) of respondents buy food at food outlets closest to where they live and they are satisfied with the types of food they have regular access to (82.3%, n=218). More than half (58.1%, n=154) of respondents indicated that they do not have to travel some distance to buy good quality food. It can therefore be concluded that respondents buy food at food outlets closest to where they live.

Affordability The cost of food, consumers' willingness to pay and the ability of households and individuals to purchase food from a financial perspective, are all factors that influence diet (Caspi *et al.*, 2012; Azuma *et al.*, 2010; Morland *et al.*, 2002). The findings of this study show that respondents regard fruits and vegetables as affordable (reasonably priced) in the food outlets where they normally shop. Only some of the respondents were undecided (11.7%, n=31) whether the fruits and vegetables in the food outlets where they normally shop are affordable.

Acceptability From the findings it can be deduced that the respondents are satisfied with the range of food outlets they have access to in their neighbourhood and that good quality fruits and vegetables are available in food outlets where they normally shop. The majority (68.3%, n=181) of respondents revealed that the food stores in their neighbourhood compare well with food stores in other areas of Gauteng. Only some (14%, n=37) respondents indicated that they are undecided whether the food stores in their neighbourhood compared well with food stores in other areas of Gauteng.

Accommodation Most (72.1%, n=191) respondents either strongly agreed or agreed that the food outlets in their neighbourhood accommodate their needs in terms of credit options and extended hours. These results show that the food outlets accommodate the respondents' needs.

From the findings of this study it can be concluded that the urban black adults in the Gauteng Province mainly purchase their food at supermarkets. The respondents purchase food from speciality shops mostly only on special occasions. The results on the food access dimensions of affordability, acceptability and accommodation of food confirm that the study group's local food environment generally meet their needs. They are satisfied with the range of food outlets they have access to in their neighbourhoods, that these outlets provide good quality fruits and vegetables, and that these outlets compared well with food stores in other areas of Gauteng. They therefore do not need to travel long distances to purchase good quality food products.

5.2.2 Conclusions on the home-food environment of the study group

The second objective deals primarily with the availability, accessibility, and visibility of food (both healthy and unhealthy foods) in the home environment. Studies have shown that the home-food environment has a potentially positive influence on sound eating habits and healthy food choices (Watts *et al.*, 2018; Fisher *et al.*, 2016; Amuta *et al.*, 2015). The role and contribution of the gatekeeper in this process should not be underestimated. Food purchasers and preparers act as gatekeepers as they determine what foods are available in the home, the quantities in which they are stored, and how and when they are prepared (Larson & Story, 2009).

5.2.2.1 Household food purchasing and preparation

Family food purchasers and preparers play central roles in shaping the food habits of household members (Burton *et al.*, 2017; Shisana *et al.*, 2013).

Studies also show that the traditional role of food purchaser and preparer is still entrusted to female members in the household, although a shift has been observed due to urbanisation and modernisation. This shift is seeing more males becoming involved in the food purchasing and preparation task (Monsivais *et al.*, 2014; Pradhan *et al.*, 2013b; Shisana *et al.*, 2013). The results of this study confirm that black females in Gauteng are still mainly responsible for the purchasing and preparation of food, and although more males (33.6%, n=89) are taking responsibility for food purchasing, only 15.5% (n= 41) are involved in food preparation. The number of males who indicated taking responsibility for food preparation is half the number of males who are responsible for food purchasing (Shisana *et al.*, 2013).

5.2.2.2 The availability of certain foods in the home

The availability of certain food types in a household is one of the elements of the home-food environment that is associated with how healthy the food consumption of the members of the household will be. More than half (55.5%, n=147) of respondents indicated fruits and vegetables were always available in their homes. Most considered their meals to be prepared in a healthy manner and indicated that vegetables form part of meals. The findings further revealed that a good proportion (69.4%, n=184) of respondents always had milk available in their households. A quarter (25.7%, n=68) of respondents indicated that they always have 100% fruit juice available in their household. From these findings it can thus be concluded that the respondents had healthy food options available in their households and that their food is prepared in a healthy manner, and that they care about eating healthy food. Apart from having healthy food and beverages most of the respondents indicated that they sometimes had other food and beverages that are not required as part of healthy eating. Two thirds (66.4%, n=176) of respondents indicated that they sometimes have chocolates and sweets available in their households. Half (50.2%, n=133) of respondents indicated that they sometimes have soft or fizzy drinks available in their household. Nearly two thirds (60.4%, n=160) of respondents sometimes have junk food in their households, while less than ten per cent (5.7%, n=15) of respondents indicated that they always have junk food available in their household.

Attitude towards healthy eating The majority (69.4%, n=184) of respondents cared very much about eating healthy food. A fair proportion of their friends somewhat cared (41.9%, n=111) about eating healthy food, while nearly a third (30.6%, n=81) indicated their friends cared very much about eating healthy food. Almost half (49.8%, n=120) of respondents indicated that they live with people who cared very much about eating healthy food. Studies have shown that people with supportive friends and family who care about healthy eating are more likely to make healthy food choices (Jastran *et al.*, 2009; Sobal *et al.*, 2006).

5.2.2.3 Frequency and attitude towards family meals

Family members are important influences on an individual's food intake and in shaping the food habits of other household members (Scaglioni *et al.*, 2018; Pearson *et al.*, 2017). Having regular family meals is a valuable strategy to ensure individual family members eat healthily and adhere to healthy eating patterns (Sedibe *et al.*, 2018; Watts *et al.*, 2018). The respondents indicated the following about the frequency of family meals, how these meals are eaten and their attitude towards family meals.

Frequency of eating meals together as a family Eating together is a common practice among urban black adults. Over half (56.6%, n=150) of respondents indicated that they eat meals together as a family daily, while another 20% (n=53) of the respondents indicated that they eat meals together as a family at least 3-4 times a week.

