

**UNIVERSITY OF EDUCATION, WINNEBA**

**ATTITUDE OF STUDENTS OF THE UNIVERSITY OF EDUCATION,  
WINNEBA TOWARDS NUTRITION INFORMATION ON FOOD LABELS**

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**A THESIS IN THE DEPARTMENT OF HOME ECONOMICS EDUCATION,  
FACULTY OF SCIENCE EDUCATION, SUBMITTED TO THE SCHOOL OF  
GRADUATE STUDIES, UNIVERSITY OF EDUCATION, WINNEBA IN  
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD  
OF A MASTER OF PHILOSOPHY (HOME ECONOMICS) DEGREE**

**MAY, 2018**

## DECLARATIONS

### STUDENT'S DECLARATION

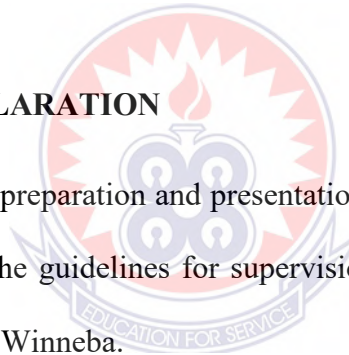
I, GyamfuaahAtaaGyimah, hereby declare that this thesis, with the exception of quotations and references contained in published works which have all been duly identified and acknowledged, is entirely my own original work and it has not been submitted, either in part or whole, for another degree elsewhere.

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### SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this thesis was supervised by me in accordance with the guidelines for supervision of Thesis as laid down by the University of Education, Winneba.



NAME OF SUPERVISOR: Professor Veronica Obatolu

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DATE:.....

## ACKNOWLEDGEMENTS

This thesis is the result of the assistance, guidance and support of many individuals. First of all, I express my sincere gratitude to my supervisor, Prof. Veronica Obatolu for her valuable time, support and commitment in directing and guiding me during this research.

I extend my profound gratitude to all lecturers of the Department of Home Economics Education, University of Education, Winneba, for their suggestions and contributions during the presentation of the proposal and seminars. Special thanks go to Mrs. Elizabeth Lani Ashong, for her valuable contributions. I am also grateful to have had the encouragement and cooperation from my fellow graduate students during our studies and especially during the preparation of this thesis.

Finally, my appreciation goes to all my family and friends for their support and motivation. My profound gratitude goes to Rev. Prince Ansah, Mr. Pancras Kwamena Tenteh, Mr. Ephraim Quaynor Teye, Mr. Freeman Arhin Aidoo and all the special friends who offered me assistance in a way or two to get this work done. God richly bless you. I am deeply grateful for the wisdom and prayers of everyone who helped throughout my schooling to this day. I thank you all.

## **DEDICATION**

This Thesis is dedicated to the entire Gyimahfamily and loved ones.



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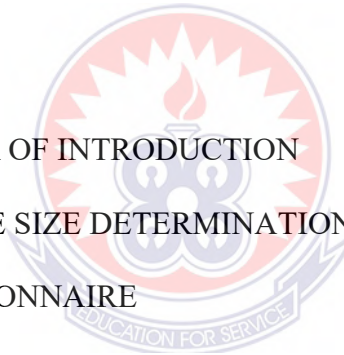
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## DEFINITION OF TERMS AND ABBREVIATIONS

For the purpose of this study, the following terms were operationally defined as follows:

**Food Label:** A panel that is printed on a package of processed food, which contains a variety of information about the nutritional value, ingredients used in the preparation, date of manufacture and date of expiration, country of origin, serving size and the method of preparation of the food item.

**Nutritional Information:** A part of a food label that tells consumers the nutritional content of a pre-packaged food. It gives information on the average amount of energy, protein, fat, saturated fat, carbohydrate, sugars and sodium in the food, as well as any other nutrients.

**Food choice:** How consumers of pre-packaged food products decide on what to buy and eat.

**Consumer:** A person who purchases and uses pre-packaged food products.

**Attitude:** A psychological and emotional state of a person, towards a person or an object. It is the consumer's feeling or opinion (positively or negatively) about nutritional information on food labels.

**WHO:** World Health Organization

**FAO:** Food and Agriculture Organization of the United Nations

**FDA:** Food and Drugs Authority

**IFIC:** International Food Information Council

**NLEA:** National Labeling and Educational Act

**NRCD:** National Redemption Council Decree

**PNDC:** Provisional National Defence Council.

**NFO:** National Family Opinions.



## ABSTRACT

The study investigated attitude of students in the University of Education, Winneba towards nutrition information on food labels. The study adopted the cross-sectional survey design and involved 344 respondents randomly sampled from a target population of about 15,778 students. Data collection was done by online survey using a questionnaire designed with Google Forms. The study found among other things, that: level of awareness of respondents about nutritional information on food labels was high (68.0%); respondents who were knowledgeable about nutritional information made healthier food choices, implying that the use of nutritional information had some significant effects ( $p=0.01$ ) on food choices; students encountered some difficulties in reading and understanding nutritional information on food labels; demographic characteristics (gender) of respondents did not significantly influence food choices of respondents ( $p=0.08$ ); there was a negative correlation (-0.642) between levels of awareness about nutritional information and effects of reading nutritional information. However, correlation between level of awareness and difficulties encountered in reading nutritional information was positive (0.555); there was a negative correlation between difficulties encountered and the effects of reading and understanding nutritional information (-0.502). It is recommended that conferences, seminars and symposia be organized on the importance of reading nutritional information; designers of food labels should use legible and readable fonts in designing food labels. It was also suggested that further studies be conducted to compare the attitude of students and workers towards the use of nutritional information for making food choices.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.0: Overview**

This chapter presents the introduction of the thesis. It covers the background to the study, statement of the problem, purpose of the study and the objectives of the study. Other areas include research questions, hypotheses, significance of the study, delimitation of the study, limitations of the study as well as the organization of the study.

#### **1.1: Background to the study**

The expanding liberalization, growing consumer demand and improvement in transport and easy communication has resulted in an increase in food trade. Consumers around the world increasingly have access to new food products and more information about food. While these developments are generally positive, they raise concerns about the potential for consumers to be misled by food labels. This requires consumers to be enlightened with the knowledge and ability to read, understand and interpret food labels and use such information in decisionmaking during purchase and consumption of foods (Samson, 2012).

A food label is any tag, brand, mark, pictorial or any description written or printed onto a food package (Weinrich, Franz & Spiller, 2015; World Health Organization [WHO] & Food and Agriculture Organization [FAO], 2010). Food labels provide information from manufacturer to consumer about a food. The information may include name of the food, ingredients used, nutritional composition, manufacture and expiry dates, recommended storage conditions, instructions for use etc.

Nutritional food label can simplify the whole concept of healthy diet because it helps the consumers to keep track on their nutrient intake such as the amount of fat, sugar, sodium, protein and carbohydrates (Asian Productivity Organization, 2002). This nutritional information is useful as it assists consumers to make informed judgment of a product's overall value as well as make choices during purchase and consumption of food. Food labels are found to be very important in assisting consumers to better understand the nutritional value of food. It also enables consumers to compare the nutritional values of similar food products and to make healthy and informed choices based on the relevant nutrition information (Samson, 2012).

Due to the growing prevalence of diet-related diseases such as obesity, diabetes and cardiovascular disease, in recent years, prevention and management of these diseases has become an important public health issue to the world at large. To reduce the incidence of diet-related diseases, government and food manufacturers need to promote the use of nutritional labels to help consumers make healthier food choices by re-examining the provision of nutrition information on food labels (WHO, 2003).

In Ghana, information on food labels is legally regulated by the Foods and Drugs Authority [FDA], which uses the information to protect consumers by ensuring the provision of clear, honest and correct information to consumers. The FDA has the task to evaluate and register food products before approval for distribution and marketing in the country. The evaluation includes the assessment of information on the food labels, to ensure that it complies with the specifications of the Foods and Drugs Authority. According to the Foods and Drugs Authority of Ghana, food labels should include name of the food, list of ingredients, net content, name and address of

the manufacturer and country of origin. Other information includes the manufacture and expiry dates, storage conditions, nutrition information and instructions for use. All of this information is essential to help consumers in making choices of food depending on preference, dietary recommendations and other reasons.

In Ghana, it seems that a lot of people make their purchases based on the attractiveness as well as the packaging style without checking the nutritional requirements. Others also just pick the product without checking anything on it before buying. As unique individuals with different health challenges, requiring certain amounts of nutrients, while others have to stay away from certain food items and ingredients, it is essential that consumers refer to food labels in making food choices. Some foods have specific instructions for preparation and use and others require specific storage conditions, therefore it is important that food labels are not only provided by manufacturers, but for the consumers to see the need to strictly adhere to the instruction of the manufacturer ([https://www.towerhamlets.gov.uk/lgnl/business/trading\\_standards/food\\_labelling.aspx](https://www.towerhamlets.gov.uk/lgnl/business/trading_standards/food_labelling.aspx)).

All these suggest the need for consumers to be well informed about all the characteristics of a food before purchase and consumption. It is however observed that most consumers do not consider all this vital information because some do not care about the consequences or the effect the product may have on their health while others may be due to ignorance. But the serious aspect is that from personal observations even educated people also make purchases without checking the



information on the package and wonders what the consequences would be if they were allergic to some ingredients or not good for their health.

The choice of food is influenced by several factors including demographic characteristics such as age, gender and educational background, health status as well as economic and situational factors such as income and time constraints. Other factors are the taste of the product and the information obtained from the label. The ability to choose a food based on information obtained on its label requires knowledge and ability to understand and interpret the information (Sunelle, Hanli&Larney, 2010). Consumers are supposed to read labels before purchasing foods, to know what they intend to consume.

Considering the alarming rate at which nutrition-related health problems and diseases affect people, there is the need for consumers to be enlightened on how to use information on food labels in making informed choices. It is important for consumers to know the ingredients and nutritional composition of a particular food because such information can help in choosing healthier foods and to avoid ingredients that consumers are allergic to. Again, it is important that consumers have basic nutrition knowledge as well as positive attitudes towards the nutrition information of food labels, so that they can use the information on food labels in choosing foods that are suitable and healthy for their individual health conditions.

## **1.2: Statement of the problem**

The practice of referring to information on food labels in making food choices is very important. This is because food labels contain important information on the characteristics of a particular food such as ingredients, origin, storage conditions and

manufacture and expiry dates. Unfortunately, it seems many people are not used to reading the information on food labels. This often leads to the purchase of expired foods, or foods with ingredients that consumers are allergic to, or must avoid due to health problems. Several studies have reported on several factors relating to consumers' inability or deliberate decision not to read food labels. These include low awareness of food labels, low level of education, low health consciousness and the influence of the media (Coveney, 2007; Sunelle, Hanli&Larney, 2010; Davies, McPherson&Fround, 2010).

Although several studies (Mahgoub, Lesoli&Gobotswang, 2007; Sunelle, Hanli&Larney, 2010; Davies, McPherson&Fround, 2010) have been conducted in other countries which indicate that a small proportion of food consumers read and use information on food labels in purchasing and consuming food products, very little is known about the magnitude of the situation in Ghana. This phenomenon might unknowingly predispose consumers into buying expired food items, or foods with undesired ingredients, which may lead to dire health consequences.

Through observation and interaction with some consumers on prepackaged foods obtained from supermarkets, the researcher encountered a situation where a consumer had a problem, after purchasing and consuming a canned drink. This consumer, who did not check the expiry date on the product before consumption, experienced a swollen throat and was rushed to a nearby hospital. Upon medical examination, it was revealed that the consumer suffered from food poisoning because of the consumption of an expired canned drink. This situation occurred because of the disregard for nutritional information of the package and appears to be common, even among students who are undergoing training to impart knowledge of people.

Again, it seems that sellers of such prepackaged food products also do not check the labels of the products they sell and sometimes even put expired products on their shelves for consumers to purchase. It seems that some of the sellers even find it difficult to discard their expired products, because of the fear of losing revenue. This situation may lead to the instance where high volumes and quantities of expired prepackaged foods are displayed for sale. The consumption of prepackaged foods has been on the rise, due to reasons such as claims made in advertisement and easy preparation procedures, even without regard to individual's health conditions and allergies, it is essential for this study to be conducted to find out the exact nature of the situation, with respect to the attitudes of consumers towards the information on food labels. It is in this context that this study sought to assess the attitude of students of the University of Education, Winneba, towards nutrition information on food labels.

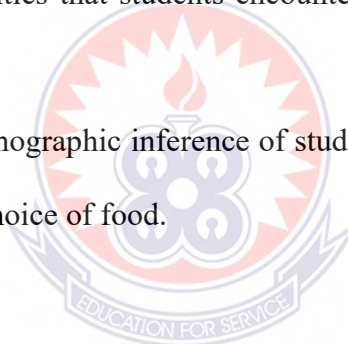
### **1.3: Purpose of the study**

The purpose of the study was to investigate the attitude of students of University of Education, Winneba towards nutrition information on food labels.

### **1.4: Objectives of the study**

The objectives of study were to:

1. evaluate the level of awareness of students of University of Education, Winneba on food labels.
2. investigate the effects of reading nutritional information on food labels on choice of food among students.
3. assess the difficulties that students encounter with nutritional information on food labels.
4. determine the demographic inference of students' attitudes towards nutritional information and choice of food.



### **1.5: Research Questions**

The following questions were raised to guide the study:

1. What is the level of awareness of students of University of Education, Winneba about food label?
2. What is the effect of reading nutritional information on food labels on choice of food among students of the University of Education, Winneba?
3. What are the difficulties students encounter with nutritional information on food labels?
4. To what extent does the demography of students of the University of Education, Winneba influence their attitudes towards nutritional information?

## **1.6: Hypotheses**

The following hypotheses were formulated and tested at the 5% significance level:

H<sub>01</sub>: There is no statistically significant difference between the food choices of students who read nutritional information and those who do not read nutritional information.

H<sub>02</sub>: There is no statistically significant difference between the food choices of female students and male students.

## **1.7: Significance of the study**

The following are the significance of the study:

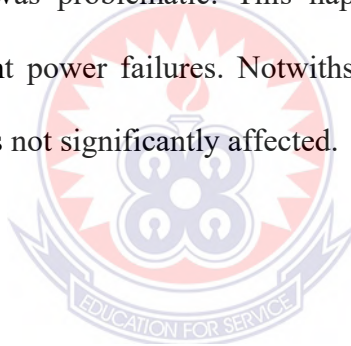
1. The outcome of this study would inform the public on the importance of nutritional information on food labels.
2. Also, national policy makers, especially the Food and Drugs Authority can rely on the findings of this study to make informed policies as far as nutritional information on food labels is concerned.
3. Curriculum developers and planners can also use the findings of this study in planning the curriculum for schools and institutions.
4. Lastly, it can serve as a basis for further research on food labels, as well as being useful as reference material for other researchers.

### **1.8: Delimitation to the study**

Even though the University of Education, Winneba has students on various programmes on different campuses, faculties and departments, this study involved only students from the Winneba campus. Again, only undergraduate students formed part of the respondents in this study. This is because they were the readily available and accessible population at the time of this study.

### **1.9: Limitations to the study**

The researcher encountered some limitations in the process of conducting this study. Among these were getting relevant information for the literature review, especially from internet sources, was problematic. This happened because of poor internet connectivity and frequent power failures. Notwithstanding all these challenges, the outcome of the study was not significantly affected.



### **1.10: Organization of the study**

The study is organized into five chapters. Chapter one focuses on the introduction to the study. It discusses the background to the study, statement of the problem, purpose and objectives of the study, research questions and hypothesis. Also, the significance of the study, delimitation and limitations and the operational definition of terminologies used in the study were stated in chapter one. In chapter two, the theoretical and conceptual frameworks that underpin the study are presented. Also, related literature was reviewed based on themes derived from the research questions. Chapter three covers the methodology used for the study. This included study area, research approach, research design, population, sample size and sampling techniques. It also covered the instrumentation, procedure for data collection, validity and reliability of the instrument for data collection, the pilot study, ethical considerations and the data analysis. Chapter four presents the results and discussion of findings from the study. Chapter five presents the summary of the study, conclusion and recommendations. Finally, some contributions to knowledge and suggestions for further research were offered.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0: Overview**

This chapter is in two parts. The first part presented the theoretical framework that underpinned the study. It also presented a conceptual framework for the study. The second part also focused on the review of related literature for the study. The literature review covered the following sub-headings:

- Theoretical framework.
- Conceptual framework.
- Food labels and Nutritional labels
- Consumers' awareness of nutritional information on food labels.
- Determinants of the use of food label.
- Frequency at which consumers read nutritional information on food label.
- Effects of reading nutritional information on the choice of food.
- Difficulties consumers encounter in reading nutritional information on food labels.
- Demographic inference of consumers' attitudes towards the choice of food.
- Laws on food labels.
- Summary of literature review



## **2.1: Theoretical Framework**

This study was underpinned by Stigler's (1961) theory, known as the economics of information theory. This theory dictates that, the consumer will continue to acquire and process information, as long as the additional costs do not outweigh the additional benefits. He further explains that, the consumer will always want to seek for more information about the product being purchased. However, if the information the consumer is trying to obtain costs higher than the extra benefit the consumer would derive from the product then there would be no need to seek such information. On the contrary, if the extra benefits attained from the information outweighs the cost of seeking for the information, then consumers would always consider getting that information.

Therefore, the key words in Stigler's (1961) theory, which are the acquisition of information and consumers attitude towards nutritional food, label falls within this research. In this research, the researcher seeks to find the knowledge and attitude of consumers towards nutritional information on food labels. As explained from the above theory, consumers will always seek for more information but there is also a condition under which consumers stop seeking for information on food labels. Consumers will always seek more information if they perceive that the benefit will outweigh the cost of obtaining such information. This implies that consumers' attitude towards information is dependent on the benefits they stand to achieve from obtaining and processing such information. This theory therefore suggests that consumers will form positive or negative attitudes towards acquiring and processing information, based on whether the benefits of the information outweigh the cost of such information or not.

### **2.1.1: Implication of the theory to the study**

The implication of Stigler's theory to this study is based on the fact that the knowledge and attitude of consumers towards the nutritional information on food labels is influenced by the benefits consumers derive from the nutritional information on food labels. In other words, consumers are expected to make a decision to read the nutritional information on food labels if they find it beneficial and cost-effective.

### **2.2: Conceptual Framework**

A conceptual framework may be described as the way in which ideas are organized to achieve a research project's purpose (Shields & Rangarjan, 2013). For a study like this, it is important to have a framework that will guide and organize the different variables. In this study, the researcher conceptualized that consumers' awareness of nutritional information, as well as the importance they attach to the nutritional information may influence their attitude towards nutritional information on food labels.

Also, the influences or the effects that nutritional information may have on the attitude of consumers, as well as the difficulties they may encounter in reading and understanding nutritional information has a direct relationship with their demographic characteristics. The demographic characteristics also have a direct link with the levels of awareness of the consumers. Together, all these variables contribute to the attitudes that the consumers will form towards the nutritional information on the product and the choice of foods they purchase. Figure 1 is a graphical representation of the conceptual framework for this study.

