FOOD PREFERENCES OF INTERNATIONAL STUDENTS AT THE UNIVERSITY OF THE FREE STATE

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CERTIFICATION

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CHAPTER 1: GENERAL INTRODUCTION

Food and water are essential requirements for all humans anywhere; it becomes the second demand after breathing. Scientists' interest in food is not only recently, but also for a long time, especially in the field of anthropology; they have recognised people, especially those exposed to migration and those who faced difficult conditions such as refugees, are more likely to change food habits and diet to suit their circumstances (Mintz & Du Bois, 2002). Human food demands are similar but research proved that belonging to different ethnic groups would influence people's food choices (Birch & Fisher, 1998).

Food consumption during life starts in childhood. It is influenced by family members and peers and is enhanced by the environment where food is presented. During the period from childhood to young adulthood, many changes take place in the diet of the individual. A child is exposed to a tremendous amount of information, which will influence food choices during the transition period of a diet consisting exclusively based on milk to the diet in childhood, through to the stages of a young adult (Birch & Fisher, 1998).

Genetic predisposition also plays an influential role in the eating habits acquired by the child, which is the preference of foods to other foods, and this shows that the favourite foods are often familiar, accustomed to be addressed in the family and become familiar with time. This explains why children prefer foods with sweet taste more than salty taste, as well as the rejection of strong tastes like sour and bitter as they learn how to discriminate between food flavours and the consequences of eating (Drewnowski, 1997).

Food and eating represent the physical, social and cultural factors, which include food and eating knowledge, food ideologies and cultural environments (Neumark-Sztainer *et al*., 1999).

One of the most influential factors on the decisions of the selection of food is the person's sense of hunger and desperate need of food. Other factors identified are (1) the time that it takes to prepare food, (2) the availability of the food and (3) the role of

parents in influencing the behaviour of their children. In addition, other factors playa visible and influential role on the food choice behaviours such as cultural and religious background, and other personal factors such as cost, body image and mood. The media and person's perception of the benefits of a particular food product also influence food choices (Neumark-Sztainer *et al*., 1999).

Food choice decisions are multi-componential and no specific theory explains the factors that influence food choices and preferences, but multiple perspectives, frameworks and theories are needed to simplify the factors and interactions in food choices (Sobal & Bisogni, 2009).

The selection procedure of food and eating is not a simple theory; it consists of multiple aspects that require constructionist thinking. Taste responses are influenced by a range of genetic, physiological, and metabolic variables. Reactions to sensual taste, smell and texture of food, are factors that helps to understand the preference of the person for food, but this fact alone is not enough to know the actual food intake of the person. In fact, it is said that people who prefer the sweet taste, are vulnerable to obesity more than their peers are. However, this is over-simplified, because in fact there are many links between tastes and preferences. In addition, we cannot forget that personal differences play an active role in influencing the choices and food selection (Sobal & Bisogni, 2009).

Food and nutrition scientists believe that "we are what we eat". This fact reflects the reality that the health and physical condition of the man who consume a balanced and varied healthy diet, is different from the man who follows an unhealthy, unbalanced diet rich in fat and sugar, which affects human health even in the form of a chronic disease (Tajfel, 1981).

This study will focus mainly on the factors that enhance and influence food and eating decisions of international students during their term of study at the University of the Free State.

Good nutrition and good food are essential to good health; it is the key to healthy growth and development of children and adolescents as well to maintain health.

Time is always been emphasised as an important factor that influences food choices for students. Most international students will not be able to have a cooked meal at lunch or dinner as when they are at home in their home country, but because they have to deal with it all by themselves and there is not enough time in the day to do it. The result is that they eat at the university's cafeterias or other food facilities. The affordability of proper food available on the campus cannot be ignored. The importance of proper, suitable food for international students motivates the research on the food choices of the international students at the University of the Free State.

1.2 Problem statement

The University of the Free State is one of South Africa's most popular destinations for students from different African countries. A large number of international students study at the university. Hosting students from different countries emphasises the importance and the responsibility to supply suitable food to fulfil the religious, cultural and dietary food needs of students at the university.

1.3 Aim of the study

This research aims to investigate whether international students at the university consider their food choices and the food served at the different food facilities on the campus to be suitable and sufficient. The study further aims to determine the factors influencing food choices of the international students.

1.4 Research questions

1. Do international students consider the food available on campus suitable?
2. How do the international students fulfil their food needs?
3. How can the food institutions on the campus change to fulfil the needs of the international students?
4. Does religion influence students' food selection?
5. Does culture influence students' food selection?

CHAPTER 2: LITERATURE REVIEW

Food selection is not a simple mechanism and the selection of one food over another is complex. It is a long process involving many factors, including food availability, as well as social and culture standards. Factors determining food preferences are both learned and innate; food preferences are influenced by environmental and psychosocial elements (Sobal & Bisogni, 2009).

According to Sobal & Bisogni (2009), “food choice decisions are frequent, dynamic, multifaceted and complex”. Food decisions are affected by social behaviour and social environment when observed from a social perspective.

A person eats and drinks several times each day and each of these occasions requires a number of decisions, like what to eat, where to eat and when to eat, even the quality and quantity needs to be decided. A variety of factors influences each of these decisions, which also include the people with whom you eat (Birch & Fisher, 1998).

Scientists have found that the factors could be classified into five sections, namely cultural and personal factors, resources, social factors and present context, all of which interact (Klazine, Ferrage & Rytz, 2014).

Other scientists identified other factors influencing individual’s food choices, for instance, “physiological factors, individual differences such as genetic predispositions, personality traits and the opportunities for learning across the life span, and social influence” (Delaney & McCarthy, 2009).

One person will be affected differently from another in food choices at different stages of his or her life cycle. A women′s decisions will differ between pregnancy, being a mother and in retirement. Experiences during the life time of an individual play a role and have significant impacts on the nature of cravings and aversions. Patterns of aversions are explained in three ways:

- As learned aversions to specific foods

- As responses to gastro intestinal illness associations
- As associations with childhood pressures to eat certain items (Delaney & McCarthy, 2009)

The period between the ages of two and five years is important. This is a sensitive stage, during which eating habits are established, the child develops preferences influenced by exposure and the influence of parents plays a role. What they are exposed to will be determined by the parents' diet, which will be influenced by culture, religion, environment and social factors (Mogharreban & Nahikian, 1996).

2.1 Major determinants of food choice

The main motive to eat is hunger, but the real and logical dimension for choosing a particular type of food is due to many factors, including physiological and nutritional needs, but they are not the only determinants. Many other factors affect food choices:

- Biological and physiological factors like hunger, taste and medical conditions.
- Economic factors such as how much the food cost, income level, availability and affordability of food.
- Physical factors such as access to supermarkets and local fruit and vegetable stores and other food shops, skills in preparing, cooking and serving foods.
- Social factors such as cultural and religious factors, family meal pattern, people surrounding like friends and relatives.
- Psychological factors which include how people feel during specific times.
- Beliefs, level of education and knowledge on food and nutrition.
- Age and stage of lifecycle.

2.1.1 Biological and physiological determinants of food choice

2.1.1.1 Hunger and satiety

The main basic determinants of food choice are caused by our physiological needs. People need food to provide the body with the essential elements of protein, carbohydrates, fats, vitamins and minerals, in order to stay alive and maintain good health. They can ensure that when the nervous system functions by responding to the feeling of hunger and satiety. Food items differ in terms of calorie content; fat comes in first place in terms of calorie content, followed by carbohydrates, but in terms of saturation, proteins give the highest sense of satiety (Johnston *et al.*, 1998). The energy density is responsible for excerpt potent effects on satiety. Low- energy-density diets generate lower satiety than high energy-density diets, high-fat and high-sugar foods, which have high energy density, can also lead to passive overconsumption (Johnston *et al*., 1998).

2.1.1.2 Palatability

Palatability can be defined as ″the property of being acceptable to the mouth 'TASTE'" (Tuleu & Breitkreutz, 2013). Appetite training is one of most important factors that play a role in children's food preferences, which can determine children's food choice (Carnell & Wardle, 2008). Children's choices do not follow a healthy pattern; they like to eat and drink foods high in sugar and high in fat content, which is not a healthy choice compared to the healthy food, vegetables and fruits. The pleasure that the sweetened and high-fat foods and the fullness it gives explain why children prefer these foods (Cooke & Wardle, 2005).

Taste plays an influential role on the selection of food. Different sensory receptors in the tongue are responsible for sensory tasting which plays an important role to draw a conclusion for each type of food. Since birth, when the child is introduced to complementary foods, many factors determine the direction of human preferences to a certain type of food. Preference for sweet taste rather than bitter taste is more instinctive behaviour in humans from birth (Booth, Sharpe & Conner, 2011). Social

events and occasions provide eating experiences, which makes people prefer specific types of food (Feunekes *et al*., 1998)

(a)Sensory aspects of food

(i) Taste and food choice

Taste is one of the chemical senses associated with the sense of smell, which has a close relationship with the behavioural centres in the brain, especially the limbic system and the hypothalamus centres where these centres are responsible for food selections, according to body need (Mennella, 2014). Preference for a specific taste starts to form in the early life with new tasting experiences (Capaldi, 1992) and continue to change while getting older (Nestle *et al*., 1998).

Research has shown the relationship between taste and the liking factor was more present than the relationship between taste and health factor (Wardle et al., 2004), as a result choosing specific food and eating preferred food make people feel happy and satisfied. Preferring a specific diet starts from childhood, as the maternal diet is transmitted to the amniotic fluid and the mother's milk; therefore the baby will get used to certain tastes and flavours, and will prefer it in future (Mennella, 2014).

Preferring sweet taste is frequently linked to the presence of carbohydrates that give fulfilment to the human body and an adequate amount of calories. It also might be innate. However, some people prefer the taste of salty or bitter tastes due to long exposure to such foods (Mennella, 2014).

Breastfed children are affected by mother's milk and what mothers eat. The flavour of fruits and vegetables appears in the milk and long exposure to the same flavour will make children getting used with it. Formula-fed children are more able to accept different flavours, due to the exposure to different types of formula milk and children fed for a long time with specific formula milk will be familiar to those flavours more than breastfed children are (Mennella, Pepino & Reed, 2005).

Repeated exposure to specific tastes will have an effect on how the baby will accept different tastes in later life, for instance, long exposure to sweet and bitter taste in the

pregnancy trimesters make the acceptance of these tastes more acceptable and would be more preferred by the child later in life (Nehring *et al.*, 2015) as result of the fact that the special tastes and flavours at the food are transmitted to the amniotic fluid (Mennella, Pepino & Reed, 2005).

Studies revealed that the repeated exposure to sweet and bitter taste would result in more acceptances of the tastes; these tastes are experienced with taste. Receptors situated in the tongue (Mennella, Pepino & Reed, 2005). People can inherit specific tastes, such as sweet tastes in food such as desserts, while the preference for fruits, vegetables, meat and fish can also be inherited (Breen, Plomin & Wardle, 2006).

Exposure to new food tastes for a long time leads to a new food liking (Mennella, Pepino & Reed, 2005), but sensory aspects of food like smell, flavour, texture and taste, are not the only factors that determine our food choice (Steptoe, Pollard & Wardle, 1995).

(ii) Flavour and food choice

Flavour is one of the most important sensory characteristics that influence the choice of food. Flavour involves a range of sensations that pass from the centre of smell in the nose and taste buds on the tongue and touch receptors in the mouth (Tuleu & Breitkreutz, 2013). A mixture of sharpness, heat and cooling is experienced when food is placed in the mouth, and will affect the experience of eating food (Tuleu & Breitkreutz, 2013).

Flavour is the impression of a sense of food, which is determined by the sense of smell and taste. The relationship between taste and olfaction is a major determinant in food preferences (Kemp, Hollowood & Hort, 2009). People do not have the same genetic receptors and odorant responsible for food acceptance (Lunde *et al*., 2012), as the flavour is a mixture between olfaction and taste (Costell, Tárrega & Bayarri, 2010). The effect of aromatic material plays an important role in determining the flavours of this as we can see when a person is infected with a cold, where they cannot distinguish between the flavours when they eat food, as flavours are all the same (Eertmans, Baeyens & Van den Berg, 2001). Natural flavourings or a mixture

of natural herbs added to food decreases the need of salt and enhances food taste (Mitchell, Brunton & Wilkinson, 2013).

A study by Kälviäinen and co-workers (2003) about the acceptance of a certain flavour of yogurt was conducted between two groups of elderly and young people to distinguish between the flavours and preferring a specific flavour. The study proved that the greater the aromatic substances in the product, the more the product was consumed, while differences emerged between the elderly and the young in the sense of taste, where the first group preferred to eat and drink sweetened foods and high concentrations of sucrose.

Yeomans (2007) identifies the learning experience after eating specific food as the flavour consequence learning, which can be negative or positive, according to the experience itself. The learning experience starts at the age of five years old and continues to develop when getting older (Nestle *et al*., 1998).

Variable different learning experiences are the reason behind food preferences, and it all has a long-lasting effect during the life span (Capaldi, 1992).

Food preferences of children are similar across the world in that they like eating high-density and sweetened food (Cooke & Wardle, 2005).

(iii) Texture

Textures include physical properties of the food, including shape and texture. When eating, the pressure and movement receptors stimulate the skin and muscles of the mouth and tongue to detect feelings of smoothness, viscosity, granular, vulnerability and fibrous textures (Tuleu & Breitkreutz, 2013).

(iv) Appearance of food

Appearance of food is a key factor that affects food preference (Furst *et al.,* 1996). We eat what our eyes like to see (Rouby, Schaal & Dubois, 2002). Research has shown that serving plays an important role in food preferences (Wilbur, 2013). Contrast in colours when serving food is preferred (Wilbur, 2013) and different food colours are important to attract attention (Furst *et al*., 1996). Variety plays an

important role in food preferences, especially when feeding kids (Wilbur, 2013). As the packaging of the products is also a key factor (Wilbur, 2013), specific colours can be useful to increase the acceptability. For instance, when orange and red colours are used, it stimulates good appetite (Ines *et al*., 2011).

2.1.2 Economic determinants of food choice

2.1.2.1 Cost and accessibility

Availability refers how close a person stay and work from a place selling foodstuffs, such as fruit and vegetable store, or grocery store or supermarkets, etc. On the other hand, the term *availability* and easy access are used to show how available healthy, safe food is in food stores. Cost plays a major role in food choice; if prices of food are high, this may be an obstacle to the customer to choose healthy food. Diet management is a key factor when it comes to the food money value (Guenther *et al*., 2008). People can follow a diet rich in vegetables, fruits, low-fat food that can be value for money (Stewart, Blisard & Joliffe, 2003), as the cost factor plays an important role in what food people choose (Darmon, Ferguson & Briend, 2002). Diet quality is positively linked to cost (Schroder, Marrugat & Covas, 2006). In low-income families, cost works as a barrier against a healthy diet (Mitchell *et al.*, 2000) Availability of food can also mean how easy consumers can get to food shops and supermarkets. Is it affordable for consumers? The quality of the food also determines whether healthy food is accessible (Voevodin, 2012)

Price is identified by Voevodin (2012) as a factor influencing the food choice of most consumers. The public, when shopping, tends to buy priorities rather than complementary items. Low-income families tend to consume less vegetables and fruit than high-income families (Stewart, Blisard & Joliffe, 2003). A healthy diet follows the nutrition recommendation and decreases the cost of foods eaten (Raynor *et al*., 2002). Many other factors influence the nature of the food they buy such as time, health and cost. Time is one of the most influential of these factors when people select food. Students or working people tend to buy meals that do not need a long time to prepare. Vegetables and fruit can be bought at competitive prices comparing with high-energy dense foods (Golan, Stewart & Kuchler, 2008). Standard

of living for families and monthly income and food prices determine the quality of the diet. Low-income families can often not afford a balanced diet because of the high cost of food (Stewart, Blisard & Joliffe, 2003). They may experience some diseases associated with poor nutrition such as obesity (Voevodin, 2012).

The time and effort to purchase food, cook it and clean up afterwards might in some cases be more than when a takeaway meal is purchased; provided the meal has the same nutritional value, fast food very often does not provide a balanced meal (Voevodin, 2012).

Students who belong to families with lower socio-economic positions tend to choose unhealthy food (foods with high content of sugar and fat). It gives them the feeling of satiety at lower price. High-protein food sources like lean meat, whole grains and fresh vegetables and fruits are also more expensive.

The economic factor remains a determining factor in the selection of food, especially for low-income families when they need to ensure a balanced diet. However, access to adequate money and families with a high monthly income does not necessarily mean that they follow a balanced diet rich in vegetables, fruits and meats, but the possibility of providing these types of food increases, which ensures access to a healthy, balanced diet (Veovodin, 2012).

2.1.3 Education and knowledge

Knowledge about nutrition and food means more than just knowing the food, which means that knowledge in this field includes knowledge of the role of the different nutrients and management of their intake to prevent nutrient-related diseases like cancer, heart diseases and even obesity (Wardle, Parmenter & Waller, 2000). Human actions and behaviour towards a certain point, resulting from the internal decisions, may have resulted from certain experiences and knowledge when people take diet decisions. In contrast, people know the foundations and rules of good nutrition, but does not necessarily follow a healthy diet. Sometimes people cannot apply that knowledge to reality. The diversity and plurality of sources of knowledge cause a lot of contradiction and confusion for adopting certain dietary decisions.

People often mistrust their sources of information (De Almeida *et al*., 1997). A study by Grosso *et al*. (2012) reveals that students whose parents are in the highest educational and occupational categories select and eat vegetables and fruits more often when compared to students whose parents with lower categories of education. The intake of sweets, junk food and sugary drinks is also much less amongst students with better-educated parents. There is a strong relationship between nutritional knowledge of the person and his actions in the decision to take a special diet, which makes it easier to assure the relationship between nutrition knowledge and healthier nutritional behaviour (Grosso *et al.*, 2012).

The desire to follow a healthy balanced diet exists amongst all people. Women are more likely to be good targets for educational programmes, because women are responsible for the shopping and food preparation in most cultures (James, 2004).

Nutrition, food and health education programmes must include families, not merely individuals. Food is usually a large part of and the reason for family gatherings. Extended families help to keep traditions alive and this will influence individual behaviours (James, 2004).

To change bad eating habits into good eating habits should be gradual, so people would not be uncomfortable with change; they should be convinced that it would be beneficial and worth the costs involved (Best *et al*., 2003).

James (2004) agrees that a positive relationship exists between the level of education and healthy and balanced diet.

2.1.4 Social determinants of food choice

2.1.4.1 Social modelling

Children tend to observe their parents and peers and copy their eating behaviour more than just following the taste of what they eat (Birch, 1999).

The way in which food is offered also influences a child′s reaction to it, food served in a friendly way are more likely to be accepted and a preference for it is developed (Birch, 1999). Adults tend to allow their food decisions to be influenced by familiar

people more often than by other people. Adults are more effective in convincing others to eat unknown food they eat themselves instead of offering it without eating (Feunekes *et al*., 1998).

Parents, family and people around children can improve and encourage a healthy diet. Especially when parents themselves eat healthy food and enjoy it with them, this gives an impression of palatability and means that the food they serve is surely tasty, which encourages children to eat (Feunekes *et al*., 1998).

Cultural and social circumstances do affect people towards making certain food choice decisions. There is also a clear difference between social classes regarding nutrition food and intake, and an unbalanced diet can result in nutrition problems such as malnutrition or overweight and other nutrition-related diseases (Feunekes *et al*., 1998).

2.1.4.2 Social context

A society is a group of people living in a common territory and shares the same institutions. They share certain characteristics and stand in a specific relation to one another. The society shares common eating habits as well. The influence of society on the individual's eating habits can be positive or negative (de Castro, 2000).

The effect can be direct or indirect and either conscious or subconscious; it can influence the kind of food, the quality or the way in which it is prepared (Feunekes *et al*., 1998).

Dietary habits can change easily. If people support each other socially it can be beneficial and effective in having new healthy dietary habits (Devine *et al.*, 2003).

Consumption of healthy and fresh foods like vegetables and fruits can be increased for individuals if they find enough support from people surrounding them like relatives, friends and parents (Sorensen, Stoddard & Macario, 1998).

Family members and food environment play a role on food choice decisions, especially for young people (Sorensen, Stoddard & Macario, 1998). Parents as food preparers play a central role in shaping food habits of household members (Hannon

et al., 2003). Parents represents a role model for their children in all behaviours, including food choice behaviours; thus, healthy eating habits and balanced diet development are primarily the responsibility of parents (Hannon *et al*., 2003).

Jago and co-workers (2007) confirm the positive relationship between the availability and consumption of certain foods in the home. Healthy essential foods should be purchased regularly to ensure a healthy balanced diet (Hannon *et al*., 2003). Having regular family meals is a successful strategy that parents can use to help ensure their children's consumption of a nutritious diet and development of healthy eating patterns. O′Dea (2003) focuses on dietary weight control behaviours and overweight status. Their findings indicate that people who suffer from social problems follow a bad diet and neglect their health, especially adolescents.

Attitudes, encouragement, and behaviours of friends and peers are factors that influence food choices of children and adolescents.

The quantity of food consumed is influenced by the presence of others, and adolescents tend to consume larger quantities of food when they eat together (Herman, Polivy & Roth, 2003).

In general, children tend to eat what their siblings eat (Hertzler, 1983; Pliner & Pelchat, 1986) and the reasons behind that could be one of the following:

1. The distance between the siblings' ages plays a role in influencing the convergence of their food choices.
2. Child-sibling pairs are more likely to exposure to the same amounts of similar foods.

The similarity between the peers of the children in food preferences has been proven. It was found that mixing the kids with peers who prefer a particular food changed the eating habits and eating impression was changed even in the absence of peers (Oliver & Thelen, 1996).

Other factors can affect the impression of eating for children, such as programmes that provide information and commercial advertising that affect decisions of food choice (Stoneman & Brody, 1981).

Children tend to choose food that their peers have chosen, even though they do not see this behaviour as copying (Stoneman & Brody, 1981).

Food choices and behaviours of children are affected by parental impressions and influences (Worsley, Coonan & Baghurst, 1983).

Children get exposure to different types of food before they create their own eating habits. This stage is therefore very important in creating food preferences and choices (Worsley, Coonan& Baghurst, 1983).

Pliner & Hobden (1992) emphasise the importance of the cultural and social environment in which children live and the impact on their food choices, especially family members, primarily the mother. It simply means that the mother's preferences become the familiar and the preferable food for the child as well.

2.1.4.3 Social setting

Most people prefer eating at home, but due to different circumstances and needs, people sometimes have to eat at schools, universities or workplaces. Places where people eat play an important role in their food choices. The availability of healthy food provides the opportunity of a healthy choice, but in some cases, the provision of healthy food is neglected in cafeterias at schools and the workplace, and it becomes difficult to keep to a healthy diet (Faugier *et al*., 2001).

The child eats at the day-care facility and becomes familiar with the food at the facility. This can influence the child's food choices late in life (Smolensky & Gootman, 2003). The nutritional quality of a diet and eventually food choices can be improved if day-care facilities provide good-quality food (Story, Kaphingst & French, 2006).

2.1.4.4 Schools

The diet of children in schools plays an important role in the total daily diet if they eat a meal at school (Story, Kaphingst & French, 2006). School environment can have a

significant influence on the health and behaviour of children, in particular, their food choices. The Food in Schools Policy can only be truly effective, when linked closely to physical education and activity in the educational associations. The responsibility of the school in accustoming and supplying students with the knowledge of comprehensive theoretical and practical foundation of healthy food and its importance to maintain health, providing them with healthy, balanced meals is a serious responsibility.

Gordon and Fox (2008) show that offerings in schools nowadays do not encourage healthy eating, because the food served in shops and vending machines is often rich in energy and low in all other nutrients. Schools in rural areas provide even less healthy food (Finkelstein, Hill & Whitaker, 2008).

2.1.5 Personal determinants

Many personal factors such as perceptions, beliefs, attitudes and motivation influence our food choices. Health and food-related health problems motivate consumers to adopt healthier food-consumption patterns. Health is a quality dimension used in the evaluation of food (Wrick, 1995).

It is expected that the demands health-conscious consumers will have on the food market might affect the production, processing and manufacture of food products (Glanz *et al.*, 1998). People differ in self-characteristics, which makes it easier to explain people's perceptions and preferences (Jaeger *et al*., 1998). Self-consciousness about body (Miller, Murphy& Buss, 1981) is one of the food-preference determinants and is known as Private Body Consciousness (PBC) (Miller, Murphy & Buss, 1981). PBC is highly related to food preferences and is known as the self-awareness that can be high or low presented (Miller, Murphy & Buss, 1981). PBC is controlled by many factors in the human body such as "body temperature, internal tensions, heart rate, and dryness of the mouth and hunger and satiety sensations" (Vabø & Hansen: 2014).

Because of health programmes, advertisements and advertising campaigns, most people know the importance of healthy and balanced eating for maintaining good

health and avoiding many of the food-related diseases. Health concern is therefore important when choosing food. The success of any diet programme depends on a set of interrelated factors. The most important factor is the person with the desire for change and wants to get rid of the problems associated with the health system (Givens, Baxter & Minihane, 2008). A person's belief that healthy eating is the easy way out and a non-costly way to ensure good health, plays an active role to influence purchasing decisions for the consumer, and thus the motive behind the drift of consumers to buy and eat organic and natural food. They assume that these products are healthier than conventional products (Givens, Baxter & Minihane, 2008). Questions like "What will we get from a specific food?" indicate our beliefs of the benefit that we get from food. It is important that the food we eat is tasty, convenient, affordable, comforting and make us feel full. We also add personal meaning to certain food, such as when we feel cold and we feel the need for a hot soup, or that we eat chocolate when we feel happy. All these are personal determinants influencing our food choice (Glanz *et al*., 1998). The obsession with health is a major motivation for the purchase of organic food and following a healthy and balanced diet (Wrick, 1995). Several studies confirm the growth in the desire of consumers to eat healthy food and food companies are more cautious and aim to please consumers (Glanz *et al.*, 1998).