How family meals are eaten Over half (53.1%, n=119) of respondents reported eating together as a family while watching television. These results concur with other national and international studies (Sedibe *et al.*, 2014; Kegler *et al.*, 2014; Feldman *et al.*, 2007). More than a third (38.4%, n=86) of respondents indicated that all members of the household eat together at the table, while only a few respondents still follow the tradition where different age groups enjoyed their meals separate from other groups (Martin-Biggers *et al.*, 2014; Viljoen *et al.*, 2005).

Attitudes towards family meals The respondents confirmed that they enjoyed eating meals with their families and that eating brings them together in an enjoyable way. The findings of this study concluded that dinner time is about more than just getting food but also to talk to each other, even though most families watch television while eating their dinner. From these findings it can be concluded that food also brings household members in Gauteng together, and thus contribute to building and maintaining family relationships.

In conclusion black Gauteng households' food purchasing and preparation is still mainly done by females, although more males are now also beginning to be involved in the food purchasing and preparation tasks. Food items that contribute to healthy eating are available in their homes and are prepared in a healthy manner. Although some respondents sometimes had food that was not required as part of healthy eating, they cared very much about healthy eating. Eating together as a family is a common practice among urban black Gauteng adults, and most households eat their meals while watching television. The respondents confirmed that they

enjoyed eating their meals with their family members and that eating brings them together in an enjoyable manner.

The conclusions on the food practices of black adults in Gauteng in the next section

5.2.3 Conclusions on the food practices of urban adults in the Gauteng Province

This third objective was designed to determine and describe the study group's food practices in terms of their eating patterns, number of meals consumed, and the composition of their meals. The objective also determined the diversity of food intake, the number of servings of food consumed per day from selected food groups, and how frequently food was consumed.

5.2.3.1 Eating patterns of the study group

The majority (64.9%, n=172) of respondents enjoyed three meals a day, although some had only two meals a day. It is assumed that the busy lifestyle and time constraints of employed urban black adults might contribute to them following a two meal a day pattern. These individuals generally consume the first meal (breakfast) at home before they leave for work, or during the morning at work. The second meal (supper) is consumed when they return home from work, as reported in other South African studies (Dolman *et al.*, 2008). Although nearly two thirds (58.9%, n=156) of respondents eat breakfast every day, breakfast was not as frequently consumed as lunch and supper. These findings concur with other studies which suggest that people skip meals due to time constraints associated with work or personal and social activities (Lazzeri *et al.*, 2016; Pelletier & Laska, 2012).

Most urban employed people spend a substantial amount of their time at work, and it is assumed that at least one meal a day is consumed at work (Dolman *et al.*, 2008; Sorensen *et al.*, 2004; Vorster, 2002). However, almost sixty per cent of respondents (58.5%, n=155) still had at least two meals a day at home during weekdays. Eating away from home has become common practice in the lifestyle of urban black people, with almost a third (30.6%, n=81) of respondents eat away from home daily. Nearly half (48.3%, n=128) of the respondents indicated that when eating away from home they often eat at their workplace.

5.2.3.2 The Dietary diversity of the study group

As part of determining food practices, it was deemed necessary to also measure the diversity of the study group's food intake. The Dietary Diversity Score (DDS) served as an indicator of the nutritional adequacy of the diet followed by the target group, as well as the household's access

to a variety of foods. A Dietary Diversity Score counts the food groups that an individual has consumed during the previous day. The DDS also reveals some information on the meal composition of the respondents (Vasileska & Rechkoska, 2012; Kennedy *et al.*, 2011:23). Nearly three quarters (72.9%, n=193) of respondents indicated that they consumed six or more of the nine food groups, while only 10.5% (n=28) of respondents indicated that they included four or fewer of the nine food groups as part of their meals or snacks the previous day.

Four other food groups that are not regarded as essential for an adequate nutritional intake were also included as part of the food groups, to measure and describe the diversity of food intake more comprehensively. These food groups (sweets, beverages, spices, and condiments) were consumed by the majority (82.9%, n=247) of the respondents the previous day. The majority (83%, n=220) of respondents indicated that they did not consume alcoholic beverages the previous day.

The diversity of food intake results reflected an adequate intake of the various food groups. For this study a mean Dietary Diversity Score of 6.5 was obtained, which is higher than the most recent South African National Health and Nutrition Examination Survey results (SANHANES-1), where a National Dietary Diversity Score of 4.2 was achieved, which is very close to the cut-off level of 4 for dietary adequacy (Cordero-Ahiman *et al.*, 2017; Ronquest-Ross *et al.*, 2015; Taruvinga *et al.*, 2013; Shisana *et al.*, 2013). From the study results, it can thus be concluded that the study group enjoyed an adequate variety of foods.

5.2.3.3 The number of servings of selected food groups

The respondents were asked to indicate the number of servings of food they consumed each day, to determine the approximate number of servings of the various food groups they consumed. A serving guide was provided for each food item to determine the approximate serving quantity the respondents consumed. The findings revealed that respondents consumed less than the recommended serving quantities of some of the essential food groups (starchy foods, vegetables and fruits, protein-rich food and milk and dairy products) than they are supposed to consume.

5.2.3.4 Frequency of consumption of selected food groups

The consumption frequency of specific food items was ascertained by asking respondents how often they consumed food from selected food groups. This also served as a cross-check to determine the types of food consumed. The food frequency questionnaire included nine food groups, namely protein-rich food, milk and dairy products, fruits and vegetables, fats and oils,

bread and cereal products, legumes and nuts, beverages, takeaway and fast foods, and snack foods.

Protein-rich food Literature indicates a decrease in the consumption of red meat and an increase in the consumption of chicken, which may be because red meat is more expensive than chicken (Valentina *et al.*, 2017; Larsson & Orsini, 2014; Schönfeldt *et al.*, 2013). The findings of this study concur with other studies conducted in South Africa which show that chicken is the most frequently consumed protein-rich food in South Africa due to its availability and affordability (Schönfeldt *et al.*, 2013; Van Zyl, Steyn & Marais, 2010).

