

Students' Level of Awareness of Expiry Dates of Caned Products

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Abstract

This study assessed the level of awareness of Polytechnic students on expiry dates of canned products. The design that was used for the study was the cross-sectional survey. Using the simple random sampling procedure, 191 students of Hospitality and Tourism Department were selected for the study. Data gathered from the use of the questionnaire was analysed using the descriptive statistics namely frequencies, percentages and means. It was found out that students showed a high consideration to expiry dates before purchasing or using canned products. With this, students refused to buy products that had no expiry dates. It is recommended that the Ghana Health Service, Ministry of Health and other Non-governmental Organisations should intensify their education on expiry dates of the product since some of the students even though aware of the effects of expired product still do not consider before purchase and usage.

Keywords: Awareness, Expiry, caned, products

Introduction

The term “expiry date” refers to the last date food should be eaten or used (Dictionary of Food Science & Technology, 2005). The whole idea about canning is to make food able to be stored for long periods of time. Yet, the cans do bear a date on the bottom although it is not mandatory to provide dates for them. Washi (2012) asserts that, the rise in diet-related diseases has been related to the poor knowledge about nutrition labels and consumption of expired foods. Most canned foods are laden with high sugar and high fat whereas consumers are ill-informed on the use of expiry dates and nutrition labels (Kim, 2001; Young & Nestle, 2002; Davey, 2004).

Several scholars such as Nayga (1999) and Kim (2001) have indicated a positive relationship between the quality of consumer's diets and consumers' use of expiry dates information on canned foods. For instance, there was an increase in individuals' intake of fibre, iron and vitamin C and a rather decline in the intake of total energy from total fat, sugars and saturated fat, cholesterol and sodium due to the use of nutritional label and knowledge of expiry dates and (Neuhouser, 1999; Ollberding, 2010).

Cowburn and Stockley (2005) as well as Campos (2011) contend that, some nations have put in place important guiding principles concerning the issue of providing expiry dates on canned foods in order to ensure strong and healthy eating. It is against this background that the researcher was motivated to undertake this study. So, the study sought to investigate students' level of awareness of expiry dates of canned products. The research attempts to find solutions to following research questions: “What considerations do students give expiry dates before purchasing canned products?” as well as “To what extent do students show consideration for expiry dates of canned products before their usage?” The study involved students in the Department of Hospitality and Tourism in carrying out the study. The researcher hopes that the study would help to unravel new discoveries and knowledge in order to help consumers make healthful food choices especially in recent times where the Ghanaian market has been flooded with imported and locally produced canned foods. Again, it is expected that, the study would add up to the information already gathered on the subject by previous studies. The subsequent paragraphs consider the Literature Review, Methodology, Results and Discussions, Conclusions and Recommendations.

Literature Review

Canned foods are foods that are enclosed or wrapped in tins and are most often heated, treated, irradiated or have natural or artificial preservatives added to prolong their shelf lives. Usually, they are packaged for the purposes of handling, transporting, preserving, optimizing product presentation, and hygiene and to facilitate product dispensing and use by the consumer (Dictionary of Food Science & Technology, 2005). Again, canned foods serve as a means of conveying foods from one location to the other and also decrease post-harvest losses (FAO, 2011).

Modernity in our world today which is characterized with a lifestyle on a fast-move has led to a rise in the demand for canned food products in order to keep up with the demand for variety and convenience by the people (Alvarez & Boye, 2012). The consequence now is that canned food products are easy to get an inexpensive (Davey, 2004) especially in the developing world (Kasapila & Shawa, 2011) and may support declining household food production in food insecure areas (Mahgoub, 2007).

Studies conducted by researchers such as French (2001) and French (2003) in the US indicate that there has been an increase in the quantities of canned and prepackaged food products for personal consumption. For instance, Coca-Cola carbonated soft drink for individual consumption was put on sale in 6.5-ounce bottles in the earliest part of the 20th century, but currently, it is being sold in 20 or 32-ounce bottles (Pendergrast, 2000; French, 2003; Davey, 2004). Due to the large quantities and increases in the demands and production of canned and prepackaged food products coupled with their relatively inexpensive prices, there is the tendency for excess production which may lead to the expiring of some of the canned food products. This may result in the health problems of consumers especially those who are ill-informed on the use of expiry dates and nutrition labels. The consequence is that diet related health problems especially obesity and food poisoning will be intensified (Kim, 2001; Young & Nestle, 2002; Davey, 2004 & Washi, 2012). Information on expiry dates of canned products is a form of food labelling process that provides information to the consumer concerning the production period, the period within which the product is best for consumption as well as information on the expiry of the product. Although the provision of the 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 labelling, the provision of expiry dates of products and prepackaged foods is mandatory (Campos, 2011). Nutrition labelling, in some countries, is compulsory to a large extent due to their concern they have for their numbers in the direction of balanced foods as well as emphasizes the right of consumers to have knowledge on the nutrition and content of a food item. Such laws call for in-depth, precise and available nutritional content information on the canned foods (Abbott, 1997).