2.2 Cultural influence

Cultural influences lead to differences in the way particular foods are prepared and consumed. Some foods like meat and milk are sometimes excluded from the diet. Cultural influences are known to change when people move to a new country; individuals adopt some of the food habits of the local culture (Caprio *et al*., 2008).

2.2.1 Cultural factors influence food-related behaviour

"Culture is a system of shared understandings and interactions that shapes, and in turn, is shaped by experience." Shared values and beliefs are core aspects of all cultures and shape perceptions of food, health, and illness (Caprio *et al*., 2008: 2214).

Food, like language, music, and dress can be a distinguishing characteristic of a culture (Caprio *et al*., 2008).

Individuals learn to understand the outside world within the framework of their own culture. Cultural behaviours, values, and beliefs learned from early childhood and transmitted from parent to child to the next generation. However, culture is static and it continues to evolve and change over time (Caprio *et al*., 2008).

Food is an expression of cultural identity in food patterns. Cultural food patterns influence food preferences and perceptions of the health value of specific food items. Cultural food patterns often prescribe what food is eaten, how it should be prepared and when it is eaten (Caprio *et al*., 2008). Cultural and social factors are responsible for different food preferences between nations (Mela, 1999). The food patterns in a culture often vary between ethnic groups, in different regions or geographic areas, even between genders.

The key factor that plays an important role in making differences between rural and urban areas is availability (Jaeger *et al*., 1998), as the availability is determined by geographic location in which the plants and crops and thus the products are available (Mela, 1999).

Globalisation and acculturation influence cultural change and cause cultural homogeneity to a certain extent (Caprio *et al.,* 2008). Dietary acculturation is explained as ″the extent to which a group change their eating patterns and/or food choices in a new environment″. Some individuals and families retain their national food choices while others adopt new choices and preparation methods. Dietary acculturation can benefit health or be detrimental to health. The younger generation are more likely to adopt more healthy food habits and eat more fruit or vegetables and fewer soft drinks compared to older generations (Caprio *et al*., 2008). The social environment that we grow up and culture are the major determinant in shaping differences among the different cultures (Kälviäinen, Roininen & Tuorila, 2003). Cultural influence guides even the amount of food that we eat (Prescott & Bell, 1995).

Media exposure broadens knowledge and it changes food behaviour and influence food preferences, by tempting individuals to experience “new” tastes (McCaughey & Scott, 1998). Fast-food restaurants promote common food tastes across cultures (McCaughey & Scott, 1998).

Cultural attitudes and norms influence food behaviour. The perceived dangers of the time influence the food behaviour in a culture. Refugees in danger of hunger may view overweight more positive than people confronted by the health hazard of obesity. Cultural perceptions of body weight as a standard for attractiveness can influence the food behaviour of a specific culture (Evilly & Kelly, 2001).

Understanding the cultural context is important when planning to change (Nestle *et al*., 1998). Many food-learning mechanisms occur because of family members and peers’ presence (Birch, 1980), the reason why people from the same culture and society will have some resemblance in food preferences (Ludy & Mattes, 2012).

Food ways are culturally recognized as appropriate patterns used in a society.. Nestle and co-workers (1998) suggest a list of constraints that the individual can use as a guide to select appropriate food. The food available in food shops is a reflection of what consumers demand and purchase and is therefore an indication of food practice in a country.

2.3 Media and food preferences

Children and adolescents are highly exposed to food marketing, which leads to them choosing food high in sugar, fat and salt, less nutritive and unhealthy (Dibsdall *et al.*, 2003). Advertised food is usually not within dietary recommendation, which increases the risk of chronic diseases, but because they are exposed to these advertisements in media, they make unhealthy food a habit in their daily routine. A study in America shows that if children watch 25 minute of TV food advertising per week, it causes a child to eat one additional snack per week, which will reflect on the monthly intake (Christina *et al.,* 2010). The more the children are exposed to specific types of food, the more they consume, because exposure makes them become more familiar with it (Evilly & Kelly, 2001).

2.4 Meal patterns

People have different eating occasions per day; the food offered during these occasions will be different from one to another. It leads to habitual food choice. Authors differ in their opinion on the effect of snacking, it can for example add to the energy intake without adding to the BMI (body mass index) (Hampl, Heaton & Taylor, 2003).

However, normal weight and overweight individuals may differ in their behaving strategies when snack food is available, as well as in their compensatory mechanisms at subsequent meals.

Research (Haapalahti *et al.*, 2003) has shown that the family that seeks healthy diet and has healthy habits and offers healthy choices, will directly affect the food consumed by the family members every day, which means that if the fresh vegetables and fruits, protein-rich foods and they ignore junk foods will influence family choices.

Research suggests that the mealtime environment, the foods served at meals and the accessibility of food at the table, influence the dietary intake. Even the size of utensils and dinnerware may influence the amount of food consumed by an individual (Arcan *et al.*, 2007).

2.5 Psychological factors and food choice

2.5.1 Stress

Psychological stress is common in modern life and can modify behaviours that affect health such as physical activity and smoking.

Stress influences food choice in different ways, depending on the type of stress experienced. The effect it has will depend on the individual, what causes the stress and the circumstances. Some people eat less; others eat more when they stress (Olive & Wardle, 1999). The mechanisms for stress can cause changes in food choice, motivation, in physiology, in eating opportunities, availability of food and meal preparation (Wardle, Parmenter & Waller, 2000).

2.5.2 Mood

Food influences mood and mood influences choice of food (Wardle, 1987). The mood scale contains items related to general alertness, relaxation and stress control. Wardle (1987) reports that mood plays an important role and determines not only the quantity of food consumed, but also the selection of food. In humans, the neuroticism is responsible for mood, implying that anxiety-prone individuals are more likely to be influenced by the desire to maintain emotional well-being through eating than emotionally stable people (Wardle, 1987).

Influence of food on mood is related in part to attitudes towards certain foods. Often individuals want to enjoy food, but they are constantly aware that it may cause weight gain. The influence of food on mood is related in part to attitudes towards certain foods. Often individuals want to enjoy food, but they are constantly aware that it may cause weight gain. Individuals sometimes feel guilty that they do not eat what they should eat (Dewberry & Ussher, 1994). Food cravings are more likely experienced by women than men (Dye & Blundell, 1997).

Olive and Wardle (1999) have observed that stress influences food choice and in the quantity of food consumed; some people eat more when stressed and other eat less. The quality of food affects the mood of man, the hormone serotonin in the brain reflects positively on the human mood. Some foods contribute to raising the hormone serotonin, which keeps energy balanced in the body, such as fish rich in omega-3, chocolate and foods high in whole grains, and legumes (Bolborea & Dale, 2013). Food choice can clearly improve mood status (King & Meiselman, 2010). Other research has found that people can feel bad after eating high-density calorie food from a guilt perspective (Macht, Gerer & Ellgring, 2003). A non-balanced diet that lacks nutrients can lead to anxiety, depression and diabetes (Kandiah *et al*., 2006) as food choice decisions are determined by physiological and psychological factors (Desmet & Schifferstein, 2008). Certain foods can decrease the level of stress (Martin *et al*., 2009), for instance, dark chocolate consumption decreases psychological stress (Lua & Wong, 2011), while eating a palatable meal high in calories can decrease hormone stress levels (Dallman *et al*., 2005). Another study

has revealed that food preparation can cause stress (Benson, Beary & Carol, 1974). On the other hand, food preparation tasks not involving duty can reflect positively on mood (Daniels *et al.*, 2012)

2.6 Eating disorders

Eating behaviour is often subject to sophisticated cognitive control. One of the most widely practised forms of cognitive control over food intake is dieting. Many individuals express a desire to lose weight or improve their body shape; therefore they follow strict diets to reach their goals (Evilly & Kelly, 2001). Sometimes individuals take it to extreme levels and cause themselves harm. It can result in eating disorders. The factors leading to eating disorders can be a combination of biological, psychological and sociocultural factors (Evilly & Kelly, 2001).

Healthy diet does not necessarily mean eating expensive or rare food; healthy eating means eating balanced food that contains all the nutrients, which include carbohydrates, proteins, fats, vitamins and minerals as needed, following the healthy eating guidelines and food pyramid principles (Cooke *et al*., 2007). No one can ignore the importance of sodium chloride and its benefits in taste, texture, and as a preservative (McCaughey & Scott, 1998). It gives taste to the food and makes it more acceptable (Ventanas, Puolanne &Tuorila, 2010). However, the dietary salt consumption is higher than nutritional needs all over the world (Brown *et al*., 2009). There is a positive relationship between higher sodium intake and hypertension, which increases the risk of cardiovascular diseases (Cooke *et al*., 2007), and higher sodium intake is linked with fast foods (Tuomilehto *et al*., 2001). Carbohydrates and fats in foods provide energy, which is needed by our body to keep us energised and warm, but excessive amounts can lead to health problems and chronic diseases (Evilly & Kelly, 2001). Protein foods are important to provide us with the necessary amino acids to build tissues and to renew cells. High-protein foods usually also contain minerals and vitamins like dairy products and meats.

Vitamins and minerals are important for health because it is important for body metabolism and to reduce the risk of free radicals (Evilly & Kelly, 2001). Free

radicals are harmful molecules that attack the body's cells and cause damage to the DNA of the cell (Aruoma, 1998).

Many diseases like cardiovascular diseases, chronic diseases, Alzheimer's disease, cancer and cataract diseases (Ashadevir & Gotmare, 2015) are caused by free radicals. Even skin ageing are caused by free radical affect; in the skin the free radicals weakens the collagen fibres in the skin (Ashadevir & Gotmare, 2015). Therefore, a balanced diet rich in fruits and vegetables is the key factor in fighting the damage caused by the free radicals (Williamson *et al*., 2000).

2.7 Consumer attitudes, beliefs, knowledge

Attitudes and beliefs can change, comparing nowadays with the past. Our attitudes towards many different nutrients and foods have changed; for instance, our attitudes to dietary fat intake have changed in the last 50 years. Less fat, especially saturated fat is consumed (King & Meiselman, 2010). Knowledge of what constitutes food and nutritional information about certain food affect the liking of specific food (Martin, Pelchat & Pliner, 1997). Presented information on the food product such as calorie content and nutritional value will affect food choice, self-attitudes and knowledge about healthy foods will increase preference of certain foods (Engell *et al.,* 1998).

The number of the people that follow a healthy diet and the preference for food that contain natural ingredients or food defined as organic is increasing worldwide (Engell *et al*., 1998).

Nutritional information presented on the product packaging would be motivation to increase consumption to people concerned about health (Engell *et al*., 1998). Repeated exposure to certain foods increase food consumption (Birch & Fisher, 1998)

Consumer expectations about specific food products affect food preferences (Kemp, Hollowood & Hort, 2009). Consumers tend to choose the brand that they are used to consume repeatedly (Foxall, 1990).

2.8 Barriers to dietary and lifestyle change

Household income and food prices are two of the most important factors that affect food decisions, especially those with limited income. The worst for families with limited income is the fear of wasting food when buying new foods, while the lack of knowledge and lack of adequate cooking skills stands in the way of the buying and preparation of new and varied meals. Knowledge of how to increase the daily quota of vegetables and fruits in the diet without incurring any extra expense is a good way to increase the quota intake of vegetables and fruits to maintain a balanced diet. (Dibsdall *et al*., 2003).

2.9 Time constraints

People who live alone often prefer to buy foods and ready-made meals from the perspective of saving time instead of cooking from the basic components, even if the ready-made foods cost more (Sobal & Bisogni, 2009).

Time is considered as a factor positively linked to eating behaviour as a predictor to which food is eaten (Komolos,Smith & Bogin, 2001). Good health is a result of good health behaviour accumulation (Nayga, Tepper & Rosenzweig, 1999); therefore, good health needs good eating behaviour and attitude (Fuchs, 1980).

A healthy eating diet means consuming more time in preparing healthy food (Nayga, Tepper & Rosenzweig, 1999). Time and effort are both essential in a healthy diet (Huston, Finke & Bhargava, 2002)

2.10 Food choice and religion

Food provides us with more than just nourishment; it strengthens social relations, and creates opportunities to meet with friends and family through social events (Just, Heiman & Zilberman, 2007).

South Africa is home to many people who have migrated from all parts of the world over the years, which means they have brought their traditional forms of cuisine with them, as food and eating customs form a major part of cultural heritage and tradition.

Most of the Asian groups brought with them and embraced a knowledge and understanding of their religious and cultural backgrounds. Religion often prescribes the way in which food should be prepared and it often forbids certain foods. The food and drinks of a particular religious group may be different from other, while variation in serving of plant and animal dishes for a specific religion is important to all followers. It is important for the host and the marketplace as well (Pretorius & Sliwa, 2011).

The diet in most religions distinguishes them from the other, some urging the regime to follow a vegetarian diet and others encouraging a low-calorie diet (Oliver *et al*., 2010). It is possible that the religious influence as a factor affects health in these cases, providing them with a religious social support and deal against behaviour that causes health risks, and encourages positive health behaviour (Omar, Hirst & Blankson, 2004).

In ancient times, food was used as a method to facilitate and assist healing, which emphasises the importance of food in religious, social and spiritual life (Just, Heiman & Zilberman, 2007).

Cooking and eating create fine opportunities to talk to children about religion and the role of food in religion (Just, Heiman & Zilberman, 2007).

There is no doubt that eating during social occasions and with family strengthens social and historical relationships between people and between countries. Judaism and Islam are religions with laws and prescribed practices of food, which are clear and explicit (Dresner, 1959).

2.10.1 Judaism

Millions of people around the world practise Judaism and Kosher (which means “fit”) is the name they use to refer to the Jewish dietary laws (Dresner, 1959).

A kosher diet is a traditional diet based on the foundations for the preparation and processing of food, which still applies. The kosher diet or Jewish Law known as Kashrus includes what one can eat and what is forbidden in the diet of the Jews. A

kosher diet also includes recipes and instructions on how to serve food (Regenstein, Chaudry & Regenstein, 2003). The kosher diet should be followed throughout the year. It has different requirements for different religious holidays. For Passover, bread and leavened products are not allowed. After the end of the holiday, they can return to the use of bread and yeast in the daily diet system. The followers of the kosher diet are not allowed to eat camel and pork and they follow strict laws at slaughter. There are laws prohibiting mixing food with others in one meal and in one place (Dresner, 1959).

2.10.2. Islam religion

Muslims believe that God is one, and that the apostles and prophets are messengers sent to make people live and benefit from their time in the reconstruction of the universe and to live in harmony with the rest of God's creation, resurrected to every nation and tribe to teach people and guide them, and make them realise the value of their time on the earth, as well as to live in harmony with creation. Muslims pray five times a day, and the prayer must be in the direction of Mecca, which is what they call direction (ALkebla). There are conditions that must be followed when entering into Islam, known as Arkan AL Islam, which includes a certificate that God is one, the prophet Mohammed is The Messenger of Allah, making pray (SALAH), paying zakat, fasting Ramadan and Hajj (visiting Mecca) (Al-Qaradawi, 1999).

Muslims comprise a large number of the population of the world. They follow dietary laws laid down in the holy Quran. They are not allowed to eat pork or any product of the pig; they are also forbidden to eat the blood of any animals; they seek special rules about meat; they are strictly halaal, which means that the animal they eat must be slaughtered according to the regulations and a short prayer said to render the meat halaal (Regenstein, Chaudry & Regenstein, 2003). Foods containing non-halaal meats are forbidden. They are allowed to eat fish with fins or scales and alcohol is forbidden.

Fasting plays an important role in Islamic religion. Particular groups of people are excluded such as pregnant women, children and sick people (Al-Qaradawi, 1999).

Fasting means to stop eating and drinking from sunrise to sunset with the clear intention to fast, which means that the Muslim person should want to fast, not because someone forces them to obey the law. Fasting commences at the beginning of the lunar month known as the Arab month, which determines the time of the beginning of the fasting and is built on scientific foundations, which are:

1. To prove sighting of the crescent (Hilal new month) by more than one person to be witnesses.
2. To be people who viewed the crescent trustworthy and with credibility.
3. Have at least two of the men view the crescent.
4. To be passed exactly 30 days from the end of the month of Shaaban, then it is determined the first day of the month of Ramadan.
5. The Mufti legitimate issues a statement from the Ministry of Religions, confirming the sighting of the moon and the beginning of Ramadan (Al-Qaradawi, 1999).

Muslims absolve from fasting in many cases, for example when the person is unable to fast as result of high but instead of fasting, he has to give charity and gives a patch of food for each day he did not fast. Pregnant and breastfeeding women are exempt from fasting, because it may be dangerous to the health of pregnant and breastfeeding women (Al-Qaradawi, 1999).

2.10.3 Hinduism

Hinduism is a way of life, which means adhering true to specific principles of living. It does not have a single founder or sacred book; it is considered a way of life. The moral and social order regulates each individual's life. They give attention to eating and drinking. Most Hindus abstain from eating beef, while some of them also refrain from eating eggs and chicken. Others are strictly vegetarian and use no alcohol. They are forbidden to eat food that is exposed to forbidden food or use utensils that have been in contact with forbidden foods (Oliver *et al*., 2010). Vegetarians prefer to use specific utensils and bowls for vegetarian foods and another for non-vegetarian dishes. Fasting is common amongst elderly Hindus. Divali and Holi are two of the

most popular festivals. There is no holy day of the week for Hindus, despite the fact that Thursday is the most important day of the week for Hindus (Oliver *et al*., 2010).

2.10.4. Christianity

Christians follow Jesus Christ. They believe in the Holy Trinity – God the father, the creator, God the son; Jesus Christ who came to earth and was crucified for the sin of men and resurrected to defeat death and free men from their sin and earn them eternal life after death and God; and the Holy Spirit supporting and directing life of a reborn Christian. The Bible is the scripture read by Christians to direct their life. Christianity branch into a variety of Christian groups, each with own customs. Not all Christians follow a specific diet, but some groups adopt food-related practices like fasting at certain times to clean the body and focus on God. Some dishes are associated with specific Christian festivals, but it is not prescribed at all (Tieszen, 2013).

2.10.5 Buddhism

Buddhists believe in the concept of creation and the rebirth, and this explains their belief that what people do in this life, as deeds and actions will affect the next life, when followers of Buddha are admitted to the ideal life free of grudges and suffering. The best-known Buddhist schools are Theravada, Mahayana, Vajrayana and Zen. They all fall under Buddhist religion, but they differ in beliefs and practices (Evans, 2008). Food and eating are strictly regulated by Buddhist food laws (Schmidt-Leukel, 2006). The religious laws are considered a way and direction of life or a philosophy in life, it is not only linked to the presence of Buddhists in their country, but they are pursued wherever they are in any country and include:

- Most Buddhists are strict vegetarians in order not to kill animals.
- Buddhists, like Hindus, believe in the concept of karma; they believe that violence comes from bad lifestyles and eating patterns and a vegetarian diet makes a person more humane and protects him from violence.
- Most Buddhists do not eat beef and some do not eat any meat and dairy.

- They do not have unified religious dates; it vary from one region to another.
- There are strict laws about Buddhist monks and nuns; they are not allowed to grow or cook their own foods (Schmidt-Leukel, 2006).

2.10.6. Baha'i religion

Recognising the appropriate foods and beverages, primarily in response to the religious demands for communities play an important role in the Baha'i religion in their events. Food is one of the most important things to express their happiness or sadness. They serve vegetarian and non-vegetarian foods separately to express their high-end hospitality and a variety of beverages (non-alcoholic) is offered.

Baha'i religion follows these guidelines relating to food and drinks:

- Baha'i followers should not consume alcohol.
- Fasting on certain days from 2 to 20 March annually, abstaining from food and drink from sunrise to sunset should be followed by all Baha'i (Momen, 2005).

2.10.7 New Age religion

A group of people who are classified as spiritual explorers believe that humanity is a state of permanent awareness and seeks to achieve the principle of equality between men and women, and to get rid of hostility, and for life to become more peaceful and people are more civilised, through units of balance between many spiritual beliefs to achieve security and peace. New age religion involves a category called ″Religion and Spirituality″, which includes phenomena like ″meditation, acupuncture, homeopathy, aromatherapy, astrology, environmentalism, hermetic practice, esoteric Christianity and chakras, channelling, divination, dreams, meditation, mental and spiritual healing″ (Nye, 2008).

2.10.8 African traditional religion (ATR)

Religion as defined by Kanu (2014) is one of the most essential and important fundamental issues in each African's life. Religion could be part of any activity in the

life, which cannot be isolated from the other aspects of the life; it is related to various activities of daily living.

The word *tradition* means “the typical things that people do, the dealing of beliefs, legends, customs, which is inherited from one generation to another”.

The African world is wide and involves many countries, which means many cultures, languages and myriads of dialects.

These are facts we cannot ignore. Nevertheless, in spite of all these differences, we can find many similarities in the religious system in that they have the same concept of God, divinities, spirits and beliefs (Kanu, 2014).

African traditional religion is practised by various identities and in various ways by a large number of Africans (Kanu, 2014). Food plays an important role in the religious system. It is used to communicate with God through many practices like fasting. Religious dietary restrictions involve what food may or may not be eaten, when to eat, how to prepare it and how long to fast.

2.11 Socio-cultural factors

Food choices are influenced by traditions, skills, values, social recourses (family and friends), psychological state and the physical environment (Dean *et al.*, 2009).

Social, cultural and psychological factors interact with the eating behaviour of individuals and influence their food intake, therefore becoming significant determinants of their food intake (De Castro & De Castro, 1989). Individuals who live alone often neglect preparing their ideal food because it is too much effort to prepare food for one person and having to store the excess (Falk, Bisogni & Sobal, 1996). Women purchase and prepare food more often than men do and therefore seemingly deal with it better. Women living on their own tend to be more concerned about the nutritional value of their food than men living on their own are (Briley, 1989).

People with poor cooking skills tend to have a high-energy intake; they most probably eat easy-to-consume, carbohydrate-rich foods instead of fruits and vegetables (Hughes, Bennett & Hetherington, 2004).

The social network surrounding the individual can influence their dietary choices positively, providing them with support and motivation in relation to food preparation and consumption. The quantity of food eaten during meals increases in the presence of other people, and the magnitude of this effect is higher and varied in the presence of familiar people (De Castro, 2000).

2.12 Availability and food choice

Food behaviour includes multiple stages of food handling: acquiring food from the market, institutions or interpersonal exchanges. The availability of food in the home reflects the generally followed diet and food habits of the family. Food preparation includes all ways and means to transform food from a raw state to a product or dish easy to digest and absorb (Sobal & Bisogni, 2009).

Many ethnic groups adapted their daily diet according to the availability of certain foods; as result, they developed cuisines that are both aesthetically satisfying and nutritionally adequate, adopting evolutionary ways to cope, which might imply that the diet is deficient in certain nutrients (Warde, 1997).

Children in particular may develop nutritional deficiencies consequently. People who tend to use or consume a particular range of foods face difficulties when they find themselves in an environment different from that of their homelands. Most of these problems of adoption occur amongst particular groups such as vegetarian people whose diet is limited in animal products, or people who seek a particular diet for example, a macrobiotics diet, Zen diet or fruitarian diet.

The food provided at schools and university outlets do not provide for specific diets, it can therefore be difficult for individuals with specific dietary needs to select a healthy, balanced meal (Masse & de Niet, 2013).

The relationship between the presence of healthy food and consumption is a direct correlation, especially at schools and universities. Providing healthy food leads to better consumption thereof and the other way round (Masse & de Niet, 2013).

Snacks are important in the daily diet to maintain the flow of energy between meals. It also can lead to excessive energy consumption resulting in weight gain, because of their high content of calories, fat, sugar and the lack of useful nutritional elements; therefore, snacking should be approached in the right way to provide the body with more efficient nutrients and less sugar, calories and fat (Christina *et al*., 2010).

2.13 Environment and food choice

″Environment is defined as the macro and community level factors, which include variable factors such as physical, legal and food policy factors.″ (Popkin, Duffey & Gordon, 2005) Many environmental factors are closely linked to activities such as diet and obesity that have a relationship with the built environment, including a wide range of human patterns of activity in different levels and geographic location within the physical environment (Handy, Boarnet & Ewing, 2002). ″The built environment consists of urban design and physical structures, the design of the city and its physical elements, transportation system, physical infrastructure of roads, sidewalks.″ (Handy, Boarnet & Ewing, 2002)

A study by Popkin and co-workers (2005) reveals that environmental factors are associated with obesity.

School or university food environments are also influenced by many factors such as location, school size, age and health food knowledge, which limit the presence and the excessive consumption of foods. What is provided in schools and universities for students to eat plays an important role in influencing the eating behaviour of students and the food chosen (Masse & De Niet, 2013).

Dietary choices are affected by food environment; there is an association between neighbourhoods with a small number of supermarkets, and increased prevalence of obesity and unhealthy dietary habits (Grosso *et al*., 2012).

The physical environment where people live and how easy it is for them to reach food stores determine their food choice and consumption of certain food (Jago, Baranowski & Baranowski, 2007).

One of the researches conducted to report and test the influence of potential control variables includes these questions: *Where, Which*, and the *Size of the school*. Some results of the studies show that the diet adopted at a school is affected by two factors: (1) school location and (2) the educational level of the school (Grosso *et al*., 2012).

In addition, people who travel to areas where healthy food is available will show that consumption of healthy eating is on the increase (Grosso *et al*., 2012).

People tend to change their food behaviour permanently if the environment changes, and if built into structures, systems, policies, and socio-cultural norms (Black & Macinko, 2008). Environment (where people live and the environment surrounding them) remains one of the factors influencing food behaviour and causing some changes associated with food such as obesity and thinness problems and other problems related to dietary intake (Black & Macinko,2008).