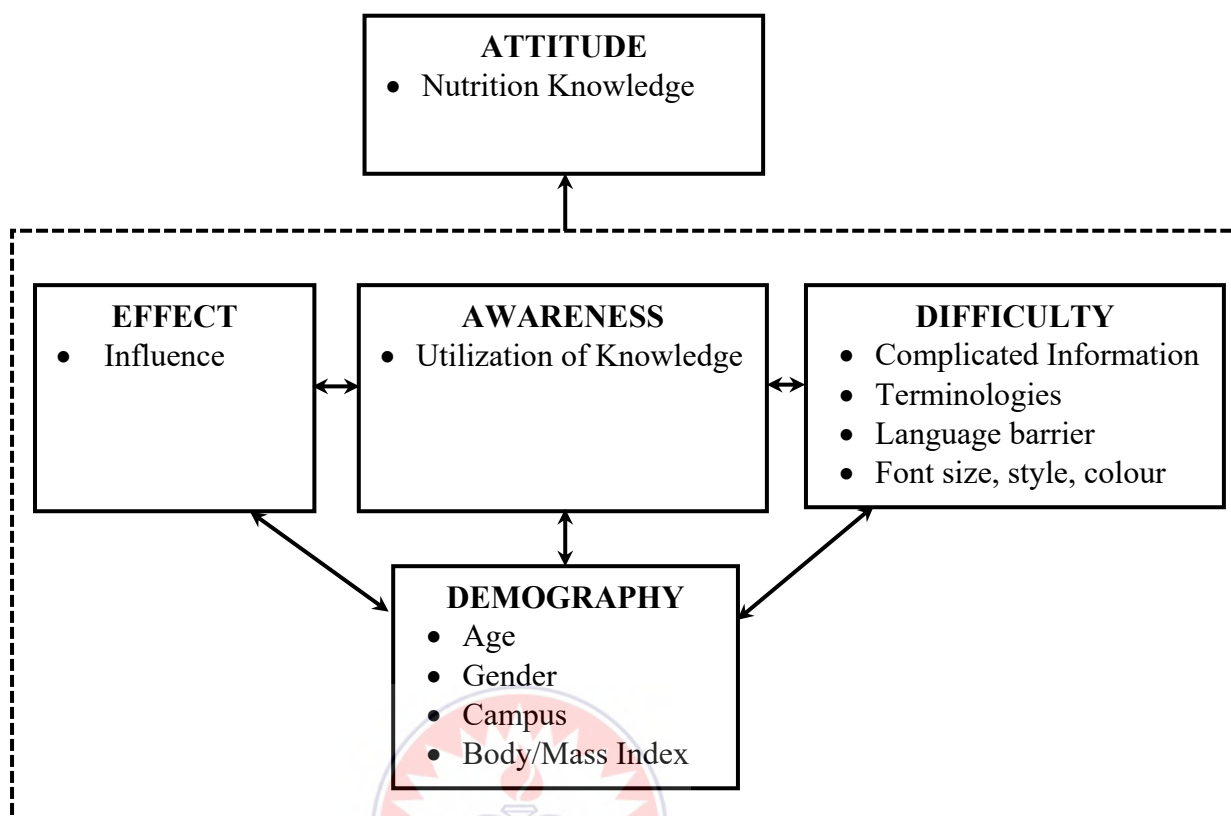


Figure 1: Conceptual framework (Researchers own construct, 2017).

### 2.3: Food labels and Nutritional labels

In order to make people feel more responsible about their diet and to induce them to make informed choices, hopefully opting for high quality food, several communication strategies have been taken (Viola, Bianchi, Croce & Ceretti, 2016). One of the simplest deals with food labels is that, it can provide some useful elements helping us to control our diet (Kerr, McCann & Livingstone, 2015; Perez-Escamilla & Haldeman, 2002). Food label, according to Azman and Sahak (2014) include any tag, brand, mark, pictorial or other descriptive matter, written printed, stenciled, marked, painted, embossed or impressed on, or attached to or included in, belonging to, or accompanying any food.

Nutrition labeling is a fact statement of the energy amount and nutrients on the food product's label (Tee, 2011). Food labels perhaps serve as the major means through which consumers get information and knowledge about nutrients. In a study conducted in a Polish population by Katarzyna, Pantil-Kuniewicz and Mieczkowska (2010), it was found that though consumers relied heavily on the mass media for knowledge on food, they maintained that food labels were the most important and broad-based source of knowledge on foods.

Food labels have been reported to play very important roles in the choice of what to consume and what not to consume. In recent years, the traditional nutrition information in table or grid form, usually found on the back of the food package, has been supplemented by a variety of simplified nutrition labels that appear on the front of the pack, often called front-of-pack (FOP) signposting information (Grunert, Wills & Fernandez-Celemin, 2010). Sunley (2012) stated that typically, nutritional information is placed on labels for two reasons. The first is to simply provide information about the product, in order to assist consumers to make their food choices and, in theory, specifically to assist them to use nutritional criteria, when making these food choices. The second is to promote the particular nutritional benefits of a food as a marketing tool.

Food labels serve as a means of quick investigative tool to ascertain the quality and nutritional content of a food sample. The importance of food labels is diverse, ranging from health to economic benefits. Annunziata and Vecchio (2012) stated that, labels provide a source of health-related information for comparing products and may, occasionally, be the consumer's first exposure to a health-related issue. Nutrition

labels are intended to help consumers choose more healthful foods (Banterle & Cavaliere, 2009). Zepeda, Sirieix, Pizarro, Corderre and Rodier (2013) explained that food labels convey attributes of foods that consumers want.

The main purpose of sustainability, product attribute and health/nutrition labels is to convey information to consumers that is otherwise intangible, that is, the production method or origin of the product Zepeda *et al.*, (2013). Interest in product attributes led to a proliferation of food labels to inform (Zander & Hamm, 2010; Vermeir & Verbeke, 2006), or perhaps confuse consumers (Gadema & Oglethorpe, 2011; Hoogland, de Boer & Boersema, 2007).

Nutrition information on food labels is regarded as a major means for encouraging consumers to make healthier choices when shopping for food (Grunert *et al.*, 2010). Findings by Dutta and Patel (2017) suggested that food labels are very important public health tools that are used to promote a balanced diet; and hence enhance public health and wellbeing. According to Annunziata and Vecchio (2012), food labels are a source of information and most often the first means for directly connecting with a consumer. Besides health benefits, Golan, Kuchler, Mitchell, Greene and Jessup (2000) explained that food labels are useful for establishing product differentiation, differentiation across food categories and within a specific category. Food label information assists consumers to better understand the nutritional value of food and enables them to compare the nutritional values of similar food products and to make healthy informed food choices based on the relevant nutrition information (Dutta & Patel, 2017).

Research findings have revealed that food labels contain information on fat, saturated fat, sugar, salt and calories (Grunert *et. al.*, 2010). More importantly, much emphasis has been placed on the need to provide consumers with more and more accurate, detailed and clear labels, specifying the types and relative amounts of saturated and unsaturated fats, polyoils, starch, salt and fiber; the list of preservatives, additives, dyes and allergens. Described this way food label would seem a practical and easily accessible tool, allowing for an informed purchase (Viola *et. al.*, 2016). Berning, Chouinard and McCluskey (2008) showed that nutritional information may act as a complement to the consumption of products with unknown nutritional quality, similar to the way advertisements complement advertised goods. Nutritional labeling has become of increasing interest to both consumers and policy makers (Kiesel, McCluskey & Villas-Boas, 2011). Nutritional attributes can be defined as credence attributes (Roe & Sheldon, 2007) but can be transformed into search attributes once nutritional information is provided.

Nutritional label can also be defined as a description used to inform the customer about the nutritional properties of a food, which also help the customer in purchasing nutritious food and consuming nutritionally balanced meals (Azman & Sahak, 2014). Hieke and Taylor (2012) explained that, nutrition labeling involves all forms of information disclosure on a product, ranging from mere nutrition fact panels to daily reference values, recommendations, health claims and disclaimers. It is generally the means by which the nutritional information of a food product is presented to the consumer. Baltas (2001) stated that the nutritional label is required as a guide for the consumer to make selection from a list of food products and to encourage the consumption of healthy products. Nutrition labeling is an attempt to provide

consumers, at the point of purchase, with information about the nutrition content of individual food products, in order to enable them to choose nutritionally appropriate food (Aygen, 2012). Viola *et. al.*,(2016) also stated that food labels make similar products easier to compare and allows the quicker identification of healthier options. It is an attractive instrument for a variety of reasons (Aygen, 2012). According to Grunert and Wills (2007), nutritional labels support the goal of healthy eating while retaining consumer freedom of choice and it reduces information search costs for consumers, which should make it more likely that the information provided is actually being used.

Like food labels, nutritional labels have the ultimate objective of helping consumers make a nutritionally informed choice. Nutritional labels mostly have information on the nutrients contained in the food. It can be a quick way of ascertaining the nutritional content of a food. Nutrition labels have emerged as a prominent policy tool for promoting healthy eating (Campos, Doxey & Hammond, 2010). Despite the numerous of points made about the importance and usefulness of nutritional labels by many researchers, the fact still remains that not all products have nutritional labels on them. There are still challenges associated with manufacturing companies and nutritional labels. Kiesel *et al.*, (2011) highlighted some of the challenges manufacturers have with nutritional labels. Their study revealed that, firms that sell less nutritious products prefer to omit nutritional information. In a market setting, firms may not have an incentive to fully reveal their product quality and may try to highlight certain attributes in their advertising claims while shrouding others (Gabaix & Laibson, 2006). Also, they may provide information in a less salient fashion (Chetty, Looney & Kroft, 2007). It is presumed that a mandatory nutritional labeling

regime should be put in place to address some of these challenges. This regulation can fill the void of information provision by presenting accurate and factual information on food labels.

### **2.3:1 Nutrition Facts on Food and Nutritional labels**

Nutrition facts labels explain what nutrients or components of food an individual's body needs to grow and stay healthy and how much of those nutrients are found in one serving of the food. Aidoo (2016) explained that the information that is required to be present on a food label include the name or description of the food, ingredient list, quantitative ingredients declaration also called percentage labelling, information on food additives, potential allergens, net contents and drained weight, name and address of the manufacturer, the country of origin, lot identification or food recall information also called code dating, date markings such as the manufacture date, expiration or best before date, storage instructions, directions for use and nutrition information. Nutritional labels come in different formats. The format that consistently produces the most positive dietary benefits is the percentage declaration of the various nutrient amounts based on the daily values for each nutrient (Drichoutis, Lazaridis & Nayga, 2006).

According to the Centre for Young Women's Health of the Boston Children's Hospital (2016), every nutrition label should have the following information clearly displayed on it:

- **Serving Size:** Serving size equals one serving of the product. All the other nutrient values listed on the label are based on this amount.



- **Servings per Container:** This number is how many servings you can get from one package. Some containers have a single serving, but others may have more than one serving per package.
- **Calories (total):** Calories are a unit of energy that come from carbohydrates, protein and fat. The amount of calories give an indication of the energy derived from the product.
- **Calories from Fat:** This number is the amount of calories or energy that come from fat. This is not equivalent to the percentage of fat in the food.
- **% Daily Value:** This value is the percentage of the recommended daily value for a nutrient that you get in one serving. A food that has more than 20% of the Daily Value of a nutrient is an excellent source; however, for some nutrients such as fat, sodium and cholesterol, the lower the percent, the better.
- **Total Fat:** This indicates the type of fats contained in the product, including monounsaturated, polyunsaturated and trans fats.
- **Cholesterol:** This is the percentage of cholesterol in the food product.
- **Sodium:** Sodium is the amount of salt in the serving of food.
- **Total Carbohydrate:** The total amount of carbohydrates in the food product. Certain types of carbohydrates are sometimes listed on the label.
- **Dietary Fiber:** The total amount of fiber in the food product.
- **Sugars:** The total amount of sugars present in the food product.
- **Protein:** The amount of protein contained in the food. Occasionally the type of amino acids contained in the product may also be indicated under this section
- **Vitamins and Minerals:** This amount is the percent (%) daily value for vitamins and minerals you are getting from a serving of the product.

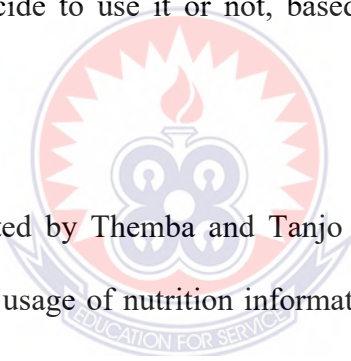
An important goal of nutrition and ingredient information is to help consumers make healthful dietary choices (Borra, 2006).

#### **2.4: Consumers' awareness of nutritional information on food labels.**

Many studies have been conducted to investigate the level of awareness of consumers to nutritional labels. Aprile and Annunziata (2005) investigated how often consumers read the labels, assessed the degree of consumers' familiarity with the different data included in the label, identified the importance attached to the various details included in the label, identified which information included in the label would mostly affect consumers' purchasing decisions and investigated the existence of different clusters and developed a description of them. Their results revealed that those who were concerned with their health would use the nutritional label as a source of information when buying healthier foods mainly because they were giving priority to their healthy lifestyle. Findings from studies conducted in developed countries suggest that most consumers are aware of nutritional labels on food products, but the use of these labels by consumers depends on several factors. However, in developing countries the awareness of consumers to nutritional label seems to be low (Campos *et. al.*, 2010).

Research findings have suggested that consumers view nutrition in a positive light. Many consumers consider diet to be a very important component of their lifestyles and regard nutrition as a positive attribute of food products (Shine, O'Reilly & O'Sullivan, 1997). Several investigations have been carried out on consumers' awareness of nutrition information on food labels. One of such studies was conducted by Dalrymple (2014), to examine awareness and use of nutrition information on food labels by consumers and also to assess consumers' behaviours, based on nutritional

label use. Questionnaires were administered to 323 respondents, who were selected using simple random and systematic random sampling techniques. The study showed that there was a high level of awareness of nutritional information by the participants. However, they did not use it in making food choices. Also, the study by Washi (2012) revealed that food labelling information is very important for people who are on special diets or with food/nutrition-related health problems such as obesity, diabetics, cardiovascular diseases and various types of cancers as it helps them to make informed choices of food. It was also found out that as education level increased, nutrition information became more important to consumers, especially to those in tertiary education levels. This shows that consumers know about nutritional information and may decide to use it or not, based on factors such as educational attainment.

The logo of the University of Education, Winneba, is a circular emblem. It features a central figure of a person with arms raised, set against a background of a sunburst. The emblem is surrounded by a red border with white text. The text at the top reads 'UNIVERSITY OF EDUCATION, WINNEBA' and the text at the bottom reads 'EDUCATION FOR SERVICE'.

An earlier study conducted by Themba and Tanjo (2013) in Botswana focused on consumer awareness and usage of nutrition information. The study was a descriptive survey, which used a structured questionnaire to collect data from a sample of 150 consumers in Gaborone, Botswana. The main findings of the study indicated that the level of awareness of nutrition information among consumers was relatively high (78%). The results further indicated that consumers who are most likely to be aware of nutritional information on food products are those with high income, high education and employed. It also noted that majority of the participants use nutrition information to inform food purchases. This outcome is attributable to the fact that educated and employed consumers are more likely to make reference to nutrition information, compared with those who are not highly educated. Wiles, Paterson and Meaker (2009) also conducted a study which reported that respondents with a

tertiary education were more likely to use the nutrition information than those with a secondary education, which suggest that nutrition knowledge is higher among those with tertiary education.

Mahgoub, Lesoli and Gobotswang (2007) conducted a research to evaluate the level of knowledge and use of nutrition information on food packages among consumers in Maseru, Lesotho. Both questionnaires and interviews were used to collect data from 260 consumers. The outcome of the study revealed that majority of the participants (59.6%) were aware of food labels, while 69.2% were aware of nutrition information on food labels. Furthermore, the results showed a positive correlation between level of education and the level of awareness about food labels. This implies that, as the level of education of consumers increased, their level of knowledge and awareness of food label also increased. This outcome points to the fact that consumer education on food labels would help consumers in making healthy food choices.

Additionally, Jike-Wai's (2011) study on the awareness and use of nutrition information on labels of packaged food snacks by commuters on Aba Road – Port Harcourt, Nigeria agrees with the studies reviewed above. In that study, the purposive sampling technique was used to select two heavy traffic zones and the simple random sampling technique was used to select 200 respondents from the two zones. Questionnaire and interview were the procedures employed for the data collection. The result of the study revealed that about 68.0% of the respondents were aware of food labels and 71.0% claimed they were aware of nutrition information on food labels. The results further showed a positive correlation between the use of nutrition information and educational level. Overall it was found that consumers were highly

aware of nutrition information on the food labels but did not use such nutrition information.

Saha, Vemula, Mendu and Gavaravarapu (2014) also conducted a survey to find out the knowledge and practices of using food label information among adolescents attending schools in Kolkata, India. With a sample size of 316 and using a cluster randomized school survey and a close-ended questionnaire, the study found out that many of the respondents were knowledgeable about food labels. It was reported that the reading of food labels was common. However, many of the respondents were only concerned about the shelf life or safety of the products. The study also recommended that authorities should create awareness about various components of food labels, to promote the use of labels. From the results of the study, it was assumed that the knowledge of the respondents about food labels and the commonness of reading food labels appear to be as a result of the fact that the respondents are students. This further explained why majority of the respondents were of the opinion that food labels are useful for making food choices.

Quantitative research conducted by the International Food Information Council (IFIC) Foundation (2003), as cited by (Borra, 2006) indicated that consumers showed high awareness of the information on nutrition labels. When aided, they were most aware of calories (89%), followed by total fat (81%), sodium (75%), sugars (73%), carbohydrates (72%), saturated fat (71%) and cholesterol (66%). This ranking provides insight into the relative importance consumers place on each of these items. When purchasing or choosing food, consumers consider calories (58%) and total fat (56%) first, followed by sodium and saturated fat (both at 45%), sugars (42%),

cholesterol (39%) and carbohydrates (34%). In all categories, awareness of the information was much higher than use.

In a summary presented by Borra (2006), it was reported that in a qualitative research conducted by the IFIC Foundation in 2004 insights were provided into consumers' awareness, attitudes and understanding of nutrition information on food packages. Out of four focus groups conducted in Baltimore and Chicago, participants in three groups were identified as "health conscious," meaning that they looked for nutrition information on food packages and used it to make decisions. Men and women in the fourth group were identified as "not very health conscious," meaning that they did not pay attention to nutrition information on food packages or use the information to make decisions. Consumers in these focus groups recognized nutrition information on food packages as a tool to help improve their health. When asked how they could improve their health or weight, they named "reading food labels" as one of many strategies, along with making better food choices, controlling portions, exercising, getting more sleep, drinking more water and others. Similar to respondents in the IFIC Foundation study, consumers in the focus groups were aware of basic information on food labels and were able to identify elements including fat, calories, carbohydrates, fiber, serving size, protein, sugars and daily value on food labels.

It is clear from the review above that many consumers claim to be aware of nutrition information on food labels. However, the level of awareness does not correlate positively with use of nutrition information. Nonetheless, there appeared to be a positive correlation between level of education and awareness of nutritional

information. This suggests that students are highly aware of nutritional information on food labels, compared to other consumers.

#### **2.4.1: Determinants of use of Food labels.**

Golan, Kuchler and Mitchell (2000) argue that the effectiveness of food labeling depends on firms' incentives for information provision, government information requirements and the role of third-party entities in standardizing and certifying the accuracy of the information. Yet nutritional information is valuable only if consumers use it in some way. The importance and true meaning of food and nutritional labels are given when consumers use them. According to Kieselet. *al.*(2011), there is a theoretical foundation for studying how market prices, household characteristics, incomes, nutrient content and taste considerations interact with and influence consumer choice on food labels.

Berninget *al.* (2008) presented a simple model of demand for nutritional information. The consumer chooses to consume goods and information to maximize utility subject to budget and time constraints, which include time to acquire and to process nutritional information. Time has been found to be a major determinant in the reading of nutrition or food labels. Findings from several studies in different jurisdictions have provided evidence for this assertion. In a study by Kim, Nayga & Capps (2001) and Lin and Yen (2008), respondents noted that reading labels takes more time than could be spent and were therefore less likely to use nutritional labels and information on fat content. Bayar (2009) has also noted that as time spent for grocery shopping increases among consumers, the level of importance attached to nutrition label information also increases.

Another strong determinant of the use of food labels is the personal characteristics and attributes of consumers. Kieselet. *al.*,(2011) stated that consumers who have strong preferences for nutritional content will acquire more nutritional information. Consumers' general understanding of the link between food consumption and health and widespread interest in the provision of nutritional information on food labels, is also documented in the existing literature (Grunert& Wills, 2007; Williams, 2005). In a study conducted in the United States, only approximately half of consumers claim to use nutrition and food labels or packages when making food purchasing decisions (Blitstein& Evans, 2006). Consumers who are more concerned about nutrition and health are more likely to use nutritional labels. Also, consumers on a special diet, organic buyers and those aware of the relationship between some diets and some diseases are more likely to search for nutrition information on food labels (Drichoutis *et. al.*, 2006). Other studies show a positive effect of current diet status on search for nutrition information. It appears that consumers with a special interest in diet, use nutritional labeling as a means to an end (Drichoutis *et. al.*, 2006). Consumers who follow a special diet may not necessarily do it because of a special medical situation, but because of their general diet-health awareness.

Grocery shoppers who are not meal planners are also more likely to engage in nutrition information search. Drichoutis *et. al.*,(2006) further stated that consumers who attach importance to price usually are less likely to use food labels, whereas those who attach importance to nutrition are more likely to search for nutritional information. Other studies reported similar findings, indicating that individuals who regarded nutrition as important are more likely to use specific nutrient information (Lin &Yen, 2008;Nayga, 1999).



In a study aimed at researching consumers' food purchasing behavior, including consumers' perceptions of nutrition labels on food packages and the effects of such nutrition labels on consumers' food purchasing decisions, Williams (2005) conveniently sampled 185 students. The findings showed that 23.94% of female respondents said that they always read the labels on packages, compared to 20.35% of male respondents. 33.8% of female respondents said that they often read the labels, compared to 30.09% of male respondents. 30.97% of male respondents said that they sometimes read labels, compared to 29.58% of female respondents. Also, 15.93% of male respondents said that they rarely read labels, compared to 8.45% of female respondents.