The respondents in this study reported frequent consumption of protein-rich food. The majority (93.3%, n=247) of respondents consumed chicken at least once a week, while just over three quarters (74.6%, n=195) of respondents consumed red meat at least once a week. Fish was not as frequently consumed compared to red meat and chicken; nearly half (42.3%, n=112) of respondents consumed fish 1-2 times a week, followed by nearly the same percentage of respondents who seldom consumed fish (41.9%, n=111).

More than a third (38.9%, n=103) of respondents consumed eggs more than three times a week, while another third (35.1%, n= 93) indicated that they consumed eggs 1-2 times a week. Only 3.8% (n=10) of respondents indicated that they never consumed eggs.

Milk and dairy products Full cream milk was more frequently consumed compared to low fat milk. 62.3% (n=165) of the respondents indicated that they consumed full cream milk at least once a week, while only 16.2% (n=43) of respondents indicated that they never consumed full cream milk. Nearly a third (31%, n=82) of respondents consumed low fat milk at least once a week.

Cheese was not frequently consumed, which could be attributed to the fact that cheese is expensive. Just over a third (38.1%, n=101) of respondents indicated that they seldom consumed cheese. More than a third (40% n=106) of the respondents seldom consumed yoghurt.

Fruits and vegetables Although fruits and vegetables should be consumed daily to meet our nutrient needs. The consumption of fruit and vegetables on a daily basis by respondents in this study was limited to only 44.9% (n=119) and 46.4% (n=123) respectively. More than half of respondents therefore did not consume the daily recommended quantity of fruits and vegetables. People in urban areas appear to consume fruits and vegetables almost every day. as it is assumed that urban food environments are generally characterised by an increased

availability of fresh fruit and vegetables. (Miller *et al.*, 2016 ; Ronquest-Ross *et al.*, 2015; Shisana *et al.*, 2014).

Fats and oils Although fats and oils were fairly well consumed by the majority of respondents, butter, tub margarine and brick margarine were not consumed as frequently as vegetable oil. The majority (74.3%, n=197) of respondents indicated that they never consumed brick margarine. Those respondents who did consume brick margarine, seldom did so. Vegetable oil was consumed at least once a week by 64.9% (n=172) of respondents. Only some (14.7%, n=39) respondents never consumed vegetable oil.

Breads and cereals White bread, rolls or buns were not as frequently consumed in comparison to brown or whole wheat bread. Less than half (45.7%, n=121) of respondents indicated that they consumed white bread, rolls, or buns at least once a week. Brown or whole wheat bread were consumed by 60.8% (n=197) of respondents at least once a week. This tendency can be attributed to the fact that brown bread is cheaper and tastier compared to white bread (Helena, 2018; Viljoen *et al.*, 2005; Labadarios, Steyn, Maunder, MacIntryre, Gericke, Swart, Huskisson, Dannhauser, Vorster & Nesmvuni, 2005). Breakfast cereals were consumed more than three times a week by nearly half (47.5%, n=126) of the respondents. The frequent consumption of breakfast cereals can be attributed to the fact that these products are more convenient to use and required less time to prepare than cooked porridge.

Maize meal porridge was not frequently consumed, compared to rice that was consumed by 77% (n=204) of respondents at least once a week. Literature reports an increase in the consumption of pasta, which was confirmed in this study. 48.3% (n=128) of respondents consumed pasta at least once a week. These findings are consistent with other food consumption surveys conducted in South Africa, which show that the frequency of consumption of maize meal has decreased. This trend is expected to grow as consumers move towards convenient food items such as rice and pasta that require shorter cooking time and less attention compared to cooking maize meal porridge. These findings also confirm the shift from traditional to Western-oriented food practices, characterised by a move from maize meal towards rice and pasta as staple foods (Popkin, 2017; Ronquest-Ross *et al.*, 2015; Shisana *et al.*, 2013; Labadarios *et al.*, 2005; Viljoen *et al.*, 2005; Nel & Casey, 2003).

Legumes and nuts Legumes and nuts were not consumed often by the target group in this study. The majority (55.1%, n=146) of respondents seldom consumed legumes, and just over ten per cent (11.3%, n=30) indicated that they never consumed legumes. Nearly half (47.9%, n=127) of respondents seldom consumed nuts, while less than ten per cent (9.4%, n=25) of respondents indicated that they never consumed nuts. These results concur with other studies

which show that legumes and nuts are not frequently consumed (Ronquest-Ross *et al.*, 2015; Micha *et al.*, 2015).

Other food groups were also included as part of the food groups to measure the frequency of food consumption. Although they are not essentially part of the diversity of food intake, they contributed to a complete account of what is eaten. These food groups included beverages, takeaway and fast-foods, and snacks.

Beverages The beverage group included fruit juice, soft drinks, sport or energy drinks, water, and cordials. The findings of this study show that water was consumed daily by the majority (83.4%, n=221) of the respondents. This can probably be due to the better education among consumers about nutrition and thus preferences for healthier beverage options, such as bottled water (Shisana *et al.*, 2013). Only 14.3% (n=44) of respondents never consumed water daily. Fruit juice was also a frequently consumed beverage. 64.2% (n= 170) of respondents consumed fruit juice at least once a week, while only 4.9% (n=13) of respondents never consumed fruit juice. Sport and energy drinks were not frequently consumed by the majority of respondents, probably because they are expensive (Stacey *et al.*, 2017; Ibrahim & Iftikhar, 2014).

Takeaway and fast food Takeaway and fast food included fried chips (slap chips), meat pies, pizzas, and hamburgers. Although some of the respondents enjoyed takeaway and fast food daily, most respondents seldom consumed takeaway and fast food. Fried chips (slap chips) were frequently consumed, and nearly a third (29.1%, n=77) of respondents consumed fried chips (slap chips) at least once a week. South African studies confirm that the consumption of takeaway and fast food is increasing because of its convenience and taste (Van Zyl *et al.*, 2010).