The different domains in which food choices are influenced can be summarised as follows:

- Personal factors such as the individual choice of food and food behaviours and interests.
- The social environment, which includes people who surround the individual, relatives, friends and family members.
- Physical environment and materialistic surrounding such as eating utensils, equipment and places of eating and shopping. (Who & Consultation, 2003).

These three influential domains have a strong effect and therefore they have a dramatic impact on the eating behaviour of individuals, both directly and indirectly (Sallis, Owen & Fisher, 2008).

2.14 Retail food stores

Many “health-food” items cannot be obtained everywhere, but healthy food like fresh fruit and vegetables, fish, meat and dairy products, brown bread and grain products are usually available if a variety of food markets is available. Research has shown that accessibility and availability of food are the most effective factors influencing the choice and consumption of food.

Food markets can be categorised in:

- Supermarkets
- Niche markets
- Convenience stores
- Farmers market

Supermarkets

These are bigger than the other food market types and the availability of various food products is better. It takes up 75% of the market for groceries, which allow prices to be more suitable and affordable than convenience markets or other food markets. Supermarkets have a wide array of food: ″Fresh meats, dairy products, canned and frozen goods, breads and many other packaged items”, which makes it easier for consumers to purchase everything in one trip and easily (McWilliams, 2009). Supermarkets within walking distance from the university and students residences should provide the best food choices.

Niche markets

This type of food shop is quite small chains compared to supermarkets. In South Africa, you find niche shops as a specialised outlet of one of the largest market entities like Woolworths, or you can find it as an individual unit. These niche markets specialise in one specific field like organic food or natural food (McWilliams, 2009).

These markets are usually located within easy reach of the more sophisticated and wealthy consumer and not where students would shop regularly.

Convenience stores

This type of market is small, and usually located close to residential areas. As people need to go to the convenience stores to pick up some items they need in between their regular shopping, the prices are higher than supermarkets; therefore, it is not wise to purchase regularly from convenience stores (McWilliams, 2009).

Farmers' market

These markets are held on a specific day during the week and present a variety of fresh produce. Farmers' markets allow customers to purchase fresh and good quality vegetables and fruits at affordable prices (McWilliams, 2009) and other food products like bread, meat, cheese, homemade jams and biscuits. Farmers' markets are not the student's regular shop. A farmer's market gives the international student an idea of the food favourites in a region.

Not all these food markets are available within walking distance of a campus, which make it less accessible to students.

2.15 Healthy diet

People become more aware of the benefits of a healthy diet. Awareness of the dangers of excessive use of sugar, salt and foods rich in fat and carbohydrates on human health spread among people and reflect to some extend the choice of food.

The following phrases often surface in advice on healthy diets for children and adults (Hawkes, 2013):

- ″Limiting fat″
- ″Limiting saturated fat″
- ″Limiting sugar″
- ″Eating lots of whole grain meals″
- ″Eating lots of vegetables and fruits″
- ″Limiting salt″

- ″Drinking lots of water″
- ″Eating a balanced diet″

A healthy body requires a balanced diet in terms of quantity and quality, which include a mix of different foods that meet the needs of the body from proteins**,** carbohydrates and fats, salts and vitamins and minerals (Steyn *et al.*, 2004). Proper nutrition is considered a mainstay of health. In case of any deficiency in nutrition, the body's resistance to disease is weak, and in addition to the balanced and healthy nutrition for prevention of diseases, diseases associated with age such as heart disease, diabetes, high blood pressure and obesity are also largely influenced by diet. The fickle mood of children is also partly blamed on diet. Scientific research in particular has shown that many foods have an effect on the nervous system and on the nature of the mood of all members of society, especially children and young people. At the forefront of these foods are food with highly concentrated caffeine and white sugar, such as coffee, tea, chocolate, soft drinks, sweets and some fatty foods; therefore, people must reduce the intake of these foods, because it contributes to overstimulating the mood, to the extent that it might cause depression. Children should eat more good food like fruits and vegetables and stay away from fats and fried foods (Steyn *et al.*, 2004).

2.16 Geographic location and food choice

Physical geography informs our food choices; we all know that physical geographic location includes terrain location, and climate.

Crops require certain conditions, and not all crops will grow everywhere. The food that are readily available will be the food consumed by the people of that region. Cultural geography informs food choices, such as religious traditions, trade routes and immigration.

Access to local food is a topic of interest to the residents, travel researchers and those concerned about nutritional health of a population (Handy, Boarnet & Ewing, 2002). Local food environment includes both the community nutrition environment (e.g. store and restaurant availability and location) and the consumer nutrition

environment (the types, quality, and prices of food in those places) (Black & Macinko, 2008; Glanz *et al.*, 1998).

Eating patterns and the different food culture is a factor affecting human life, especially if man faces a period of migration. Access to lunch and adequate nutrition are complex in many places and a great challenge for migrant people. Lack of good nutrition over long periods leads to serious consequences on human health and nutrition related diseases to nutrition such as heart and blood vessel disease, diabetes and others. The quality and quantity of lunch have a significant impact on health. Lack of adequate food in terms of quantity and quality leads to weight loss and malnutrition problems; therefore, the lack of availability of appropriate food for migrants is a violation of the right to food (Sobal & Bisogni, 2009).

CHAPTER 3: RESEARCH METHODOLOGY

A social quantative research approach was followed for this study. Bhattacherjee (2012) defines social science as “the science involved to study the behaviors of people in different social forms either in groups, collections, firms, societies or economics, their individual behavior or behavior when they are in groups”.

Social science is categorised into three disciplines, namely psychology, which responsible to study human behaviours; sociology, which studies and understands the behaviour of social groups; and economics, which is involved in studying and understanding the consumer′s motivation, needs and behaviour in firms, markets and economies (Bhattacherjee, 2012).

Social science research is systematically controlled. It critically investigates the reliability of phenomena, guided by theory and hypotheses about a particular situation.

The research focus was to obtain highly structured data; therefore, a quantitative research method was suitable for the study, where an exploratory survey was conducted with careful consideration of available knowledge and ethic consideration as well for different ethnic groups in order not to make them feel offended in any way. In order to elaborate on the reasons why these methods were chosen for the research, the following sections are included: an overview of the research strategy, study population and location; sample selection process; procedures for collecting data and data analysis; ethical consideration; reliability and validity of the study; and statistics used in this study.

3.1 Research strategy

The purpose of this study is to focus mainly on the factors that enhance and influence food and eating decisions of international students during their term of study at the University of the Free State. The importance of food and good nutrition is an interest for many scientists, especially in the field of anthropology (Mintz & Du Bois, 2002). A quantitative research strategy was used in this study in order to obtain

a large amount of information about international students at the university of the Free State, Bloemfontein. An electronic questionnaire on Evasys was used as a method of data collection, where respondents' reactions were used to generalise the results from the sample to the population of the international students of the University of the Free State.

3.2 Study population and location

In the current study, the study population was international students at the University of the Free State in Bloemfontein (South Africa). The questionnaire was sent electronically to all international students registered at the University of the Free State.

3.3 Sampling method

Permission to get the e-mail addresses for students was obtained through ethical permission from the Dean of Student Affairs, the Vice-Rector of Research, the Registrar and the Office for International Students. 1 858 questionnaires were sent out, but only 210 completed questionnaires (11.3%) were returned. More individuals could be reached by e-mail and respondents felt more comfortable to give information, especially personal information anonymously by e-mail. Questions related to cultural or religious issues might be sensitive to some respondents.

3.4 Data collection

Data were collected via e-mail over a period of one month. The use of questionnaires for data collection was suitable for this study to collect a large amount of relatively simple data, but data that could only be obtained from the individual students.

3.4.1 Questionnaires for the food preferences of the international students at the University of the Free State

A 62-item questionnaire was designed; three sections were included, which took 15-20 minutes to complete. All the questions were tabulated and coded with nominal

scales, 5-point Likert scales, multiple-choice options or “yes” or “no” questions for easy administration and analysis. An EvaSys programme was used in this study and the survey was sent via e-mail as a link to all the different potential participants, thus the whole population.

Section A of the questionnaire had four sub-questions, all about demographic characteristics such as the age, gender, the level of the studies (undergraduate or postgraduate) and where the students live, whether on campus or not.

Section B includes 36 sub-questions to determine what is important about the food that they eat on a typical day.

Section C comprised “yes” and “no” questions and open questions. In this section, the researcher wanted to know if there were any specific food items that students could not find on the campus. With the “yes” and “no” questions it was easy for students to answer and for the researcher to analyse it.

3.5 Pilot study

A pilot study was conducted to ascertain that all questions are clear and understandable to the international student community. The participants of the pilot study were students from the Bloemfontein Campus of the University of the Free State in Bloemfontein. The results were used to establish the completion time of the questionnaire and which questions cause confusion to the respondents. Questions causing confusion were changed for better understanding by respondents.

CHAPTER 4: RESULTS AND DISCUSSION

This chapter presents the findings of this study. The study aim to determine the factors influencing food choices of the international students and to know whether international students at the University of the Free State consider the food available on campus to be suitable and the cafeterias on the university campus offer suitable food for international students which can fulfil their food needs or not.

The data were collected with an electronic questionnaire to all the international students at the University of the Free State. Two hundred and ten students responded.

The results on the respondents' needs, preferences, and the availability of preferred food on the campus will be discussed in this chapter.

Frequencies

The figure below shows that the majority (47%) of the respondents were aged between 21–30 years, whilst 29% of the respondents were 31–40 years old. Only 9% of the students were younger than 21 years and only 15% were older than 45 years.

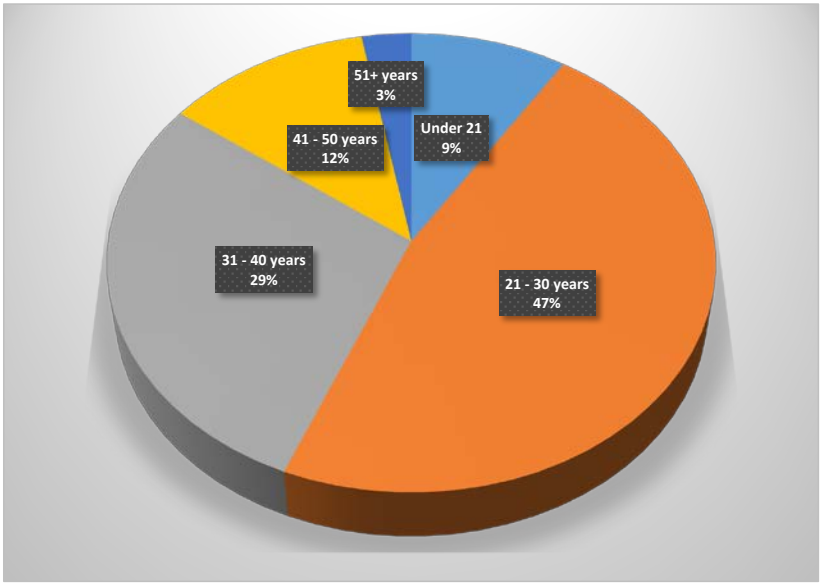

Figure 1: Age distribution of the respondents

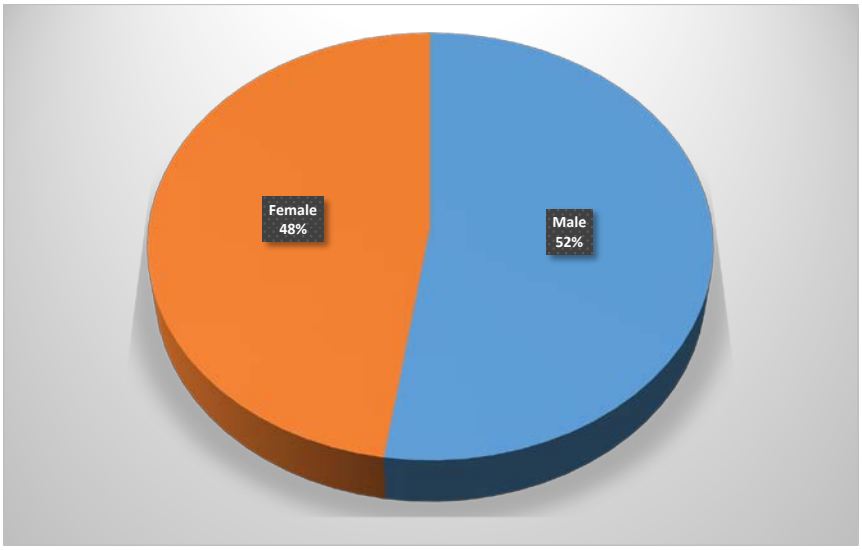

Figure 2: Gender distribution of the respondents

52% of the students who participated in the study were males whilst 48% of the students were females.

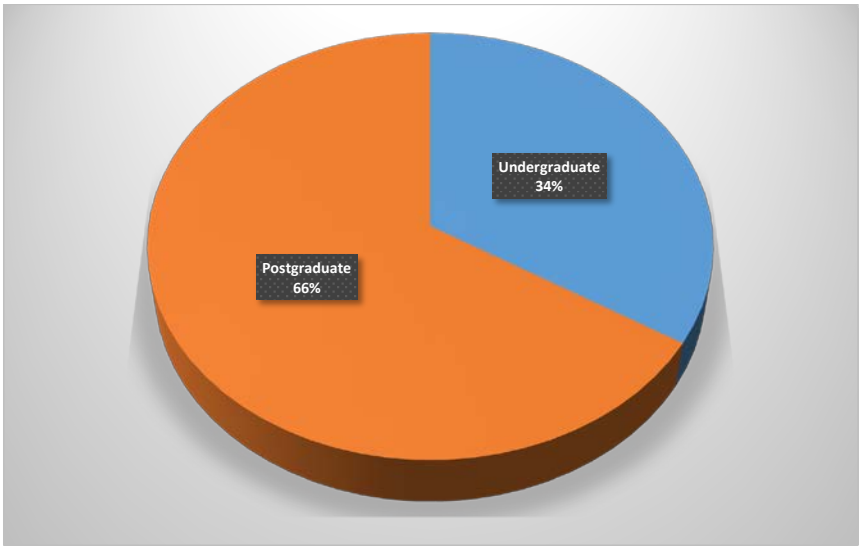

Figure 3: Study level of the respondents

66% of the students were at postgraduate levels whilst 34% of the students were at undergraduate level. These results explain the large percentage of the students in the more mature ages of 21–30 years (47%) and 31–40 years (29%).

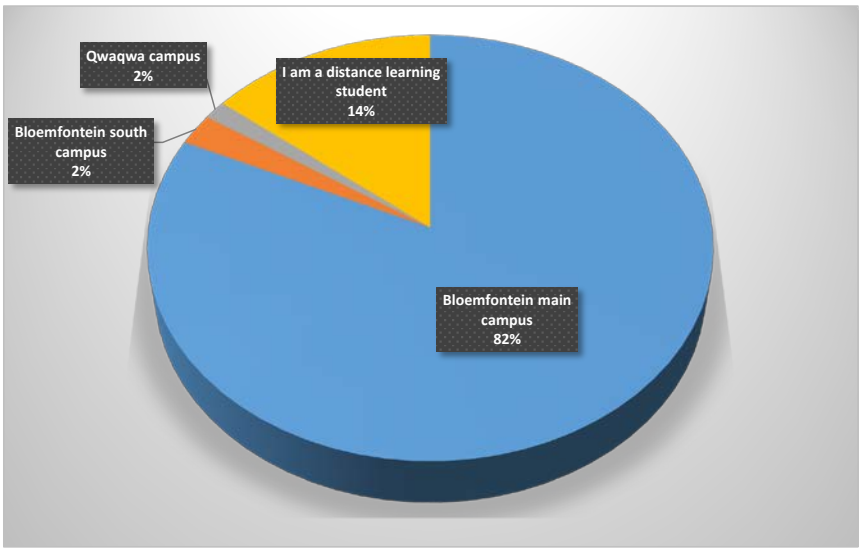

Figure 4: Campus distribution of the international students at the University of the Free State

The figure above shows that the majority (82%) of the respondents were based at the Bloemfontein Campus; 2% are from the QwaQwa Campus, whilst 2% of the respondents were based at the South Campus.

The results of the study will therefore be applicable to the Main Campus.

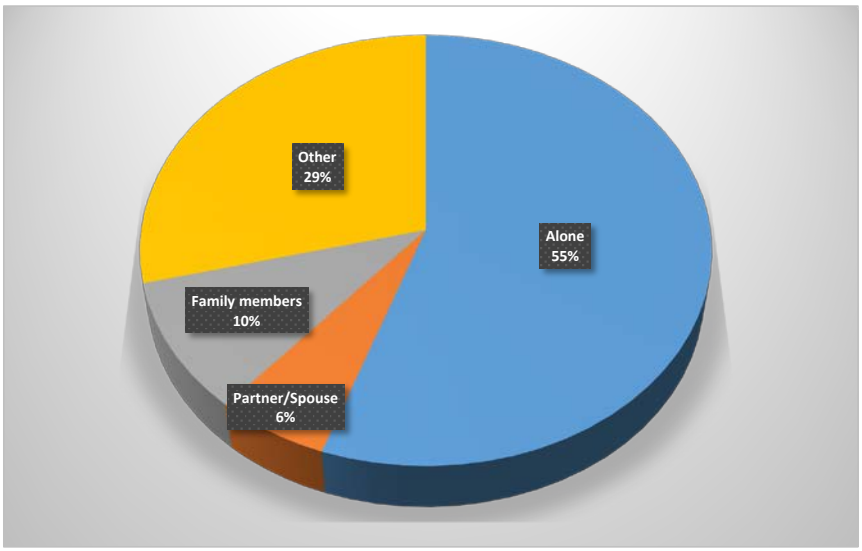

Figure 5: Living arrangements of respondents

The figure above shows that 55% of the respondents lived alone in Bloemfontein, 10% lived with family members, 6% lived with their partner/spouse and 29% had other arrangements. The majority of the students lived alone and made their food decisions only for themselves.

4.1 The nutrition and health-related aspects influencing food preferences

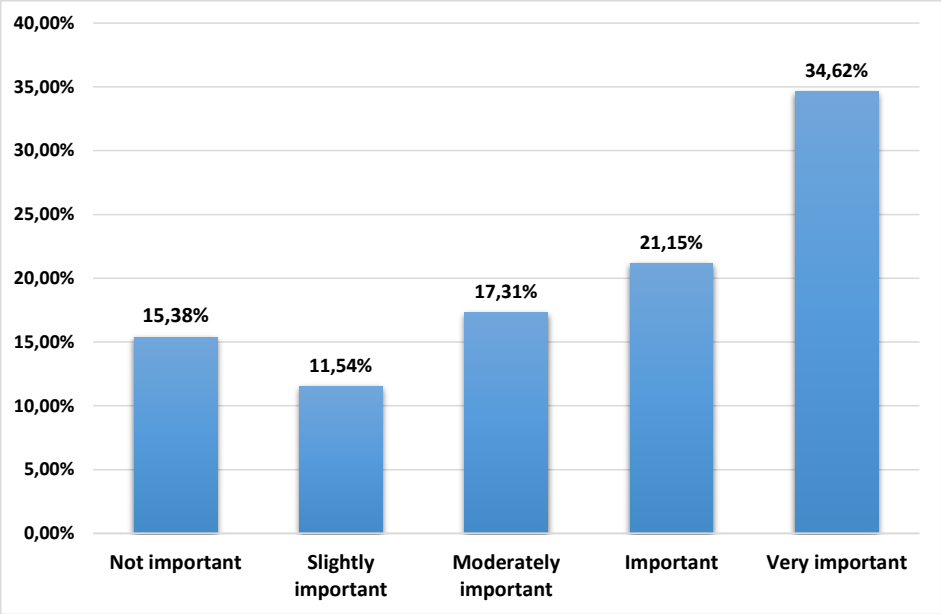

Figure 6.1: The importance of food without additives to international students at the University of the Free State

Figure 6.1 shows that 34.62% regarded it very important to consume food containing no additives. Health obsession remains the primary drive for consumers who paid for the purchase of organic or natural food, and the priorities and needs of the family and social status were factors motivating consumers to follow a healthy and balanced diet (Wrick, 1995). Only 15.38% of the respondents regarded it as not important. People nowadays are more concerned about their health (Yeomans, 2007), knowing that the food contain natural ingredients, increase the consumption of that specific food (Mitchell, Brunton & Wilkinson, 2013). It is important that the additives added xome from natural resources (Mitchell, Brunton & Wilkinson, 2013). As the additives added have more than a preserving function, it is added to enhance the taste of specific food and to increase acceptability (Eertmans, Baeyens & Van den Berg, 2001).

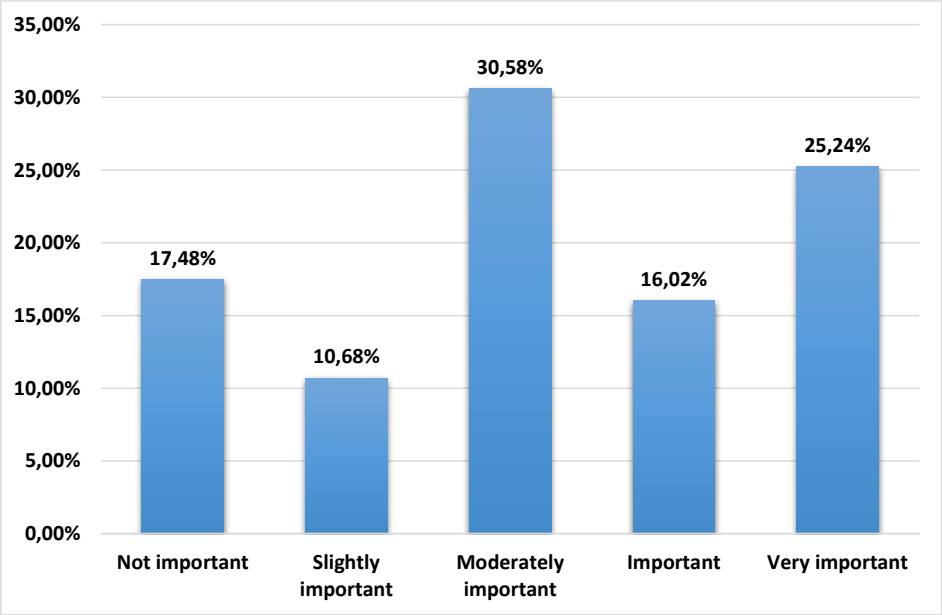

Figure 6.2: The importance of food low in calories

The results on the question whether it is important that the food is low in calories are interesting. 30.58% indicated that it was moderately important, while 25.24% considered it very important, with 17.48% considering it as not important. These results are in agreement with the observation of Evilly and Kelly (2001) that many individuals have a desire to lose weight or to improve their body shape and therefore follow a diet to reach their dietary goals and body image. Food containing a high percentage of fat is usually liked more than food high in sugar or in salt. Unfortunately, these are linked with chronic diseases like cancer or cardiovascular diseases, unlike the foods high in fibre and roughage (Li *et al*., 2014).

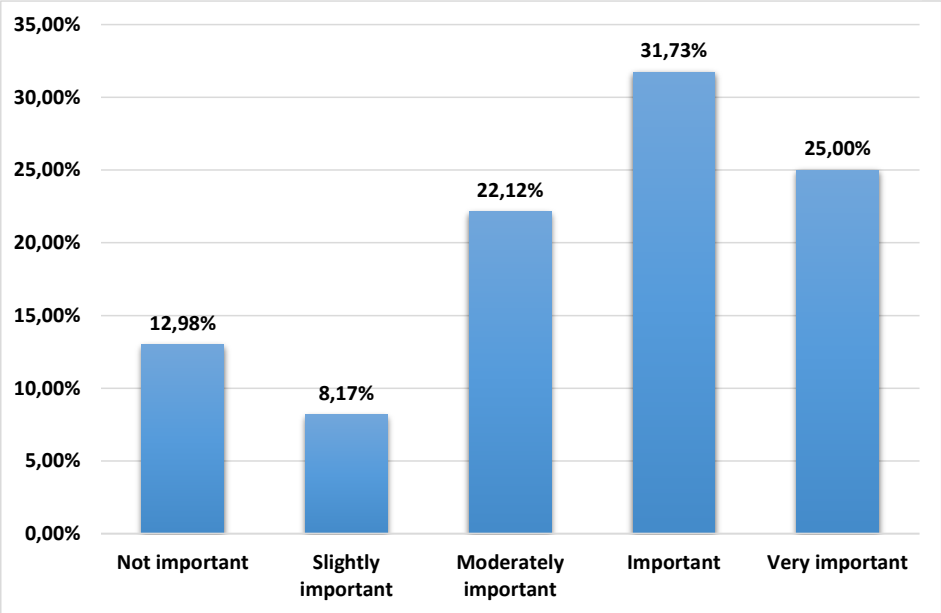

Figure 6.3: The importance of food that contain only natural ingredients

The figure shows that most respondents considered the content of food to be natural as very important (25%), important (31.73%), moderately important (22.12%), and slightly important (8.17%). Only 12.98% considered it as not important. Healthy eating plays an important part in maintaining good health, which helps the individual to experience the feeling of well-being. Eating a wide variety of foods is the way to get a balanced diet and to provide the body with all the nutrients, especially natural foods free from additives and preservatives. Fresh vegetables and fruits are rich in antioxidants and vitamins that keep the body healthy and prevent diseases (Li *et al*., 2014). Food is considered to be natural when no artificial ingredients are added (Negowetti, 2014), but if the products contain added colour, synthetic substances and added flavours, it would not be considered as natural ingredients (Negowetti, 2014).