Finally, 4.23% of female respondents said that they never read labels, compared to 2.65% of male respondents. 26.76% of female respondents said that these nutritional labels have a "great deal of influence" on their buying decisions, compared to 18.58% of male respondents. 29.20% of male respondents said that labels have "some influence", compared to 21.13% of female respondents. 42.25% of female respondents said that labels have "a fair amount of influence", compared to 33.63% of male respondents. 15.04% of male respondents said that labels have "little influence", compared to 5.63% of female respondents. And finally, 4.23% of female respondents said that labels have "no influence", compared to 3.54% of male respondents.

In the same study (Williams, 2005), a correlation analysis between household size and use of nutritional labels produced a correlation coefficient of  $r = 0.14$ . Analyzing by segments of household size reveals that a significant portion of respondents in single-person households (38.1%) said that they always read the labels on food packages. 40% of respondents in two-person households often read food labels. Of the respondents in three-person households, one-third often read food labels, 30.3% sometimes read food labels and 27.27% always read food labels. Of the respondents in four-person households, 32.76% often read food labels, 31.03% sometimes read food labels and 15.52% always read food labels. Of respondents in households of five people or more, 36.36% sometimes read food labels, 24.24% often read food labels, 18.18% always read food labels and 18.18% rarely read food labels.

These findings strongly agreed with observations by (Drichoutis *et al.*, 2006) in a review of related papers, that type of household also has an effect on food label use. Specifically, smaller households and households with young children are more likely to engage in nutrition information search behaviors. In addition, households in non-city or rural areas are more likely to use nutritional labels. When the relationship between degree of education and label use was analyzed, Williams (2005) found out that that 34.29% of college graduates often look at nutritional labels, 28.57% always look at labels and 25.71% sometimes do. Of respondents with a graduate education, 43.33% often look at labels, 26.67% always do and 20% sometimes do. Of those with a high school education, 50% sometimes look at labels, 25% often do and 25% rarely do. And of those with some college education, 33.62% sometimes look at labels, 28.45% often do, 18.97% always do and 15.52% rarely do.

#### **2.4.2: Frequency at which consumers read nutritional information on food labels.**

Although a growing number of studies have examined effective ways to communicate nutrition information by putting it on food labels (Roberto & Khandpur, 2014), with many of these studies indicating that consumers are aware of nutritional information of food labels, there is still much to learn about the frequency at which consumers use this information in making food choices. Research studies show that about half of Americans often use the nutrition information on food labels when making food choices (Blitstein & Evans, 2006; Byrd-Bredbenner, Alfieri & Kiefer, 2000; Ollberding, Wolf & Contento, 2010). More specifically, 54% of the respondents reported using the nutrition information on food labels often when buying a product for the first time and almost always, when making food-purchasing decisions (Blitstein & Evans, 2006). This suggests that nutritional information is an important source of information for consumers.

Similarly, Aygen (2012) surveyed 500 consumers living in Istanbul, Turkey to find out consumers' understanding and use of nutrition labels on packaged food products. Data was collected through the use of a structured questionnaire. The study showed that with respect to reading nutrition facts labels, 18 percent of the respondents always read nutrition labels. Also, 25 percent noted that they usually read nutrition labels, while 32 percent said they read sometimes. Another 14 percent reported that they occasionally read nutrition facts labels. Ten percent of the respondents indicated that they never read nutrition facts labels, while a few respondents (0.6%) had no idea what nutritional labels were. This outcome shows that many of the respondents referred to nutritional information on food labels either always, sometimes, or

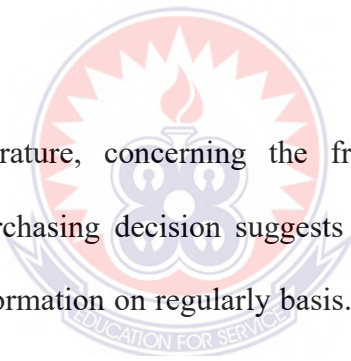
occasionally. According to the Food Marketing Institute's Shopping for Health survey (2004), as cited by Borra (2006), most consumers (83%) always or sometimes check the Nutrition Facts panel when buying foods for the first time. Nearly one-half (48%) check the Nutrition Facts panel to purchase healthy foods for their family and nearly one-quarter (23%) do so to lose weight.

Furthermore, Song, Huang, Chen, Zhu, Li and Wen (2015) published the findings of a study they conducted on the understanding, attitude and use of nutrition label among consumers in China. The study adopted the cross-sectional survey design and used a questionnaire to collect data from 1153 consumers in a Chinese city. The study revealed that about 88 percent of the respondents indicated that they read nutritional labels either sometimes or always. Again, it emerged from the study that there was a significant correlation between the frequency of reading nutritional information and the educational status of the respondents. This outcome suggests that many of the consumers who read nutritional information frequently are educated. The result showed that participants indicated that they frequently read nutrition label and this was in agreement with the findings of Tang and Ma (2013), who reported that consumers always read nutritional information for food purchasing purposes.

However, Graham and Jeffery (2011) suggests that self-reported estimates of nutritional information usage by consumers may be exaggerated. In their study, Graham and Jeffery (2011) used eye-tracking technology and found out that only 9% of 203 adult participants actually viewed the nutritional fact panel during a food purchasing task, despite 33% of the participants self-reporting that they almost always referred to the nutritional fact panel when buying food from shops. This outcome

supports the findings of Bozkir (2009), which revealed that about 46% of males and 40% of females did not to read nutrition labels, at all.

Graham and Jeffery (2011) concluded that although food labels are intended to be used by the entire population, they are more likely to be used by those who are well-educated, those who have healthier eating habits, higher incomes and greater nutrition knowledge (Campos *et al.*, 2010). However, there is evidence that people with chronic diseases such as hypertension, diabetes, heart disease report greater nutrition awareness and use of nutritional information on food labels, compared with those without chronic diseases (Lewis, Arheart, LeBlanc, Fleming, Lee, Davila *et al.* 2009).



Evidence from the literature, concerning the frequency of use of nutritional information for food purchasing decision suggests that consumers' self-report that they rely on nutrition information on regularly basis. However, the use of self-reports may not be a correct picture of the reality. It is important to note that this current study is set apart from existing literature, with respect to the respondents and the setting of the study. Whereas, the other studies reviewed were conducted with respondents in developed countries, this study will be conducted in a developing country with students as respondents.

The literature that has been reviewed above is set apart from this study, with respect to the demographic attributes of the respondents, the nature of the data collection, as well as the method of data analysis. Whereas this study focused on university students, much of the studies reviewed above used different respondents, including

adolescent students and general consumers. Also, even though many of the studies reviewed used questionnaire to collect data, the method of data collect differs significantly from the method used in this study. All of these variables make the conduction of this study worthwhile.

### **2.5: Effects of reading nutritional information on choice of food.**

Many studies have examined the effects of food package information and marketing on consumer beliefs, preferences and choices (Wartella, Lichtenstein, Yaktine& Nathan, 2011). Nutrition information on food labels is an important source of nutrition information, which consumers must consider in making food choices. It is perceived that consumers with prior knowledge on nutrition are more likely to use that information and to make healthful decisions based on this information. As cited by Norazlan Shah, Muhammad, Hasmira, Mashita, Norfazilah, Fazlyla *et al.* (2013), basic knowledge in nutrition is essential for consumers to understand the use of nutrition facts on the label for choosing a healthy diet. Consumers with good nutrition knowledge were reported to be more likely to use the nutrition label when shopping for foods (Barreiro-Hurle, Gracia& De-Magistris, 2010; Wardle, Parmenter& Waller, 2000). Attitude towards nutrition fact label, which includes usefulness, accuracy and truthfulness acts as a mediator for label reading behavior and nutrition knowledge (Misra, 2007). Moreover, the increasing emphasis on the importance of nutrition has made consumers more concern about nutritional information, especially on foods they wish to avoid (Shine *et al.*, 1997).

Nutritional labels are likely to be effective when they address specific informational needs and can be processed and used by their target audience (Verbeke, 2005).

Drichoutis *et al.*(2006) argued that nutritional label use affects purchasing behavior mainly because consumers want to avoid the negative nutrients in food products. According to Drichoutis *et al.*(2006), the effects can be even greater if labeling is combined with an information campaign to educate consumers. It appears that nutritional information affects purchasing behavior because it influences valuations and perceptions of the product. There have been several studies that looked at the effect that claims create on personal evaluations. Health claims food labels have been found to create favourable judgments about a product. For example, when a product features a health or nutrient content claim, consumers tend to view the product as healthier and are then more likely to purchase it, independent of their information search behavior (Drichoutis *et al.*, 2006). Consumers may prefer the immediate gratification offered by a tasteful product rather than the long run benefits of a nutritious product (Drichoutis *et al.*, 2006).

Several studies conducted within the past decade (Bonsmann&Wills, 2012; Fitzgerald, Damio, Segura-Perez& Perez-Escamilla, 2008; Hieke& Taylor, 2012; Lahteenmaki, 2013; Miller &Cassady, 2015; Spronk, Kullen, Burdon& O'Connor, 2014) have reported findings that appear to be consistent with the assertion and belief that knowledge or awareness of nutritional information significantly provides support for food label use and influences the food choices among consumers. These outcomes confirm earlier research findings, which show that consumers' knowledge about nutrition information is positively correlated to better nutrition intake (International Food Information Council [IFIC], 2003). These findings corroborated findings by Drichoutis *et al.*,(2006), that nutritional label use contributes to a better dietary intake or to reduced consumption of 'unhealthy' foods. Other studies have found nutritional

label use to increase dietary quality of consumers, with higher improvements detected when health claim information was used

Pletzke, Henry, Ozier and Umoren (2010) conducted an experimental study to assess the effect of nutrition education on consumers' knowledge, attitude and behaviour toward trans fatty acids in foods. The researchers used the Solomon four-group design with 47 adult participants. A nutrition education program on trans-fat and the Nutrition Facts Panel was developed as the intervention for the study. Data was collected using a 17-item questionnaire. A comparison of pre-test and post-test result with participants in the experimental group showed that there was a significant improvement on the use of nutritional labels when buying packaged food, especially on the selection of healthier foods and feeling more knowledgeable and confident. Also, the analysis of the grocery receipts of the participants revealed that the participants purchased lower proportion of foods containing trans fatty acids, after a period of two weeks. These results suggest that education on nutrition and the use of nutrition information can promote an improvement in consumer's understanding and decision to make healthier food choices.

Similarly, Barreiro-Hurle *et. al.* (2010) conducted a study to find out whether nutrition information on food products lead to healthier food choices. Using a survey, the researchers collected data from two cities in Spain. The results showed that the use of nutrition information by consumers influenced consumer choice of healthier food products, although different types of consumers use various types of nutritional labels. This outcome implies that regardless of the type of nutrition label that consumers use, their food choices are significantly influenced.



Kozup, Creyer and Burton (2003) conducted an experiment to examine consumers' food choice based on claims on food labels. The study involved 147 consumers, who participated in an online survey. From the study, it was revealed that consumers who were exposed to food labels which claimed that the product was good for the heart had significantly more favorable attitudes about the product than those who saw the same package without the label. These attitudes included judging the product to be nutritious and good for the heart. As a result, these consumers preferred these products to others which did not specifically make such claims. The outcome of Kozup's *et. al* (2003) study suggested that food labels and the information they contain have a significant effect on consumers' choice of pre-packaged foods.

Similarly, Labiner-Wolfe, Lin and Verrill (2010) studied consumers' reactions to pre-packaged food labels that nutrition facts panels and those that did not have nutrition facts panels. The researchers used 4,320 participants, who were part of an online consumer panel. The study found out that consumers rated pre-packaged food products which showed nutrition facts panels claiming to have low carbohydrates content as more helpful for weight management and lower in calories than identical product which did not make any claims of having low carbohydrate content. This perception among the consumers clearly suggests that claims on food labels apparently influence consumers' beliefs and perceptions about the benefits and healthfulness of food products and further influence the choice of pre-packaged food products.

Drewnowski, Moskowitz, Reisner and Krieger (2010) evaluated the reactions of 320 consumers to claims made on food labels about 48 nutrients contained in some selected pre-packaged food products. The claims on the food labels ranged from the presence or absence of nutrients including protein, vitamin C, vitamin A, fiber, calcium, iron, fat, saturated fat, cholesterol, sugar and sodium. Consumers were asked to rate the healthfulness of the product from least healthy to most healthy. It was observed from the findings that consumers' perceptions of the healthfulness of the products were influenced most by claims about the presence of protein and fiber, followed by claims about the absence of saturated fat and sodium, then by claims about the presence of vitamin C and calcium. It is important to note that the nutritional information on food labels, detailing the presence or absence of some specific nutrients on food labels played a significant role in the preferences of pre-packaged food products by the consumers. This implies that some consumers actually make the food choices based on the nutritional information that is displayed on food labels.

Similar studies in New Zealand involving 1,525 consumers found out that majority of consumers (72 percent) relied on nutritional information on food labels to make food choices (Gorton, Mhurchu, Bramley & Dixon, 2010). It was also revealed that these consumers were able to understand and accurately interpret the claims on food labels. Furthermore, the study noted that while a large majority of consumers (72 percent) interpreted claims of nutritional information correctly, many other consumers also inferred from the claims that the product was healthy. This result supports and argument that consumers largely use nutritional information for making healthy food choices.

Studies in European have also confirmed the belief that nutritional information on food labels significantly influences consumers' food choices. Verbeke, Scholderer and Lahteenmaki (2009) and Aschemann-Witzel and Hamm (2010), conducted studies which found out that food products whose packages contain health-related product claims were preferred by consumers over products without such claims. Also, products with health-related claims were viewed as more attractive, thereby provoking greater purchase intentions among consumers. The findings of these studies suggest that nutritional information on food labels can influence consumers' perceptions of a product. For instance, in France, the Ministry of Agriculture and Fisheries (2004) conducted a study which revealed that 33% of respondents claimed they buy their food products based on claims in nutritional information and 24% based on food labels. Mannell, Brevard, Nayga, Combris, Lee and Gloeckner (2006) have also reported similar findings about consumers' use of nutrition labels in France. Drichoutis, Lazaridis and Nayga (2005) also reported similar findings in a study conducted with consumers in Greece, while the UK Food Standards Agency (2004) and the Institute of Grocery Distribution (2004) also gave similar reports.

Darkwa (2014) conducted a study in Ghana on the knowledge of nutrition facts on food labels and their impact on food choices on consumers. The study adopted the case study design and involved 100 consumers from a municipal community. The objective of the research was to investigate consumers' knowledge of food labels and how this knowledge guides their decisions when making purchasing choices with regard to food. Data collection for the study was done using a questionnaire. Darkwa (2014) reported that 65 out of the 100 consumers who responded to the questionnaire looked at or read food labels before selecting a food to purchase. Also, 75% of the

respondents reported reading the food labels prior to selecting pre-packaged foods. The study further found out that nutrition knowledge had a low to average impact on consumers' food choices. Half of the respondents who reported reading the food labels did not do so regularly. This finding implied that consumers do not always refer to nutritional information when purchasing pre-packaged foods. Also, it emerged that even though 45% of the respondents had some form of tertiary education, only 22% of them accurately understood and explained what is meant by recommended dietary allowance. The outcome of this study strongly suggests that not all consumers of pre-packaged food products regularly made reference to nutritional information in taking decisions about which food to purchase.

In terms of the effect of reading nutrition information or nutritional knowledge on the dietary habits of consumers, a number of research studies exist that corroborate the viewpoint. One of such studies is the work of Spronk *et. al.*, (2014), who conducted a literature review of 29 studies that examined the relationship between nutritional knowledge and dietary intake. From the review it was observed that individuals with higher nutritional knowledge tend to consume more fruits and vegetables, as well as have a higher intake of fiber and carbohydrates than those with lower nutritional knowledge. The study further pointed out that these individuals also tend to follow the dietary guidelines more closely than those with lower nutritional knowledge. Also, the findings demonstrated a negative relationship with overall nutritional knowledge and overall energy intake. Therefore, individuals with higher overall nutritional knowledge have a lower daily energy intake, while individuals with higher nutritional knowledge also tend to have a lower intake of fat and sweetened beverages than those with lower nutritional knowledge.

Studies by Alaunyte, Perry and Aubrey (2015) also demonstrate a positive relationship between nutritional knowledge and healthier food choices. It noted that there was a positive correlation between greater nutritional knowledge and consumption of more fruits and vegetables in professional rugby players. Similarly, the study by Parmenter and Waller (2000) assessed the nutritional knowledge of 1,040 adults. This study found that there was a positive correlation between nutritional knowledge and healthy eating habits. Specifically, participants who had more knowledge about nutrition and those who read nutritional information on food labels were 25 times more likely to meet current dietary recommendations for fruits, vegetables and fat intake.

In other research, consumers' eating behaviours significantly improved after acquiring knowledge on nutrition compared to those who did not have such nutritional knowledge (Watson, Kwon, Nichols & Rew, 2009), implying that greater nutritional knowledge is related to making healthier food choices (Hochstadt, 2016). Most empirical research, suggests that provision and use of information can significantly change dietary patterns (Drichoutis *et al.*, 2006). Studies have found that nutritional label use contributes to a better dietary intake or to reduced consumption of 'unhealthy' foods (Drichoutis *et al.*, 2006). Other studies have found nutritional label use to increase dietary quality of consumers, with higher improvements detected when health claim information was used (Drichoutis *et al.*, 2006).

Furthermore, Hieke and Newman (2015) studied the effects of several nutrition labeling formats on consumers' food choices with a mixed sample of 276 students and adults from a European university. Overall, the outcome of the studies reviewed

above point towards the conclusion that the use of nutritional information on food labels has a significant positive influence on the food choices of consumers.

However, while several studies suggest that the use of nutritional information results in dietary quality and healthy food choices, Cooke and Papadaki (2014) hold a counter view. In their study to assess the relationship between nutrition knowledge and attitudes towards healthy eating, the researchers conducted an online cross-sectional survey with 500 students in 37 UK universities. The study reported that attitudes towards healthy eating differed depending on the nutrition label use. Also, they reported that nutrition label use does not predict dietary quality. This outcome is in contrast with the findings of Barreiro-Hurle *et al.* (2010), Hieke and Newman (2015) and Pletzke *et al.* (2010); and further suggests that consumer's attitudes towards the use of nutritional labels does not determine the dietary habits they form.

Many studies have examined effects of different types of information on food labels on consumer preferences, choices and behavior. These studies largely demonstrate that such information can influence consumers and likely affects some groups more than others, including those with less knowledge about or interest in nutrition. Nonetheless there have been contrasting findings to the possible positive effects of food and nutrition labels. Some researchers have argued that provision of health-related information does not always lead to healthier consumption (Drichoutis *et al.*, 2006).

However, considering the seeming mixed results that have emerged from the literature, it is necessary to conduct this current study to determine what the reality is.

Whereas the studies in the literature reviewed above used respondents in metropolitan centers, this current study used respondents in a relatively small community. Also, this study is set apart from other studies in terms of the focus of the research. While other studies reviewed above used experimentation and relied on mixed participants such as adults and students from different settings, this current study collected data from students within the same university. Again, this current study presents a local perspective to the issue under discussion, considering that the studies reviewed above are of European context.

## **2.6: Difficulties consumers encounter in reading nutritional information on food labels.**

Within the past decade, governments, food companies and consumers in many parts of the world, have taken a serious look at the provision of nutrition information on food labels (Wills, Schmidt, Pillo-Blocka & Cairns, 2009). Food labels are valuable tools that can help consumers make informed decisions about their diet and lifestyle (Christoph, Ellison & Meador, 2016). An essential condition that would make labels really efficient in guiding food choices and in modulating dietary patterns would be that the consumers were interested in consulting them, but most of all they understood what they read (Sharf, Sela, Zentner, Shoob, Shai & Stein-Zamir, 2012; Mackison, Wrieden & Anderson, 2009; Cowburn & Stockley, 2005). Therefore, it is important that the nutrition information provided be appropriate and easily understood by consumer.

Unfortunately, consumers have experienced some difficulties in understanding the information presented on food labels, particularly technical and quantitative information. A study on food labels conducted by Sunley (2012) indicated that

responses most commonly recorded pertain to excessive complexity and the lack of a simple format. This situation makes the provision of nutritional information a little difficult for food processing companies and other agencies. This is because nutrition information of any sort and particularly that of a quantitative nature, is not easy to communicate to consumers. Consumers tend to perform poorly with manipulation of quantitative nutrient information (Drichoutis *et. al.*, 2006).