Snack food The frequency of snack food consumption varied, and most respondents seldom consumed snack foods. Nearly a third (30.5%, n=81) of respondents indicated that they consumed potato chips (crisps) at least once a week, while another third (29.8%, n=79) of respondents also consumed sweets and cookies or biscuits at least once a week.

Beverages, takeaway/fast food, and snack food are not essential foods. The study confirmed that they are seldom consumed by the majority of respondents, although there is a small percentage of respondents who indicated that they consume these food groups almost daily.

The findings on the frequency of consumption of the various food groups confirm that increased availability and accessibility of food contribute to consumption frequency. It can be further

concluded that the meal patterns of urban black adults continue to shift. Due to their busy lifestyles, urban black adults are now consuming three meals a day, of which at least one is assumed to be at work. Eating away from home is becoming more common as those who are employed spend more time away from home.

Overall food intake diversity reflected an adequate intake of various food groups. However, the number of servings of some essential foods consumed a day did not meet the recommended number of servings of the South African Food Based Dietary Guidelines. The consumption frequency of a large variety of foods confirms that food is available, accessible, and affordable, and frequently consumed by most of the respondents. Convenience was a considerable contributor to the consumption frequency of non-essential food groups such as takeaway food, fast food, and snack food, which are generally easy to access and easy to enjoy on the go. This last finding is particularly relevant to employed urban black adults who spend a large part of their waking hours away from home (Askari Majabadi, Solhi, Montazeri & Shojaeizadeh, 2016).

5.2.4 Conclusion on how the local and home-food environments contribute to the food practices of the study group

The fourth objective was designed to identify and describe how the local and home-food environments contribute to the food practices of the study group. The findings throughout the study show that both the local food environment and the home-food environment contribute to the food practices of the study group. The five access dimensions of availability, accessibility, affordability, acceptability, and accommodation all contribute to the food practices of the study group. The frequency of purchasing food, the accessibility to various food stores and the convenient location of food stores in the urban environment are all factors that contribute to the food practices of the study group.

The availability of certain food types in the home and the study group's attitude towards healthy eating are important determinants of the study group's food practices in the home-food environment. Elements such as the person responsible for food purchasing and preparation, frequency, and attitude towards family meals at home contribute to healthy food practices.

5.3 SIGNIFICANCE OF THE STUDY

The aim of the study was to explore and describe the food practices of black adults in the Gauteng Province and how the local and home-food environments contributes to the food practices of the study group. This study added to the limited body of knowledge regarding the

contribution of local and home-food environments on the food practices of urban black adults in Gauteng.

Although the study was confined to the Gauteng Province, the findings confirm a continuing shift in the meal patterns of urban black adults due to rapid urbanisation and interaction with Western-oriented food practices. The busy lifestyles of urban black adults have also increased the prevalence of skipped meals, snacking between meals, and having meals away from home. The study also provides valuable information about the diversity of food consumed by urban black adults. The diversity of food intake of urban black adults reveals an adequate dietary diversity. The low intake of fruits and vegetables is however of concern although these items are available, accessible, and affordable in the local urban food environment. The study further provided information about consumers' perceptions of food access dimensions, which were considered to be satisfactory. The study reveals that household food purchasing and preparation are still mainly done by females, although males seem to be increasingly involved in food purchasing and preparation tasks. Food items recommended as part of healthy eating patterns are generally available in most of the households and they are prepared in a healthy manner. The respondents and most of their friends cared about eating healthy food. Eating meals in places other than at home is a common practice. This can probably be attributed to increasing urbanisation, as people spend at least half of their waking hours at work. Most urban employed people spend a substantial amount of their time at work and it is assumed that one meal a day is consumed at work (Dolman *et al.*, 2008; Sorensen *et al.*, 2004; Vorster, 2002). The respondents enjoy family meals together, viewing these occasions as a time to spend time and talk with other family members.

The results of the study could therefore be used in nutrition and consumer facilitation and education, as it contributes to the knowledge on the food environments and food practices of the urban South African population.

The next section deals with the limitations of the study.

5.4 LIMITATIONS OF THE STUDY

When conducting a study of this nature, limitations are often experienced, and this study is no exception.

- The gender distribution of the study group was unevenly distributed. Only 44.5% (n=118) of the respondents who participated were females.

- One third (30.9%, n=82) of the respondents in the study group had no children, which limited information regarding families with children.
- The nature of the survey questionnaire only made provision to record one day's food intake, although it is acknowledged that longer reporting periods of food intake pose certain other challenges.

5.5 RECOMMENDATIONS

Based on the results of this study, the following recommendations can be made:

- Consumer educators and facilitators should take this research into account when educating consumers on the Food-based Dietary Guidelines for South Africa. The findings of this study confirm that urban consumers have easy and adequate access to food in the urban food environment. The results of this study further show that many respondents did not adhere to some of the guidelines of the Food Based Dietary Guidelines in terms of the quantities of legumes, fruits and vegetables and dairy products to be consumed to ensure a healthy diet.
- Based on the results of this study it is also recommended that consumer educators should inform consumers how healthy or unhealthy their everyday food choices are. Sound food practices should be enforced, and more specific guidelines should be given on what needs to be improved on.

5.6 SUGGESTIONS FOR FUTURE RESEARCH

Based on findings from this study into the contribution of the local and home-food environment on the food practices of urban black adults in the Gauteng Province, the following suggestions for future research are made:

- It could be of value to ensure equal representation of the two gender groups in the sample in future studies.
- It could be helpful in future research to include more respondents with young children (2-6 years) and 6-12 years old and to seek specific information on the food practices of these young families.
- This study could be replicated in other regions of South Africa to determine if differences are found and to determine why they exist.
- More detailed information regarding serving sizes and frequency of consumption should be sought. Mixed methods with focus group discussions could be used to obtain more rich and detailed results.