In the United States of America (US), apart from foods that are meant for immediate consumption, the Nutrition Labeling and Education Act of 1990 (NLEA), makes it mandatory to display details of nutritional content on canned and pre-packaged foods (FDA, 1994). The NLEA was passed due to the following reasons 1) to assist clients in making improved food selections through enhanced access to the information of a diet, 2) to safeguard clients from erroneous or false claims related to health issues on food packages, as well as 3) to motivate producers to advance the quality of the nutrition of their food items by making the content of nutrition evident (Mayer, 1998). Labeling of diet of prepackaged food is also mandatory in Australia, New Zealand and Canada (Cowburn & Stockley, 2005). In December 2005, the law on mandatory nutrition labelling was first enacted, and hence in 2007, it happened to be compulsory on every pre-packaged food (Health Canada, 2010).

Several researchers have examined how reading of expiry dates and nutrition label influence or affect consumers' behaviour. For instance, Satia (2005) and Kempen (2012) found that individuals who frequently read nutrition labels were mindful of their health and ensured a healthy dietary and a way of life including consuming fruits and vegetables that were fresh, reducing the intake of liquor as well as exercising regularly and more often improved their nutrition knowledge than those who do so less often. Also, De Magistrisi (2010) reported that individuals who utilized nutritional labels more often avoided snacking.

Factors such as gender, age, ethnicity, socio-economic status, matrimonial position, the size of the household, the composition of the household have been related to mindfulness of expiry dates as well as utilization of the labels of nutrition. Several researches have discovered that women, in general, will probably check for expiry dates and use nutrition labels than men (Nayga, 1999; Kim, 2001; Prathiraja & Ariyawardana, 2003; Worsley, 2003; Satia, 2005).

Females tend to have good information about staying healthy than males because of the essential role they play as women in choosing and preparing food despite the fact that there has been a paradigm shift in recent times as a result of modernity. This has been attributed to the fact that women are generally inclined to feed their families with balanced and safe foods. This has been confirmed by Loureiro (2006) who reported that men attach less importance to expiry dates and nutrition labels provided that their households were in good health. For example, studies by Reid (1996), Wandel (1997), Loureiro (2006), Mannell (2006) discovered that moderately aged or more youthful grown-ups will probably check for the expiry dates and utilize the labels of nutrition than adult people. This finding was given confirmation by Burton and Andrews (1996) study that asserted that adult individuals did not have much comprehension about information on nutrition and read just the list of ingredients, whereas youthful individuals were more likely to read both the expiry dates and the labels on the food package, or only the labels on the food package. However, the majority of researchers have discovered that advancement in age correlated positively with the probability of utilising labels of nutrition (Drichoutis, 2005; Satia, 2005; Misra, 2007). For example, McLean-Meynsse and Summers (2008) found that, making use of labels of nutrition was lesser in the midst of 18-25 years and 26-40 years age groups than adult clients. Particularly, there was the probability that, people who had advanced in education tended to be aware and used the markings/information on nutrition than the lower educated (Guthrie, 1995; Schupp, 1998; Neuhauser, 1999; Kim, 2001; Drichoutis, 2005; Wiles, 2009). Schupp, (1998) observed respondents who had high school or higher education showed much awareness to nutritional labels than respondents who had lower education. Kumar and Pandit (2008) have investigated the association between the knowledge and utilization of labels on prepackaged foods and educational attainment. They indicated that individuals with graduate, postgraduate or doctorate degrees were knowledgeable and were very mindful of expiry dates and food label information together with information on diet when buying food items that were pre-packaged in comparison with to people with lower academic backgrounds.

Research has discovered relationships among consumers' views concerning health and nutrition and knowledge level of expiry dates as well as utilization of information on diet (Kim, 2000; Lin & Lee 2003; Drichoutis, 2005). Kim (2000) indicated that consumers who viewed nutrition as important to their lifestyle had a higher probability to check for expiry dates and utilized labels on diets compared with those who showed disregard for food and health. Research indicated that consumers who considered it necessary to eat a balanced diet would more often look out for the amount of fat they consumed and check for information on fat when choosing packaged foods than those who did not show concern for the health implications of the food they ate. Drichoutis (2005) studies reported that people who had great concern for eating healthy diets would more often show high levels of reading content of a particular diet.