Studies conducted by Rothman, Housam, Weiss, Davis, Gregory, Gebretsadik *et. al.* (2006) and Misra (2007) revealed that many consumers are unable to read and understand nutrition information on food labels. However, for consumers who can read nutrition information, they may not use nutritional labels because they still require time and effort to process the information (Kiesel *et. al.*, 2011). Reading of Nutritional Facts Panel, for instance, necessitates that the consumer removes the product from the shelf and turn the product to read the nutritional information on the product. In addition, consumers often have difficulty evaluating the information provided on the Nutritional Facts Panel or how to relate it to a healthy diet (Kiesel *et. al.*, 2011). Many people say that food labels are confusing and/or they don't trust manufacturers to put honest information on the package (Aidoo, 2016). Most consumers maintain that there's just too much choice, too much confusing information and too little time in which to make a smart decision on a food or nutrition label (Wiles, 2006). Besides food labels aren't always very clear or usable. So even if people really do want to read and use labels, they find it hard to do (Aidoo, 2016).



According to Rothman *et al.*(2006), many patients struggle to understand current food labels and that this can be particularly challenging for patients with poor literacy and numeracy (math) skills. Poor understanding of nutrition labels can make it difficult for patients to follow a good diet. Results from several other studies highlight the fact that consumers encounter some difficulties in understanding and using the information presented on food labels. Research has shown that the amount of complicated information on food labels presents difficulties for consumers in understanding nutritional information. Higginson, Kirk, Rayner and Draper (2002) noted that food labels need to have simpler designs and must be educative about the value or meaning of the label message. Even though Taylor and Wilkening, (2008) postulated that food labels are designed to be easy-to-use, Graham and Jeffery's (2011) study revealed that most consumers typically only view the top five lines of food labels. This suggests that much of the additional information is rarely used. This is perhaps because the bottom half of most food labels are written in smaller fonts, which has been cited as a deterrent to its use (Cowburn&Stockley, 2005). Ranilovic and Baric (2011) noted that the small letter size poses a starting barrier to older consumers.

Samson (2012) conducted a study to determine the level of awareness on pre-packaged food labelling information among consumers in Tanzania, their perception of the importance of such information and the difficulties encountered in reading and using pre-packaged food labels. Using a cross-sectional survey, a questionnaire was used in collecting data from 208 respondents. The outcome of the study revealed that the difficulties consumers encountered in reading food labels included small font sizes, the use of technical language and the use of unfamiliar language. These findings

strongly correlated with the findings of a study by Philip *et. al.*,(2010) as cited by Aidoo (2016), that use of food labelling among consumers is affected by the format of many food labels being inadequate, especially the size of labels and the printing fonts used, as well as the style of language in which they are written. These difficulties in consumer understanding gave rise to approaches like the “traffic light” labeling (Drichoutis *et. al.*, 2006). The idea of the “traffic light” labeling is to place colors next to each nutrient of a product, similar to traffic lights, which will indicate low, medium and high assessments of the nutrient (Drichoutis *et. al.*, 2006). Foods will be labeled with a panel of colored spots relating to the amount of salt, sugar, fat and saturated fat (Drichoutis *et. al.*, 2006).

Some French consumers in a study pointed out that information should be printed in a larger letter size and that different colours should be used (Mannell *et. al.*,2006). More specifically, the study found that about 70 percent of the respondents reported that the use of unfamiliar languages and technical language was a major barrier for reading nutrition information. About 17 percent also noted that small font sizes were a factor that made it difficult for them to read nutrition information on food labels. This suggests that consumers would have little or no difficulties in reading nutritional information if the food labels are written in plain and simple language, with very clear and visible texts.

Similarly, Affram and Darkwa (2015) conducted a study to assess consumers’ knowledge, understanding and use of food label information. Data was collected from 600 pre-packaged food shoppers who were randomly sampled, using a questionnaire and observation. Findings from the study showed that the participants were highly

aware of food labels. However, difficulties such as small font sizes were reported by participants as the main factors that prevented them from reading and using food label. This finding in part strongly agreed with the findings of Samson (2012), which suggested that even though consumers may be aware of food labels, barriers such as font size and perhaps the style may discourage them from actually using such information for food purchasing decisions.

Wartella *et. al.*, (2011) reviewed extensive literature on the difficulties consumers encountered in reading and using nutritional information on food labels. The literature review found out that, actual food label use is much less than what is reported. This was because consumers reported they are confused by the information on the food label and have difficulty understanding serving sizes (Cowburn&Stockley, 2005). Also, reviews of studies conducted by Grunert and Wills (2007) in Europe and Mhurchu and Gorton, (2007) in Australia and New Zealand all made the same findings and conclusion. These studies suggest that consumers usually encounter some difficulties in understanding various information on food labels and end up with subjective interpretations of the information on food labels.

Furthermore, several studies have reported a number of reasons why nutrition labels are not used by consumers. These include lack of time (Barreiro-Hurle *et. al.*, 2010), difficulty with the presentation of information and lack of understanding of food label information (Cowburn&Stockley, 2005). Additionally, Higginson, Rayner, Draper and Kirk (2002) noted that a lack of understanding about which nutrients are important also created difficulties for some consumers. Cowburn and Stockley's (2005) study indicated that although consumers may be able to use numerical

information on food labels to perform simple calculations, their ability to correctly interpret the information on the food labels, declined, especially with consumers whose educational background and attainment was relatively low. In addition, Cowburn and Stockley (2005) reported that during shopping on food products, customers took into account the contents of several nutrients simultaneously, to ensure they chose healthier foods.

Annunziata and Vecchio (2012) conducted a survey on factors affecting consumers' use and understanding of nutrition information on food labels. The study involved 400 consumers in Italy and employed a questionnaire for data collection. From the survey it emerged that around 62% of the respondents indicated that it was not easy to understand the information included in the nutritional label. Also, 72% of respondents viewed nutritional information as too technical and difficult to understand, while 86% complained that the letters used in the food labels are too small and barely visible. Furthermore, about 73% of the respondents did not understand the actual nutritional values related to a single serving. Another recent study by Hassan and Dimassi (2017), using 748 supermarket shoppers in Lebanon revealed that food labels are difficult to understand because they contain too much information. Finally, Annunziata and Vecchio (2012) reported that 52% of their respondents noted that nutritional claims on food labels were not very reliable. In summary, the findings showed that, despite the high interest of consumers in reading the nutritional information on food products, they do not find it easy to do so.

Kim and Kim's (2009) study also mentioned that consumers report that they encounter difficulties in reading and understanding information on food labels

because some food labels are confusing in its terminology or language. Other difficulties reported including difficulties in locating the nutrition information. The study concludes that due to these difficulties, some consumers stated that it took too much time to read the food labels, leading to the situation where some of them become annoyed. Similar findings were made by Keenan, Abusabha and Robinson (2002) to the effect that consumers have difficulty interpreting dietary guidelines. Baltas (2001) and Besler, Buyuktuncer and Uyar (2012) also reported that the format of presentation of nutritional information presented some difficulties for consumers in making references to such information for food choices.

Jacobs, de Beer and Larney (2011) and Tessier, Edwards and Morris (2000) also noted that consumers complain about the font sizes on food labels being too small. According to Besler *et al.* (2012), consumers have demanded a simplified standard for food labels, with clearer and more comprehensible indications, as a result of the difficulties they encountered in reading nutritional information on food labels. The use of bold text, colored nutrition panels and whole numbers instead of decimals and calories instead of joules or energy has to be expressed both in terms of calories and joules where  $1 \text{ kcal} = 4,18 \text{ KJoules}$ ) are preferred by the majority of consumers (Drichoutis *et al.*, 2006).

Notwithstanding all these difficulties with reading nutrition information, Newman, Howlett and Burton (2014) have noted that food retailers and manufacturers have developed nutrition labeling systems in which nutrition information is presented in a straightforward way to consumers. However, consumers may not use nutritional labels

because consumers still require time and effort to process the information. It was therefore considered necessary to conduct this study to find out the difficulties encountered by university students in reading and comprehending nutritional information on food labels and its impact on their attitudes towards food labels.



## 2.7: Demographic inference of consumers' attitudes towards the choice of food.

Entrepreneur Recent international studies highlight how many variables influence the consumer's approach to food labels, the degree of comprehension and the frequency of reading. In these studies (Cecchini&Warin, 2016; Hess, Visschers&Siegrist, 2012;Miller & Cassady, 2012; Chen,Jahns, Gittelsohn& Wang, 2012),socio-demographic factors like education level and socio-economic status, age, gender, individual interest and knowledge in nutrition, as well as health-consciousness are of great importance. In a study conducted by Viola *et. al.*,(2016) it was found out that, women mostly cared more about nutritional contents than men. There has been no consensus on the effect of age, income, or working status on nutritional label use. However, education and gender have been found to positively affect label use (Drichoutis *et. al.*, 2006).

Kiesel *et al.*,(2011) opined that females are more likely to use labels and label usage decreases with age and with lower income regardless of label use, certain factors contribute to higher healthy eating index, such as college education and income. These findings agreed with studies by other researchers who also noted that females are generally more likely than men to use nutritional labels (Drichoutis *et. al.*, 2006; Kim *et al.*, 2001a; Kim, Nayga& Capps2001b; McLean-Meyinsse, 2001). This may be attributed to the fact that many males do not agree that nutritional information is useful, that the information can help in food choice, or that health is a matter of importance to them (Nayga, 1999). Again, several previous studies (Campos *et. al.*, 2010; Mandal, 2010; Bates, Burton, Howlett& Huggins, 2011)have expected gender differences to emerge in choice behaviour, such that they hypothesized that females would make overall healthier choices than males.

## 2.8: Laws on Food Labels.

The importance of food labels and the role of nutritional labels have evoked the passing of some legislation and legal frame work to govern food labelling. Food labeling regulations began with regulatory marks, which served as logistical aids to the enforcement of adulteration laws and the levying of duties and taxes on bread (Moore, 2001). The industrialization of food production in the nineteenth century made consumers more reliant on food labels as a key source of information in making purchases. Trademarks provided a partial assurance of quality to purchasers, but there was a clear need for regulation to prevent misleading and fraudulent labeling (Moore, 2001). Once anti-misbranding statutes were passed in the early twentieth century, regulators began to realize the need for more comprehensive regulation including affirmative labeling requirements (Moore, 2001). Besides, another motivation for the introduction of food labelling regulations was to satisfy consumers demand to be provided with adequate information about the characteristics of a food product such as nutrition information (Lasztity, Petro-Turza&Foldesi,2004).Provision of nutritional information on food packages is desirable if it can generate more revenues (Drichoutis *et al.*, 2006).

At first such affirmative labeling requirements were basics such as weight, the name of the food and the address of the manufacturer. However, with advances in nutrition science and the realization of the connection between food consumption and long-term diseases, affirmative labeling requirements included detailed nutrition information. Today nutrition labeling had become so specific in some countries that it is seen as means to educate the public about nutrition (Moore, 2001).



In most developed countries, there are specific legislations to govern food and nutritional labels. However, in most developing countries the legislation on food and nutritional labels is absent or when present, it is not robust enough. In such developed countries, the display of nutritional information (energy and key nutrient contents) on packaged goods is either required by law or considered as common practice. For instance, in Europe nutritional labelling has become mandatory (Viola *et. al.*, 2016).

Some legal framework also provides the list of information that should be provided on food labels. In Europe for example, the regulation (EU) No. 1169/2011 established the conditions for a standardized label writing in form and content and, as regards nutritional declaration (Viola *et. al.*, 2016). The regulation stipulated that manufacturers have to declare the energy value of the products as well as six nutrients amounts (fat, saturates, carbohydrate, sugars, proteins, salt) expressed per 100 g or 100 mL of product (Viola *et. al.*, 2016).

Campos *et. al.*,(2010) argued that the provision of nutritional content information may or may not be mandatory in a country depending on the provisions of the legislative instrument or legal requirements governing food labeling. According to Abbott (1997), in some countries, nutrition labeling is mandatory largely because of their population drift toward healthy and wellness foods and also reflect a response to consumers' right to know the content and nutrition of a food product. Such laws require detailed, accurate and accessible nutritional content information on the packaged foods.

Some researchers have questioned the full benefits of food labelling regulations. For instance, Drichoutis and colleagues (2006) asserted that although the Nutritional Labeling and Educational Act [NLEA] of the USA have been effective since 1994 and continues to serve as a good reference point for mandatory food labeling, there is no significant change in the average nutritional quality of food products offered for sale by manufacturers and retailers after the implementation of the NLEA. This suggested that the benefits from information provision might be more limited than previously thought and expected.

According to Aidoo (2016), the current laws establishing food labelling obligations in Ghana have their roots in a long history of legal provisions dating back to about 1888. The current complement of labelling legislation consists of statutes and subsidiary legislation passed between 1960 to 2000 (Aidoo, 2016). The system has evolved through a number of regime changes, economic upheavals and rebirths and bears up well providing a very respectable assembly of food labelling rules which promotes both commercial interests and provides consumer information (Aidoo, 2016). As a member of Codex Alimentarius Commission, Ghana has adopted the voluntary guidelines for regulating nutrition labeling. Per the guidelines of Codex Alimentarius Commission, nutrition labeling is voluntary for all foods, except in the case where a nutrition or a health claim is made. Ghana, by maintaining a voluntary status on nutrition labeling, permits the importation and local production of pre-packaged foods which do not necessarily bear nutrition labeling. As a result, some pre-packaged foods in Ghana do not bear nutrition labels and consequently deny consumers the opportunity to discriminate between different products on the basis of their nutrition contents (Aidoo, 2016).

Besides, there are other legislative and legal frameworks that govern food and nutrition labelling. In Ghana, the legislation on food labels, although is conclusive and robust, is not as specific as those of the developed countries. The laws on food labels in Ghana enshrined in Section 148 of the Public Health Act 2012, (Act 851), is enforced by the Foods and Drugs Authority (FDA). It appears that the Ghana Standards Authority complements the work of the Foods and Drugs Authority by ensuring that products and labelling standards are adhered to and maintained. This role of the Ghana Standard Authority is enshrined in NRC 173, LI.1541.

It is critical to note that food labelling regulations are confronted with a number of challenges that compromises the effectiveness of these regulations. Buckingham (2003) explained that legislation creating labelling obligations over the years has become overgrown with several statutes governing labelling and even more subsidiary legislation dealing with labelling obligations for similar products in different ways. In addition, the enforcement of laws on food and nutrition labels in most countries is not impressive and so people flout these laws sometimes with impunity. However, this problem is not peculiar to Ghana, neither is it peculiar to developing countries. Studies from other jurisdictions have shown that enforcement of laws is also a major challenge to many countries. According to Aidoo (2016), the enforcement of these laws is difficult because of the lack of, or inadequacy of resources. Again, the possibility of manufacturing industries falsifying information on nutrition labels can also hamper the effectiveness of food labelling regulations.

## **2.9: Summary of Literature Review.**

Copious related literature on the subheadings identified in the study was reviewed. Several studies which formed part of the review acknowledged that the consumers' knowledge or awareness of nutritional labels was high. Also, it was observed from the reviewed literature that many studies revealed that consumers frequently referred to nutritional information in making their food choices. However, it emerged that consumers faced a number of difficulties in reading nutritional information. These difficulties included unfamiliar and technical language, small font's sizes, unnecessary information. Furthermore, it was found from the extensive that literature review, that the use of nutritional information on food labels affects the food-purchasing choices of consumers. Besides, it was found that most of the studies used the cross-sectional survey design and used questionnaire to collect data. The review revealed that there is a gap in existing literature on consumers attitudes towards nutritional information on food labels. This gap is the perspective of the situation within the context of consumers in developing countries like Ghana, a gap which this study sought to fill.

## CHAPTER THREE

### METHODOLOGY

#### 3.0: Overview

This chapter presents the methods used for the study. The areas covered are the study area, research approach, research design, population, sample size, sampling technique, instrumentation, validity and reliability and ethical considerations.

#### 3.1: Study Area

The University of Education, Winneba (UEW) is in the Effutu Municipality in the Central region of Ghana. It is situated between latitudes 5°21'58" N and longitudes 0°37'44" W of the eastern part of Central region. The Municipality lies between the Gomoa West District to the west, Gomoa Central to the north and Gomoa East to the east. On the southern flank is the Gulf of Guinea. The administrative capital is Winneba, a town renowned for its specialized major institution of higher learning, the University of Education, Winneba. It covers a total land area of 95 square kilometers. Data from the 2010 Population and Housing Census (Ghana Statistical Service, 2010) indicated that the Municipality has a population of 68,597 which represents 3.1 percent of the population of the Central region.

Winneba is traditionally known as 'Simpa' which was derived from the name of the leader of the Effutus 'Osimpa' who led the Effutus of the Guan ethnic stock from the Northern part of Ghana to the present location. The name Winneba originated from European Sailors who were often aided by favourable wind to sail along the bay. From the use of the words 'Windy Bay', the name Winneba was coined. The town is

one of the communities in the country to first encounter European traders. It served as a port where foreign goods were discharged and transported to the interior and major commercial areas such as Agona Swedru and Akim-Oda.

Due to its role as a harbour town and a place of early European settlers, Winneba became the administrative capital of the then Central Province of the Gold Coast. The cocoa boom in the forest areas led to the relocation of major trading companies in the 1940s to Agona Swedru and this affected the growth of the town. The township suffered even greater loss when the Tema harbour was constructed; the port activities at Winneba were thus shut down and relocated to Tema. Consequently, most of the commercial activities also shifted from Winneba to Tema and Accra. Winneba is generally low lying with granite rocks and isolated hills and lies within the dry-equatorial climatic zone characterized by low rainfall and long dry season of five months. The annual rainfall ranges from 400 millimeters to 500 millimeters. Mean temperatures range from 22 degrees Celsius to 28 degrees Celsius.

The University of Education, Winneba which is the exact study area for this research was established in September, 1992 as a University College under PNDC Law 322. On 14th May, 2004 the University of Education Act, Act 672 was enacted to upgrade the status of the University College of Education of Winneba to the status of a full University. The University College of Education of Winneba brought together seven diploma awarding colleges located in different towns under one umbrella institution. These Colleges were the Advanced Teacher Training College (ATTC), the Specialist Training College (STC) and the National Academy of Music (NAM), all at Winneba; the School of Ghanaian Languages, Ajumako; the College of Special Education,

Akwapim-Mampong; the Advanced Technical Training College, Kumasi; and the St. Andrews Agricultural Training College, Mampong-Ashanti. The three sites in Winneba now referred to as the Winneba campus is the seat of the main administration with satellite campuses at Kumasi, Mampong and Ajumako.

### **3.2: Research Approach**

This study adopted and followed the quantitative approach of research. The quantitative research approach is a method of inquiry used to answer questions about relationships among measured variables, with the purpose of explaining, predicting and controlling some phenomena. Gay, Mills and Airasian (2009) defined this approach as the collection and analysis of numerical data to describe, explain or predict a phenomenon of interest. Also, it is used when the researcher has the intention of confirming and validating relationships between variables and also to develop generalizations that contribute to theory. Researchers employ the quantitative approach due to its strengths that allows the researcher to be detached from the research participants, in order to have the ability to draw unbiased conclusions (Leedy & Ormrod, 2005).

This study employed the quantitative approach because the researcher sought to determine the relationship between the variables (Babbie, 2010) that make up students' attitudes towards nutritional information of food labels. This approach was deemed appropriate for the study because it conforms to the goal of the quantitative approach, as noted by Babbie (2010). Again, the quantitative method of inquiry was found to be fit for the study because it allows for greater objectivity and accuracy of results.

Another reason for employing this approach was the fact that it usually involves few variables and many cases and employs prescribed procedures to ensure validity and reliability of the instrument used (McNabb, 2008). It is also noted that quantitative methods allow researchers to provide summaries of data that support generalizations about the phenomenon under study (Singh, 2007).

### **3.3: Research design**

The cross-sectional survey design was adopted for the study. This design was selected because the study sought to sample opinions from students on issues relating to their attitude towards nutritional information on food labels. A cross-sectional survey is one in which data are collected from selected individuals at a particular point in time (Cohen, Manion & Morrison, 2007), knowing that such information could change later. It also involves collecting data at just one point in time from a sample that is drawn from a predetermined population by administering a questionnaire to individuals, to find out specific characteristics of the group (Fraenkel & Wallen, 2000; Owens, 2002). Cross-sectional surveys are effective for providing a snapshot of the current behaviour, attitudes and beliefs of the population about a given phenomenon (Cohen *et al.*, 2007).