5.7 CONCLUDING REMARKS

The findings of this study confirm a continuing shift in the food practices of black urbanites in South Africa. Eating away from home is becoming more common as more time is spent away from home. The study further confirmed that black urban consumers have easy and adequate access to food in the urban food environment. The Dietary Diversity Score reflected an adequate intake of the various food groups, although the number of servings of food consumed a day was less than the recommended servings according to the Food Based Dietary Guidelines of South Africa. The findings further showed that the study group did not adhere to the Food Based Dietary Guidelines of South Africa in terms of the quantities of legumes, fruits and vegetables, and dairy products to be consumed daily.

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Addendum A
Informed consent form for respondents

Dear respondent,

QUESTIONNAIRE ON FOOD PRACTICES

The purpose of the study is to learn about the food purchasing and eating patterns of adults in Tshwane. Through this research we would like to understand how urban consumers make their food choices and how the local urban, home, and individual environments influence what, where, when and why food is bought and eaten. The current knowledge on the food practices of urban South African adults is limited and this study will enable us to plan and give more meaningful consumer education on healthy food choices and eating.

Thank you for taking time to share your food shopping and eating practices.

You will be asked to answer a number of questions regarding your food shopping and eating patterns. All answers will be recorded for further use by the investigators only. You are welcome to refrain from answering any questions that cause you any discomfort or that you perceive as an infringement of your privacy. Your refusal to participate, your withdrawal of consent, or your discontinued participation will not result in any penalty. Please note that your participation is voluntary and does in no way release the researchers of the involved institutions from their legal and professional responsibilities. All information will be treated as highly confidential and the identity of respondents need not be disclosed and will remain anonymous. The results of this study will be presented anonymously.

Your decision to respond to the questions will be interpreted as confirmation that you agree to participate.

Should you wish to partake in future on-going research such as focus group discussions pertaining to this study please give a contact number or e-mail address in the space provided.

Dr Annemarie Viljoen
Department Consumer Science

Addendum B

Ethics letter of approval

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Natural and Agricultural Sciences
Ethics Committee

E-mail: ethics.nas@up.ac.za

Date: 21/07/2016

ETHICS SUBMISSION: LETTER OF APPROVAL

Dr A Viljoen,
Department of Consumer Science
Faculty of Natural and Agricultural Sciences
University of Pretoria

Reference number: EC160318-009
Project title: Investigation of food environments, food practices and dietary intake of adults in Tshwane

Dear Dr Viljoen,

We are pleased to inform you that your submission conforms to the requirements of the Faculty of Natural and Agricultural Sciences Ethics committee on the condition that the only participation of the subjects is as described in the proposal narrative.

Please note that you are required to submit annual progress reports (no later than two months after the anniversary of this approval) until the project is completed. Completion will be when the data has been analysed and documented in a postgraduate student's thesis or dissertation, or in a paper or a report for publication. The progress report document is accessible of the NAS faculty's website: Research/Ethics Committee.

If you wish to submit an amendment to the application, you can also obtain the amendment form on the NAS faculty's website: Research/Ethics Committee.

The digital archiving of data is a requirement of the University of Pretoria. The data should be accessible in the event of an enquiry or further analysis of the data.

Yours sincerely,

p/p **Chairperson: NAS Ethics Committee**

Addendum C

Survey questionnaire on food practices

QUESTIONNAIRE ON THE FOOD ENVIRONMENTS OF ADULTS IN THE GAUTENG PROVINCE

For official use only

Respondent Number | | | | | |

Section A: Socio-demographic information

A1 What is your age? | | | A1 | | |

A2 What is your gender? Male 1 | Female 2 | A2 |

A3 Please indicate your area of residence in the Gauteng Province

A4 What is your highest level of education?

Lower than grade 12	1
Grade 12	2
Grade 12 plus a degree/diploma	3
Postgraduate degree	4

A5 What is your approximate monthly household income rounded up to the nearest R1000? (this question is optional)

R

A6 What is the approximate monthly food budget for your household, rounded up to the nearest R1000?

R

A7 What is your preferred home language?

Afrikaans	1
English	2
Ndebele	3
Northern Sotho	4
Sotho	5
Swazi	6
Tsonga	7
Tswana	8
Venda	9
Xhosa	10
Zulu	11
Other	12

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A8 How many people live in your household?

A9 Indicate the structure that best describes your family/ household. Mark only one.

Single (living on my own)	1
Married couple (without children)	2
Nuclear family (both parents and children)	3
Extended family (parents, children, and other family members)	4
Single parent family (father / mother and children)	5
Living with other family members (not parents or children)	6
Living with partner / friends or others	7

A10 Please indicate the number of **dependent children** under 18 years old who are part of your household?

A11 Please indicate how many children of the following age groups are currently part of your household?

Infants (0-2 years of age)	
Toddlers and pre-schoolers (between 3-6 years of age)	
Primary schoolers (between 7-12 years of age)	
Secondary schoolers (between 13-18 years of age)	

A12 Please indicate the number of **adults (older than 18 years**) that are currently part of your household

A13 Who is **mainly** responsible for **most** of your household's **food purchases**?

Yourself	1
Husband / Wife / Partner	2
Children	3
Another person in the household	4

A14 Who is **mainly** responsible for **most** of your household's **food preparation**?

Yourself	1
Husband / Wife / Partner	2
Children	3
Domestic worker / helper	4
Another person in the household	5

A15 In terms of the Employment Equity Act of SA, to which population group do you belong to?

African	1
Asian	2
Coloured	3
Indian	4
White	5
Other	6

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Section B: Usual food shopping patterns

B1 How often do you buy from the stores or food outlets listed below?