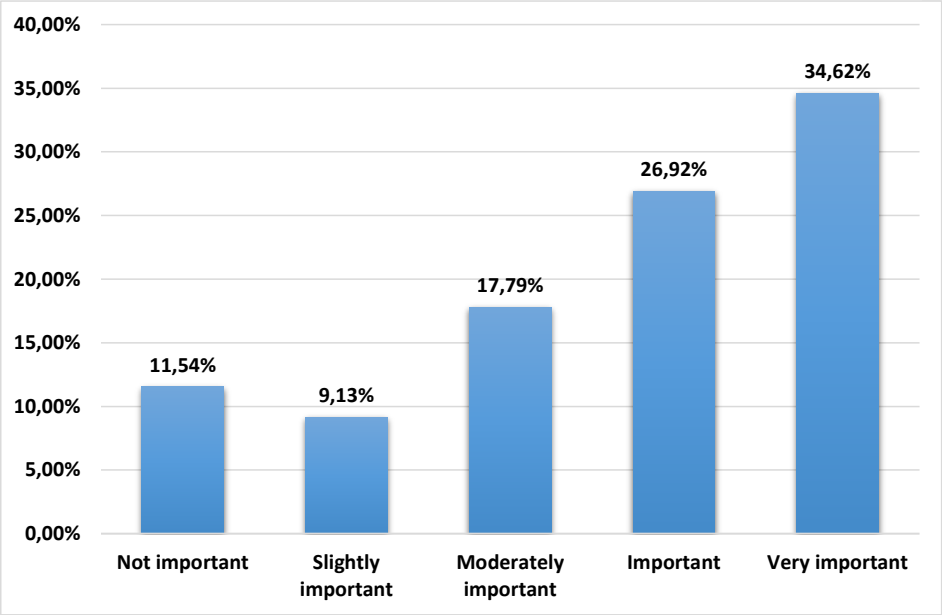

Figure 6.4: The importance of food low in fat

The results in Figure 6.4 show that 61.5% of the respondents regard food that is low in fat as important whilst 57.7% highlighted that food high in fibre and roughage was important (Figure 6.5).

This is in agreement with the view of other research, which indicates that good nutrition and good food are essential to good health, providing the body with the essential elements of protein, carbohydrates, fats, vitamins and minerals in order to maintain good health and avoid food and nutrition related diseases (Johnston *et al*.,1998). A diet rich in saturated fatty acids leads to fat accumulation in body tissues (Westerterp *et al*., 2008). High intake of fats found in fast foods and unhealthy foods results in diseases like cancer, cardiovascular diseases and obesity-related diseases (Rokling-Andersen *et al*., 2009)

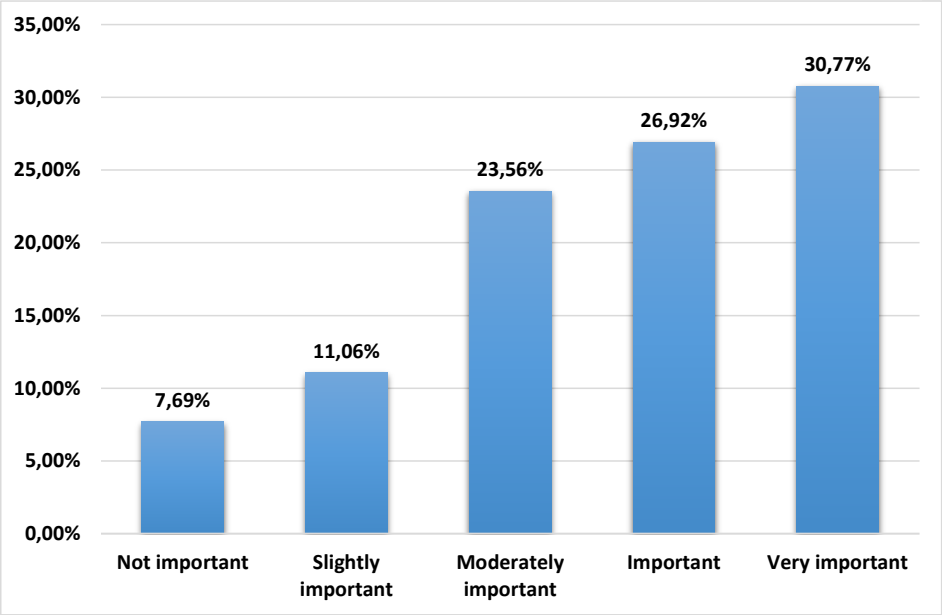

Figure 6.5: The importance of food high in fibre and roughage

The majority of students considered food high in fibre to be very important (30.77%), important (26.92%) or moderately important (23.56%). Only 7.69% did not consider it important. This result is in agreement with other studies that show that the consumer is concerned about healthy eating (Li *et al.,* 2014) and that consuming lots of fruits and vegetables is considered to be healthy (Steyn *et al*., 2004), as it contains a high percentage of fibre and roughage (Hawkes, 2013). Dried beans, legumes and grains are also good sources of fibre (Anderson, 1983), while foods low in dietary fibre were linked to chronic diseases (Anderson, 1983).

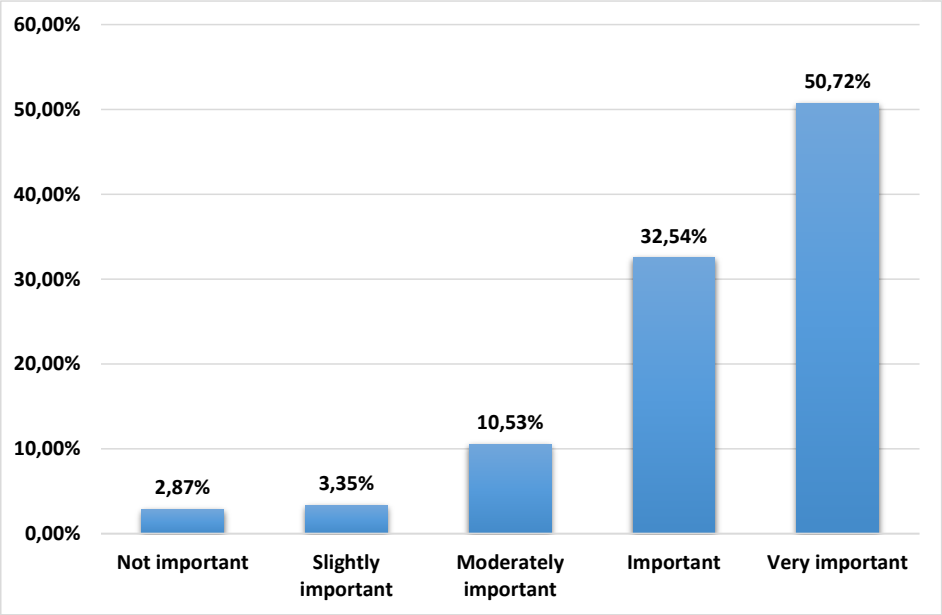

Figure 6.6: The importance of food high in nutritional value

The figure shows that 50.72% of the respondents indicated that it was very important that food should be nutritious; 32.45% considered it important and another 10.53% said that it was moderately important or slightly important (3.35%). Only 2.87% indicated that the nutritional value of the food was not important.

These results are in agreement with the observation that most people regard nutritional food like fruits and vegetables, calcium rich foods, protein, fibres and food with essential micronutrients as important (Haapalahti *et al*., 2003)

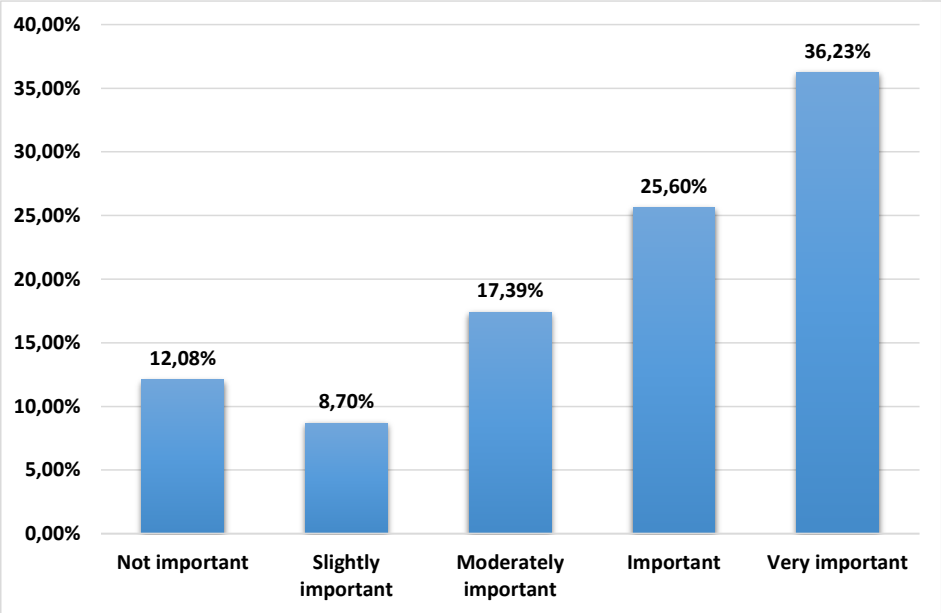

Figure 6.7: The importance of food that helps to control weight

The figure shows that most respondents indicated that food that could help to control weight was very important (36.23%), important (25.60%), moderately important (17.39%) and slightly important (8.7%), while 12.08% did not think it was important. The nature of diet, healthy choice of foods, and pattern of the active life are the most important factors in maintaining weight and reducing the risk of disease associated with overweight. In addition, the natural properties of foods such as vegetables, fruits, whole grains and healthy fats from fish and plant sources, low intake of salt are all factors that combine to affect the health of the body and maintaining body weight (Polman *et al*., 2014). It is known that the energy we get from carbohydrates and fats is important to provide warmth and to keep us alive (Evilly & Killy, 2001), but excessive amounts can lead to obesity and related diseases (Ventanas, Puolanne & Tuorila, 2010). A high-fibre diet provides one with a good amount of roughage, which keeps one feeling full and removes the excess of dietary fats (Li *et al*., 2014).

It is interesting to notice that the results on this questionnaire are very similar to the question of importance of food low in fat (Figure 6.4), but they differ from the question on importance of food low in energy supply (Figure 6.2). It indicates that the respondents consider the fat content of food the determinant of body weight.

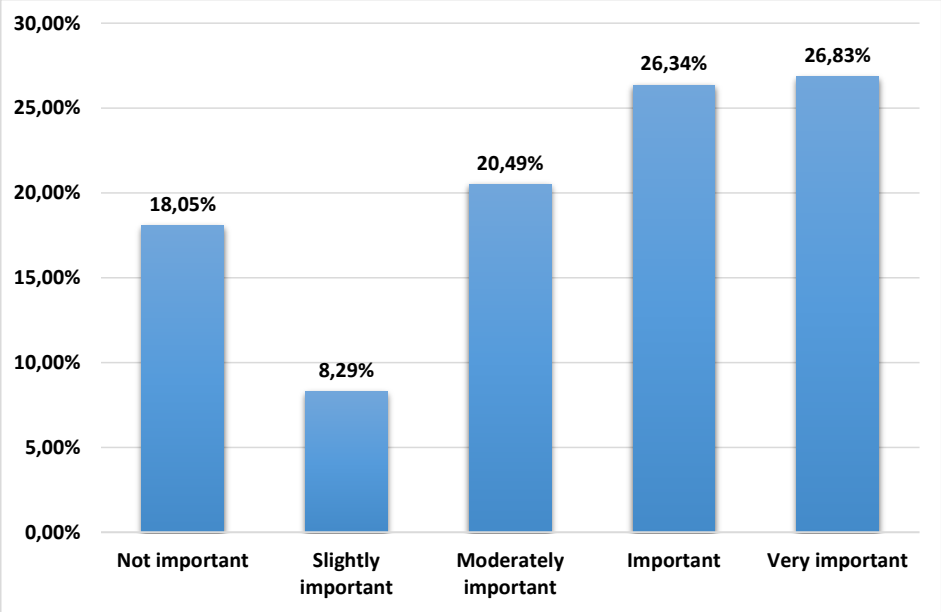

Figure 6.8: The iImportance of food that is packaged in an environmentally friendly packaging

Figure 6.8 shows that 26.83% of the respondents said that the food packaged in an environmentally friendly packaging was very important, 26.34% important, 20.49% moderately important, 8.29% slightly important, and 18.05% not important. Packaging is defined as the way that food is kept safe and healthy for a long time. At the same time, packaging can make food unsafe to consume when it comes to the use of specific component materials, which can make it unhealthy and risky like paraben and other component materials. People nowadays are more concerned about safe, healthy, beneficial, renewable and environmentally friendly packaging (Sautron *et al*., 2015). As we live in the world which should be safe and life-

sustainable for all of us, consumers become more concerned about packaging in an environmentally friendly way (Sautron *et al*., 2015) in that the packaging should be recyclable, renewable and able to reuse (Blumer, 2010).

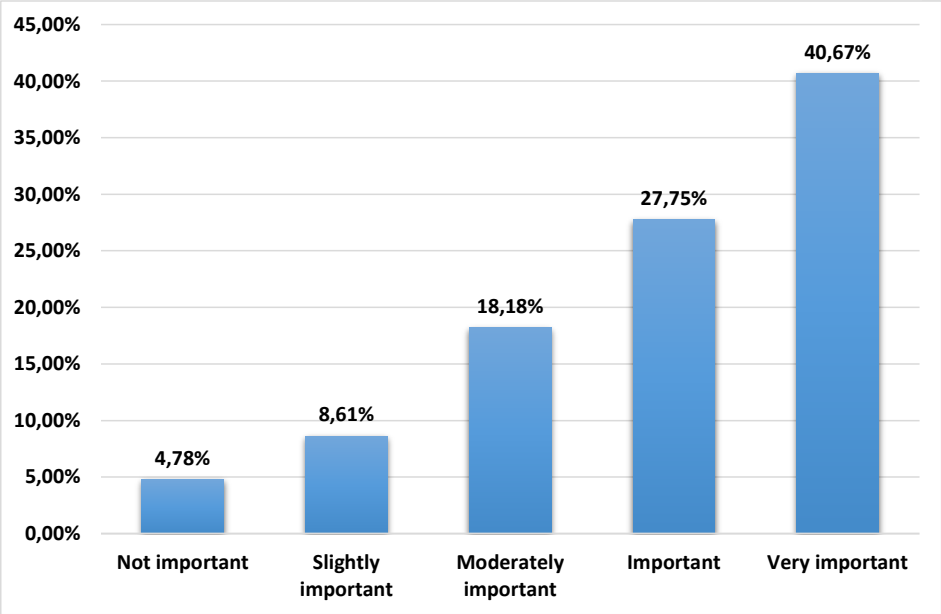

Figure 6.9: The importance of food with vitamins and minerals

Figure 6.9 shows the importance of food containing vitamins and minerals. 40.67% considered it very important, 27.75% considered it important, 18.18% considered it moderately important and 8.61% considered it slightly important, while only 4.78% considered it not important. This is in agreement with the known facts that proper nutrition is important for good health (Steyn *et al.,* 2004). A balanced diet with good intake of vegetables and fruits is always recommended for good health (Clarke *et al*., 2014). Vegetables and fruit provide the body with good sources of vitamins and minerals (Abdou & Hazell, 2014). Vitamins and minerals are important to utilise the energy from carbohydrates, proteins and fats (Gibney *et al*., 2005). Both vitamins (water-soluble vitamins and fat-soluble vitamins) are needed by the body in small amounts, but their benefits and functions are huge (Abdou & Hazell, 2014). It plays

an important role in cellular reactions (Shahab-Ferdows *et al.*, 2012). Vitamins and minerals play an important role in protecting cellular membrane from bacterial and virus invasion (Gommans *et al*., 2013); therefore, to strengthen the immune system and protect the body from disease (Clarke *et al*., 2014).

As expected, these results compare well with the question on the importance of food high in nutritional value (Figure 6.6), but interesting that the results are more closely related to the results on the question on the importance of food low in fat (Figure 6.7).

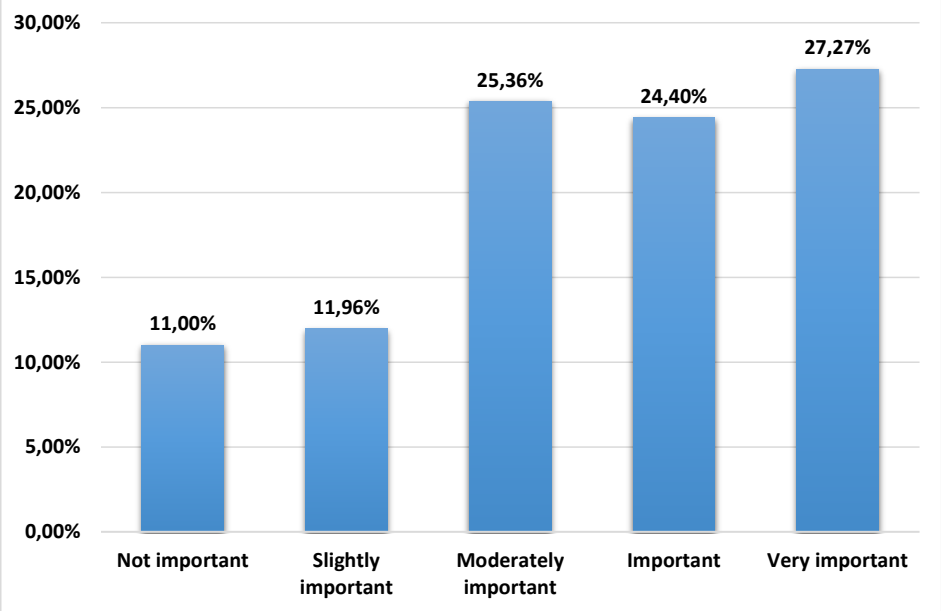

Figure 6.10: The importance of the absence at artificial ingredients in food

The majority of respondents indicated that they considered it very important (27.27%), important (24.40%), and moderately important (25.36%), while 11.00% considered it not important. Artificial ingredients are nowadays often found in products (Akiyama *et al*., 2000). We cannot ignore their benefits in preserving food for a long time (Wrick, 1995) or to giving food a more acceptable appearance (Eerthmans, Baeyens & Van den Berg, 2001). It makes food colourful (Akiyama *et*

al., 2000) and appealing. It is known that the different food additives, colouring agents and preservatives are harmful to human health, because they contain materials and industrial chemicals and compounds that affect the human body; if not in the near future, it will affect the body in long term (Grunert, Wills & Celemin, 2010). However, it is important that the artificial ingredients be regulated additives and already approved for use in food. Safety conditions are the key factor that should be considered by consumers (Akiyama *et al.,* 2000).

As expected, the results on this question closely relate to the results on the question asking on the importance of food only containing natural ingredients (Figure 6.3).

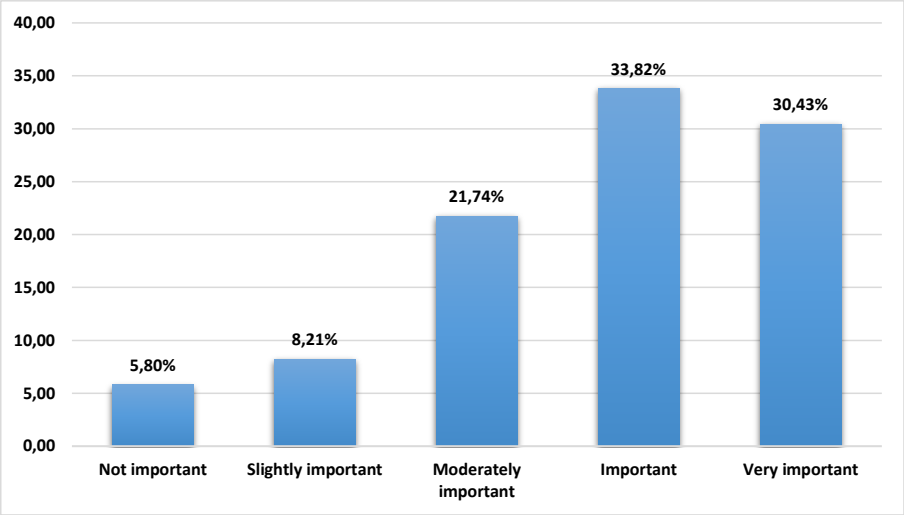

Figure 6.11: The importance of food rich in protein

The results shown in Figure 6.11 indicate that 33.82% of the respondents considered protein-rich food to be important, 30.43% considered it very important and 21.74% consider it moderately important. Only 5.80% of the respondents considered food-rich in protein as not important. The result is in agreement with the value of protein as explained by Westerterp and co-workers (2008) as necessary to repair the tissue of body organs as well as the satiety value of it. The importance of a high-protein diet is related to weight control (Halton & Hu, 2004) as the energy needed to metabolise

the protein is high compared to carbohydrates and fats (Mikkelsen, Toubro & Astrup, 2000). The high price of high-protein foods like meat is clearly considered important by consumers (Voevodin, 2012). It is interesting, though, that only 30.43% of the respondents considered food rich in protein as very important.

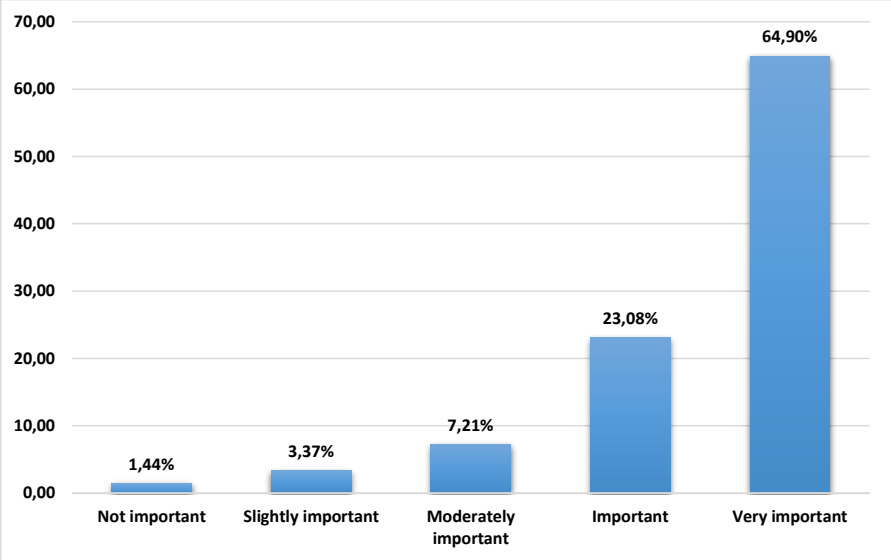

Figure 6.12: The importance of healthy food

Figure 6.12 shows that 64.9% of the respondents considered it very important that food keep them healthy and another 23.08% regarded it important that food should keep them healthy. Only 1.44% (account of three respondents) indicated that it was not important that food should keep them healthy. It is a generally accepted fact that food is required for the growth and development of children and adolescents, as well as to maintain good health (Johnston *et al*., 1998). A healthy diet reflects the balanced diet that contains all the nutrients (Ventanas, Puolanne & Tuorila, 2010) by following the healthy eating guidelines and food pyramid principles (Evilly & Kelly, 2001). Food quality and quantity are both important factors determining our food choice (Ashadevir & Gotmare, 2015).

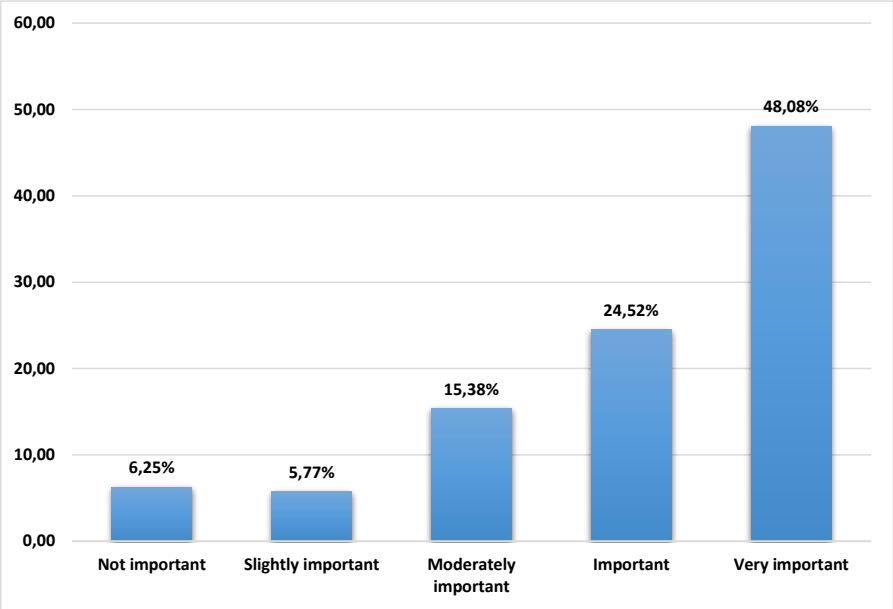

Figure 6.13: The importance of food for skin/teeth/hair and nails

The figure above shows that 48.08% of the respondents regard food that was good for their skin, teeth, hair or nails as very important, and 24.52% regarded it as important. Only 6.25% considered it not important. Most people nowadays consider the importance of healthy and balanced diets for maintaining good health (Wrick, 1995). As long as an individual is alive, the cellular activity continues to produce energy and harmful substances called free radicals (Aruoma, 1998), which attack the cellular membrane and damage the DNA. Free radicals weaken collagen fibres in the skin causing ageing (Ashadevi & Gotmare, 2015); therefore, eating a balanced diet high in vitamins and minerals provides the body with essential nutrients (Williamson *et al*., 2000) like vitamin A, E, C, B, Iron and their important role in keeping a good, healthy appearance.

The results shown in Figure 6.1 to 6.13 indicate that the respondents considered the health value of their food to be important and it further gave an indication that they were well informed on the health value of food.