By using a cross-sectional survey, the study sought to collect and analyze numerical data to describe, explain or predict the phenomenon of interest to the researcher (Gay, Mills & Airasian, 2009). It may also help to confirm and validate the relationships that exist between the variables and to develop generalizations that contribute to theory. The use of the cross-sectional survey design also allows for objective measurement of



variables of interest. Also, the study adopted the cross-sectional survey design because it allows for quicker collection of large amounts of quantifiable data from respondents at a reasonably lower cost (Muijs, 2004). Another reason for choosing this design is that it gave the respondents the opportunity to complete the questionnaires in their own time (O’Leary, 2004), thereby obtaining data which could be described as accurate and authentic. Again, the survey design was used for the study because it provided all the respondents with standardized questions which made measurement more precise and also eliminated the researcher’s own biases and prejudices (Sincero, 2012).

### 3.4: Population

The population of a study is the sum aggregate or totality of the phenomena of interest to the researcher (Alhassan, 2006). In this research, the target population included all undergraduate students at the University of Education, Winneba, who were pursuing full-time regular programmes at the Winneba campus during the 2017/2018 academic year. The total number of students who met this criterion was 15,778. Therefore, the targeted population for the study was 15,778. Table 1 is a breakdown of the population for the study:

**Table 1: Population of the study**

Campus	Frequency	Percentage
South Campus	5,161	32.7%
Central Campus	530	3.4%
North Campus	10,087	63.9%
<b>Total</b>	<b>15,778</b>	<b>100.0%</b>

**Source:** *Field Data*(2018)



### **3.5: Sample size**

Sample refers to a sub-group on which information is obtained for a study (Creswell, 2005). The sample for the study involved students from all the three campuses of the Winneba Campus of the University of Education, Winneba. In order to get a representative sample size from this population, the researcher used Krejcie and Morgan's (1970) table for determining sample size from a given population. According to Krejcie and Morgan (1970) (Appendix B), 375 are appropriate for a population size of 15,000. However, only 344 responded to the survey by the time limit, a response rate of 92%.

### **3.6: Sampling technique**

Sampling technique refers to the process of selecting a portion of the population to represent the entire population (Fraenkel & Wallen, 2000; Muijs, 2004). In this study, the simple random sampling technique was used to sample 375 students to participate in the survey. This sampling technique is conducted where each member of the population has an equal opportunity to become part of the sample (Leavy, 2017).

### **3.7: Instrument**

Data collection for the study was done using a structured questionnaire. The questionnaire, which was designed with Google Forms, was a close-ended type in the form of a likert scale, while some aspects contained items that were measured on nominal, ordinal, interval and ratio scales. The likert scales were rated as 5 = Strongly Agree (SA), 4 = Agree (A), 3 = Neither Agree nor Disagree (NAD), 2 = Disagree (D) and 1 = Strongly Disagree (SD). The items in the questionnaire were grouped under

four sections. Section A of the instrument had five items and focused on the demographic information of the respondents. Section B had eight items and focused on the level of awareness of the respondents about nutritional information on food labels. Section C, which was focused on the effects of reading nutritional information on food labels, contained 13 items. Also, Section D was about the difficulties consumers encountered in reading and understanding nutritional information on food labels. It also contained seven items. In all, the questionnaire had 33 items.

### **3.8: Validity, Reliability of Instrument and Pilot Study**

Validity refers to the extent to which the research instrument serves the use for which it is intended (Seidu, 2006). The instrument was tested for face validity, content validity, as well as construct validity. For the instrument to have face validity, the researcher sent the instrument to colleagues to proof-read and to offer the necessary suggestions which ensured that the instrument measured what it was meant to measure. Also, content validity in the instrument was checked by giving out the instrument to the research supervisor to determine the suitability of the items before pre-testing. All the necessary corrections in the items were made and declared valid by the researcher supervisor. Finally, construct validity was also ensured by critically developing the instrument by following established frameworks for designing questionnaires.

The reliability of an instrument is the consistency of the instrument in producing the same or similar results given the same condition on different occasions (Seidu, 2007). To ensure reliability of the questionnaire, the researcher pilot-tested it with 16 students. The test-retest technique was used to determine the reliability of the

instrument, where the same 16 students were asked to respond to the questionnaire after a period of one week. The two results were subjected to Cronbach's alpha reliability analysis using Statistical Package for Social Sciences (SPSS) version 21.0. The first test yielded a reliability coefficient ( $r$ ) of 0.880 while the second test also resulted in  $r = 0.751$ . This result, which is greater than the accepted standard value of 0.70 for social science research (Field, 2009; Hof, 2012) therefore implied that the instrument was reliable; hence it was used for the actual study.

The questionnaire was pilot-tested with 16 students from the campuses, in order to identify problems such as unclear wording or the appropriate length of time needed to administer the questionnaires. The piloting was done to establish the validity and reliability of the questionnaire by checking for clarity of items, instructions and layout as well as to gain feedback on the questionnaire (Cohen et al., 2007). Also, the pilot study was conducted to determine whether the questionnaire would be understood by the sample to be surveyed. Results from the pilot study suggested that the respondents of the study would understand the questions in the instrument. Therefore, the researcher decided to use the instrument for the study.

### **3.9: Data Collection**

Prior to the administration of the questionnaire, the researcher sought permission from the respondents. The permission was sought using an introductory letter, which was obtained from the Head of the Department of Home Economics Education, UEW. The researcher sent the introductory letter to the online WhatsApp platforms of the Students' Representative Council (SRC) and other organized students' associations.

This was to introduce the researcher to all potential respondents. The researcher then sent the Google Forms questionnaires to the online WhatsApp platforms and encouraged interested students to take part in the survey by completing all the statements on the questionnaire and submitting when done.

### 3.10: Data Analysis

The responses to the questionnaire were coded and analyzed using version 21 of the SPSS software. The SPSS software was used because it is reasonably user friendly and does almost all of the data analysis needed as far as quantitative analysis is concerned. Frequency tables with percentages, mean and standard deviation were calculated and used to describe and analyze the data and also to answer the research questions. Also, the independent sample *t*-test was used to test the hypotheses for statistical significance at 0.05 significant level. Also, the Eta squared ( $\eta^2$ ) formula was used to determine whether the difference in the mean scores of the female and male respondents was purely based on their gender. The Eta squared ( $\eta^2$ ) was calculated to check the magnitude of the difference:

$$\eta^2 = \frac{t^2}{t^2 + (N1 + N2) - 2}$$

$$\eta^2 = \frac{3.70^2}{3.70^2 + (112 + 232) - 2}$$

$$\eta^2 = \frac{13.69}{13.69 + (112 + 232) - 2}$$

$$\eta^2 = \frac{13.69}{355.69}$$

$$\eta^2 = 0.038$$

The Pearson product-moment correlation analysis was also computed to test the strength and direction of the relationships that exist between the level of awareness of nutritional labels, the effect of reading food labels on choice of foods and the difficulties encountered in reading nutritional information on food labels.

### **3.11: Ethical considerations**

In research, ethical issues are of high relevance and therefore require due attention. The ethical concerns in research focus on creating a relationship that upholds mutual respect and responsibility, in which participants will be pleased to candidly participate in the study. This results in the situation where valid results are highly likely to be obtained. The researcher explained the purpose of the study to the respondents and sought their consent to participate in the study. Assurances of confidentiality, privacy and anonymity were also given to the respondents before the commencement of data collection. Finally, the respondents were informed of their rights to withdraw from the study at any point in time, if they considered it necessary.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.0: Overview

This chapter presents the results and discussions of the findings. Data were analyzed according to each research question posed and also based on the questionnaire items. For purposes of the discussion of the findings, the responses of “Strongly Agree” (SA) and “Agree” (A) to the likerttype items were combined and interpreted as having the same idea, whiles “Strongly Disagree” (SD) and “Disagree” (D) were also treated as having the same idea. This was to simplify the data for easier discussion. The results of the frequency distributions of opinions expressed by the respondents to each item were used for the analysis and discussion.

#### 4.1: Demographic data of Respondents

The study collected demographic data from the respondents. These data included details on gender, age, campus and body mass index (BMI), which were calculated from the self-report height and weight of the respondents. This section presents the results of the analysis of the demographic data. Table 2 shows the frequency and percentage of gender, age range, BMI and the campus site for the students. About 67% of the respondents were male and about 33% female, 53%, 42% and 5% of the respondents were below 25, within 25 to 35 and above 35 years respectively. Most of the respondents were for the North Campus of the University and more than half of the respondents were within the normal BMI for age.



**Table 2: Demographic information of the respondents (n=344)**

<b>Variable</b>		<b>Frequency</b>	<b>Percentage (%)</b>
<b>Gender</b>	Male	232	67.4
	Female	112	32.6
<b>Age</b>	Below 25 years	184	53.4
	25 – 35 years	144	41.9
	Above 35 years	16	4.7
<b>Campus</b>	North Campus	240	69.8
	Central Campus	40	11.6
	South Campus	64	18.6
<b>Body Mass Index</b>	Underweight (less than 18.5)	56	16.3
	Normal (18.5 - 24.9)	192	55.8
	Overweight (25.0 - 29.9)	56	16.3
	Obese (greater than or equal to 30)	40	11.6
<b>Total</b>		<b>344</b>	<b>100.0</b>

**Source:** *Result of SPSS Analysis (2018).*

The age distribution of the respondents as shown in Table 2, indicates that majority (184, representing 53.4%) of the respondents were below 25 years old. Next, 144(41.9%) were found to be aged between 25 years and 35 years, while the remaining 16(4.7%) were above 35 years. This study found out that most of the respondents were less than 35 years, with more than half (53.4%) falling below age 25. This suggested that the respondents were fairly young people; and lended support to the findings of Yetter and Capaccioli (2010), which stated that respondents who prefer web and online surveys are relatively younger than those who prefer traditional paper surveys. It also agreed with the findings of Larson, Neumark-Sztainer, Harwood, Eisenberg, Wall and Hannan (2011) who noted that response to web and online surveys is highest among young adults. It is probable that this outcome is

because of the high level of attraction of the web and online environment to young adults (Keipi, Oksanen&Rasanen, 2015; Lehdonvirta&Rasanen, 2011).

Additionally, the researcher collected data on the campuses where the respondents were situated at the time of the study. The details of this information are also captured in Table 2. From the table, it was observed that 240(69.8%) respondents were situated at the North campus, 40(11.6%) were also situated at the Central campus, while the remaining 64(18.6%) were also at the South campus. This showed that majority of the respondents were situated at the North campus, which is the largest campus by land size and also by number of departments and halls of residence that are found there.

Furthermore, the study collected data to determine the Body Mass Index (BMI) of the respondents. This was done by gathering data on the height and weight of respondents. The data was then used to calculate the BMI. It was evident from the table that, 56(16.3%) of the respondents had BMI scores less than 18.5, while another 56(16.3%) were observed to be overweight. This implied that 16.3% of the respondents were underweight and another 16.3% were found to be overweight. Also, the data revealed that 192(55.8%) of the respondents had BMI scores between 18.5 and 24.9. This result also showed that more than half (55.8%) of the respondents were within the normal weight range. Again, it was revealed that 40(11.6%) of the respondents had BMI scores greater than or equal to 30.0. This suggested that 11.6% of the respondents were obese.

This study revealed that majority 55.8% of the respondents had BMI scores range of 18.5 and 24.9. This result is consistent with the 66.0% of student respondents with a

normal BMI of 18.5 and 24.9 and 7.8% reported obese in Lynn's (2012) study. Similarly, Anderson and Good (2016) found that all the participants (undergraduate university students) in their study who had their calculated BMI scores ranging from 22.1 to 25.1. Furthermore, this result is in agreement with the finding of Okumusoglu (2016), whose study revealed that 75.55% of the participants' BMI is in the "normal" range. Again, it supported the finding of Wehigaldeniya, Oshani and Kumara (2017), which found out that 16.7% of their participants were underweight, with 77.5% having normal weight and 5.8% were overweight.

It is important to note that the respondents in the aforementioned studies (Anderson & Good, 2016; Lynn, 2012; Okumusoglu, 2016; Wehigaldeniya, Oshani & Kumara, 2017) have similar characteristics as those in this current study – all groups of respondents were university students whose ages ranged between 18 and 30 years. Perhaps, this result was to be expected because the respondents are university students, a category of persons who are supposed to know more; and also, be concerned about nutrition and health-related issues. Another possible reason for this outcome is the fact that young people usually place great importance on being thin and many desire thinner bodies (Ikeda, Crawford & Woodward-Lopez, 2006) to obtain normal weight for the purpose of fitting into society (Nichter, 2001). It can therefore be deduced from the results that many university students have BMI scores ranging from 18.5 to 24.9, which corresponds to normal weight. Again, a conclusion that higher educational attainment correlates positively to maintaining the normal body weight may not be out of place.

## **4.2: Presentation of results question-by-question**

### **4.2.1: Research Question 1: What is the level of awareness of students of University of Education, Winneba about food labels?**

To answer this research question, eight (8) statements were presented to the respondents in a likert scale. The frequency distributions and percentages of the opinions expressed by the respondents were calculated and used for answering the question. The statements sought to address issue about the level of awareness of the respondents about food labels. Table 3 shows the frequency and percentages, as well as the mean and standard deviation of the responses to items 1 to 8, which sought to find out the respondents' level of awareness of nutritional information on food labels. From the analysis, it emerged that 312 (90.6%) of the respondents agreed that packaged food labels have nutritional information. Also, 16 (4.7%) indicated that they neither agreed nor disagreed with the statement, while another 16 (4.7%) disagreed completely. Again, 160 (46.5%) of the respondents reported that they agreed with the assertion that nutritional information is always truthful, while 112 (32.6%) disagreed. The remaining 72 (20.9%) neither agreed nor disagreed with the statement.

**Table3: Level of awareness of nutritional information on food labels (n=344)**

Statement	Agree F (%)	NAD F (%)	Disagree F (%)	Mean (SD)	Interpretation
Pre-packaged food labels have nutritional information.	312 (90.6%)	16 (4.7%)	16 (4.7%)	4.16 (0.806)	Agree
Nutritional information is always truthful.	160 (46.5%)	72 (20.9%)	112 (32.6%)	3.26 (1.038)	NAD
Nutritional information on food labels guide me in making food choices.	232 (67.4%)	32 (9.3%)	80 (23.3%)	3.56 (1.228)	Agree
All food labels include expiry date.	168 (48.8%)	48 (14.0%)	128 (37.2%)	3.26 (1.333)	NAD
Food labels state the ingredients used and the method for preparation.	248 (72.1%)	72 (20.9%)	24 (7.0%)	3.81 (0.786)	Agree
Food labels have caution statements written on the package.	240 (69.8%)	64 (18.6%)	40 (11.6%)	3.77 (0.962)	Agree
Food labels indicate the nutritional facts (calories levels, fats, protein content, vitamins, etc.).	304 (88.4%)	24 (7.0%)	16 (4.7%)	4.14 (0.735)	Agree
I understand the caution statements written on food labels.	208 (60.5%)	96 (27.9%)	40 (11.6%)	3.60 (0.920)	Agree

**Source:** Result of SPSS Analysis (2018).

**Key:** F = Frequency, % = Percentage, SD = Standard Deviation, NAD = Neither Agree nor Disagree.

The respondents' views about this statement appear to be a reflection of the situation on the ground, since the Food and Drugs Authority of Ghana insists that all packaged foods must have food labels. It is worthy to note that the display of nutritional information on pre-packaged foods is mandatory in most countries. For instance, in the USA and Canada, pre-packaged foods are mandated to carry a nutrition label (Campos *et al.*, 2010; Health Canada, 2010; Government of Canada, 2002; US Food and Drug Administration, 1994). These mandatory regulations are perhaps the reasons for which many food products imported into Ghana have food labels displayed on them, as confirmed by the findings in this study.

Also, with respect to respondents' views on whether nutritional information is always truthful, not all people have trust in the veracity of the nutritional information. This is clear from the result of this study, which showed that at least more than fifty percent (53.5%) of the respondents did not accept emphatically that nutritional information is always truthful. Similar studies by several researchers have concluded that nutritional information is not always accurate. These studies include those of Freuman (2012), who noted that nutrition facts labels are not always factual and the United States Government Accountability Office (2008), which found out that about 90.0% of 300 nutrition fact labels that were audited were unacceptably inaccurate with the information they provided to consumers.

Again, the outcome further supported the reports by other researchers who found out that nutritional information was not always accurate. For instance, Urban, McCrory, Dallal, Das, Saltzman, Weber *et al.* (2011) reported that there was substantial inaccuracy for some individual restaurant foods, with understated energy

contents for those with lower energy contents. Also, Reinagel (2011) stated that food labels usually underestimate the calorie counts far more often than they overestimate them. The point to make out of these results is that the stated nutritional information on food labels is not entirely accurate, as several empirical studies have provided evidence for. It is therefore imperative for consumers to take note and make food choices by referring to food labels more advisedly.

Furthermore, when the respondents were asked whether nutritional information on food labels guided them in making food choices, majority of them 232, representing 67.4% agreed that their food choices were guided by the nutritional information. Of the remaining 112, 80(23.3%) of them disagreed, while 32 respondents, representing 9.3% neither agreed nor disagreed with the statement. The outcome pointed to the fact that majority of the respondents relied on and benefited from nutritional information on food labels, agreeing with the findings of Bazhan, Mirghotbi and Amiri (2015), which also found out that 82.8% of participants claimed to look at food label information when purchasing food products.

Also, Ollberding, Wolf and Contento (2010) indicated in their survey report that about two-thirds of their respondents claimed to use information on food labels to make purchasing decisions. The outcome of this current study appeared to be so because the respondents are university students who can read and write. The result of this study is consistent with the outcomes of several studies (Mahgoub, Lesoli & Gobotswang, 2007; Drichoutis *et al.*, 2005; Satia, Galanko & Neuhouser, 2005), which noted that nutritional information search and use is positively correlated with education,

implying that persons with higher education backgrounds are more likely to read food labels than those with lower education backgrounds.

For item 3, which sought to find out respondents' views on whether all food labels included expiry dates, it was revealed that not all the respondents agreed to the statement. Out of the 344 respondents, 168 (48.8%) agreed to the statement. Another 128 (37.2%) disagreed with the assertion, while the remaining 48 (14.0%) were neither in agreement nor disagreement with the statement. This result suggested that majority of the respondents did not believe that food labels displayed expiry dates. It is interesting to note that respondents had divergent views on the presence of expiry dates on food labels, since the Food and Drugs Authority of Ghana and other organizations and agency hold that food processing companies should display expiry dates on food labels.

Meanwhile, 72.1% of the respondents stated that food labels state the ingredients used and the method for preparation, while 7.0% of them indicated that they disagreed with the claim that food labels state the ingredients used and the method for preparation. The remaining 20.9% neither agreed nor disagreed with the assertion. The result suggested that majority of the respondents were of the view that indeed food labels provide information about the ingredients used and the method of preparing packaged foods. This finding agrees with that of Bonsmann and Wills (2012) who revealed that most pre-packaged food labels give details of the list of ingredients used in the preparation of the food. Also, the outcome suggested that pre-packaged food processors and importers adhere to the dictates of the Food and Drugs Authority and other international agencies like the California Department of Public Health (2013)



who direct that all packaged foods composed of two or more ingredients must include an ingredient list which is legible and correctly listed by their common or usual names (e.g., sugar instead of sucrose).

Further, most of the respondents, 240, making 69.8%, claimed that food labels have caution or warning statements written on the packages. Of the remaining 30.2%, 11.6% stated that they disagreed with the statement that food labels have caution statements, while 18.6% neither agreed nor disagreed with the claim. This outcome pointed to the fact that the majority of the respondents agreed to the statement and further suggested that food processors and importers adhere to guidelines concerning the provision of caution or warning statements on food labels. The findings of this study corroborated those of other researchers (Barnett, Leftwich, Muncer, Grimshaw, Shepherd, Raats *et. al.*, 2011; Pieretti, Chung, Pacenza, Slotkin & Sicherer, 2009; van Hengel, 2007) who have showed that food labels display caution statements about allergies and other possible side effects. It is important to note that caution statements such as allergies and negative side effects are very important details of food labels because it is the lifeline to ensure the safety of consumers who are food allergy sufferers.

On the claim that food labels indicate the nutritional facts (such as calories levels, fats, protein content, vitamins, etc.), the analysis revealed that 304 (88.4%) of the respondents gave an affirmative response, while 16, representing 4.7% and 24 (7.0%) disagreed and neither agreed nor disagreed respectively to the statement. This showed that majority of the respondents frequently checked nutritional information on food labels, as indicated by 90.6% of the studies respondents who noted that pre-packaged

foods labels have nutritional information. Finally, the respondents were asked whether they understood the caution statements written on food labels. Out of the 344 respondents, 208 (60.5%) indicated their agreement to the fact that they understood caution statements on food labels. Forty (11.6%) also stated that they do not understand such caution statements, while the remaining 96 (27.9%) neither agreed nor disagreed with the statement.