Shop or food outlet	Daily	3 – 4 times per week	1-2 times per week	more than 3 times per month	Special occasions	Never
Supermarket (i.e. Shoprite, Checkers, Spar, Pick n Pay, Woolworths food store)	1	2	3	4	5	6
Fresh fruit and vegetable food market (Fruit Stop, fruit shop, Food Lovers Market, greengrocer)	1	2	3	4	5	6
Butcher	1	2	3	4	5	6
Convenience store (i.e. Caltex, BP Express, Shell Select, Sasol)	1	2	3	4	5	6
Fast food outlet (i.e. KFC, Nando's, McDonalds, Hungry Lion)	1	2	3	4	5	6
Street vendor	1	2	3	4	5	6
Spaza shop	1	2	3	4	5	6
Open or community market	1	2	3	4	5	6

B2 Please indicate which of the listed items you have purchased from which food outlet in the past 7 days. **You may mark more than one outlet per group of items**.

Item	Did not purchase item	Supermarket	Fruit and Vegetable Market	Butcher	Convenience Store	Fast Food Outlet	Spaza Shop	Street Vendor
Fruit (includes fresh, frozen, canned or in jar)								
Citrus fruit (oranges, lemons, naartjies)	1	2	3	4	5	6	7	8
Orange-coloured fruit (yellow peaches, mangoes, pawpaw, spanspek, plums)	1	2	3	4	5	6	7	8
Other fruit (apples, bananas, grapes, pears, litchis)	1	2	3	4	5	6	7	8
Vegetables (includes fresh, frozen, canned, or boxed)								
White roots and tubers (potatoes, white sweet potatoes)	1	2	3	4	5	6	7	8
Orange-fleshed vegetables (pumpkin, carrot, butternut, orange-fleshed sweet potato)	1	2	3	4	5	6	7	8
Dark green leafy vegetables spinach, kale, indigenous green leafy vegetables)	1	2	3	4	5	6	7	8

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Item	Did not purchase item	Supermarket	Fruit and Vegetable Market	Butcher	Convenience Store	Fast Food Outlet	Spaza Shop	Street Vendor
Other vegetables (tomatoes, onion, green beans, cabbage, gem squash, peas, beetroot)	1	2	3	4	5	6	7	8
Milk and dairy products								
Milk (fresh, powdered, UHT, maas)	1	2	3	4	5	6	7	8
Cheese and cottage cheese	1	2	3	4	5	6	7	8
Yoghurt	1	2	3	4	5	6	7	8
Dairy beverages (Yogi Sip, dairy-fruit beverages)	1	2	3	4	5	6	7	8
Beverages								
Fruit juice	1	2	3	4	5	6	7	8
Cordials and concentrates (Oros, Wild Island, Caribbean)	1	2	3	4	5	6	7	8
Soft drinks (fizzy and energy drinks)	1	2	3	4	5	6	7	8
Meat								
Beef	1	2	3	4	5	6	7	8
Mutton/ Lamb	1	2	3	4	5	6	7	8
Goat Meat	1	2	3	4	5	6	7	8
Chicken	1	2	3	4	5	6	7	8
Pork	1	2	3	4	5	6	7	8
Boerewors	1	2	3	4	5	6	7	8
Offal cuts	1	2	3	4	5	6	7	8
Bacon	1	2	3	4	5	6	7	8
Processed meat (ham, cold cuts, polony, Viennas, Russians)	1	2	3	4	5	6	7	8
Biltong	1	2	3	4	5	6	7	8
Bread and bread-like products								
Bread (white, brown),	1	2	3	4	5	6	7	8
Buns, bread rolls	1	2	3	4	5	6	7	8
Sweet buns	1	2	3	4	5	6	7	8
Scones	1	2	3	4	5	6	7	8
Fat cakes	1	2	3	4	5	6	7	8
Crisp breads / Crackers	1	2	3	4	5	6	7	8
Rusks	1	2	3	4	5	6	7	8
Cereal products								
Maize meal	1	2	3	4	5	6	7	8
Rice	1	2	3	4	5	6	7	8
Flour (cake, bread)	1	2	3	4	5	6	7	8
Sorghum	1	2	3	4	5	6	7	8
Pasta (macaroni, spaghetti, noodles)	1	2	3	4	5	6	7	8
Oils and fats								
Oil (sunflower, olive, canola)	1	2	3	4	5	6	7	8
Margarine (brick)	1	2	3	4	5	6	7	8
Margarine (tub)	1	2	3	4	5	6	7	8
Butter	1	2	3	4	5	6	7	8
Lard	1	2	3	4	5	6	7	8

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Item	Supermarket	Fruit and Vegetable Market	Butcher	Convenience Store	Fast Food Outlet	Spaza Shop	Street Vendor	Supermarket
Eggs								
Eggs	1	2	3	4	5	6	7	8
Legumes and nuts								
Dry beans (sugar, butter), split peas	1	2	3	4	5	6	7	8
Lentils	1	2	3	4	5	6	7	8
Nuts (peanuts, pecans, walnuts, macadamias)	1	2	3	4	5	6	7	8

B3 Indicate to what extent you **agree / disagree** with the following statements about the food outlets you buy from.

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
I am satisfied with the range of food outlets I have access to in my neighbourhood	1	2	3	4	5
Good quality fruit and vegetable products are available in the food outlets I normally shop	1	2	3	4	5
Healthy foods are available in the food outlets where I normally shop	1	2	3	4	5
I usually buy food at the food outlets closest to where I live	1	2	3	4	5
I am satisfied with the types (variety) of food I have regular access to	1	2	3	4	5
The food stores in my neighbourhood compare well with food stores in other areas of Gauteng	1	2	3	4	5
Fruits and vegetables are affordable (reasonable priced) in the food outlets I normally buy from	1	2	3	4	5
I have to travel some distance to buy good quality food	1	2	3	4	5
These outlets accommodate my needs (i.e. credit options, extended hours)	1	2	3	4	5

B4 Do you make use of on-line/ internet shopping for food?

Yes	1	No	2

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B5 How do you normally transport your purchased food home?