4.2 Skills and time-related factors influencing respondents' food preferences

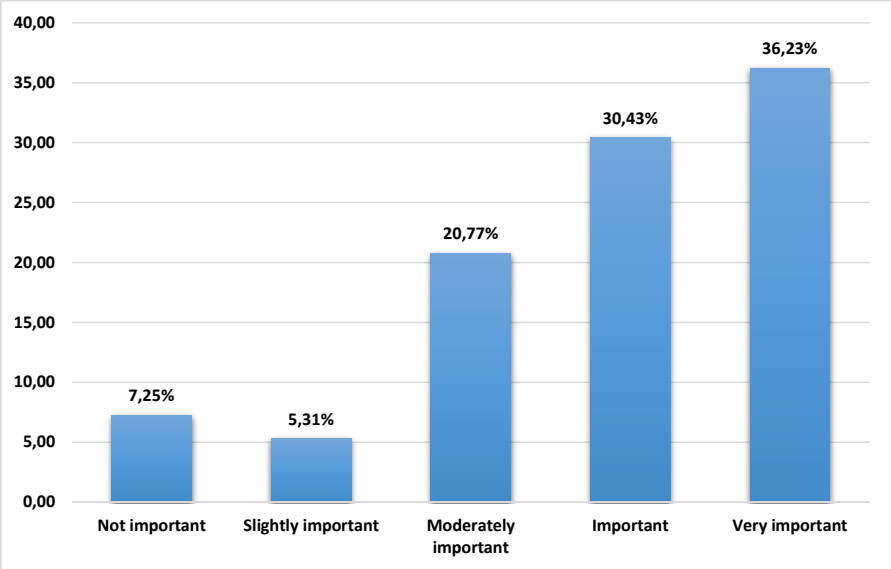

Figure 7.1: The importance of easy-to-prepare food

The figure above indicates that 36.23% of the respondents regarded food that was easy to prepare as very important and 30.43% as important. Only 7.25% indicated that it was not important. Because of the busy life that students lead, they prefer to buy foods and ready-made meals from the perspective of maintaining the time instead of cooking from the basic components (James, 2004). Time and effort consumed when preparing food was a factor affecting food choice (Voevodin, 2012) as food easy to prepare and did not take a long time and had the same nutritional value was preferred by people (James, 2004). The results of this study confirm their results.

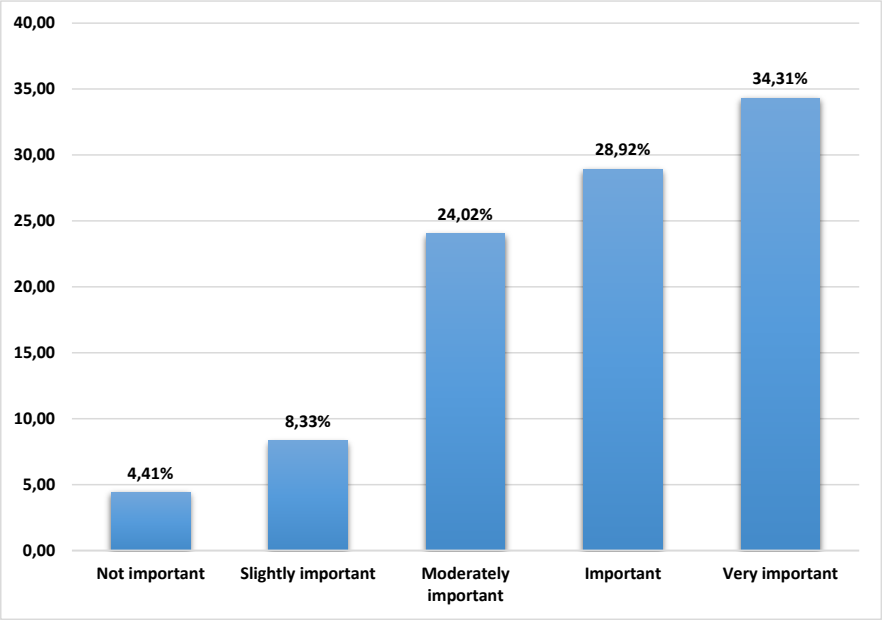

Figure 7.2: The importance of food that is simple to cook

The results shown in Figure 7.2 indicate that the students considered food simple to cook very as important (34.3%), important (28.92%) and moderately important (24.02%). The results are not surprising, considering that students mainly live on their own and will not go to the trouble of preparing difficult dishes. They do not want to spend that much time on cooking; furthermore, they are most probably not skilled in cooking and their facilities would be restricted. The results repeated by Hughes and co-workers (2004) also indicate that people with poor cooking skills and limited time would prefer easy-to-prepare foods.

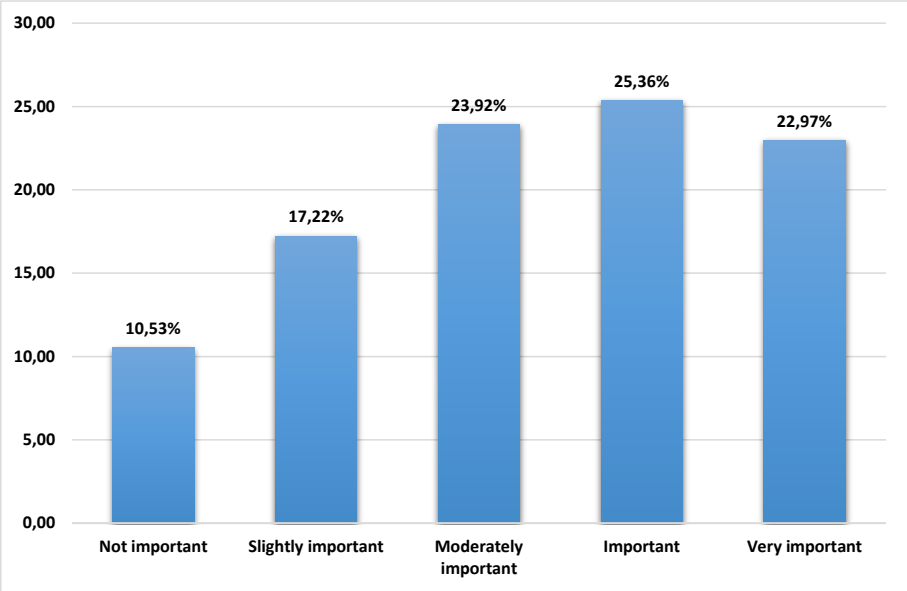

Figure 7.3: The importance of quick-to-prepare food

The results shown in Figure 7.3 indicated that the respondents considered it important that food should be quick to prepare (25.36%), 23.92% considered it moderately important, slightly fewer considered it very important and 10.53% indicated that it was not important. Although still important, the frequency seemed to be slightly lower.

The results are still in agreement with the results of Hughes and co-workers (2004), who found that people with poor cooking skills or limited time prefer easy-to-prepare foods.

Comparing these results with those of the importance of food that is simple to cook (Figure 7.2) it is clear that it was not important to the students that it should be simple to cook rather than quick.

4.3 Money-related factors influencing respondents' food preferences

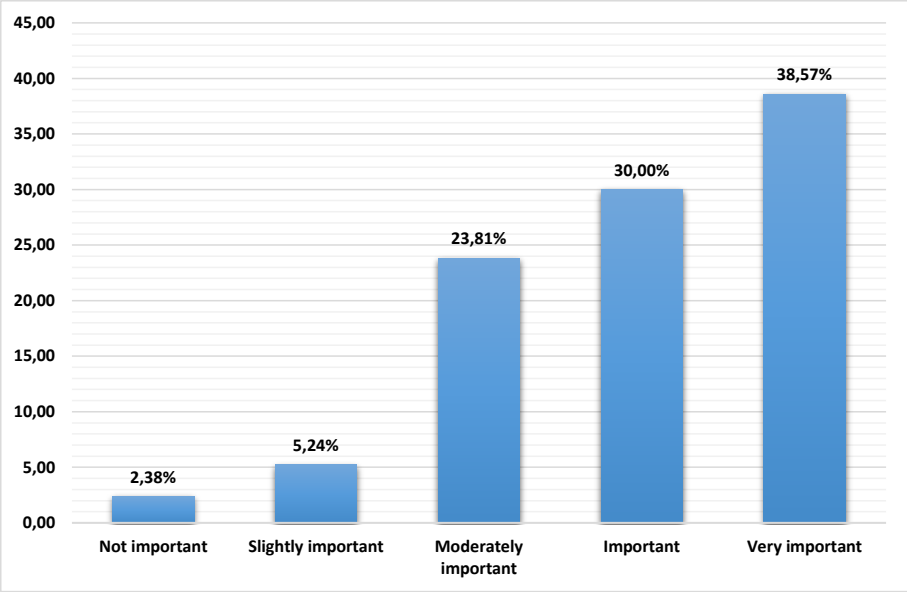

Figure 8.1: The importance of food that is not expensive

The figure above shows that 38.57% of the respondents regarded food that is not expensive as very important, 30% regarded it important and 23.8% regarded it as moderately important. As cost plays a major role in food choice, the public, when shopping, tends to buy priorities rather than complementary items. Standards of living and monthly income and food prices are all factors affecting food choice decisions (Veovodin, 2012). Diet management is a key factor when it comes to the food money value (Guenther *et al*., 2008). People can follow a diet rich with vegetables, fruit, low-fat food that can be value to the money (Stewart, Blisard & Joliffe, 2003) as the cost factor plays an important role in what food people choose (Darmon, Ferguson & Briend, 2002). Diet quality was positively linked to cost (Schroder, Marrugat & Covas, 2006) in low-income families, with cost the barrier against a healthy diet (Mitchell *et al*., 2000). Students very often have a very tight budget and need to find affordable food, especially because food is a daily expense

that can amount to a large sum if not managed well. Only a few students do not need to consider the price they pay for food.

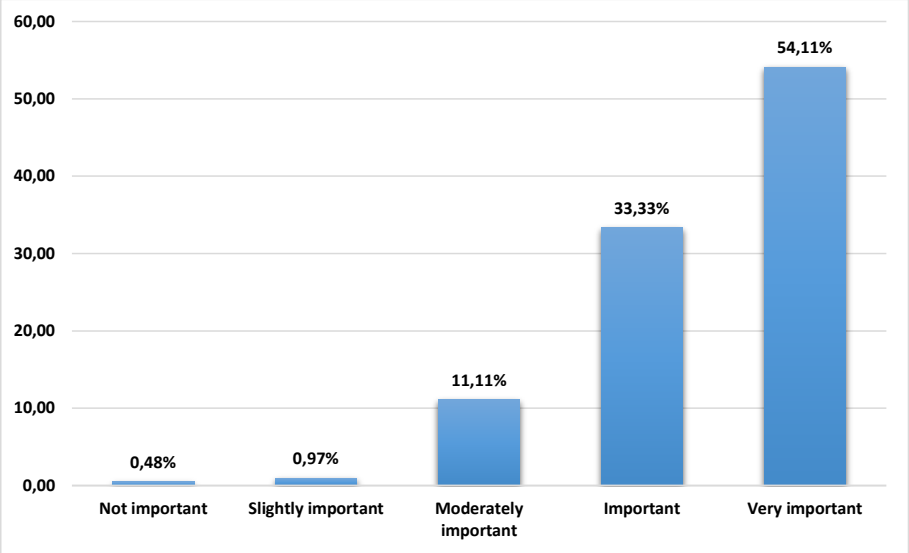

Figure 8.2: The importance of good-value-for-money food

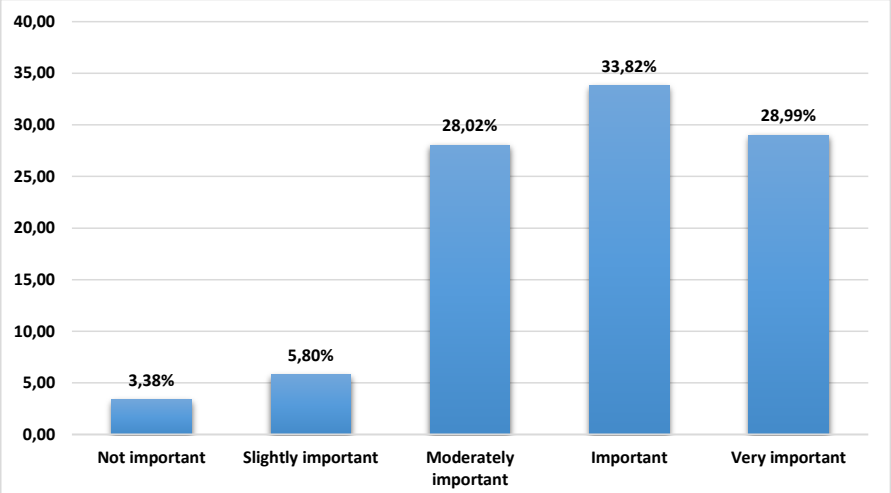

Figure 8.3: The importance of cheap food

Figure 8.2 and 8.3 show the results of two closely related but completely different aspects of food.

Figure 8.2 indicates that for most students (54.11%) it is very important that food purchased are good value for money. One student (0.48%) was not concerned that food be good value for money. Figure 8.3 indicates the importance of the actual price of the food. In this case, the highest percentage indicated that it was important (33.82%), 28.99% considered it very important and 28.02% moderately important, while 3.38% did not consider it important. These results can be explained by the observation of Voevodin (2012) that people with a low income set their priorities clear and would rather spend the money available on healthy food and food with a high satiety value instead of spending money on complementary foods. People can follow a diet rich with vegetables, fruits, low-fat food that can be value for money (Stewart, Blisard & Joliffe, 2003). Nevertheless, food considered valuable like meat and fresh vegetables and fruits tend to be expensive and therefore difficult to afford on a low budget, as most students have to work with. The cost factor plays an important role in what food people choose (Darmon, Ferguson & Briend, 2002). Diet quality was positively linked to cost (Schroder, Marrugat & Covas, 2006) in low-income families, with cost acting as a barrier against a healthy diet (Mitchell *et al.,* 2000).

In terms of easy-to-prepare and affordable food, the respondents seemed to have sound and healthy principles to make food decisions. It seemed that they were well informed in this regard.

4.4 Sensory-related aspects as factors in food preferences

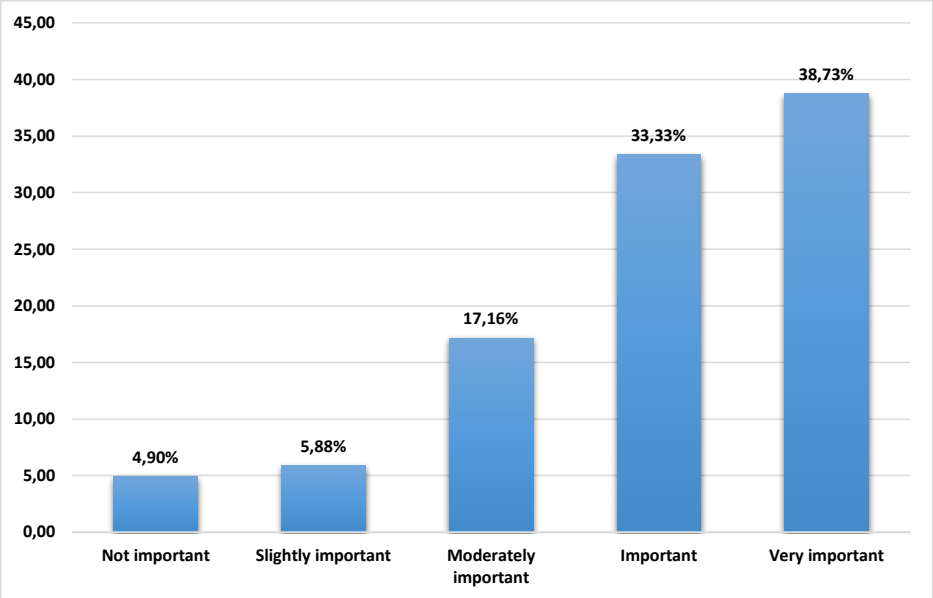

Figure 9.1: The importance of the aroma of food

Figure 9.1 shows that the respondents considered it very important (38.73%), important (33.33%), and moderately important (17.16%) that their food should smell nice. The aroma of food is an important aspect of the sensory quality of food.

Only 4.9% of the respondents indicated that it was not important that food should smell nice as the personal inclinations represented the number-one reason on how to choose the food. The tendency to certain flavours are favoured by most people. That may be salted foods or sugary foods, high-fat foods or some may prefer the taste of chili common in certain cooking dishes like curry or Indian cuisine.

Genetics also plays an important role that may affect some flavour preferences (Ghawi, Rowland & Methven, 2014). Aroma is described by the flavour (Anthon & Barrett, 2003). The relationship between taste and olfaction are major determinants in food preferences (Kemp, Hollowood & Hort, 2009). People do not have the same

genetic receptors odorant, which is responsible for food acceptance (Lunde *et al.*, 2012), as flavour is a mixture between olfaction and taste (Costell, Tarrega & Bayarri, 2010).

4.5 Personal inclination influences the favoured flavour for food

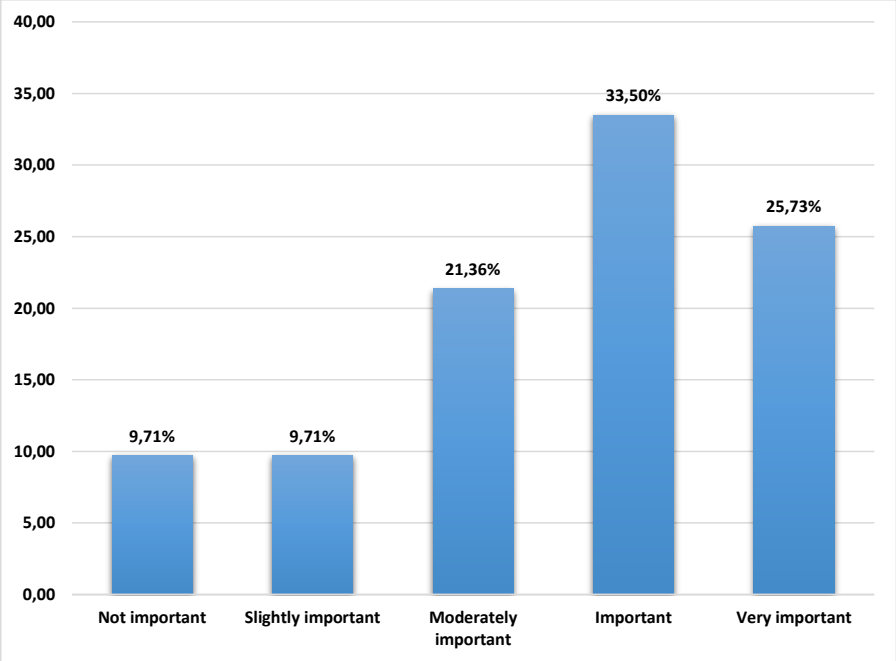

Figure 9.2 the importance of the texture of food

The results shown in Figure 9.2 indicate that the respondents considered the texture of food to be important (33.50%), very important (25.73%), moderately important (21.36%) and 9.7% considered it only slightly important, while another 9.7% considered it not important. Compared to the other sensory aspects of food, more respondents considered it important than very important. Sensory properties of food, which consist of many characteristics such as appearance, aroma and texture (Lunde *et al*., 2012) are important to consumers in that they determine the type of food are preferred. The texture of food can be soft, smooth, rough, or crunchy

(Kemp, Hollowood & Hort, 2009). It is found that smooth texture food indicates high calorie content (Dazeley & Price, 2015).

Compared to the aroma of food it seems that the texture of food is less important than the aroma of the food to the respondents.

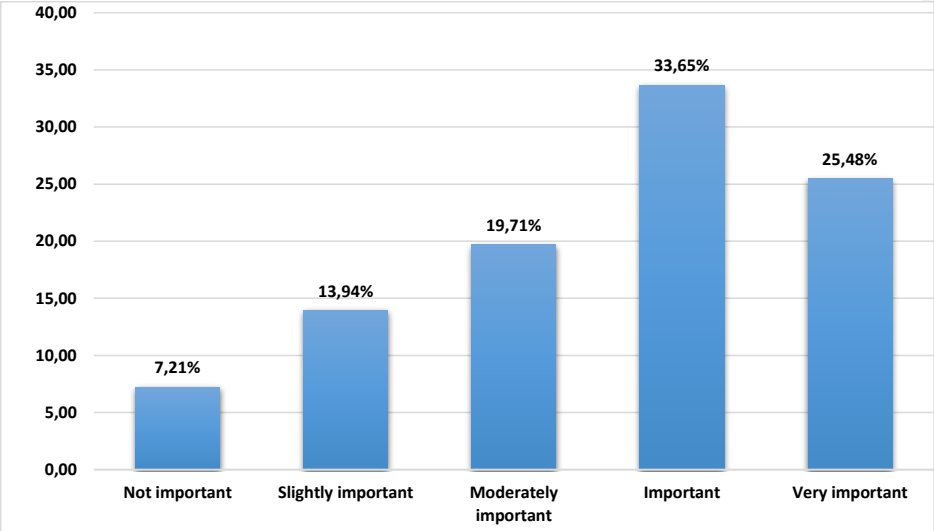

Figure 9.3: The importance of the appearance of food

Figure 9.3 shows that the respondents consider it important (33.65%) that their food should look nice. Interesting, though, a lower percentage (25.48%) considered it very important that it looked nice, 19.71% moderately important and only 7.2% did not consider it important that food should look nice. Although the foundation of eating is the taste, the way to provide food and appearance of food play an important role in the choice of food and the impact on the amount of eating and the appetite. The diversity in a meal and the size of it, as well as presentation will influence the choice of food (Hetherington *et al*., 2015). Research has shown that serving plays an important role in food preferences (Wilbur, 2013). Contrast in colours when serving food is preferred (Wilbur, 2013). Different food colours are important to attract people's attention (Wilbur, 2013); therefore, variety plays an important role in food preferences, especially when feeding kids (Goff, 2006). As the packaging of the

products is also a key factor (Wilbur, 2013), specific colours can be useful to increase acceptability, like the orange and red colours if used, will lead to a good appetite (Ines *et al*., 2011).

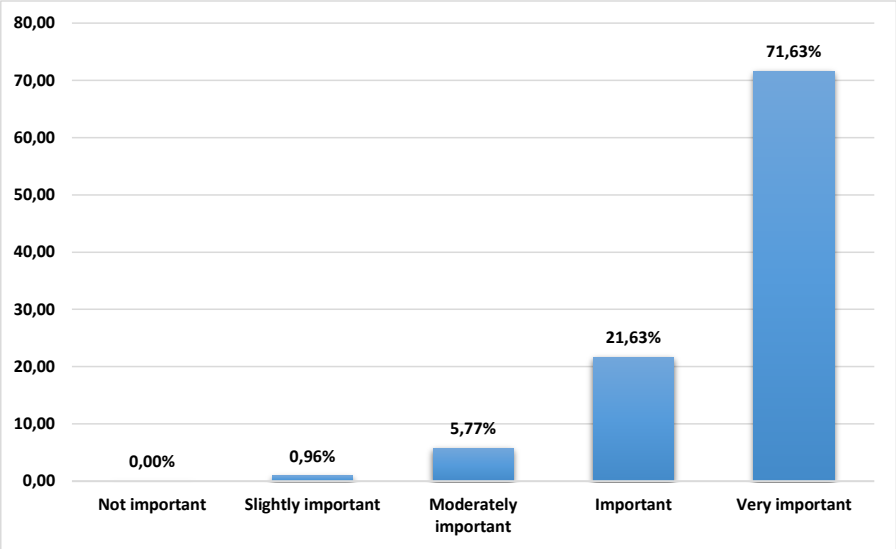

Figure 9.4: The importance of the taste of food

The results shown in Figure 9.4 clearly portray the importance of the taste of food. Most respondents (71.63%) considered it very important and not a single respondent considered it as unimportant. Moderately important did not get more than 5.77% and even important reached only 21.63%. These results confirm the research of others that the taste of food is of the most importance. Preference for a specific taste starts to form in the early life with new tasting experience (Capaldi, 1992) and continue to change in getting older (Nestle *et al.*, 1998).

The relationship between taste and the liking factor was more presented than the relationship between taste and healthiness factor (Wardle *et al.*, 2004). As a result, choosing specific food and eating preferred food make people feel happy and satisfied. Preferring a specific diet is started from childhood, as the maternal diet is transmitted to the amniotic fluid and mother milk. A baby becomes used to the taste

and flavour and will prefer it in future (Mennella, 2014). Studies reveal that the repeated exposure to sweet and bitter taste will result in better acceptance of the tastes. These tastes are experienced with taste receptors situated in the tongue (Mennella, Pepino & Reed, 2005). People can inherit specific tastes, like the inheritability to sweet tastes such as desserts, inheritability to fruits, vegetables, meat and fish (Breen, Plomin & Wardle, 2006).

Exposure to new food tastes over a long time lead to a new food liking (Mennella, Pepino & Reed, 2004), but sensory aspects of food like smell, flavour, texture and taste are not the only factors that determine our food choice (Steptoe, Pollard & Wardle, 1995).