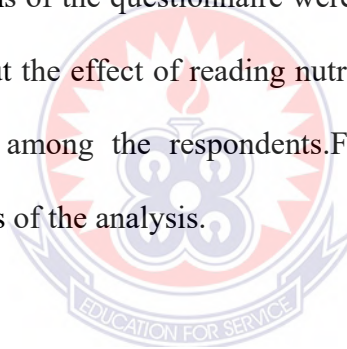
This outcome agrees with the findings of Robinson, Viscusi and Zeckhauser (2016), who stated that warning or caution statements on food labels do not convey sufficient information for individuals to balance the risks and benefits. They further noted that the situation is because the present systems of providing caution or warnings on food labels fails at distinguishing between large and small risks. Also, NFO Donovan Research (2003) reported their survey undertaken in New Zealand and Australia, which revealed about 56.0% of consumers, did not understand caution statements such as “use by” date. The study authors noted substantial concern at this finding, given the fact that ‘date marks’ were the most commonly identified and used food label element (Quigley & Watts Ltd., 2014).

It is important to state that caution statements must be displayed on food labels regardless of whether consumers understand them or not. Leung (2011) noted that the caution or warnings on food labels is very useful because it would help further educate people about the importance of dietary habits; and is essential for making sure that they can adopt a healthier lifestyle by eating well. Overall, the results of the analysis of the responses to research question one revealed that there was a high level of agreement (68.0%) to the statements that sought to answer the question of the level

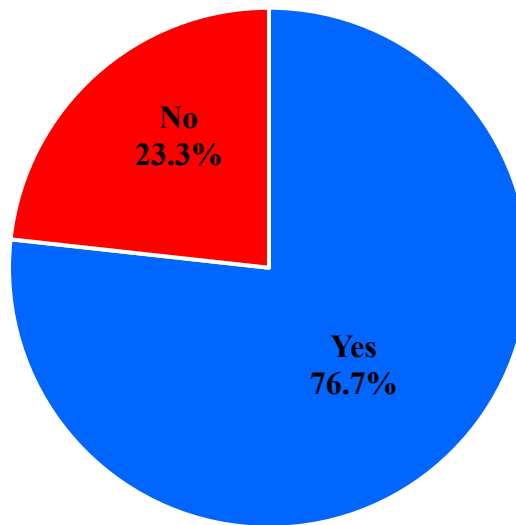
of awareness of food labels. It was also observed that 16.6% and 15.4% of the responses corresponded to disagree and neither agree nor disagree respectively. This suggested that the respondents are very informed and knowledgeable about food labels and nutritional information.

#### **4.2.2: Research Question 2: What is the effect of reading nutritional information on food labels on choice of food among students of the University of Education, Winneba?**

In answering research question 2, frequency and percentages of the respondents' views on eleven (11) items of the questionnaire were generated and used. These items were aimed at finding out the effect of reading nutritional information on food labels on the choice of food among the respondents. Figures 2–13 provides a graphic presentation of the results of the analysis.

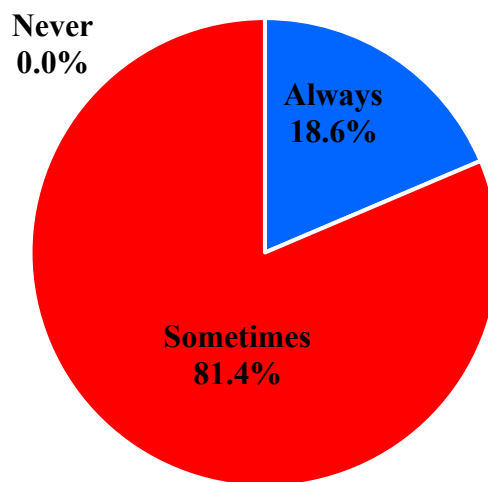


The respondents of the study were asked whether they check the information on food labels before purchasing. The results obtained showed that out of the 344 respondents, 264, which represented 76.7% indicated that they checked information on food labels before purchasing, while 80 (23.3%) noted that they did not (see Figure 2).



**Figure 2: Checking/Reading Food labels before purchasing**

It is evident from the Figure 2 above that, majority of the respondents noted that they checked food labels before purchasing. This gives an indication that the respondents knew about the existence of food labels on pre-packaged, as indicated earlier by 90.6% of the studies respondents who noted that they are aware of food labels on pre-packaged food products. Similarly, respondents were asked about how often they checked the information on food labels. The result of the analysis indicated that 64 respondents (18.6%) always checked information on food labels, while 280 (81.4%) noted that they checked information on food labels only sometimes. None of the respondents reported never checking information on food labels. Figure 3 shows a graphical presented of the results.

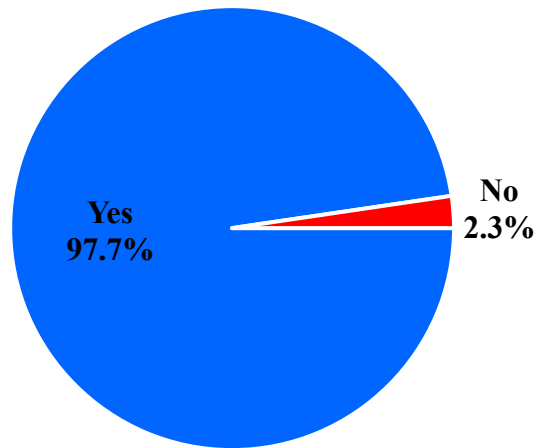


**Figure 3: Frequency of checking food label information before purchase.**

The results, as presented in Figure 3 above, suggested that majority of respondents sometimes referred to information on food labels. This outcome agrees with the findings of the Food Safety Authority of Ireland (2009) and Borra (2006) which found out that majority of consumers checked the information on food labels, even though they do not always do so. Borra (2006) cited the survey by the Food Marketing Institute (2004), which reported that most consumers (83.0%) always or sometimes check the nutrition facts panel when buying foods for the first time. Also, the Food Safety Authority of Ireland (2009) found out that 29% of the respondents in their survey reported that they sometimes consulted food labels when purchasing food products. It is important to note that all the respondents indicated that they read nutritional information on food labels before purchasing food products.

Furthermore, respondents were asked whether they thought it was important to read nutritional information on food labels before purchasing. The result showed that

whereas 336 (97.7%) thought it was important, the remaining eight (2.3%) did not think it was important. Figure 4 below gives a graphical presentation of the result.

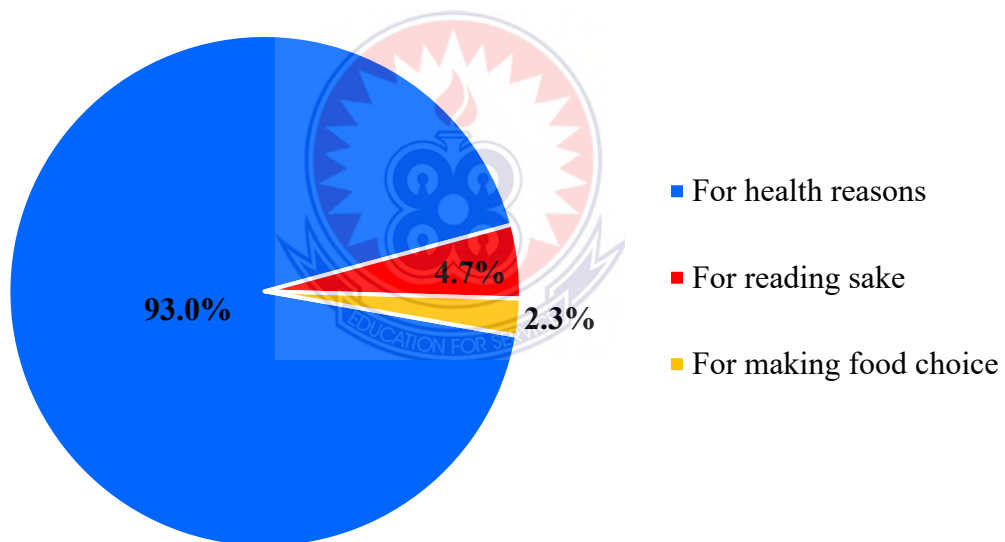


**Figure 4: Importance of reading nutritional labels before purchase.**

Figure 4 above shows that almost all the respondents (97.7%) were of the view that it is important to read nutritional information on food labels before purchasing. This suggested that most of the respondents have a positive perception about the importance of nutritional information on food labels. The outcome of this study is in conformity with those of other studies, which have highlighted the importance of food labels. One such study is that of Dutta and Patel (2017), which stated that food label information is important to the extent that it assists consumers to better understand the nutritional value of food and enables them to compare the nutritional values of similar food products and to make healthy informed food choices based on the relevant nutrition information. Again, it is imperative to note that the demography of the respondents in this study may have played a significant role in the result, considering that the respondents are university students, whose education may have influenced their viewpoints. This observation is consistent with Aidoo's (2016) view that as

education level increased, nutrition information became more important to consumers, especially to those in tertiary education levels.

Next, the respondents were asked about why they would read nutritional information on food labels before purchasing. Out of the 344 respondents, 320 (93.0%) indicated that they would read nutritional information for health reasons. Also, 16 (4.7%) noted that they would read for reading sake, while the remaining eight (2.3%) stated that they would read for making food choices (see Figure 5).

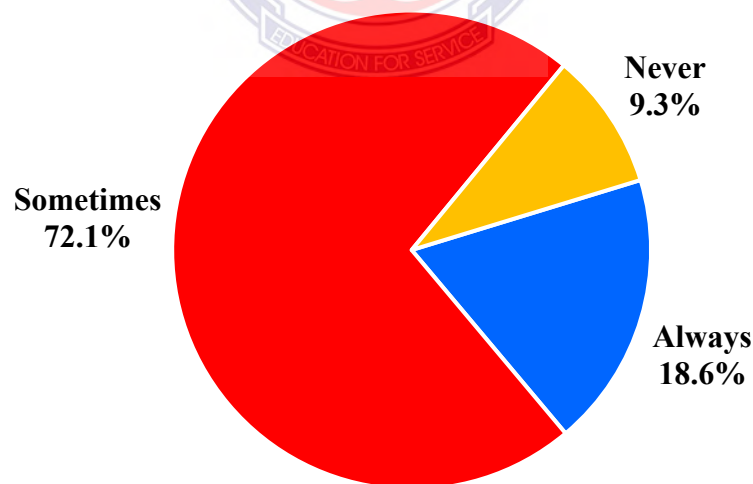


**Figure 5: Reasons for reading nutritional information on food labels.**

A review of Figure 5 shows that majority of the respondents read nutritional information for health reasons. This is evidence of the fact that many of the respondents are conscious of their health and therefore take measures to ensure that their purchase and consumption of pre-packaged food products is based on nutritional information. Because food labels provide a source of health-related information

(Annunziata & Vecchio, 2012), consumers rely on it help them choose more healthful foods (Banterle & Cavaliere, 2009). Also, the result of this study is consistent with the report by the Food Safety Authority of Ireland (2009), which stated that more than six in ten people are now concerned about healthy eating, which may explain why looking for nutrient information and calorie content are now top of the list of reasons for consulting food labels.

Still further, respondents responded to the question about how often they make food choices based on the nutritional information. The outcome showed that 312 (90.7%) of the respondents make food choices based on nutritional information either always (18.6%) or sometimes (72.1%). The remaining 32 (9.3%) never chose a particular food product based on nutritional information. Figure 6 shows a graphical presentation of this result.

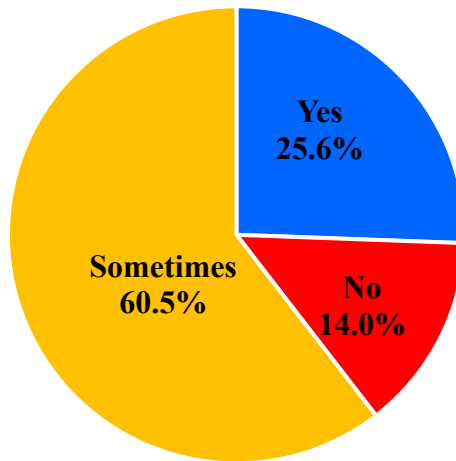


**Figure 6: Frequency of making food choices based on the nutritional information.**



Figure 6 shows that less than 10.0% of the respondents indicated that they have never used nutritional information as a basis for their food choices. This result gives credence to the work of Dalrymple (2014) which reported that although there was a high level of awareness of nutritional information by consumers, not all of them used it in making food choices. Perhaps, there are other factors that inform food choices by consumers, apart from nutritional information. Also, it emerged that more than 90.0% of the respondents used nutritional information for making food choices. This outcome agrees with the study by Saha *et al.*, (2014) which noted that many respondents use nutritional information for making food choices. From the results of their study, it can be deduced that majority of the respondents were of the opinion that food labels are useful for making food choices as a result of the fact that the respondents were students.

Following from this observation that majority of the respondents were of the opinion that food labels are useful for making food choices, they were asked whether they purchase pre-packaged foods that do not have food labels. The responses to the question is presented in Figure 7.

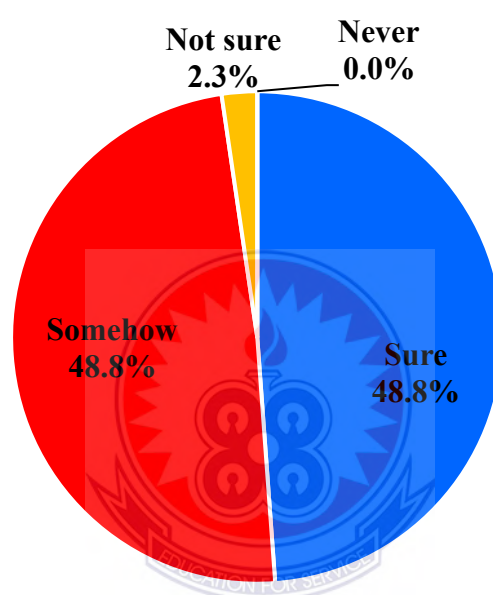


**Figure 7: Purchase of packaged foods without food labels.**

From the analysis, it was found out that 88 (25.6%) of the respondents purchased packaged foods that did not have food labels. Also, 208, representing 60.5% of the respondents indicated that they sometimes purchased packaged foods, which did not have food labels, while the remaining 48 (14.0%) noted that they never purchased any packaged food products, which did not have a label. This outcome suggested that already the respondents were aware of the importance and usefulness of food labels, majority of them (86.0%) actually sometimes or always purchased packaged food products that did not have a label. This finding is contrary to the findings of Aschemann-Witzel and Hamm (2010) and Verbeke, Scholderer and Lahteenmaki (2009), which concluded that consumers preferred food products with labels that contained health-related claims to those without such information or claims.

Furthermore, the respondents were asked to indicate which food products among cassava, kontomire, fresh tomatoes and Indomie noodles, must have a nutritional food label before they would purchase them. After the analysis of the result, it was found out that all the respondents (100.0%) indicated that the Indomie noodles must have a

label before they would purchase it. This outcome confirmed the fact that the respondents actually had knowledge and awareness of food labels and also that they knew which food products are expected to have such a label before it is deemed good for purchasing and consumption. Again, respondents were asked if they believed that nutritional information on food labels could help them make a good choice of food. The result is presented in Figure 8.

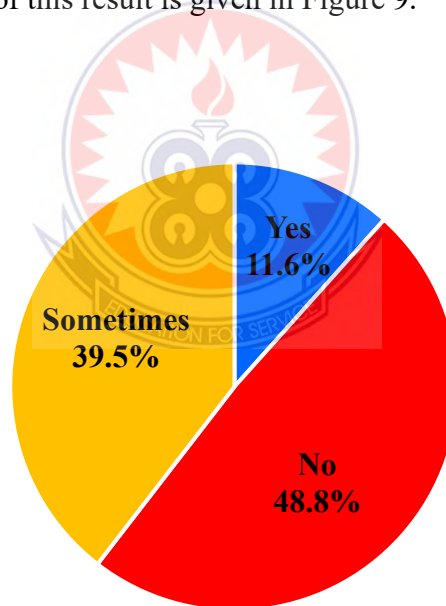


**Figure 8: Nutritional information helps in making good food choice.**

From Figure 8, it is clear that 168 (48.8%) of the respondents surely believed that nutritional information on food labels can be of help to them in making good food choices. Another 168 (48.8%) of the respondents stated that they somehow believed what they read can help in choosing food, while 8 (2.3%) stated that they were not sure about the reliance on food labels in making good food choices. The result showed that almost all the respondents (97.6%) believed somehow or surely that food labels are helpful for making good food choices. This outcome gives support to views of Christoph, Ellison and Meador (2016) and Azman and Sahak (2014), which stated that

food labels are valuable tools that can help consumers make informed decisions about their diet and lifestyle. It also confirms the opinion of Banterle and Cavaliere(2009), that nutrition labels are intended to help consumers choose more healthful foods.

The next item presented to the respondents was about whether they felt irritated when reading nutritional information on food labels. After analyzing the result, it was found out that 40 (11.6%) of the respondents indicated that they feel irritated when reading nutritional information. Another 168 (48.8%) respondents however noted that they do not feel irritated reading nutritional information, while 136 (39.5%) stated that they sometimes feel irritated too, when reading nutritional information on food labels. The graphical presentation of this result is given in Figure 9.

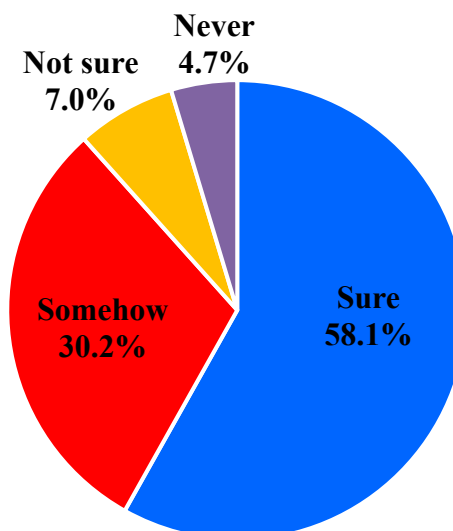


**Figure 9: Nutritional information on food labels is irritating to read.**

The result as presented in Figure 9 showed that about a half of the respondents (51.2%) reported feeling irritated about reading nutritional information either sometimes or always. This outcome is in support of Kim and Kim's (2009) study which noted that some consumers reported becoming annoyed or feeling irritated

when reading nutritional information on food labels, due to some challenges they encountered, including the use of confusing terminology or language and the amount of time it took to read the food labels. It can be deduced from the outcome that the irritation or annoyance that arises as a result of reading nutritional information is likely to deter consumers from reading further and possibly have a negative impact on the importance attached to food labels by consumers. Again, it is obvious; from the result that when food labels are presented in a concise and clear format, with no difficulties posed to consumers during reading, the issue about feeling irritated when reading such valuable nutritional information may not arise.

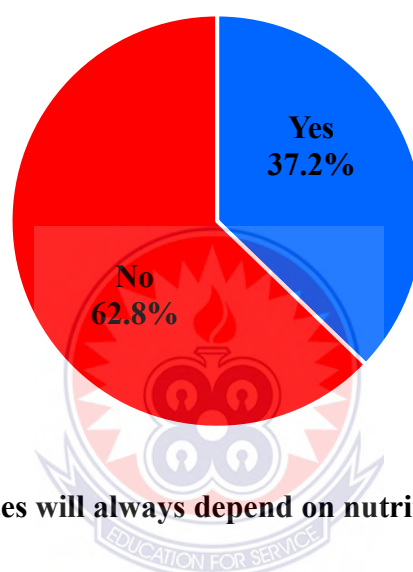
Also, respondents were asked whether they thought nutritional information can help them acquire in-depth knowledge about food products. Out of the 344 respondents, 200 (58.1%) stated that they surely thought that nutritional information could help them get in-depth knowledge about food products. Also, 104 (30.2%) indicated that they somehow believed that they can also benefit from nutritional information, as far as knowledge about food products are concerned. Twenty-four (7.0%) respondents however stated that they were not sure they could get in-depth knowledge about food products from reading nutritional information, while the remaining 16 (4.7%) categorically stated that they never think nutritional information can help them acquire knowledge about food products. Figure 10 gives a pictorial presented of the results.



**Figure 10: Nutritional information helps in acquiring in-depth knowledge about food products.**

From Figure 10, it is evident that majority of the respondents were of the view that the use of nutritional information can help them acquire in-depth knowledge about the food product. This outcome supports several studies which reported that food labels are a major source of knowledge about food products. These studies include that of Katarzyna *et al*, (2010), which found that though consumers relied heavily on the mass media for knowledge on food, they maintained that food labels were the most important and broad-based source of knowledge on foods. Also, Pletzke, Henry, Ozier and Umoren (2010) reported that participants of an experimental study they conducted noted a significant improvement on their use of nutritional labels, as well as feeling more knowledgeable and confident about food products. It is obvious therefore, that the consumers' use of nutritional information leads to the acquisition of in-depth knowledge about food products.