Studies have emphasized that nutrition knowledge or diet-health knowledge are important factors associated with nutrition label awareness and use (Szykman, 1997; Drichoutis, 2005; Rasberry, 2007). Szykman (1997) observed that respondents who had knowledge of diet-related chronic diseases used nutritional information more often than those who did not. Likewise Kim (1999) and Rasberry (2007) studies' findings showed that people who showed awareness for healthy diets more often utilized the diet information when they bought food items so that they could keep away from some nutrients and obtain certain peculiar nutrients (e.g. fat, calories and sugar) of various food items compared with those who had little or no knowledge on how to utilize the information on pre-packaged foods. Again, studies indicate that people with advanced information on nutrition showed minimal mistrust concerning diet labels (Moorman, 1998). According to Nayga (1996) and Levy and Fein (1998), individuals who had adequate nutrition knowledge made better prepackage food choices. Nayga (1996), Nayga (1999), Lin and Lee (2003), Drichoutis (2005) also discovered that people who were mindful of nutrition stood a higher chance of using specific nutrient information. Consumers are supposed to read a food label and check for expiry dates of food products before purchase in order to have information about the benefits and consequences of what they are buying.

Methodology

Research Design

The design used for the study was the cross-sectional survey which is a type of the descriptive design. Gay (1992) asserts that, the descriptive survey design allows a researcher to gather information on the present state of the topic being examined. The study adopted this design in order to have the opportunity to describe students' level of awareness of expiry dates of canned products. But the design has its own pitfalls as it does not give room for the manipulation of variables as in experimental research (Yin, 2001).

Sample and Sampling Procedure

A sample is basically the subset of the real quantum of individuals of a population. In order to give the sample size a sound scientific methodological backing, the table for selecting sample size given by Krejcie and Morgan (as cited in Sarantakos, 1997, p. 163) was employed.

Students were selected using the simple random sampling procedure. In this kind of sampling procedure, the probability that any of the members can be selected is high (Sarantakos, 1997, p. 141). A list of a total number of students in the Department of Hospitality and Tourism formed the sampling frame. The lottery method was used in the selection procedure. Paper chits, which were written YES or NO to represent the total number of students in the department were folded and then tossed into a bowl, out of which each folded chit was picked by each student. The students who picked YES were included in the study.

Research Instrument

The questionnaire was the sole data collection instrument. Reasons for the choice of the instrument were that the students from which data was sought from were literates who can read and write. This made the questionnaire an appropriate instrument to use for data collection. Also, the questionnaire provided a high level of anonymity to respondents who wanted to remain unknown. Again, the questionnaire is appropriate when collecting information from a large number of people, within a shorter possible time when especially the population is easily accessible (Deng, 2010; Amedahe & Gyimah, 2005).

The questionnaire items were put into three parts (sections A, B, and C). Section A sought for the background information of the respondents, and the remaining sections (B & C) covered the first and second research questions respectively. The three-point Likert scale was used in structuring the questionnaire items.

Data Analysis

This study sought to investigate students' level of awareness of expiry dates of canned products. The study adopted the descriptive statistics such as the use of frequencies, percentages, mean of means and standard deviation distributions in analyzing the information gathered using the Statistical Product and Service Solutions.

Results and Discussion

Data was analysed and presented systematically beginning with the background information of the respondents, followed with the research questions that guided the study. Table 1 shows the characteristics of students in the Department of Hospitality and Tourism who served as respondents for the study.

Table 1: Characteristics of Sampled Students (n=191)

Variable	Subscale	No.	%
Gender	Male	23	12.0
	Female	168	88.0
Age	20 years and below	35	18.3
	21-25 yrs	101	52.9
	26- 30 yrs	36	18.8
	31-35 yrs	18	9.4
	41-45 yrs	1	0.5
Level	100	111	58.1
	200	8	4.2
	300	72	37.7
Any Health Condition	Vegetarian	21	11.0
	On special diet	109	57.1
	Allergic to some foods	61	31.9

Source: Field data, 2016

Out of the targeted sample size of 191 students; all the 191 students were involved in the study. This indicates 100.0% return rate. From Table 1, the majority of the students were females. This is because 12.0% were males whereas 88.0% were females. This may be due to the perception that many people have concerning the hospitality industry as a job for females.