4.6 Psychological aspects influencing food preferences

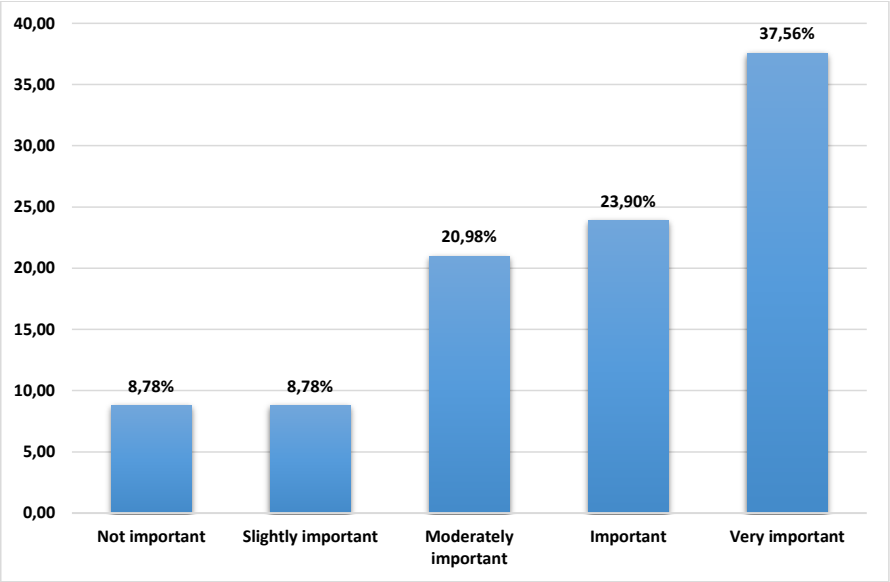

Figure 10.1: The perceived importance of food to lift spirit

The results shown in Figure 10.1 indicate that a large percentage of the respondents considered it very important (37.56%) that their food should cheer them up; another

23.9% considered it important and 20.98% moderately important. 8.78% considered it slightly important and another 8.78% considered it not important. Olive and Wardle (1999) claim that mood plays an important role in the selection of food and the quality of food consumed. They further noted that an individual is likely to be influenced by the desire to maintain emotional well-being by eating or by what they eat.

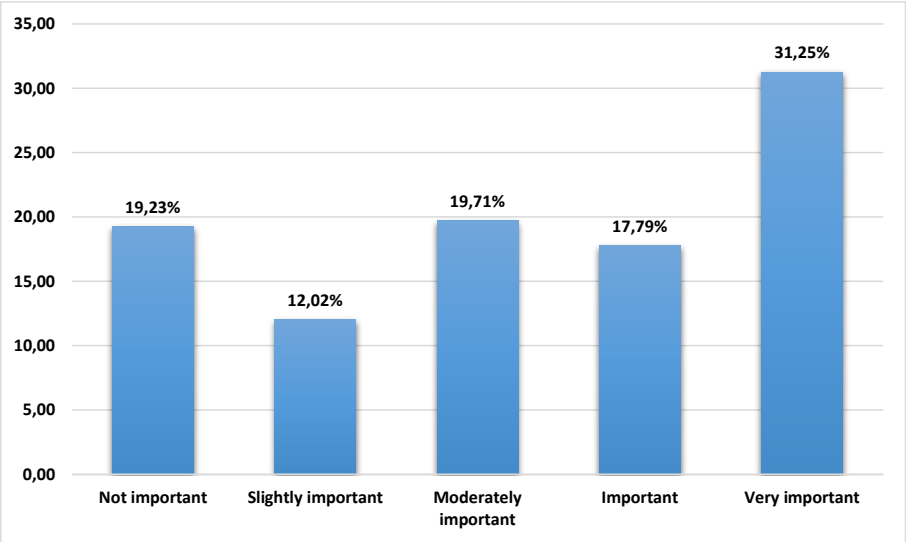

Figure 10.2: The percieved importance of food in coping with stress

The results shown in Figure 10.2 indicate that although 31.25% of the respondents indicated that their food was very important to help them cope with stress, 19.23% considered food not important to help them cope with stress. Olive and Wardle (1999) observe that stress influences food choice. Some people eat more when stressed and others eat less (Nestle *et al.*, 1998). The quality of food affects the mood of humans' hormone serotonin in the brain reflected positively on the human mood. Some foods contribute to raising the hormone serotonin, which keeps energy balanced in the body, foods such as fish rich in omega-3, chocolate and foods high in whole grains and legumes (Bolborea & Dale, 2013). A non-balanced diet lacking nutrients can lead to anxiety, depression and diabetes (Kandiah *et al*., 2006) as food

choice decisions are determined by physiological and psychological factors (Desmet & Schifferstein, 2008). Certain foods can decrease the level of stress (Martin *et al.*, 2009). Dark chocolate consumption decreases psychological stress (Lua & Wong, 2011). Eating a palatable meal high in calories can decrease hormone stress levels (Nestle *et al.*, 1998). Another study revealed that food preparation could cause stress (Benson, Beary & Carol, 1974). On the other hand, food-preparing tasks not involving duty can reflect positively on mood (Daniels *et al.*, 2012)**.**

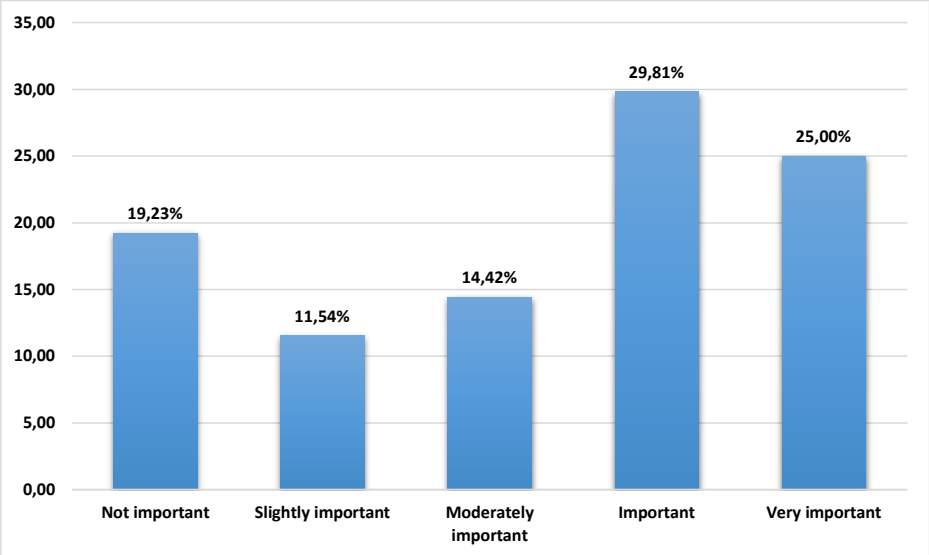

Figure 10.3: The importance of food in keeping alert

The results shown in Figure 10.3 indicate that 29.8% of the respondents considered food important in keeping alert and less. 25.0% considered it very important, while 19.23% considered it not important in keeping alert. Eating some food and drinks, although it tastes sour and unwanted, keeps people feel positive, such as eating caffeinated beverages (Lua & Wong,2011), and the positive impact of drinking water in maintaining the body in a state of activity and help to concentrate (Munoz *et al.*, 2015). Martin and co-workers (2009) agree with the statement and say, “Some food let people feel positive, caffeinated beverages consumed for long periods keep

people alert and even by drinking water, maintain the body's ability to keep up the activity and concentration."

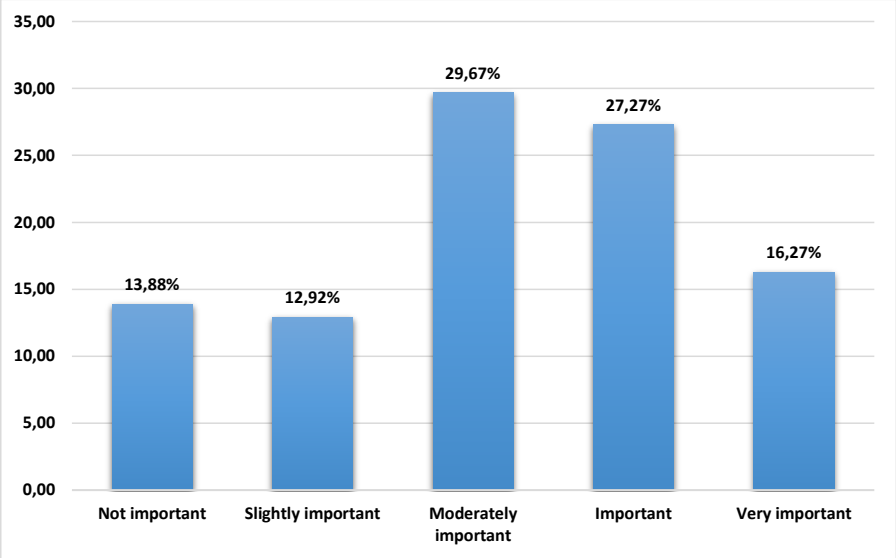

Figure 10.4: The perceived importance of food in keeping relaxed

The results shown in Figure 10.4 are interesting with a precentage indicating it moderately important that food should keep them relaxed the favoured reply, while there were few differences in the percentages where respondents considered it very important (16.27%), not important (13.88%) and slightly important (12.92%). It is safe to say that students were divided in their opinion about it.

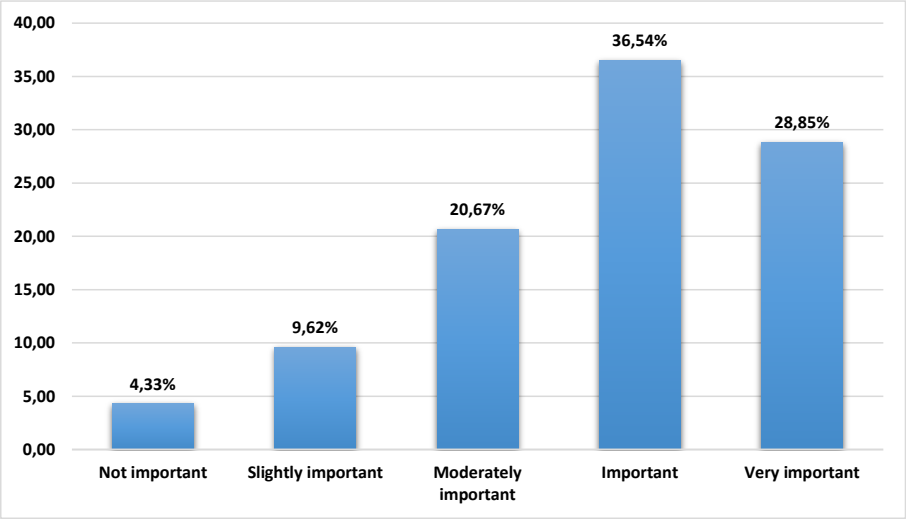

Figure 10.5: The perceived importance of food in feeling good

The respondents considered it important (36.54%) that their food would make them feel good. It might be that the sense of satiety is important in this regard.

Eating fruit and vegetables provides the body with vitamins and minerals that play a role in maintaining the health and supply the body with nutrients, such as bananas rich in potassium intake, and the careful eating of a full meal rich in protein and low in fat improves mood and makes one feel better, because it gives a sense of fullness and activity (Higgs & Donohoe, 2011).

4.7 Social and convenience factors influencing food preferences

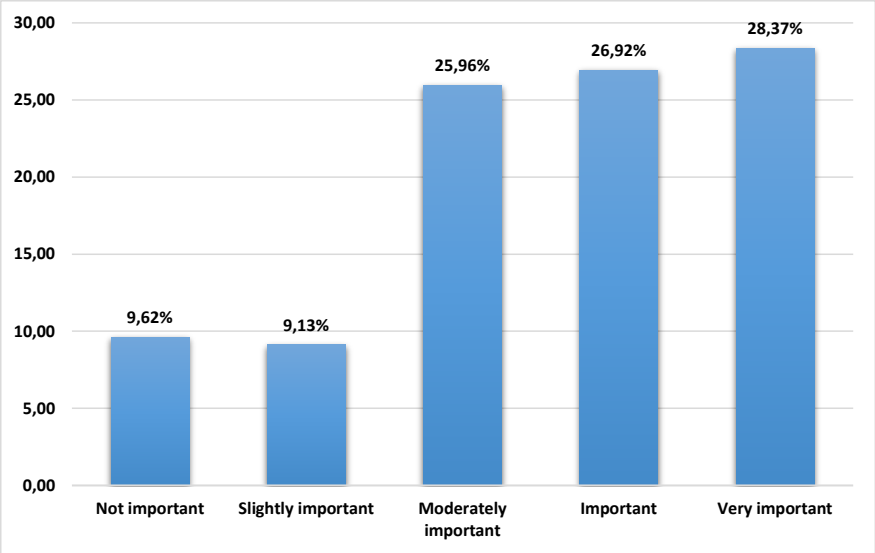

Figure 11.1: The importance of familiar food

55.29% of the respondents regarded food familiar to them as important; some 28.37% considered it very important; 26.92% considered it important; and 25.96% considered it moderately important. Literature indicates that family members and surrounding environment play an important role on food choice (Sorensen, Stoddard & Macario, 1998).

Many ethnic groups adapted their daily diet according to the availability of certain foods. As a result they have developed cuisines which are both aesthetically satisfying and nutritionally adequate (Warde, 1997).

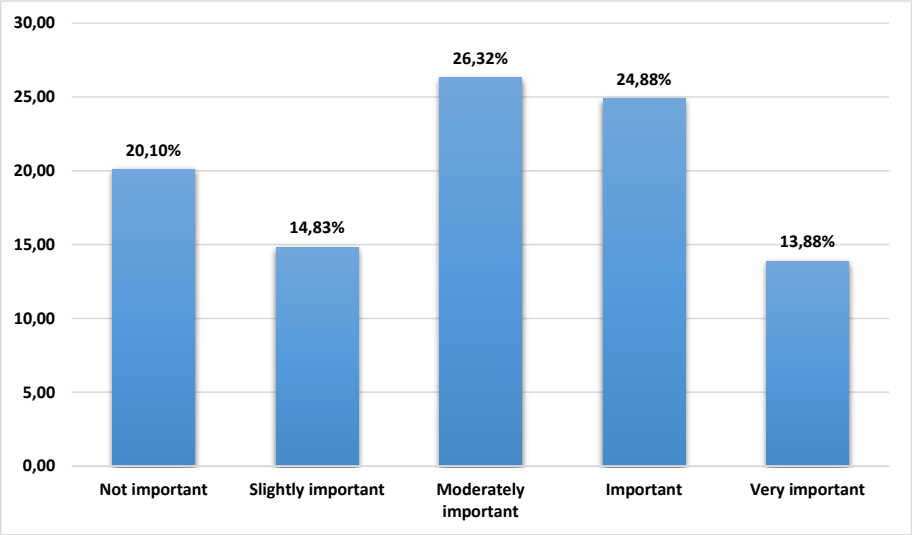

Figure 11.2: The importance of food that the students are used to

The results shown in Figure 11.2 indicate that the respondents did not consider it very important to eat the food they usually eat. Their reaction varies between moderately important (26.32%), important (24.88%) and not important (20.10%). It seems that some students have an open mind to try the unfamiliar, while other wants familiar food. It is known that people adapt their daily diet according to the availability of certain foods, and even develop cuisine according to the availability of food (Warde, 1997).

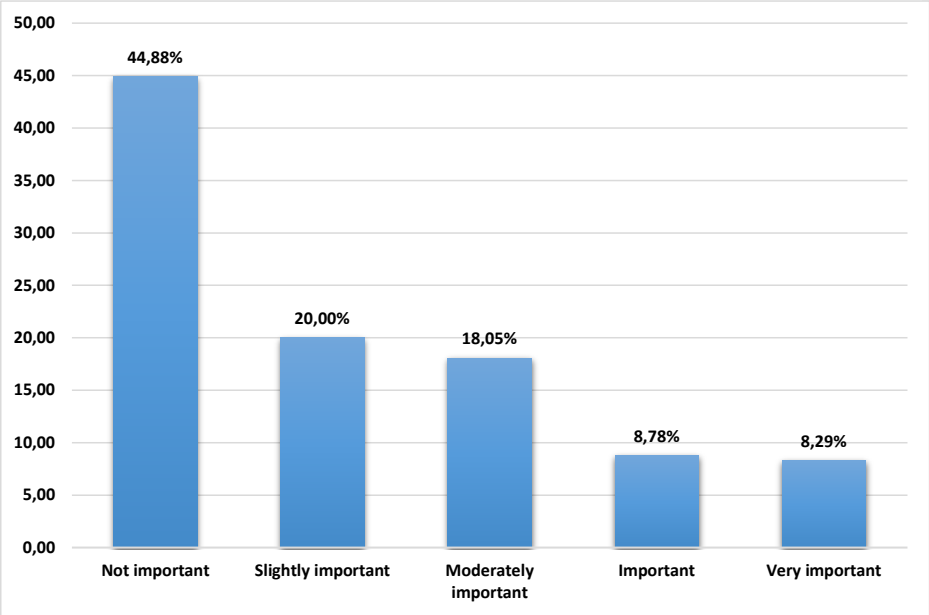

Figure 11.3: The importance of food the students are used to from childhood

The results shown in Figure 11.3 indicate that the respondents did not consider the food they ate as children important (44.88%). These results seem to contradict the results shown in Figure 11.1 on familiar food, which clearly show that they made a difference between the food familiar to them and the food they ate as a child. It might be that they had already developed different food preferences in their adult life because of availability or different circumstances. Hannon and Co-workers (2003) claim that parents are primarily responsible for the food habits of children, the results of this study indicate that this important influence can diminish in adult life.

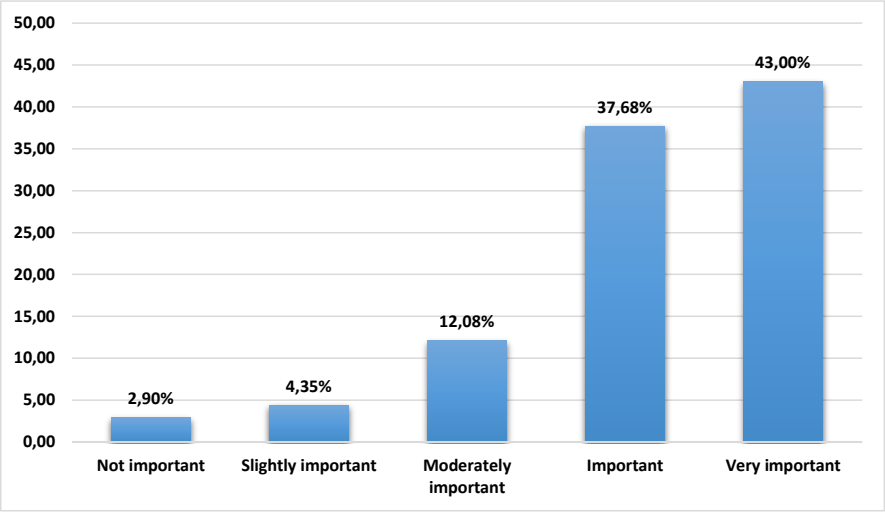

Figure 11.4: The importance that food be easily available in shops and supermarkets

Figure 11.4 shows that the majority of the students regarded food that was easily available in shops and supermarkets as very important (43.09), or important (37.68%). This result can be explained in view of other research results, as availability of foods in the home reflects the generally followed diet and food habits of the family (Sobal & Bissogni, 2009). International students often rely on public transport during their stay in Bloemfontein. It is therefore more convenient and less expensive if they can purchase their food from a nearby store and it is therefore not surprising that they respond with *very important* and *important*.

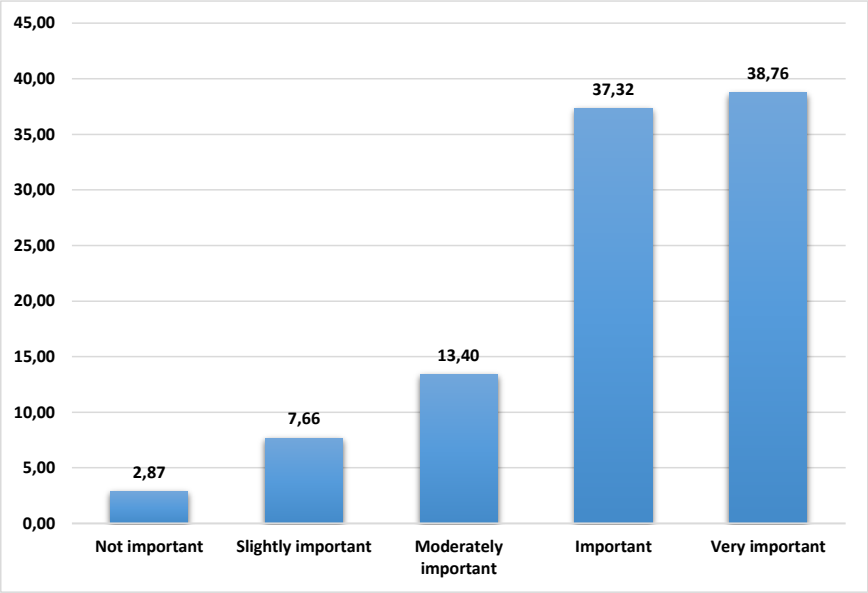

Figure 11.5: The importance of food shop close to the residence and workplace

The results shown in Figure 11.5 indicate that food shops close to the house and the work are very important to 38.67% and important to 37.32%. The result was expected as the students largely depended on public transport, which is expensive for them. It is also in agreement with literature indicating that people purchase food from stores and shops close to them, which can even determine their food choice and consumption (Jago, Baranowski & Baranowski, 2007).

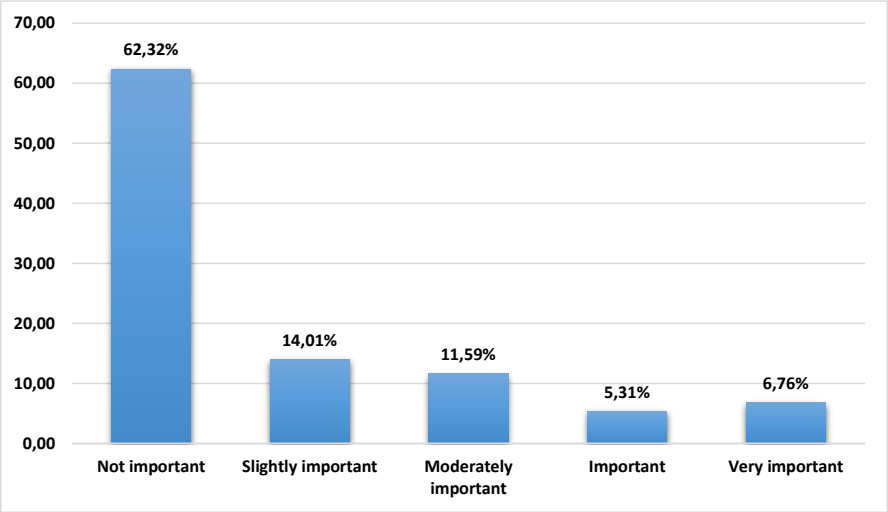

Figure 11.6: The importance of food coming from countries that the student approves of politically

The results shown in Figure 11.6 on the question whether it is important that food come from countries the respondents politically approves of show clearly that the respondents did not consider it important. The response of 62.32% was not important. They may not be very interested in politics or they may feel that they did themselves harm if they were that selective about food or they may feel that food and politics were not that closely related, or they did not care much about it.

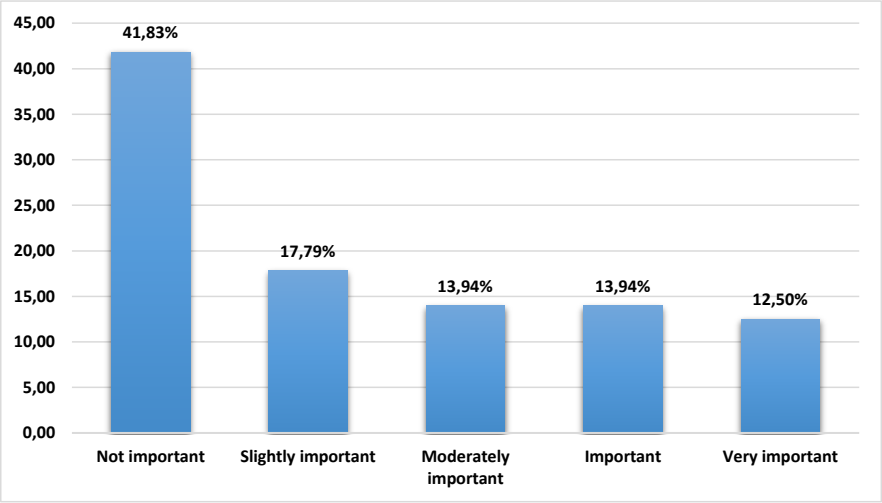

Figure 11.7: The importance of the country of origin of food to be clearly marked

The results shown in Figure 11.7 clearly indicate that a large percentage (41.83%) of the respondents did not consider it important that the country of origin be clearly marked. It is interesting, though, that a slightly lower percentage had this view compared to the 62.32% that did not feel that it was important that they politically approved of the country of origin. The reason might be that they wanted to know, although it would not influence their purchase. It can also be because of expected quality from a country, or it can be in consideration of the distance the food had to travel. From a sustainability point of view, this would be recommendable. It is also possible that they wanted to support favourite countries like their home country, but the fact is that 41.83% of them did not consider it important.

4.8 Religion as a factor influencing food preference

Do your religious convictions influence your food selection?