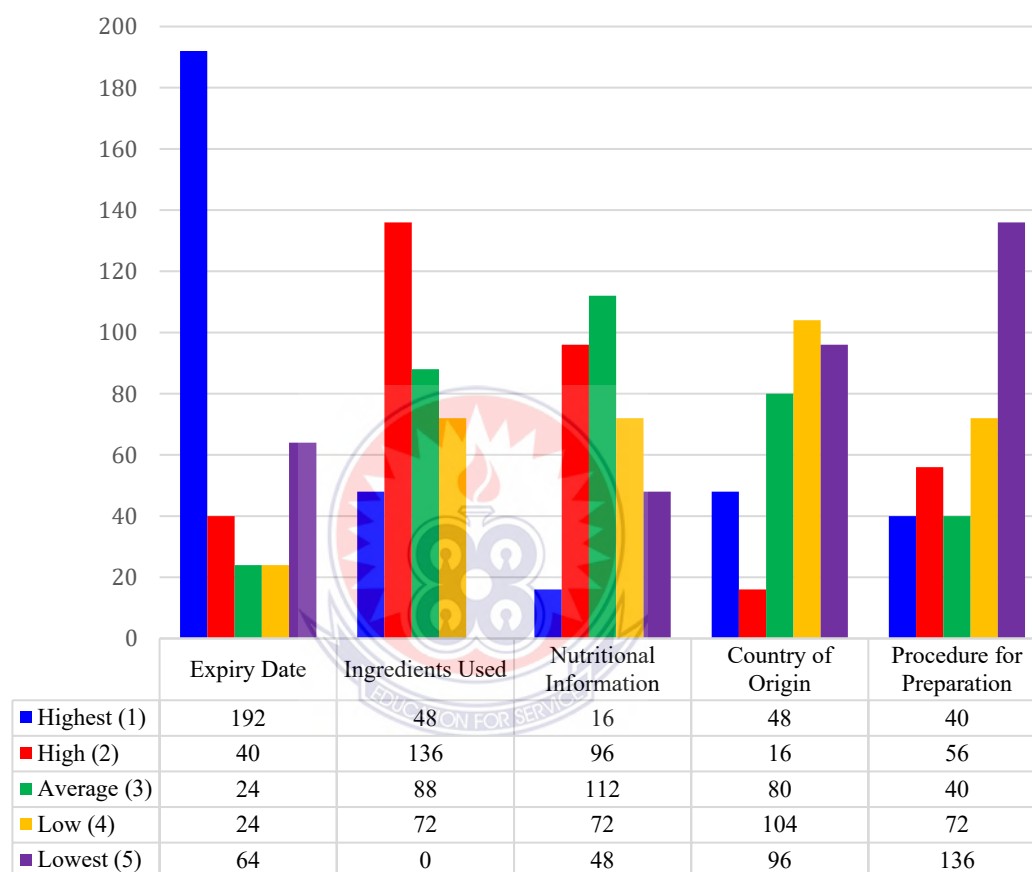
Again, the opinion of the respondents was sought on whether they would always depend on nutritional information to make their food choices. The responses obtained showed that 128, representing 37.2% stated that they will always depend on nutritional information to make food choices, while 216 (62.8%) respondents indicated that they will not always depend on nutritional information in making their food choices (see Figure 11).



**Figure 11: Food choices will always depend on nutritional information.**

From the result of the analysis, it can be inferred that majority of the respondents were not ready to always depend on nutritional information for their food choices. Perhaps the majority of the respondents (62.8%) may be giving an indication that they will refer to nutritional information on some occasions, but not always, as compared to the minority (37.2%) who stated that they will always rely on and make use of nutritional information for choices. However, this outcome is not in agreement with that of Gorton *et al.*, (2010) which reported that 72.0% of their respondents relied on nutritional information on food labels to make food choices, supporting the argument that consumers largely use nutritional information for making healthy food choices.

Again, the respondents were asked to rank, in order of importance, the expiry date, ingredients used, nutritional information, country of origin and the procedure for preparation of pre-packaged food products. The responses are shown in Figure 12.



**Figure 12: Order of importance of specific aspects of information on food labels.**

From the analysis of the data, it was observed that expiry date was the most important aspect of food labels to consumers. This was showed by majority of the respondents (192, representing 55.8%) who ranked expiry date as the highest most important aspect of food labels. Also, 40 (11.6%) respondents considered expiry date as second most important aspect of food labels, followed by 24 (7.0%) respondents each who viewed expiry date as third and fourth most important information respectively.



This result showed that many people relied on expiry dates for information about pre-packaged food products. Perhaps, majority of the respondents indicated that they considered expiry date as most important because it provided critical information to consumers, as noted by Shah, Guyan and Hu (2016) who described expiry date as an important piece of external information consumers search for while purchasing perishable grocery products as it provides information about the shelf life and freshness of perishable grocery products such as milk, bread, eggs, meat, or packaged vegetables.

Tsiros and Heilman (2005) also noted that consumers use expiry dates to reduce the uncertainty and risk of purchasing a stale and denigrated quality food product that could negatively impact their health and safety. It is likely that expiry dates are considered the most important aspect of food labels because it provides critical information that can help consumers to make healthy food choices. However, 64 (18.6%) respondents indicated that they considered expiry date as the least important information on food labels. The result suggested that nearly one-fifth of the respondents did not consider the expiry date as the most important piece of information on food labels. This outcome is inconsistent with the study conducted by Newsome, Balestrini, Baum, Corby, Fisher, Goodburn *et al.* (2014), which stated that many people placed heavier reliance on expiration dates.

Also, the ingredients used in producing pre-packaged foods were ranked as the second most important piece of information on food labels. This result came from 136 (39.5%) respondents, followed by 88 (25.6%) who ranked the ingredient list as being

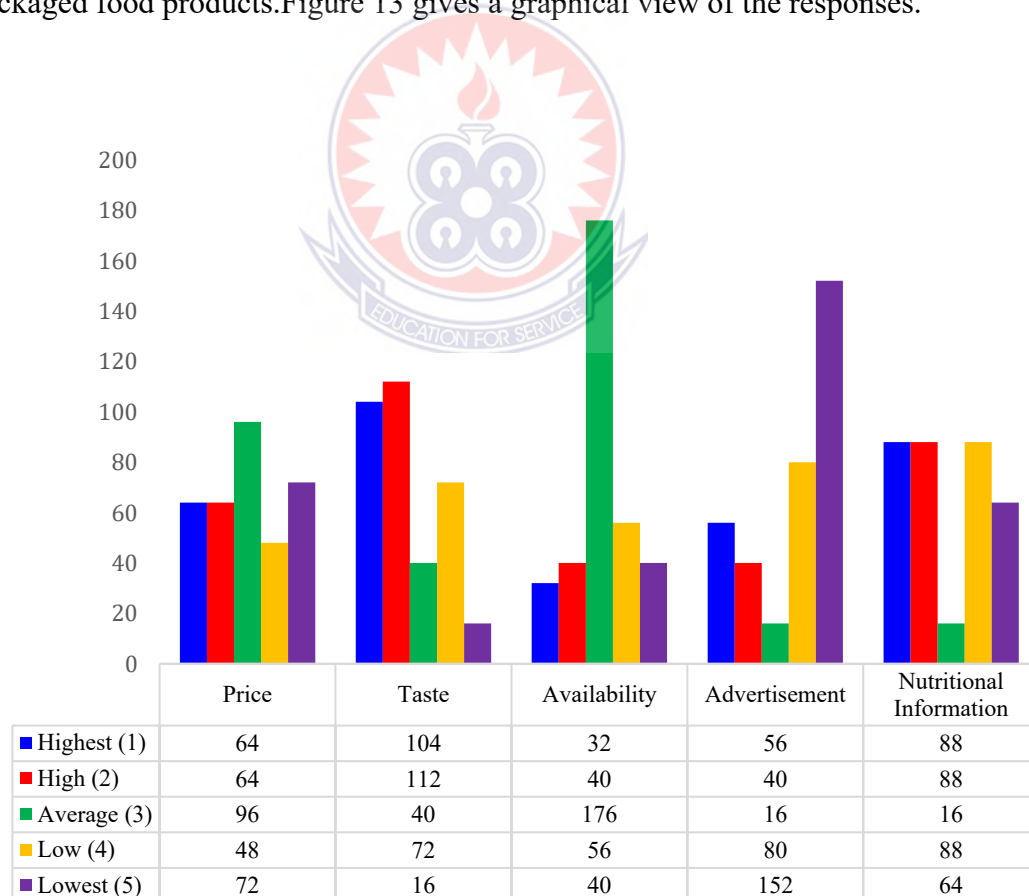
third most important and 72(20.9%) respondents indicating that ingredients were fourth on the order of importance. Only 48 (14.0%) respondents considered the ingredient list as the top most important aspect of food labels. Similarly, nutritional information was placed third by majority of the respondents (112, representing 32.6%), while 96 (27.9%) respondents ranked nutrition information as the second most important aspect of food labels.

Again, 72 (20.9%) respondents considered nutritional information as fourth most important information on food labels, whereas 48 (14.0%) respondents noted that it was the least important aspect of food labels. It is important to note that only 16 (4.7%) respondents stated that nutritional information was the most important aspect of food labels. This result gave some proof to the finding of Graham and Jeffery's (2011) study which reported that only 9.0% of their study participants actually viewed the nutritional fact panel during a food purchasing task, despite 33.0% of the participants self-reporting that they almost always referred to the nutritional fact panel when buying food from shops.

Furthermore, country of origin was ranked as fourth most important aspect of food labels by the majority of the respondents (104, representing 30.2%), while 136 (39.5%) respondents noted that the procedure for preparation was the least important aspect of food labels. This outcome appeared to suggest that many consumers do not really view the country of origin of pre-packaged foods as a very important factor to consider before purchasing. This finding clearly contradicted several other studies (Degoma&Shetemam, 2014; Javed, 2013; Gudero, 2009; Ghani, Salaria, Farzand& Jan, 2007; Yasin, Noor&Mohamad, 2007; Gurhan-Canli&Maheswaran, 2000) which reported that country of origin is a major factor consumers consider in appraising and

evaluating the quality of products for purchasing decisions. Yunus and Rashid (2016) also indicated a significant and highly correlated relationship between country image and purchase intention ( $r = 0.727, p < 0.01$ ). Therefore, the result of this study, which placed country of origin of pre-packaged food products at fourth most important information consumers consider, appeared to have been influenced by the nature or kinds of pre-packaged food products, or prior knowledge and perceptions about the sources of the products the respondents of this study usually purchased.

Similarly, the respondents were asked to indicate the order of impact of the price, taste, availability, advertisement and nutritional information, in purchasing pre-packaged food products. Figure 13 gives a graphical view of the responses.



**Figure 13: Order of impact of specific factors that influence the purchasing of pre-packaged foods.**

According to the results, majority of the respondents (104, representing 30.2%) noted that the taste of the food product had the most impact on their purchasing decision. Another 112 (32.6%) considered taste as the second most impactful factor in purchasing food products. This outcome suggested that majority of the respondents are likely to purchase products that they have tasted in the past before and also appears to have been influenced by the age (95.3% below age 35) of the respondents in this study. This assertion confirmed the finding of Roininen, Lahteenmaki and Tuorila (1999), which stated that young people are more interested in taste of food products, at the expense of health, than older consumers.

Next to taste, 176 (51.2%) of the respondents indicated that the availability of a product has a huge impact of their decision to purchase, while 88 (25.6%) respondents opined that nutritional information impacted their purchasing decision most. Also, it emerged from the analysis that advertisement had the least impact of purchasing decision of consumers. This was revealed by 152 (44.2%) of the respondents. The outcome of the study suggested that even though advertisement has been noted as a major factor that influences consumers' decision to purchase food products (Pabalkar & Balgaonkar, 2014; Essays UK, 2013; Haroon, Qureshi, Zia-ur-Rehman & Nisar, 2011), it did not play a major role in the purchasing decision of this study's respondents. Perhaps advertisement did not have a significant influence on the respondents because majority of them were adults, who have the ability to decide on what to purchase instead of relying on advertisements. This agreed with Fleming, Thorson and Atkin (2010) who found out that although advertising was influential in shaping young people's attitudes and perceptions, the effects of advertising on intentions to consume was not evident among those between 21 and 29 years.

In general, the responses to the statements under research question two pointed out that the respondents were informed and quite knowledgeable about the effects of reading nutritional information on food labels.

#### **4.2.3: Research Question 3: What are the difficulties students encounter with nutritional information on food labels?**

Research question 3 was concerned with the difficulties students encountered in reading and understanding the nutritional information on food labels. Items 27–33 of the questionnaire were used to answer this research question.

From the responses that emerged, it was observed that majority of the respondents (55.8%) indicated that they always understand nutritional information on food labels. However, 120 of the respondents, representing 34.9%, stated their disagreement to the statement about always understanding nutritional information on food labels. Finally, the remaining 32 (9.3%) respondents neither agreed nor disagreed to the statement. Also, 152 (44.2%) of the respondents revealed that they agreed to the statement that the font style (style of the writings) of nutritional information on food labels sometimes made reading understandable, while 128 (37.2%) disagreed with statement. The other 64 (18.6%) respondents also neither agreed nor disagreed with the statement.

This outcome showed a slight balance between the numbers of respondents who agreed absolutely that the font style used in writing nutritional information on food

labels sometimes made reading understandable and those who disagreed totally. The observation that font style affects the reading and understanding of text, as noted by some respondents (37.2%) is supported in literature by studies which concluded that font style affects the readability of text (Hojjati&Muniandy, 2014; Amdur, 2007; Peck, 2003).It is therefore important for food label designers to consider the use of serif fonts (like Times New Roman, Courier and Helvetica) which are more legible because their serifs add more information to the readers' eyes and enhance the legibility of the text by helping the readers to distinguish the letters and words more easily (McCarty &Mothersburgh, 2002).

With regards to whether the font size (size of the writings) of nutritional information on food labels sometimes made it difficult to read food labels, 280(81.4%) agreed, 24, representing 7.0% neither agreed nor disagreed and the remaining 40 (11.6%) also disagreed. This result suggested that majority of the respondents actually had some difficulties in reading nutritional information on food labels due to the size of the fonts used. The finding is consistent with the result of a study conducted by Cowburn and Stockley (2005) which revealed that the use of smaller font sizes in writing nutritional information on food labels serves as a barrier for many consumers, especially older persons, in their attempt to read nutritional information. Also, this outcome is consistent with the worksof Affram and Darkwa (2015), Samson (2012), as well as Jacobs, de Beer andLarney (2011), whichallrevealed that the difficulties consumers encountered in reading food labels included small font sizes. It is obvious that the use bigger font sizes would be a great way of getting consumers to easily read food labels, as has been noted by Mannellet. *al.* (2006).

Conceivably, the small size of the font is because there are many details that must be displayed on the food labels, which are already designed, based on the size of the package. This implies that the bigger the package size, the higher the likelihood of having enough space for all the information that must be shown on the package. Notwithstanding this apparent challenge, designers of food labels must ensure that very important information, such as nutritional information are written legibly for the consuming public to be able to read without any difficulties.

Additionally, respondents were asked to indicate whether the language (English, French, Chinese, etc.) used in writing the information on food labels was always understandable to them. From the analysis, it emerged that there was a fair balance between the respondents who responded in the affirmative (152, representing 44.2%) and those who disagreed that they always understood the language used in writing information on food labels (152, representing 44.2%). The remaining 40 (11.6%) respondents again neither agreed nor disagreed to the statement.

This result slightly deviated from what has been reported in previous studies. Whereas this study found only 44.2% of respondents having difficulties understanding food labels written in languages other than the native language of the respondents, researchers including Aidoo (2016), Kim and Kim (2009) and Mannellet. *al.*, (2006) reported very high percentages (at least 70.0%) of their respondents having difficulties understanding food labels written in other languages. Perhaps, the fact that this study was conducted in a university where some students study foreign languages such as French, German and Spanish, may have played a major role in arriving at this result. Nonetheless, it is important that nutritional

information be written in the language that consumers will understand in order for them to make informed decision on their choice of food product for better diet and better health (Commeey, Frimpong & Hagan, 2014).





Again, respondents were asked whether they encountered difficulties in understanding

the technical terminologies, such as calories, serving size, daily intake, etc., that was written on food labels. Out of the 344 respondents, 256 of them, which represented 74.4% agreed to the statement, while 56 (16.3%) disagreed. The remaining 32 (9.3%) of the respondents neither agreed nor disagreed with the statement. This outcome suggested that majority of the respondents agreed that they had some difficulties in understanding the technical terminologies that are written on food labels and has corroborated several studies which reported similar findings. These include Annunziata and Vecchio (2012), Samson (2012) and Mannellet. *al.*, (2006), who all noted that the use of technical language presented difficulties to consumers when reading food labels.

Furthermore, the study sought information about whether the colour of the packages of pre-packaged food labels made reading more appealing. It emerged from the analysis that majority of the respondents (240, representing 69.8%) responded in the affirmative. Also, 24 (7.0%) respondents disagreed with the statement, while the remaining 80 (23.3%) neither agreed nor disagreed. This result again suggested that the colour and design of most pre-packaged food labels were appealing to majority of the respondents. This may be an indication that designers of such food labels use colours that are appropriate and attractive to consumers, thereby generating the appealing effect that was noted by majority of the respondents. This outcome confirmed the views of Mannellet. *al.* (2006) that the use of different colours for designing food labels would help consumers in reading and understanding the information better.

Finally, the issue of whether the information on some food labels made it difficult for consumers to understand the usefulness of the products was examined. The analysis showed that 248 (72.1%) respondents, who were in the majority stated that some food labels contained information that made it difficult to appreciate the usefulness of some products. Whiles 48 (14.0%) respondents disagreed with the statement, another 48 (14.0%) respondents stated that they neither agree nor disagree with the statements. This suggested that from the consumers' point of view, not all the information on food labels were necessaryfor understanding the usefulness of the products.

In sum, the results of the analysis of the responses to research question three indicated that there was a high level of agreement to the statements that sought to answer the question about the difficulties encountered in reading and understanding nutritional information on food labels. This suggested that there are some difficulties that are encountered by consumers in reading and understanding nutritional information. Table 4 highlights the responses given to the items in research question three.

**Table 4: Difficulties encountered in reading and understanding nutritional information on food labels (n=344)**

<b>Statement</b>	<b>Agree F (%)</b>	<b>NAD F (%)</b>	<b>Disagree F (%)</b>	<b>Mean (SD)</b>	<b>Interpretation</b>
I always understand nutritional information on food labels.	192 (55.8%)	32 (9.3%)	120 (34.9%)	3.26 (1.185)	NAD
The font style of nutritional information on food labels sometimes makes reading understandable.	152 (44.2%)	64 (18.6%)	128 (37.2%)	3.12 (0.971)	NAD
The font size of nutritional information on food labels sometimes makes it difficult to read food labels.	280 (81.4%)	24 (7.0%)	40 (11.6%)	4.00 (0.916)	Agree
The language (English, French, Chinese, etc.) used in writing the information on food labels is always understandable.	152 (44.2%)	40 (11.6%)	152 (44.2%)	3.00 (1.259)	NAD
I have difficulties understanding the technical terms (calories, serving size, daily intake, etc.) on food labels	256 (74.4%)	32 (9.3%)	56 (16.3%)	3.95 (1.057)	Agree
The colour of the packaging makes reading more appealing.	240 (69.8%)	80 (23.3%)	24 (7.0%)	3.84 (0.835)	Agree
The information on some food labels makes it difficult to understand the usefulness of the product.	248 (72.1%)	48 (14.0%)	48 (14.0%)	3.63 (0.942)	Agree

**Source:**Field Data (2018).

**Key:**F = Frequency, % = Percentage, SD = Standard Deviation,  
NAD = Neither Agree nor Disagree.

Table 4 above shows the responses to items on the difficulties encountered by the respondents in reading and understanding nutritional information on food labels.

#### 4.2.3.1: Correlation analysis of students' level of awareness, effects and difficulties in reading nutritional information

Again, study sought to test the strength and direction of the relationship that exist between the variables that were studied in the research. These variables were the level of awareness of nutritional labels; the effect of reading food labels on choice of foods and the difficulties encountered in reading nutritional information on food labels. The Pearson correlation analysis was conducted for the purpose. Table 5 shows the output of the test.