I walk and carry it myself.	1
Somebody helps me carry my food.	2
I take a taxi/ bus.	3
I use a car.	4

Section C: Usual eating patterns

C1 How many meals do you eat a day? (this excludes snacking between meals)

C2 During the past week, how many days did you eat **breakfast**?

Never	1
1-2 days	2
3-4 days	3
5-6 days	4
Everyday	5

C3 During the past week, how many days did you eat **lunch**?

Never	1
1-2 days	2
3-4 days	3
5-6 days	4
Everyday	5

C4 During the past week, how many days did you eat **supper**?

Never	1
1-2 days	2
3-4 days	3
5-6 days	4
Everyday	5

C5 During the past week, how many days did you **snack** between meals?

Never	1
1-2 days	2
3-4 days	3
5-6 days	4
Everyday	5

C6 How many of your daily meals do you eat **at home** on a weekday?

None	1
1 meal	2
2 meals	3
All meals	4

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C7 How often do you eat a meal or meals **away from home**?

Never	1
1-2 times per month	2
3 times per week	3
Daily	4

If answer is **Never** continue with C9

C8 If you eat away from home, where do you eat most often?

Fast food outlets	1
Restaurants	2
Supermarkets	3
Street vendors	4
Workplace	5

C9 How often do you and your family/household members eat a meal together?

Daily	1
3-4 times per week	2
1-2 times per month	3
Never	4
Not applicable I live on my own	5

If your answer is **Never/ Not applicable**, continue with question C12

C10 When eating with family/household members, how are most of the meals eaten?

All members of the household eat together at the table	1
Different age groups are formed and eat separately	2
We watch television while eating	3

C11 How strongly do you **agree /disagree** with the following statements?

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
I enjoy eating meals with my family	1	2	3	4	5
In my family eating brings people together in an enjoyable way	1	2	3	4	5
In my family mealtimes are a time for talking with other family members	1	2	3	4	5
In my family, dinner time is about more than just getting food, we all talk to each other	1	2	3	4	5
In my family we often watch television while eating dinner	1	2	3	4	5

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Indicate which statement applies best to you.

C12 I care about eating healthy food

Not at all	1
A little bit	2
Somewhat	3
Very much	4

C13 Many of my friends care about eating healthy food

Not at all	1
A little bit	2
Somewhat	3
Very much	4

C13 The people I live with care about eating healthy food.

Not at all	1
A little bit	2
Somewhat	3
Very much	4
Not applicable – I live on my own	5

C15 Indicate how often the following applies to the food in your home.

	Always	Usually	Sometimes	Never
Fruits and vegetables are available in my home	1	2	3	4
Vegetables are served with main meals in my home	1	2	3	4
Milk is available in my home	1	2	3	4
100% fruit juice is available in my home	1	2	3	4
Potato chips and other salty snacks are available in my home	1	2	3	4
Chocolates and other sweets are available in my home	1	2	3	4
Soft/ fizzy drinks (Coke, Sprite, Fanta) are available in my home	1	2	3	4
We have “Junk food” in my home	1	2	3	4
Food is prepared in a healthy manner in my home	1	2	3	4

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C16 Please indicate if you have included foods from the following groups as part of your **meals** or **snacks yesterday.**

	Yes	No
Cereals: maize, rice, wheat, sorghum, and any other foods made from cereals such as porridge, bread, pasta, and noodles	1	2
White roots and tubers: potatoes and white sweet potatoes	1	2
Orange-fleshed vegetables and fruit: Pumpkin, carrots, butternut, orange-fleshed sweet potatoes, yellow peaches, pawpaw, mangoes, plums, spanspek, apricots	1	2
Dark green leafy vegetables: spinach, kale, indigenous green leafy vegetables	1	2
Other vegetables: tomatoes, onion, green beans, lettuce, cabbage, broccoli, cauliflower, eggplant, gem squash, beetroot	1	2
Other fruit: apples, bananas, grapes, pears, litchis, oranges, naartjies	1	2
Legumes and nuts: dried beans, dried peas, lentils, nuts, or foods made from these (i.e. peanut butter, hummus)	1	2
Fats and oils: oils, fats or butter added to food or used in cooking	1	2
Meat, poultry, or fish: beef, pork, mutton/lamb, goat, chicken, duck, fresh, frozen, tinned, or dried fish or shellfish	1	2
Milk and dairy products: milk, maas, cheese, yogurt, or any other milk products	1	2
Eggs: eggs from chicken, duck, or any other egg	1	2
Sweets: sugar, honey, sugary foods such as chocolates, candies, cookies, cakes, and sugar sweetened beverages such as fizzy drinks and cordials	1	2
Spices and condiments: spices, salt and pepper, condiments (i.e. tomato sauce, soy sauce, salad dressing)	1	2
Beverages: coffee, tea, herbal teas	1	2
Alcoholic beverages: beer, wine, whiskey, brandy, vodka	1	2

C17 **How many servings** of the following foods do you usually eat each day? Use the serving guide provided for each item to determine the approximate serving quantity you eat.

Food	Servings per day
Starchy food (rice, maize meal, bread, pasta, breakfast cereals). ***Serving size:*** 1 slice of bread, ½ cup rice, pasta, porridge,	
Vegetables (fresh, frozen, or salad). ***Serving size***: ½ cup cooked, 1 cup for raw leafy vegetables	
Fruit (all fresh) ***Serving size:*** ½ cup chopped fruit, 1 medium apple, banana, 2 medium sized apricots, plums, ½ cup fruit juice, 2 tablespoons raisins	
Meat, chicken, or fish. ***Serving size:*** meat - palm size, slice 10mm, chicken – 1 medium breast, white fish – 1 large piece	
Milk and dairy products (yoghurt, cheese, cottage cheese, maas). ***Serving size:*** 1 cup milk, yoghurt, maas, 1 cube of 30mm cheese.	
Soft drinks (fizzy drinks i.e. Sprite, Coke, Fanta). ***Serving size:*** 340ml can	
Water. ***Serving size***: 1 cup/ 1 glass	
Tea and coffee. ***Serving size****:* 1 cup	
Sugar in tea or coffee. ***Serving size:*** 1 teaspoon	
Potato crisps or other savoury snacks ***Serving size:*** 1 small packet (35g)	
Chocolates bars. ***Serving size:*** 1 bar	