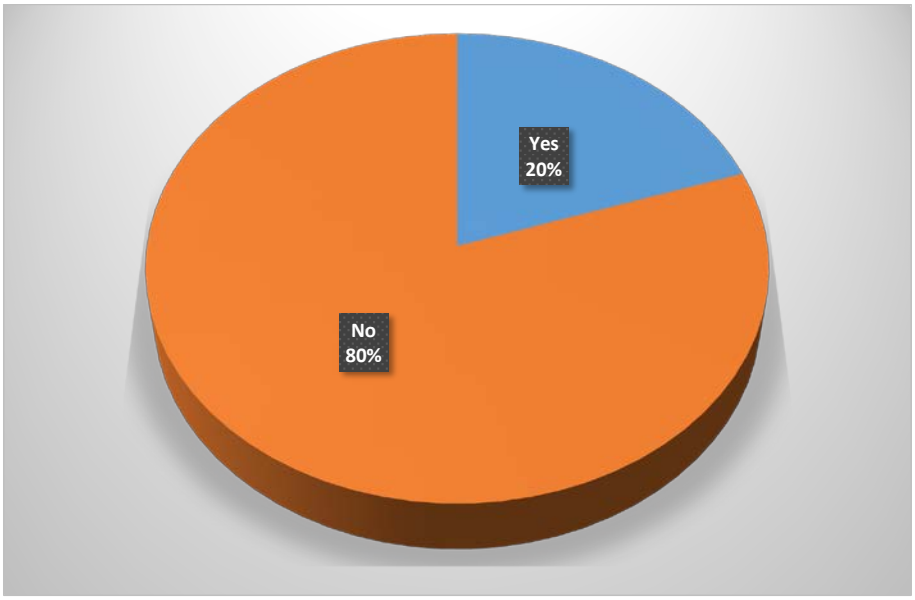

Figure 12: The extent to which religious convictions influence food selection

Figure 12 shows to what extent the international students at the University of the Free State felt that their religious convictions influenced their food selection. The majority of the respondents (80%) indicated that their religion did not determine their food selection.

Do you find food suitable for your religious conviction easily?

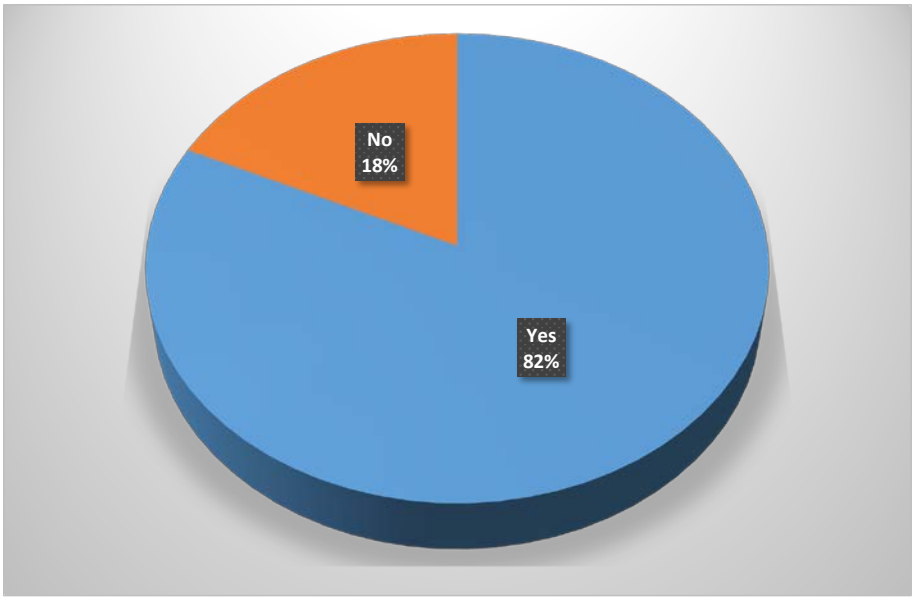

Figure13: the extent to which the international students of the University of The Free State find food suitable for their religious convictions easily

Figure 13 shows that 82% of the international students at the University of the Free State found it easy to find food suitable for their religious conviction. This result is similar to the previous answer, which indicates that religion did not influence their food selection. These results can largely be explained by the fact that 86.83% indicated that they were Christians (Figure 17) and mostly did not have prescribed or forbidden foods.

Does your culture influence your food selection?

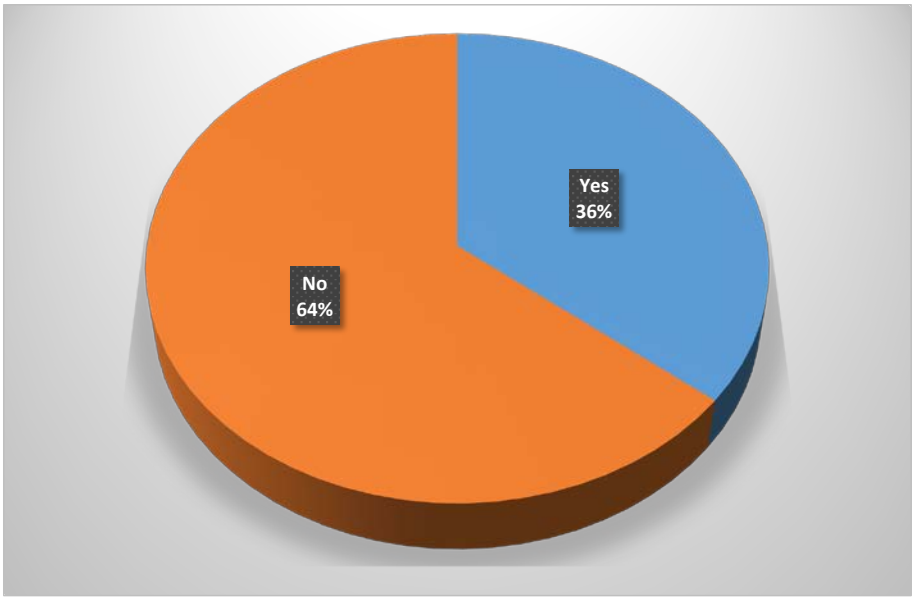

Figure 14: The extent to which the international students at the UFS perceive their culture to influence their food selection

Figure 14 shows that food selection of 36% of the respondents was influenced by culture whereas the food selection of 64% was not.

The research included many different cultures from the international students at the University of Free State belonging to 26 different cultures. The largest group was Sesotho (28), which is not surprising, as Lesotho is close. Representatives from the Shona (Zimbabwe), also a neighbouring country, comprise the second-largest group (13%)

The different cultures represented at the University of the Free State international student body, as indicated by the respondents.

Name of culture	**Number of respondents**
African	7
Africans	1
Chikunda	1
Coloured	1
Congolese	1
Daurara	1
Dutch	2
Ethiopian	1
European	1
German	3
Herero	2
Karanga (Zimbabwe)	2
Korean	1
Musigi	1
Ndebele	1
Ngoni	1
Oshiwamloo	2
Pan Ofican	1
Shona (Zimbabwe)	13
Sotho	28
Swahili	1
Swati	2
Venda	1
Yoruba (Nigeria)	5
Zambian	1
Zimbabwean	1

Do you regularly find the food product(s) that you prefer?

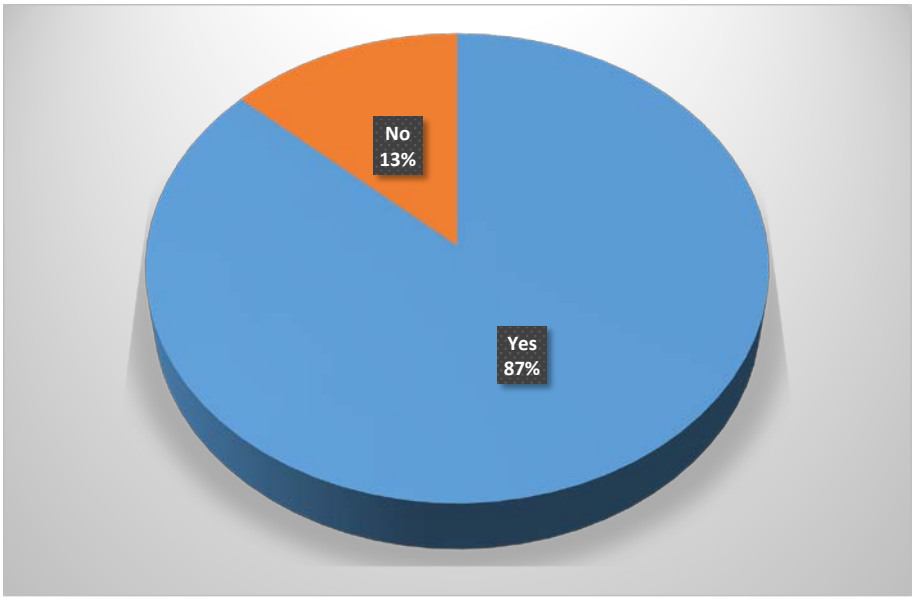

Figure 15: The availability of food products that international students of the University of The Free State prefer

Figure 15 shows that 87% of the respondents indicated that when shopping, they regularly found the food products that they preferred. This result is important as it indicates satisfaction in the availability of food products.

In restaurants, do you regularly find the dishes that you prefer?

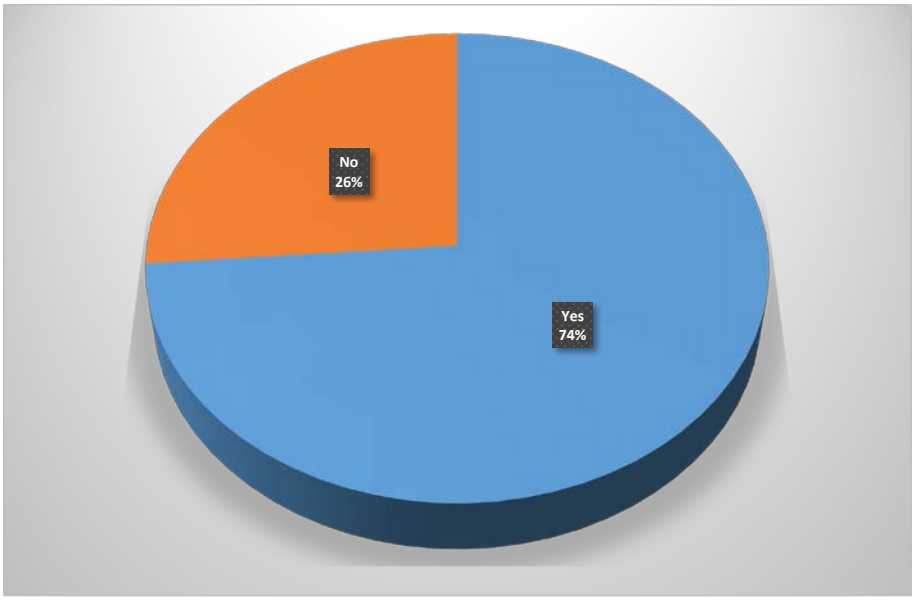

Figure 16: The availability of the preferable dishes for the international students of the Free State at the restaurants

Figure 16 shows that 74% of the respondents regularly found the dishes they preferred in restaurants.

The level of satisfaction with the dishes on the menu of restaurants is somewhat lower (but still high) than the level of satisfaction with the availability of food production outlets.

Christianity	86.83
Islam	2.93
Judaism	0.49
Buddhism	0.49
Hinduism	0.49
African religion	0.98
Baha'i religion	0.49

Secular	1.95
Non	4.88
Other	0.49

Figure 17: Religious groups to which international students at the University of the Free State belong

Figure 17 above shows that the majority (86.83%) of the respondents belonged to the Christianity religious group. These results are interesting because according to the South African demographics, Christians form 80%, Muslims 1.5% and 15% were unspecified (South Africa Demographics Profile, 2013).

Do you follow a specific diet for medical reasons?

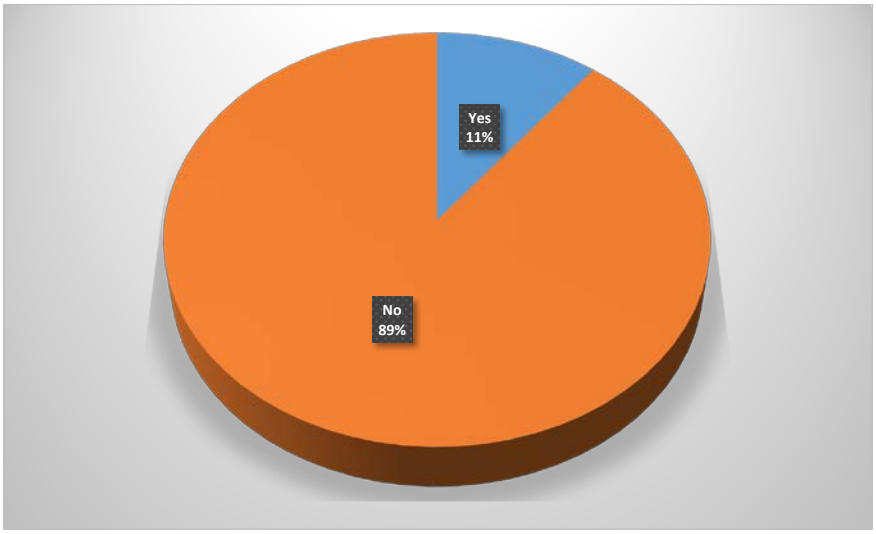

Figure 18: The percentage of respondents that follow a specific diet for medical reasons

Figure 18 shows that only 11% of the respondents followed a specific diet for medical reasons. The low percentage of students that needed to follow a specific diet for medical reasons can most probably be ascribed to the fact that the major part of the group were younger than 30 years of age and secondly, that students with a

major health problem might prefer not to study outside the borders of their home country.

Do you follow a specific diet for any other reason?

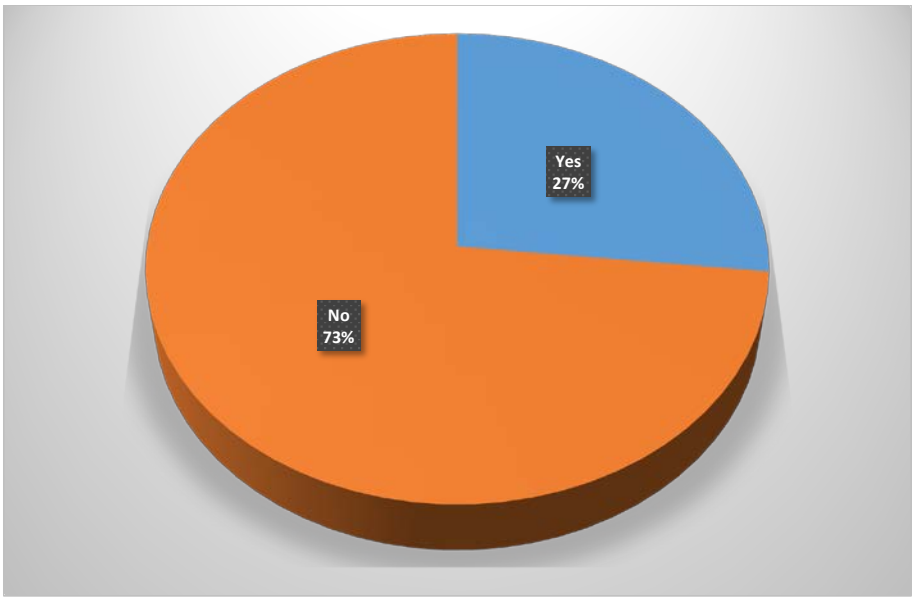

Figure 19: Respondents following a specific diet for reasons other than medical

Figure 19 above indicates that 27% of the respondents followed a specific diet for reasons other than medical. Added to the 11% following a diet for medical reasons, 38% of the International students did follow a diet.

What do you prefer?

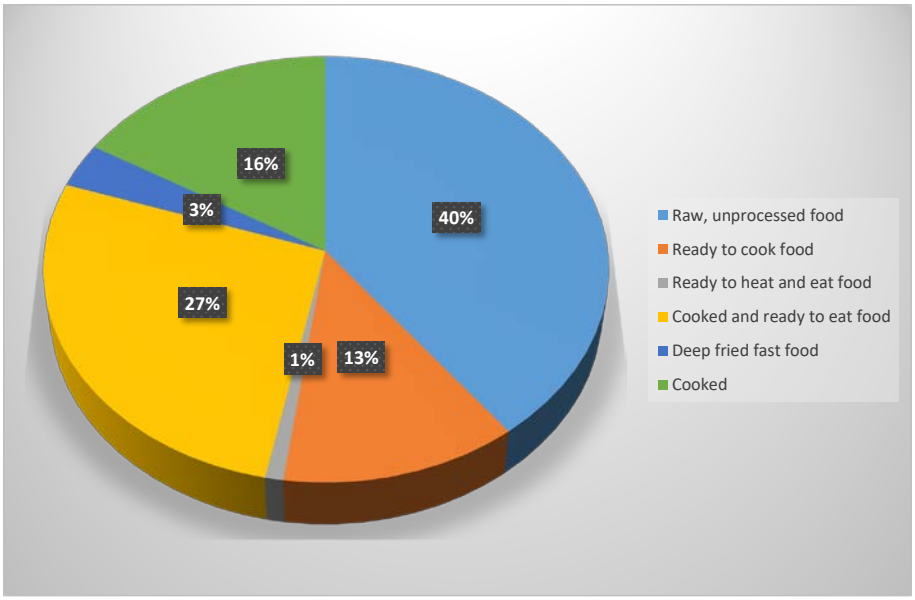

Figure 20: The preferable food for the international students of the University of The Free State

The largest group of 40% preferred raw unprocessed food, which indicates that they preferred to prepare the food in their own way, or to their own personal preference. In this way, they most probably also prepare more healthy food. The other large group preferred ready-to-eat meals, as they might not have the skills or the utensils required for food preparation. Deep-fried food and ready-to-heat food were preferred by only 1% and 3% of the students.

How often do you cook?

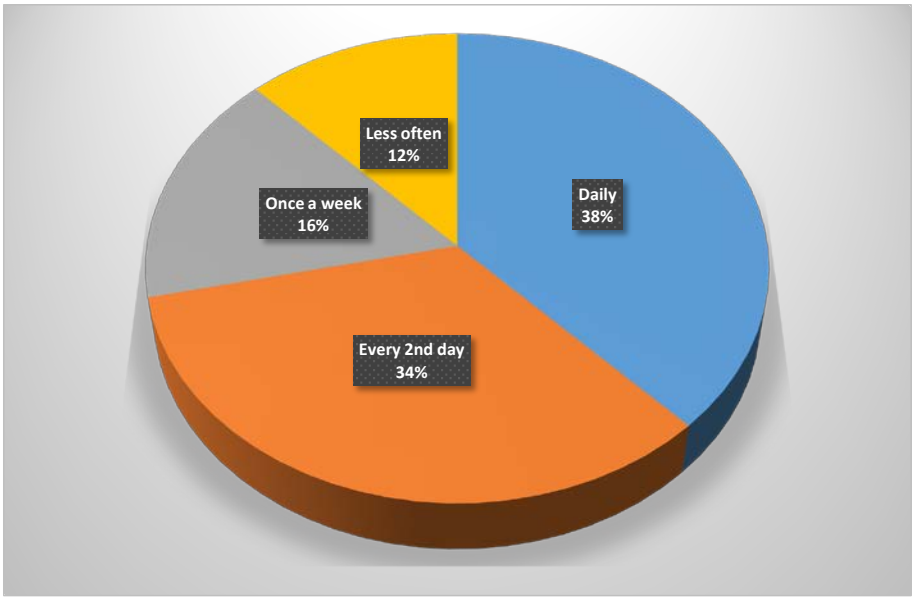

Figure 21: The indication of how many times that the respondents usually cook

Figure 21 shows that 38% of the respondents cooked daily, whilst 34% of the respondents cooked every second day. These results indicated that at least 72% (38% daily and 34% every second day) of the international students at the University of the Free State cooked their own meals. This further indicates that supermarkets within walking distance from their residences were more important than the food outlets on the campus.

Where do you purchase uncooked food most often?

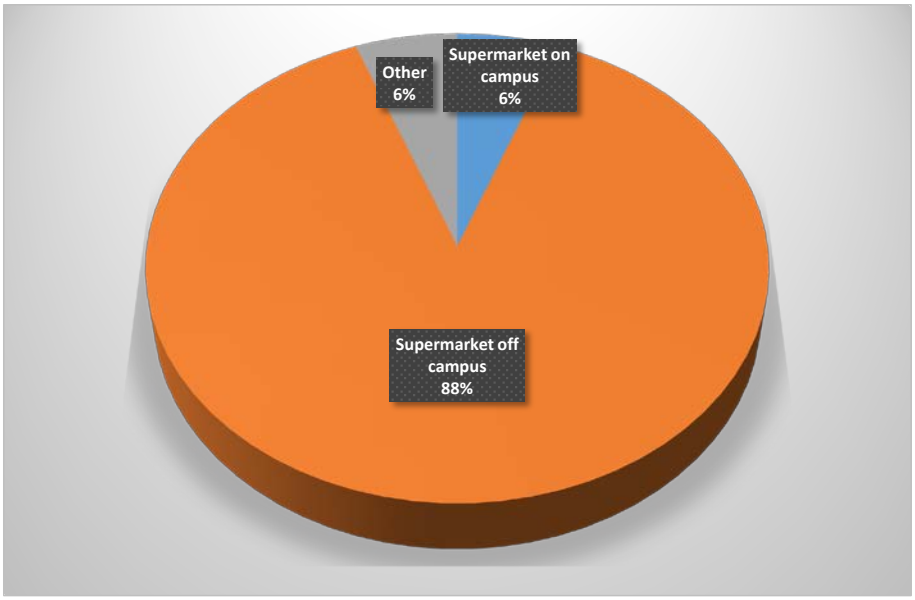

Figure 22: From where do the respondents purchase their food?

Figure 22 show that 88% of the respondents purchased their uncooked food from the supermarkets off-campus, 6% purchased their food from supermarket on campus and 6% of the respondents purchased their food from other places. These results are partly in agreement with the results on the previous question, with 88% + 6% of them purchasing from supermarkets. The fact that only 6% purchased from the supermarket on campus can be interpreted in different ways. The first reason was that they purchased close to where they stayed, which would be sensible and is in agreement with the claim of other researchers finding that consumers preferred to purchase everything in one trip not far from home (McWilliams, 2009). The fact that only 6% purchased regularly from the supermarket on campus might indicate that the supermarket might not fulfil in their food needs.

A question was asked: Do you have facilities to cook yourself?

83.1% of the respondents stated that they had facilities to cook by themselves and 16.9% of the respondents they did not have facilities. A large percentage (72%) of students prepared their own food regularly, which indicates the importance of availability of kitchen facilities in accommodation for students.

In the design of the project, the researcher foresaw the possibility that international students might experience the need for specific food products that were not available on campus. One of the objectives of this research project was to advise the management of the University of the needs, which can easily be dealt with.

The question was asked and the following list of items was obtained:

- Vegetables and tubers: yams, cassava, abra, rapes – especially cassava and yams
- Pap, papa, sadza, porridge (mealie meal cooked)
- Dry beans and bean products, lentils, chickpeas and other pulses
- Meat (game and goat meat)
- Fish
- Spices
- Nuts
- Gluten-free products
- Food with less salt
- Food not fried
- Food with less sweeteners

Some of these items are not freely available because it is not grown on commercial scale in South Africa, e.g. cassava and abra. It is available in fruit and vegetable stores in Bloemfontein, but obviously not within walking distance from where these students lived. The other items listed are freely available in Bloemfontein in most supermarkets, but not on campus.

The need for cooked pap (mealie meal cooked porridge) arose in a variety of the names it is known by in different countries. It is also a favourite in South Africa, but

not available in the food outlets on campus, an oversight that could easily be corrected.

4.9 The results of the statistical analysis of the research data

4.9.1 Factor values

A 5-point Likert scale was used for the food preference questions, ranging from 1 for *not important* to 5 for *very important*. The factor values were calculated to determine the most important food preferences overall and for the different demographic groups. To get the factor value, a mean for each of the questions was calculated and the mean value ranges from 1 to 5, with 3 being the middle value. The mean lower than 3 indicates that food preference is fundamentally not important to respondents. The closer the mean is to 5, the more important food preference is to the respondents. However, because we work with categorical variables we cannot interpret the mean as it is. Therefore, the mean for each question is then changed into a factor value (FV) or an Average Score (AS). The FV is then calculated. A mean of 3 is equal to a FV of 0.5. A FV greater than 0.5 indicates that food preference is important to the majority of the respondents.

Table 1 below shows the factor values for the overall group for each of the food preferences.

Table 1 – Food preferences

It is important to me that the food I eat on a typical day	Mean	FV
Tastes good	4.639	0.910
Keeps me healthy	4.466	0.867
Is good value for money	4.396	0.849
Is nutritious	4.249	0.812
Is easily available in shops and supermarkets	4.135	0.784
Is good for my skin/teeth/hair/nails etc.	4.024	0.756
Can be bought in shops close to where I live or work	4.014	0.754
Is not expensive	3.971	0.743
Smells nice	3.951	0.738

Contains lots of vitamins and minerals	3.909	0.727
Is easy to prepare	3.831	0.708
Can be cooked very simply	3.804	0.701
Is cheap	3.792	0.698
Makes me feel good	3.760	0.690
Is high in protein	3.749	0.687
Cheers me up	3.727	0.682
Helps me control my weight	3.652	0.663
Is low in fat	3.639	0.660
Is high in fibre and roughage	3.620	0.655
Looks nice	3.563	0.641
Has a pleasant texture	3.558	0.640
Is familiar to me	3.553	0.638
Contains no additives	3.481	0.620
Contains only natural ingredients	3.476	0.619
Contains no artificial ingredients	3.450	0.612
Is packaged in an environmentally friendly packaging	3.356	0.589
Takes no time to prepare	3.330	0.583
Keeps me awake and alert	3.298	0.575
Helps me cope with stress	3.298	0.575
Helps me to cope with life	3.238	0.559
Is low in calories	3.209	0.552
Helps me relax	3.191	0.548
Is what I usually eat	2.976	0.494
Has the country of origin clearly marked	2.375	0.344
Is like the food I ate when I was a child	2.156	0.289
Comes from countries I approve of politically	1.802	0.200

As discussed above, the higher the factor value, the higher the level of importance for that food preference. Table 1 above shows that the five important food preferences are food that tastes good, keeps them healthy, is good value for money, is nutritious and food that is easily available in shops and supermarkets. Moreover, the unimportant food preferences were indicated as food they usually eat, food that

has the country of origin clearly marked, is like the food they ate when they were a child, and food that comes from countries they approve of politically.