**Table 5: Pearson correlation analysis for respondents' level of awareness, effects and difficulties in reading nutritional information.**

		Awareness	Effects	Difficulties
Awareness	Pearson Correlation	1	-.642**	.555**
	Sig. (2-tailed)		.000	.000
	N	344	344	344
Effects	Pearson Correlation	-.642**	1	-.502**
	Sig. (2-tailed)	.000		.000
	N	344	344	344
Difficulties	Pearson Correlation	.555**	-.502**	1
	Sig. (2-tailed)	.000	.000	
	N	344	344	344

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Source:** *Result of SPSS Analysis (2018)*

To assess the relationship between levels of awareness of nutritional labels and the effect of reading food labels on choice of foods, the Pearson correlation coefficient was computed. It emerged from the result that there was a negative correlation between the two variables, where  $r = -0.642$ ,  $N = 344$ ,  $p < 0.001$ . Also, the result indicated that there was a strong correlation between level of awareness of nutritional labels and the effect of reading food labels on choice of foods.

Again, the relationship between level of awareness of nutritional labels and the difficulties encountered in reading nutritional information on food labels was computed using the Pearson product-moment correlation coefficient. The outcome indicated a positive and strong correlation between the variables, with  $r=0.555$ ,  $N=344$ ,  $p<.001$ . Also, there was a positive correlation between the effect of reading food labels on choice of foods and the difficulties encountered in reading nutritional information on food labels. Furthermore, the correlation analysis showed that negative but strong correlation between the effect of reading food labels on choice of foods and the difficulties encountered in reading nutritional information on food labels ( $r=-0.502$ ,  $N=344$ ,  $p<0.001$ ). Overall, the analysis showed a strong correlation between the three variables.

#### **4.2.4: Research Question 4: To what extent does demography of students of the University of Education, Winneba influence their attitudes towards nutritional information?**

Research question four was focused on finding out the extent to which the demographic characteristics of the respondents influenced their attitudes towards nutritional information. To answer this research question, frequency, percentages, mean and standard deviation scores of the respondents' views on the statements in the questionnaire were generated and used. Specifically, data on the levels of awareness of nutritional information, as well as data on the difficulties encountered by respondents in reading nutritional information, were used for this purpose. The responses were categorized according to the gender of the respondents. Table 6 shows

the analysis of the effect of gender on the respondents' attitudes towards nutrition information, with respect to their level of awareness.

From the analysis, it was found out that majority of the respondents who agreed to all the statements under the level of awareness subtheme were male. Similarly, majority of respondents who disagreed to the majority of the statements were male. Again, the outcome suggested that gender plays a very important role in consumers attitudes towards nutritional information on food labels.



**Table 6: Effect of gender on attitude towards nutritional information (n=344)**

Statements	Gender	Agree F (%)	NAD F (%)	Disagree F (%)	Total F (%)
Pre-packaged food labels have nutritional information.	Male	208 (60.5%)	16 (4.6%)	8 (2.3%)	232 (67.4%)
	Female	104 (30.2%)	0 (0.0%)	8 (2.3%)	112 (32.6%)
	Total	312 (90.7%)	16 (4.7%)	16 (4.7%)	344 (100.0%)
Nutritional information is always truthful.	Male	104 (30.2%)	48 (14.0%)	80 (23.3%)	232 (67.4%)
	Female	56 (16.3%)	24 (6.9%)	32 (9.4%)	112 (32.6%)
	Total	160 (46.5%)	72 (20.9%)	112 (32.6%)	344 (100.0%)
Nutritional information on food labels guide me in making food choices.	Male	152 (44.2%)	16 (4.7%)	64 (18.6%)	232 (67.4%)
	Female	80 (23.2%)	16 (4.7%)	16 (4.7%)	112 (32.6%)
	Total	232 (67.4%)	32 (9.4%)	80 (23.2%)	344 (100.0%)
All food labels include expiry date.	Male	112 (32.6%)	32 (9.4%)	88 (25.6%)	232 (67.4%)
	Female	56 (16.3%)	16 (4.7%)	40 (11.6%)	112 (32.6%)
	Total	168 (48.8%)	48 (14.0%)	128 (37.2%)	344 (100.0%)
Food labels state the ingredients used and the method for preparation.	Male	160 (46.5%)	56 (16.3%)	16 (4.7%)	232 (67.4%)
	Female	88 (25.6%)	16 (4.7%)	8 (2.3%)	112 (32.6%)
	Total	248 (72.1%)	72 (20.9%)	24 (6.9%)	344 (100.0%)
Food labels have caution or warning statements written on the package.	Male	152 (44.2%)	48 (14.0%)	32 (9.4%)	232 (67.4%)
	Female	88 (25.6%)	16 (4.7%)	8 (2.3%)	112 (32.6%)
	Total	240 (69.8%)	64 (18.6%)	40 (11.6%)	344 (100.0%)
Food labels indicate the nutritional facts (calories levels, fats, protein content, vitamins, etc.).	Male	200 (58.1%)	16 (4.7%)	16 (4.7%)	232 (67.4%)
	Female	104 (30.2%)	8 (2.3%)	0 (0.0%)	112 (32.6%)
	Total	304 (88.3%)	24 (6.9%)	16 (4.7%)	344 (100.0%)
I understand the caution or warning statements written on food labels.	Male	168 (48.8%)	56 (16.3%)	8 (2.3%)	232 (67.4%)
	Female	40 (11.6%)	40 (11.6%)	32 (9.4%)	112 (32.6%)
	Total	208 (60.4%)	96 (28.0%)	40 (11.6%)	344 (100.0%)

**Source:** Result of SPSS Analysis (2018).

**Key:**F = Frequency, % = Percentage, NAD = Neither Agree nor Disagree.

Furthermore, responses to statements about the difficulties respondents encounter in reading nutritional information was used to determine the influence of gender on attitudes towards nutritional information. The responses are presented in Table 7 below.

**Table 7: Effect of gender on difficulties respondents encounter in reading nutritional information (n=344)**

Statements	Gender	Agree F (%)	NAD F (%)	Disagree F (%)	Total F (%)
I always understand nutritional information on food labels.	Male	128 (37.2%)	32 (9.4%)	72 (20.8%)	232 (67.4%)
	Female	64 (18.6%)	0 (0.0%)	48 (14.0%)	112 (32.6%)
	Total	192 (55.8%)	32 (9.4%)	120 (34.9%)	344 (100.0%)
The font style sometimes make reading understandable.	Male	96 (28.0%)	56 (16.3%)	80 (23.2%)	232 (67.4%)
	Female	56 (16.3%)	8 (2.3%)	48 (14.0%)	112 (32.6%)
	Total	152 (44.2%)	64 (18.6%)	128 (37.2%)	344 (100.0%)
The font size sometimes makes it difficult to read food labels	Male	176 (51.2%)	16 (4.7%)	40 (11.6%)	232 (67.4%)
	Female	104 (30.3%)	8 (2.3%)	0 (0.0%)	112 (32.6%)
	Total	280 (81.5%)	24 (6.9%)	40 (11.6%)	344 (100.0%)
The language used in writing the information on food labels is always understandable.	Male	96 (27.9%)	16 (4.7%)	120 (34.8%)	232 (67.4%)
	Female	56 (16.3%)	24 (6.9%)	32 (9.4%)	112 (32.6%)
	Total	256 (74.4%)	40 (11.6%)	152 (44.2%)	344 (100.0%)
I have difficulties understanding the technical terms (calories, serving size, daily intake, etc.) on food labels	Male	176 (51.2%)	16 (4.7%)	40 (11.6%)	232 (67.4%)
	Female	80 (23.2%)	16 (4.7%)	16 (4.7%)	112 (32.6%)
	Total	256 (74.4%)	56 (16.3%)	56 (16.3%)	344 (100.0%)
The colour of the packaging makes reading more appealing.	Male	176 (51.2%)	32 (9.4%)	24 (6.9%)	232 (67.4%)
	Female	64 (18.6%)	48 (14.0%)	0 (0.0%)	112 (32.6%)
	Total	240 (69.8%)	80 (23.2%)	24 (6.9%)	344 (100.0%)
The information on some food labels makes it difficult to understand the usefulness of the product.	Male	176 (51.2%)	32 (9.4%)	24 (6.9%)	232 (67.4%)
	Female	72 (20.9%)	16 (4.7%)	24 (6.9%)	112 (32.6%)
	Total	248 (72.0%)	48 (14.0%)	48 (14.0%)	344 (100.0%)

**Source:** Result of SPSS Analysis (2018).



**Key:** F = Frequency, % = Percentage, NAD = Neither Agree nor Disagree.

Table 7 shows the result of the analysis of the responses about the effect of gender on the respondents' attitudes towards nutrition information, as far as the difficulties they encounter when reading nutritional information was concerned. The result indicated that, for all the responses to all the statements, majority of the respondents who agreed were male. Correspondingly, majority of respondents who disagreed to the majority of the statements were male. It is probable that the outcome is so due to the differences in the number male and female respondents who participated in the study. Furthermore, it can be deduced from the outcome that gender and demography in general plays a major role in the attitudes that consumers have towards nutritional information on food labels.

### 4.3: Hypotheses Testing

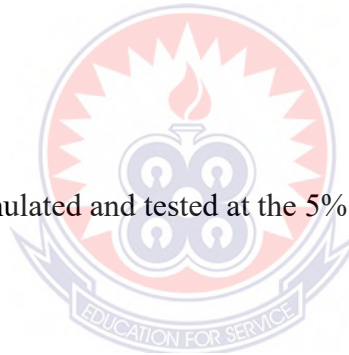
Two hypotheses were formulated and tested at the 5% significance level in this study.

#### 4.3.1: Hypothesis 1

H<sub>0</sub>1: There is no statistically significant difference between the food choices of students who read nutritional information and those who do not read nutritional information.

H<sub>A</sub>1: There is statistically significant difference between the food choices of students who read nutritional information and those who do not read nutritional information.

An independent-samples *t*-test was conducted to compare the differences in food choices of students who read nutritional information and those who do not read nutritional information. The outcome of the *t*-test is presented in Table 8.





**Table 8: Independent *t*-test for differences between readers and non-readers of nutritional information.**

	Reading Nutrition Information		<i>t</i>	<i>Df</i>
	Readers Mean (SD)	Non-readers Mean (SD)		
Healthy food choice	1.93(0.33)	2.07(0.44)	-2.56	106

**Source:** *Result of SPSS Analysis (2018)*

From the result of the test, it was found out that there was a statistically significant difference in scores for students who read nutritional information ( $M=1.93$ ,  $SD=0.33$ ) and students who do not read nutritional information [ $M=2.07$ ,  $SD=0.44$ ;  $t=-2.56$ ,  $p=0.01$ ]. Therefore, the null hypothesis ( $H_0$ ) was rejected, thus accepting the alternate hypothesis ( $H_A$ ). This result suggested that there is a relationship between reading nutritional information and making food choices and confirmed the report by Spronket *al.* (2014) that individuals with higher nutritional knowledge tend to make better dietary intake decisions and also tend to follow the dietary guidelines more closely than those with lower nutritional knowledge.

#### 4.3.2: Hypothesis 2

$H_0$ : There is no statistically significant difference between the food choices of female students and male students.

$H_A$ : There is statistically significant difference between the food choices of female students and male students.

Again, an independent-samples *t*-test was conducted to compare the differences in making healthier food choices between female and male students. Table 9 shows the result of the *t*-test.

**Table 9: Independent *t*-test for differences between female and male students.**

	Gender of Respondents		<i>t</i>	<i>Df</i>
	Female Mean (SD)	Male Mean (SD)		
Healthy food choice	2.04 (0.19)	1.95 (0.18)	3.70	342

**Source:** *Result of SPSS Analysis (2018)*

**Key:** SD=Standard Deviation

The *t*-test result showed that there was no statistically significant difference in the scores for female students ( $M=2.04$ ,  $SD=0.19$ ) and male students [ $M=1.95$ ,  $SD=0.18$ ;  $t=3.70$ ,  $p=0.08$ ]. Therefore, the null hypothesis ( $H_0$ ) was accepted, thus rejecting the alternate hypothesis ( $H_A$ ). This outcome suggested that the gender of consumers did not influence their food choices. This result therefore contradicted the works of Campos *et al.*, (2010), Mandal (2010) and Bates *et al.*, (2011), which stated that females make healthier food choices than males.

The magnitude of the difference in the mean scores of the female and male respondents was calculated at  $\eta^2 = 0.038$ . This value implies that only 3.8% of the variance in the ability to make healthier food choices is explained by the gender of the respondents. The result suggested that being female or male had a very small effect on the respondents' ability to make healthier food choices.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

#### 5.0: Overview

This chapter presents the summary of the findings, conclusion, recommendations of the study, contributions to knowledge and suggestions for future research.

#### 5.1: Summary of Findings

The study found that respondents had a high level of awareness about nutritional information on food labels. The respondents were well-informed about the effects of reading nutritional information on food labels, although they encountered some difficulties in reading and understanding nutritional information. These difficulties included tiny font sizes, illegible font styles and lack of understanding of some technical terminologies. Also, it emerged from the study that reading nutritional information has significant influence on making food choices. However, the study revealed that the gender of respondents had no significant influence on food choices. Furthermore, it was also found that there was a correlation between consumers' level of awareness and the effect of reading nutritional information on food choices, as well as the difficulties consumers encountered in reading nutritional information.

#### 5.2: Conclusions

The use of nutritional information is vital to making healthy food choices as far as pre-packaged foods are concerned. This study concludes that students of the University of Education, Winneba are highly knowledgeable and aware of nutritional information

on food labels. The respondents also demonstrated a good understanding of the effects of reading nutritional information on their food choices. However, it was noted that several factors presented some difficulties for the respondents when it came to the reading and understanding of nutritional information on food labels. Also, the study showed that reading nutritional information has significant influence on making food choices, whereas gender has no significant influence on food choices among consumers. It is therefore valid to conclude that if the level of awareness of nutritional information is high among consumers, their understanding of the effects of nutritional information on making healthy food choices is enhanced, although there may be some difficulties in reading and understanding the nutritional information on food labels.

### **5.3: Recommendations**

The following recommendations were made based on the findings of the study:

1. University authorities should organize conferences, seminars and symposia on the importance of reading nutritional information, to encourage the university community to take nutritional information seriously, and also to enhance the knowledge and level of awareness among consumers. This is to encourage consumers of pre-packaged foods to develop positive attitudes towards nutritional information.
2. Designers of food labels should endeavor to use legible and readable font in designing food labels and packages. This is to ensure that the difficulties associated with reading nutritional information are eliminated. Also, the use of terminologies that are too technical for consumers should be modified and replaced with simpler expressions and terminologies.

3. The University library should develop brochures and fliers to be published in the library and on the university's website, to educate consumers about the need to take nutritional information more seriously and to build positive attitudes towards food labels and nutritional information. This would be necessary in ensuring that consumers improve upon their dietary habits.

#### **5.4: Contributions to Knowledge**

Research evidence showed that attitude towards nutritional information have been conducted with various respondents in developing countries. In some cases, these studies focused on children, students and other consumers of pre-packaged foods. However, there is little or no study that was specifically directed at investigating the attitudes of university students towards nutritional information, with emphasis on developing countries that import several pre-packaged food products from other developed countries. This study contributes to knowledge by providing some insight into the nature of university students' perception and use of nutritional information for making food-purchasing decisions. It also showed that the factors that make it difficult for consumers to depend on nutritional information for making healthier food choices in developing countries is similar to those that influence consumers in developed countries.

#### **5.5: Suggestions for Further Research**

This study provides a glimpse of selected variables that affect consumers' attitudes towards nutritional information for making food choices. Further studies could include a systematic examination of all other factors that may influence consumers' attitude towards nutritional information. Further research could also be conducted to compare

the attitudes of students and workers towards the use of nutritional information for making healthier food choices. Also, a study to analyze the attitudes of students with disabilities and those disabilities towards the use of food labels in making purchasing decision could also be conducted to determine whether disability plays a role in forming attitudes towards nutritional information or not.





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## APPENDICES

### APPENDIX A: LETTER OF INTRODUCTION



**UNIVERSITY OF EDUCATION, WINNEBA**  
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Our Ref: HED/L3/VOL.3/121

27<sup>th</sup> February, 2018

**TO WHOM IT MAY CONCERN**

**ATAA GYAMFUAH GYIMAH**

We write to introduce Ms. Ataa Gyamfuaah Gyimah, an M.Phil student with index number (8160100008) of the Department of Home Economics Education, University of Education, Winneba, who is conducting a research titled "Attitude of Students of the University of Education, Winneba Towards Nutrition Information on Food Labels".

We would be very grateful if you could give her the assistance required.

Thank you.

Yours faithfully,



**MS. THERESA A AMU**  
**AG. HEAD OF DEPARTMENT**  
HEAD  
HOME ECONOMICS EDUCATION  
UNIVERSITY OF EDUCATION  
WINNEBA

**APPENDIX B: SAMPLE SIZE DETERMINATION TABLE**

TABLE 1  
Table for Determining Sample Size from a Given Population

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note.—*N* is population size.  
*S* is sample size.

## APPENDIX C: QUESTIONNAIRE

### SURVEY ON THE ATTITUDE OF UEW STUDENTS TOWARDS NUTRITION INFORMATION ON FOOD LABELS

This research is being conducted by a student from the University of Education, Winneba on **attitude of students of the University of Education, Winneba towards nutrition information on food labels**, as part of her Master's degree programme. You are assured of full confidentiality, privacy, and anonymity of all the information that will be given by you. You should therefore feel free to give the right information to ensure the success of this work. Kindly fill it out to the best of your ability. Your thoughtful and truthful responses will be greatly appreciated

#### PART 1 (Demographic Information)

What is your gender?

Male

Female



What is your age?

Below 25 years

25 – 35 years

Above 35 years

On which campus is your department located?

North Campus

Central Campus

South Campus

What is your height (in centimetres)? \_\_\_\_\_

What is your weight (in kilograms)? \_\_\_\_\_

<b>Part 2: Level of awareness of nutritional information on food labels.</b>					
<b>Statement</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neither Agree nor Disagree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
Packed foods labels have nutritional information.					
Nutritional information is always truthful.					
Nutritional information on food labels guide me in making food choices.					
All food labels include expiry date.					
Food labels state the ingredients used and the method for preparation.					
Food labels have caution written on the package.					
Food labels indicate the nutritional facts (calories levels, fats, protein content, vitamins etc.).					
understand the cautions written on food labels.					

<b>Part 3: Effect of reading nutritional information on food labels.</b>
Do you check the information on food labels before purchasing? [ ] Yes      [ ] No
How often do you check information on food labels? [ ] Always      [ ] Sometimes      [ ] Never
Do you think it is important to read nutritional information on food labels before purchasing? [ ] Yes      [ ] No
Why would you read nutritional information on food labels before purchasing? [ ] For health reasons      [ ] For reading sake      [ ] For making food choice

How often do you make food choices based on the nutritional information? <input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Never
Do you purchase packaged foods that do not have food labels? <input type="checkbox"/> Yes <input type="checkbox"/> No
Which of the following foods must have nutritional food label before purchasing? <input type="checkbox"/> Cassava <input type="checkbox"/> Kontomire <input type="checkbox"/> Fresh Tomatoes <input type="checkbox"/> Indomie Noodles
Do you believe that nutritional information on food labels can help you make a good choice of food? <input type="checkbox"/> Sure <input type="checkbox"/> Somehow <input type="checkbox"/> Not Sure <input type="checkbox"/> Never
Do you feel irritated when reading nutritional information on food labels? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes
Do you think nutritional information can help you acquire in-depth knowledge about food products? <input type="checkbox"/> Sure <input type="checkbox"/> Somehow <input type="checkbox"/> Not Sure <input type="checkbox"/> Never
Will you always depend on nutritional information to make your food choices? <input type="checkbox"/> Yes <input type="checkbox"/> No

<b>Rank in order of importance (from 1 – 5) the following aspects of the information on food labels.</b>					
<b>Statement</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Expiry date					
Ingredients					
Nutritional information					
Country of origin					
Procedure for preparation					

<b>Rank in order of impact (from 1 – 5) the factors that influence you in purchasing packaged food.</b>					
<b>Statement</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Price					
Taste					
Availability					
Advertisement					
Nutritional information					
<b>Statement</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neither Agree nor Disagree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
I always understand nutritional information on food labels.					
The font style (style of the writings) sometimes make reading understandable.					
The font size (size of the writings) sometimes make it difficult to read food labels					
The language (English, French, Chinese, etc.) used in writing the information on food labels is always understandable.					
I have difficulties understanding the technical terms (calories, serving size, daily intake, etc.) on food labels					
The colour of the packaging makes reading more appealing.					