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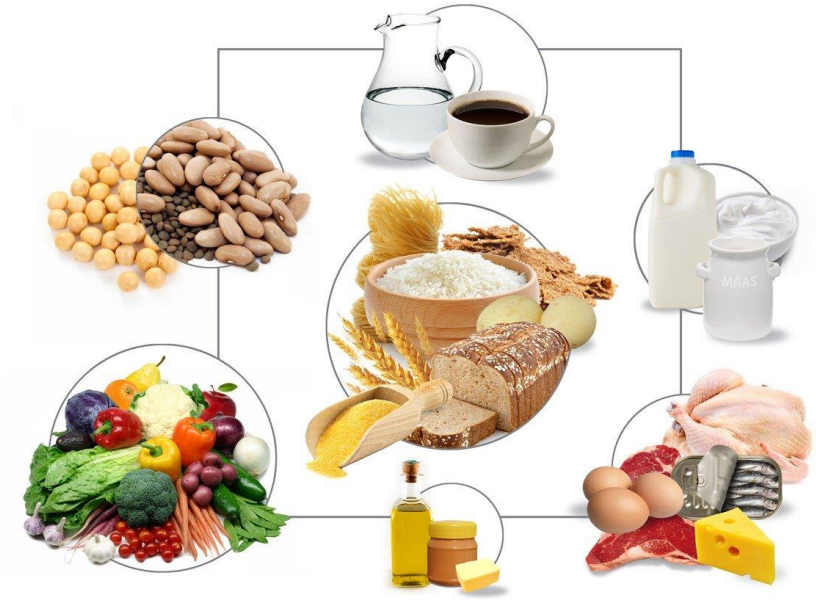
C18 Indicate how often you eat or drink the following foods.

	Daily	3-4 times per week	1-2 times per week	Seldom	Never
Red meat (beef, pork, mutton)	1	2	3	4	5
Chicken	1	2	3	4	5
Boerewors	1	2	3	4	5
Processed meat	1	2	3	4	5
Fish	1	2	3	4	5
Eggs	1	2	3	4	5
Full cream milk	1	2	3	4	5
Low fat milk	1	2	3	4	5
Cheese	1	2	3	4	5
Yoghurt	1	2	3	4	5
Fruit	1	2	3	4	5
Vegetables	1	2	3	4	5
Salads	1	2	3	4	5
Butter	1	2	3	4	5
Margarine (tub)	1	2	3	4	5
Margarine (brick)	1	2	3	4	5
Vegetable oil	1	2	3	4	5
White bread, bread rolls and buns	1	2	3	4	5
Brown or whole wheat bread	1	2	3	4	5
Breakfast cereals	1	2	3	4	5
Maize meal porridge	1	2	3	4	5
Rice	1	2	3	4	5
Pasta (macaroni, spaghetti, noodles)	1	2	3	4	5
Potatoes	1	2	3	4	5
Legumes (dry beans, lentils, split peas)	1	2	3	4	5
Nuts	1	2	3	4	5
Fruit juice	1	2	3	4	5
Soft drinks (fizzy such as Coke, Sprite, Fanta)	1	2	3	4	5
Sport or energy dinks (Energade, Red Bull)	1	2	3	4	5
Water	1	2	3	4	5
Pizza	1	2	3	4	5
Potato chips (crisps)	1	2	3	4	5
Fried chips (slap chips)	1	2	3	4	5
Cake, tart, cupcakes or muffins	1	2	3	4	5
Meat pie	1	2	3	4	5
Bar of chocolate	1	2	3	4	5
Sweets	1	2	3	4	5
Cordials (Oros, Wild Island, Caribbean)	1	2	3	4	5
Hamburger	1	2	3	4	5
Cookies, biscuits	1	2	3	4	5

Addendum D

Food-based dietary guidelines for South Africa



Food Based Dietary Guidelines for South Africa 2012 (Vorster *et al.*, 2013).

- Enjoy a variety of foods.
- Be active.
- Make starchy food part of most meals.
- Eat plenty of vegetables and fruit every day.
- Eat dry beans, split peas, lentils, and soya regularly.
- Have milk, maas or yoghurt every day.
- Fish, chicken, lean meat, or eggs can be eaten daily.
- Drink lots of clean, safe water.
- Use fats sparingly. Choose vegetable oils rather than hard fat.
- Use sugar and foods and drinks high in sugar sparingly.
- Use salt and food high in salt sparingly.

Addendum E

Dietary Diversity

Food group	Example
Starchy staples	Maize, rice, wheat, sorghum, bread, pasta and noodles, potatoes, and white sweet potatoes
Orange-fleshed vegetables and fruits	pumpkin, carrots, butternut, orange-fleshed sweet potatoes, yellow peaches, pawpaw, mangoes, plums, spanspek, apricots
Dark green leafy vegetables	Spinach, kale, indigenous green leafy vegetables
Other fruits and vegetables	Tomatoes, onion, green beans, lettuce, cabbage, broccoli, cauliflower, eggplant, gem squash, beetroot
Legumes and nuts	Dried beans, dried peas, lentil, nuts, or food made from these items (i.e. peanut butter, hummus)
Fats and oils	Oils, fat, or butter added to food or used when cooking
Meat, poultry, and fish	Beef, pork, mutton or lamb, goat, chicken, duck, fresh, frozen, tinned, or dried fish or shellfish
Milk and dairy products:	Milk, maas, cheese, yoghurt, or any other milk product
Eggs	Chicken, duck, or any other egg