Table 2 below shows the food preferences separated for males and females. The top 5 important food preferences for males is the same as that for females. This food tastes good, keeps them healthy, is good value for money, and is nutritious as well as food that is easily available in shops and supermarkets. In addition, the unimportant food preferences are the same for males and females. This food has the country of origin clearly marked, is like the food they ate when they were a child, as well as food that comes from countries they approve of politically.

Table 3 below shows the food preferences separated into 5 age groups: Under 21, 21–30 years, 31–40 years, 41–50 years and 51+ years. The top 5 important food preferences for the respondents who were under 21 years old are food that tastes good, that is easily available in shops and supermarkets, that is good value for money, that keeps them healthy, and food that is good for their skin/teeth/hair/nails, etc. The important food preferences for those aged between 21 and 30 years old are food that tastes good, that is good value for money, that keeps them healthy, that can be bought in shops close to where they live or work, and food that is not expensive. Furthermore, the top 5 important food preferences for the respondents who are aged between 31 and 40 years old are food that tastes good, that keeps them healthy, that is nutritious, that is good value for money, and food that is easily available in shops and supermarkets. The top 5 important food preferences for those aged between 41 and 50 years old are food that keeps them healthy, that is low in fat, that is nutritious, that tastes good as well as food that is high in fibre and roughage. Lastly, the top 5 important food preferences for the respondents who are 51 years old and above are food that keeps them healthy, that is nutritious, that contains only natural ingredients, that helps them control their weight, and food that smells nice.

Table 2 – Food preferences by gender

It is important to me that the food I eat on a typical day	**Gender**			
	Male		**Female**	
	Mean	FV	Mean	FV
Is easy to prepare	3.945	0.736	3.704	0.676
Contains no additives	3.606	0.651	3.343	0.586
Is low in calories	3.112	0.528	3.313	0.578
Tastes good	4.556	0.889	4.730	0.933
Contains only natural ingredients	3.523	0.631	3.424	0.606
Is not expensive	3.927	0.732	4.020	0.755
Is low in fat	3.670	0.667	3.606	0.652
Is familiar to me	3.725	0.681	3.364	0.591
Is high in fibre and roughage	3.609	0.652	3.633	0.658
Is nutritious	4.227	0.807	4.273	0.818
Is easily available in shops and supermarkets	4.083	0.771	4.194	0.798
Is good value for money	4.364	0.841	4.433	0.858
Cheers me up	3.642	0.660	3.818	0.705
Smells nice	3.963	0.741	3.938	0.735
Can be cooked very simply	3.792	0.698	3.816	0.704
Helps me cope with stress	3.312	0.578	3.283	0.571
Helps me control my weight	3.560	0.640	3.755	0.689
Has a pleasant texture	3.514	0.629	3.606	0.652
Is packaged in an environmentally friendly packaging	3.463	0.616	3.237	0.559
Comes from countries I approve of politically	1.935	0.234	1.657	0.164
Is like the food I ate when I was a child	2.486	0.371	1.796	0.199
Contains lots of vitamins and minerals	3.964	0.741	3.848	0.712
Contains no artificial ingredients	3.606	0.651	3.280	0.570
Keeps me awake and alert	3.370	0.593	3.220	0.555
Looks nice	3.624	0.656	3.495	0.624
Helps me relax	3.358	0.589	3.010	0.503
Is high in protein	3.926	0.731	3.556	0.639

Takes no time to prepare	3.468	0.617	3.180	0.545
Keeps me healthy	4.472	0.868	4.460	0.865
Is good for my skin/teeth/hair/nails etc.	4.019	0.755	4.030	0.758
Makes me feel good	3.787	0.697	3.730	0.683
Has the country of origin clearly marked	2.519	0.380	2.220	0.305
Is what I usually eat	3.294	0.573	2.630	0.408
Helps me to cope with life	3.370	0.593	3.092	0.523
Can be bought in shops close to where I live or work	4.046	0.761	3.980	0.745
Is cheap	3.853	0.713	3.724	0.681

Table 3 – Food preferences by age

It is important to me that the food I eat on a typical day	**Age**									
	Under 21		21–30 years		31–40 years		41–50 years		51+ years	
	M	FV	M	FV	M	FV	M	FV	M	FV
Is easy to prepare	3.68	0.67	3.80	0.70	3.98	0.75	3.76	0.69	3.33	0.58
Contains no additives	3.11	0.53	3.16	0.54	3.86	0.72	3.84	0.71	4.17	0.79
Is low in calories	3.11	0.53	3.00	0.50	3.09	0.52	4.04	0.76	4.00	0.75
Tastes good	4.83	0.96	4.63	0.91	4.63	0.91	4.63	0.91	4.17	0.79
Contains only natural ingredients	3.28	0.57	3.24	0.56	3.51	0.63	4.16	0.79	4.50	0.88
Is not expensive	3.95	0.74	4.08	0.77	3.95	0.74	3.76	0.69	3.00	0.50
Is low in fat	3.42	0.61	3.47	0.62	3.45	0.61	4.72	0.93	4.17	0.79
Is familiar to me	3.00	0.50	3.60	0.65	3.67	0.67	3.44	0.61	3.33	0.58
Is high in fibre and roughage	3.22	0.56	3.39	0.60	3.75	0.69	4.32	0.83	4.17	0.79
Is nutritious	3.89	0.72	4.08	0.77	4.41	0.85	4.64	0.91	4.67	0.92
Is easily available in shops and supermarkets	4.44	0.86	4.07	0.77	4.10	0.78	4.16	0.79	4.17	0.79
Is good value for money	4.32	0.83	4.47	0.87	4.41	0.85	4.24	0.81	3.83	0.71

Cheers me up	3.44	0.61	3.77	0.69	3.81	0.70	3.64	0.66	3.00	0.50
Smells nice	3.61	0.65	3.94	0.73	4.07	0.77	3.84	0.71	4.20	0.80
Can be cooked very simply	3.56	0.64	3.89	0.72	3.70	0.68	4.08	0.77	3.17	0.54
Helps me cope with stress	2.79	0.45	3.39	0.60	3.09	0.52	3.72	0.68	3.17	0.54
Helps me control my weight	3.53	0.63	3.54	0.64	3.49	0.62	4.28	0.82	4.33	0.83
Has a pleasant texture	3.78	0.69	3.49	0.62	3.47	0.62	3.80	0.70	3.67	0.67
Is packaged in an environmentally friendly packaging	3.39	0.60	3.13	0.53	3.33	0.58	4.04	0.76	4.00	0.75
Comes from countries I approve of politically	2.06	0.26	1.67	0.17	1.88	0.22	1.80	0.20	2.33	0.33
Is like the food I ate when I was a child	2.11	0.28	2.19	0.30	2.10	0.28	2.12	0.28	2.33	0.33
Contains lots of vitamins and minerals	3.74	0.68	3.81	0.70	3.95	0.74	4.24	0.81	4.00	0.75
Contains no artificial ingredients	3.22	0.56	3.19	0.55	3.65	0.66	3.96	0.74	3.83	0.71
Keeps me awake and alert	3.50	0.63	3.24	0.56	3.25	0.56	3.52	0.63	3.00	0.50
Looks nice	3.17	0.54	3.45	0.61	3.78	0.70	3.76	0.69	3.33	0.58
Helps me relax	2.56	0.39	3.15	0.54	3.32	0.58	3.48	0.62	3.00	0.50
Is high in protein	3.33	0.58	3.77	0.69	3.79	0.70	3.84	0.71	3.83	0.71
Takes no time to prepare	3.00	0.50	3.50	0.63	3.18	0.55	3.52	0.63	1.83	0.21
Keeps me healthy	4.11	0.78	4.33	0.83	4.61	0.90	4.80	0.95	4.83	0.96
Is good for my skin/teeth/hair/nails etc.	4.11	0.78	3.98	0.74	3.95	0.74	4.21	0.80	4.17	0.79

Makes me feel good	3.39	0.60	3.73	0.68	3.92	0.73	3.76	0.69	3.67	0.67
Has the country of origin clearly marked	2.22	0.31	2.37	0.34	2.32	0.33	2.52	0.38	3.00	0.50
Is what I usually eat	2.67	0.42	3.11	0.53	2.98	0.50	2.64	0.41	2.83	0.46
Helps me to cope with life	2.89	0.47	3.09	0.52	3.39	0.60	3.56	0.64	3.50	0.63
Can be bought in shops close to where I live or work	3.89	0.72	4.14	0.79	3.93	0.73	3.80	0.70	3.83	0.71
Is cheap	3.78	0.69	4.00	0.75	3.78	0.70	3.20	0.55	2.83	0.46

Food preferences that are not important for all age groups are food that has the country of origin clearly marked, food that is like the food they ate when they were a child, and food that comes from countries they approve of politically. In addition, the food preferences separated into undergraduate and postgraduate students are presented in Table 4 below. The table shows that out of the top 5 important food preferences for undergraduate students, 4 of them are similar to those of the postgraduate students. This food tastes good, is good value for money, food, is easily available in shops and supermarkets and keeps them healthy. The one important food preference for undergraduate students that is different from the postgraduate students is the food that can be bought in shops close to where they live or work, whilst postgraduate students preferred nutritious food. Similar to the different age groups, food preferences that are not important are the same for both undergraduate and postgraduate students and these are food that has the country of origin clearly marked, food that is like the food they ate when they were a child, and food that comes from countries they approve of politically.

Table 4 – Food preferences by study level

It is important to me that the food I eat on a typical day	**Study level**			
	Undergraduate		Postgraduate	
	Mean	FV	Mean	FV
Is easy to prepare	3.754	0.688	3.874	0.719
Contains no additives	3.072	0.518	3.691	0.673

Is low in calories	2.913	0.478	3.343	0.586
Tastes good	4.779	0.945	4.569	0.892
Contains only natural ingredients	3.101	0.525	3.662	0.665
Is not expensive	4.114	0.779	3.920	0.730
Is low in fat	3.443	0.611	3.741	0.685
Is familiar to me	3.471	0.618	3.584	0.646
Is high in fibre and roughage	3.304	0.576	3.765	0.691
Is nutritious	3.900	0.725	4.419	0.855
Is easily available in shops/supermarkets	4.159	0.790	4.111	0.778
Is good value for money	4.449	0.862	4.368	0.842
Cheers me up	3.746	0.687	3.704	0.676
Smells nice	3.879	0.720	3.985	0.746
Can be cooked very simply	3.776	0.694	3.830	0.707
Helps me cope with stress	3.214	0.554	3.333	0.583
Helps me control my weight	3.400	0.600	3.776	0.694
Has a pleasant texture	3.594	0.649	3.537	0.634
Is packaged in an environmentally friendly packaging	3.044	0.511	3.511	0.628
Comes from countries I approve of politically	1.696	0.174	1.852	0.213
Is like the food I ate when I was a child	2.309	0.327	2.074	0.269
Contains lots of vitamins and minerals	3.786	0.696	3.971	0.743
Contains no artificial ingredients	3.174	0.543	3.606	0.651
Keeps me awake and alert	3.333	0.583	3.294	0.574
Looks nice	3.426	0.607	3.613	0.653
Helps me relax	3.072	0.518	3.234	0.558
Is high in protein	3.638	0.659	3.815	0.704
Takes no time to prepare	3.348	0.587	3.343	0.586
Keeps me healthy	4.159	0.790	4.618	0.904
Is good for my skin/teeth/hair/nails etc.	4.000	0.750	4.037	0.759
Makes me feel good	3.559	0.640	3.854	0.714
Has the country of origin clearly marked	2.232	0.308	2.449	0.362
Is what I usually eat	3.188	0.547	2.861	0.465
Helps me to cope with life	3.224	0.556	3.257	0.564

Can be bought in shops close to where I live or work	4.130	0.783	3.956	0.739
Is cheap	3.985	0.746	3.706	0.676

Furthermore, Table 5 below shows the food preferences separated into the different UFS campuses: Bloemfontein (Bfn) Main Campus, Bloemfontein South Campus and QwaQwa Campus. The table shows that the top 5 important food preferences for the students on the Bloemfontein Main Campus are food that tastes good, food that keeps one healthy, food that is good value for money, food that is nutritious, and food that is easily available in shops and supermarkets, whilst the top 5 important food preferences for the students on the Bloemfontein South Campus are food that tastes good, food that is easily available in shops and supermarkets, food that is good value for money, food that smells nice, and food that can be cooked very simply. The important food preferences for the students on the QwaQwa Campus are food that is good value for money, food that cheers them up, food that smells nice, food that helps them cope with stress, and food that makes them feel good.

The table also shows that the food preferences that are not important are the same for the students on all three campuses and these are food that has the country of origin clearly marked, food that is like the food they ate when they were a child, and food that comes from countries they approve of politically.

Table 5 – Food preferences by campus

It is important to me that the food I eat on a typical day	**Campus**					
	Bfn Main Campus		**Bfn South Campus**		**QwaQwa Campus**	
	Mean	FV	Mean	FV	Mean	FV
Is easy to prepare	3.817	0.704	4.000	0.750	4.333	0.833
Contains no additives	3.482	0.621	4.200	0.800	4.000	0.750
Is low in calories	3.167	0.542	3.400	0.600	2.333	0.333
Tastes good	4.641	0.910	5.000	1.000	4.667	0.917
Contains only natural ingredients	3.476	0.619	3.600	0.650	3.000	0.500
Is not expensive	4.017	0.754	4.200	0.800	3.667	0.667
Is low in fat	3.641	0.660	3.600	0.650	3.000	0.500

Is familiar to me	3.567	0.642	3.500	0.625	4.333	0.833
Is high in fibre and roughage	3.620	0.655	3.500	0.625	3.333	0.583
Is nutritious	4.251	0.813	4.200	0.800	4.000	0.750
Is easily available in shops and supermarkets	4.141	0.785	4.600	0.900	4.333	0.833
Is good value for money	4.408	0.852	4.600	0.900	5.000	1.000
Cheers me up	3.695	0.674	4.200	0.800	5.000	1.000
Smells nice	3.940	0.735	4.500	0.875	5.000	1.000
Can be cooked very simply	3.783	0.696	4.400	0.850	4.333	0.833
Helps me cope with stress	3.253	0.563	3.800	0.700	5.000	1.000
Helps me control my weight	3.615	0.654	4.200	0.800	3.667	0.667
Has a pleasant texture	3.536	0.634	3.800	0.700	3.333	0.583
Is packaged in an environmentally friendly packaging	3.407	0.602	3.400	0.600	2.333	0.333
Comes from countries I approve of politically	1.787	0.197	2.400	0.350	1.333	0.083
Is like the food I ate when I was a child	2.174	0.293	2.200	0.300	2.000	0.250
Contains lots of vitamins and minerals	3.895	0.724	4.200	0.800	4.000	0.750
Contains no artificial ingredients	3.450	0.613	3.400	0.600	2.667	0.417
Keeps me awake and alert	3.294	0.574	3.600	0.650	4.000	0.750
Looks nice	3.529	0.632	3.800	0.700	3.333	0.583
Helps me relax	3.152	0.538	3.800	0.700	4.000	0.750
Is high in protein	3.729	0.682	4.200	0.800	4.000	0.750
Takes no time to prepare	3.304	0.576	3.800	0.700	4.000	0.750
Keeps me healthy	4.465	0.866	4.000	0.750	4.000	0.750
Is good for my skin/teeth/hair/nails, etc.	4.047	0.762	3.800	0.700	3.667	0.667
Makes me feel good	3.771	0.693	3.400	0.600	5.000	1.000
Has the country of origin clearly marked	2.388	0.347	3.000	0.500	1.333	0.083
Is what I usually eat	3.012	0.503	3.400	0.600	3.000	0.500
Helps me to cope with life	3.238	0.560	3.400	0.600	4.000	0.750
Can be bought in shops close to	4.082	0.770	4.200	0.800	3.333	0.583

where I live or work						
Is cheap	3.899	0.725	3.800	0.700	3.667	0.667

The food preferences were also separated into students whose food selection is influenced by religious convictions and those who are not. The results are presented in Table 6 below. The table shows that the top 5 important food preferences for the students whose food selection is influenced by religious convictions are food that keeps them healthy, food that tastes good, food that is nutritious, food that contains lots of vitamins and minerals, and food that is good value for money. Four of the top five important food preferences are the same as the top five for the complete group of students. The fourth of the top 5 foods that contain lots of vitamins and minerals is in line with the other health-related preferences. The items marked as not important were the same as for the complete group, which indicates that religion does not cause a difference in the general requirements. The important food preferences for those students whose food selection is not influenced by religious convictions are food that is easy to prepare, food that contains no additives, food that is low in calories, food that tastes good, and food that contains only natural ingredients. Moreover, the food preferences not important for the students whose food selection is influenced by religious convictions is food that has the country of origin clearly marked, food that is like the food they ate when they were a child, and food that comes from countries they approve of politically.

Table 6 – Food preferences by religious convictions

It is important to me that the food I eat on a typical day	**Do your religious convictions influence your food selection?**			
	Yes		**No**	
	Mean	FV	Mean	FV
Is easy to prepare	3.780	0.695	3.853	0.713
Contains no additives	4.024	0.756	3.358	0.589
Is low in calories	3.800	0.700	3.073	0.518
Tastes good	4.634	0.909	4.642	0.911
Contains only natural ingredients	4.049	0.762	3.339	0.585
Is not expensive	3.976	0.744	3.982	0.745

Is low in fat	3.925	0.731	3.588	0.647
Is familiar to me	3.683	0.671	3.503	0.626
Is high in fibre and roughage	3.951	0.738	3.537	0.634
Is nutritious	4.463	0.866	4.206	0.802
Is easily available in shops and supermarkets	4.073	0.768	4.152	0.788
Is good value for money	4.390	0.848	4.399	0.850
Cheers me up	4.000	0.750	3.652	0.663
Smells nice	4.325	0.831	3.864	0.716
Can be cooked very simply	3.615	0.654	3.853	0.713
Helps me cope with stress	3.775	0.694	3.200	0.550
Helps me control my weight	4.150	0.788	3.561	0.640
Has a pleasant texture	3.825	0.706	3.500	0.625
Is packaged in an environmentally friendly packaging	3.795	0.699	3.262	0.566
Comes from countries I approve of politically	2.225	0.306	1.685	0.171
Is like the food I ate when I was a child	2.359	0.340	2.104	0.276
Contains lots of vitamins and minerals	4.439	0.860	3.794	0.698
Contains no artificial ingredients	3.951	0.738	3.337	0.584
Keeps me awake and alert	3.805	0.701	3.170	0.542
Looks nice	4.050	0.763	3.440	0.610
Helps me relax	3.537	0.634	3.102	0.526
Is high in protein	3.975	0.744	3.703	0.676
Takes no time to prepare	3.488	0.622	3.277	0.569
Keeps me healthy	4.829	0.957	4.388	0.847
Is good for my skin/teeth/hair/nails, etc.	4.366	0.841	3.945	0.736
Makes me feel good	4.146	0.787	3.661	0.665
Has the country of origin clearly marked	2.829	0.457	2.255	0.314
Is what I usually eat	3.098	0.524	2.934	0.483
Helps me to cope with life	3.725	0.681	3.116	0.529
Can be bought in shops close to where I live or work	3.951	0.738	4.024	0.756
Is cheap	3.800	0.700	3.782	0.695

For those students whose food selection is not influenced by religious convictions the food preferences not important include food that they usually eat, food that helps

them to cope with life, food that can be bought in shops close to where they live or work, and food that is cheap.

Table 7 – Food preferences by culture

It is important to me that the food I eat on a typical day	**Does your culture influence your food selection?**			
	Yes		**No**	
	Mean	FV	Mean	FV
Is easy to prepare	3.875	0.719	3.833	0.708
Contains no additives	3.703	0.676	3.394	0.598
Is low in calories	3.257	0.564	3.185	0.546
Tastes good	4.595	0.899	4.659	0.915
Contains only natural ingredients	3.892	0.723	3.265	0.566
Is not expensive	4.095	0.774	3.910	0.727
Is low in fat	3.770	0.693	3.573	0.643
Is familiar to me	3.730	0.682	3.439	0.610
Is high in fibre and roughage	3.757	0.689	3.557	0.639
Is nutritious	4.432	0.858	4.167	0.792
Is easily available in shops/supermarkets	4.122	0.780	4.153	0.788
Is good value for money	4.419	0.855	4.392	0.848
Cheers me up	3.685	0.671	3.738	0.685
Smells nice	4.056	0.764	3.900	0.725
Can be cooked very simply	3.806	0.701	3.823	0.706
Helps me cope with stress	3.324	0.581	3.321	0.580
Helps me control my weight	3.811	0.703	3.585	0.646
Has a pleasant texture	3.554	0.639	3.585	0.646
Is packaged in an environmentally friendly packaging	3.630	0.658	3.215	0.554
Comes from countries I approve of politically	2.230	0.307	1.557	0.139
Is like the food I ate when I was a child	2.514	0.378	1.962	0.240
Contains lots of vitamins and minerals	4.257	0.814	3.758	0.689
Contains no artificial ingredients	3.757	0.689	3.293	0.573
Keeps me awake and alert	3.527	0.632	3.174	0.544
Looks nice	3.589	0.647	3.534	0.633
Helps me relax	3.149	0.537	3.233	0.558

Is high in protein	3.849	0.712	3.705	0.676
Takes no time to prepare	3.203	0.551	3.406	0.602
Keeps me healthy	4.649	0.912	4.371	0.843
Is good for my skin/teeth/hair/nails, etc.	4.203	0.801	3.924	0.731
Makes me feel good	3.918	0.729	3.677	0.669
Has the country of origin clearly marked	2.730	0.432	2.189	0.297
Is what I usually eat	3.257	0.564	2.805	0.451
Helps me to cope with life	3.493	0.623	3.115	0.529
Can be bought in shops close to where I live or work	3.973	0.743	4.030	0.758
Is cheap	3.836	0.709	3.750	0.688

Table 7 above presents the food preferences for students whose food selection is influenced by their culture and those who are not. The table shows that 4 of the top 5 important food preferences for the students whose food selection is influenced by culture are the same as for those whose food selection is not influenced by culture, These 4 are food that keeps them healthy, food that tastes good, food that is nutritious, and food that is good value for money. The other preference for those students whose food selection is influenced by culture is food that contains lots of vitamins and minerals, whilst for the students whose food selection is not influenced by culture the other food preference is food that is easily available in shops and supermarkets.

In addition, the food preferences not important for the students whose food selection is influenced by culture are food that takes no time to prepare, food that helps them relax, food that has the country of origin clearly marked, food that is like the food they ate when they were a child as well as food that comes from countries they approve of politically. Whilst the not-important food preferences for the students whose food selection is not influenced by culture are food that helps them to cope with life, food that they usually eat, food that has the country of origin clearly marked, food that is like the food they ate when they were a child as well as food that comes from countries they approve of politically.

4.10 Conclusion

In this chapter, the main findings with regard to the research questions were summarised and general conclusions based on the findings of the studies presented in this dissertation were described.

4.10.1 Findings with regard to the research questions

Q1. Do the international students consider the food available on campus suitable?

> The respondents to the questionnaire considered the food available on the campus suitable. They did indicate, though, that different types of food should be provided as well.

Q2. Do the food outlets on the university campus offer suitable food for international students?

> The respondents to the questionnaire Indicated that they could find fast food, fried food and food rich in sugar, while they would prefer more healthy food. Samp, fresh foods and other simple foods were mentioned as possible alternatives that the food outlets on campus could offer.

The results indicate that students were concerned about healthy eating and further that they were well informed on the nutritional value of food.

The results also showed that international students wanted food that was quick and easy to prepare. 40% of them preferred to purchase raw, unprocessed food and prepare it themselves. They also indicated that food should not be expensive, but value for their money was more important than cheap food.

The respondents were more concerned about the taste of food than the appearance and texture, although they considered both appearance and texture as important. They wanted food to lift their spirit and help them feel good, but they were divided in their perception of the importance of food helping them to cope with stress and keeping them relaxed.

Q3. How do the international students fulfil their food needs?

The respondents indicated that they fulfilled their needs by purchasing uncooked food from supermarkets off campus.

According to the respondents' answers in Figure 22, which show that 88% of the respondents purchased their uncooked food from the supermarkets off campus, 6% purchased their food from supermarket on campus and 6% of the respondents purchased their food from other places, that indicated that there were many food needs for international students that they could not it on the campus, but they got it from the supermarkets out of the campus.

The respondents named many items that the campus restaurants could provide like the food the respondents wanted and could not find on campus:

- Vegetables and tubers: yams, cassava, abra, rapes – especially cassava and yams
- Pap, papa, sadza, porridge (mealie meal cooked)
- Dry beans and bean products, lentils, chickpeas and other pulses
- Meat (game and goat meat)
- Fish
- Spices
- Nuts
- Gluten-free products
- Food with less salt
- Food not fried
- Food with less sweeteners

Q4. How can the food institutions on the campus change to fulfil the needs of the international students?

Many foods required by the respondents were easily available in the supermarkets and food shops, but we could not find it in the campus, such as many healthy foods that are not fried and less salt or less sweetened and many other suggestions from the international students to fulfil their food needs and can be easily available.

The respondents were divided in their need for food that they were used to, but their childhood food was not important to them at all.

The availability of the food they wanted in shops is very important and that these shops are close to their residence.

The country of origin of food was indicated as not important and it was not important that it came from a country they approved of politically either.

The results indicated that only a small percentage (20%) of the students were influenced by their religious conviction when selecting food and only 18% did not find food suitable for their religious conviction on campus.

The results show that the larger percentage (64%) of the students were influenced by their culture in their food preference. 87% of the students indicated that they found their preferred food products regularly available on campus and 74% found the dishes they preferred regularly on campus.

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