In line with this, Prathiraja and Ariyawardana, (2003) posit that, females tend to have good information about staying healthy than males because of the essential role they play as women in choosing and preparing food despite the fact that there has been a paradigm shift in recent times as a result of modernity. This has been attributed to the fact that women are generally inclined to feed their families with balanced and safe foods. Further findings from Nayga (1999), Kim (2001), Prathiraja and Ariyawardana (2003), Worsley (2003) and Satia (2005) have supported the earlier assertion that, women, in general, are more likely to check for expiry dates and use nutrition labels than men. Again, with respect to the age of the respondents, 18.3% of the respondents were 20 years and below, 52.9% were between 21-25 years, 18.8% were between 26-30 years, 9.4% were between 31-35 years, and 0.5% were between 41-45 years. Thus the majority of the students were between 21-25 years.

This finding has implications for this study due to the various opinions researchers have shared on the subject in relation to age. For instance, this evidence was supported by Burton and Andrews (1996) findings which asserted that adult individuals did not have much comprehension about information on nutrition and read just the list of ingredients, whereas youthful individuals were more likely to read both the expiry dates and the labels on the food package, or only the labels on the food package. This means that young people are more inclined to pay attention to the reading of expired canned food products than the elderly ones. It is also evident from Table 1 that the majority of the respondents were Level 100 students. This is because, 58.1% were Level 100 students, 4.2% were Level 200 students, and 37.7% were Level 300 students. In connection with this study, Kumar and Pandit (2008) discovered that, individuals with graduate, postgraduate or doctorate degrees were knowledgeable and were very mindful of expiry dates and food label information together with information on diet when buying food items that were pre-packaged in comparison with to people with lower academic backgrounds. Therefore, it is expected that, the respondents being undergraduate students will demonstrate knowledge about the need to check for expiry dates on canned food products. As to whether the respondents had any health condition, 11.0% were vegetarians, 57.1% were on special diet and 31.9% were allergic to some foods. So it goes that, the majority of the students were on special diet. This may be due to due to the fact that, being on a special diet requires individuals to check the nutrient content of the foods they eat (Drichoutis, 2005). In terms of ethnicity, the respondents were from Waala, Dagaati, Akan, Kassena, Dagomba, Eve, Guan, Jirapa, Fiapre, Krobo, Fiapre and Dagaare.

This section presents the results and discussions of data collected to answer the two research questions formulated to guide the study. It comprised data from both the questionnaire.

Consideration given to expiry dates before purchasing canned products

Research Question 1: What consideration do students give to expiry dates before purchasing canned products?

The main objective of this research question was to find out whether students considered expiry dates before purchasing canned products. This research question was important because students’ level of awareness of expiry dates of canned products is determined by the level of consideration students gave to expiry dates before purchasing canned products. The responses are illustrated in Table 2.

Table 2: Views of students concerning their consideration for expiry dates before purchasing canned products (n=191)

Statement	M	SD
I check expiry date when purchasing a canned product.	1.12	.38
Expiry dates are necessary to me.	1.05	.22
I refuse to buy products that have no expiry dates.	1.29	.55
I use expired products even when I notice them.	1.87	.36
I normally forget to check expiry dates of products.	1.82	.53
I prefer nearly expired products because they are cheaper.	1.89	.40
I check labels of products before I buy them.	1.17	.47

Source: Field data, 2016

Scale:1 = Agree, 2 = Disagree,

3 = Uncertain

Mean of means = 1.46

Mean of Standard Deviation = 0.42

A look at Table 2 shows that the students to a large extent show consideration for expiry dates before purchasing canned products. A mean of means of 1.46 and a Mean of Standard Deviation of .42 clearly indicates that the students agreed to a lot of the statements which were meant to identify the consideration given to expiry dates before purchasing canned products. This is shown in the following instances in the rest of the items.

When students were asked: “I check expiry date when purchasing a canned product”, it was found out that a significant majority of the students agreed to the fact. A mean of 1.12 and a standard deviation of .38 was attained. Though the mean is lower than the mean of means of 1.47, the degree of agreement between the responses of the students is considered appreciable because of the lower standard deviation obtained which is lower than the mean of standard deviation of 0.42. Also, the majority of the students agreed with the statement; “Expiry dates are necessary to me”. A mean of 1.05 and a standard deviation of .22 was attained for this item and this falls within the option “agree” looking at the scale under Table 2. This finding resonates with the view of Philip (2010) whose study on the behavior of people concerning the use of nutritional information in the UK showed that nutritional information were studied and adopted by almost half of the people. A standard deviation of .55 and a mean of 1.29 compared to mean of standard deviation of .42 and a mean of means of 1.46 clearly indicates that students refuse to buy products that have no expiry dates. The high standard deviation of .55 shows that there were variations in the responses and that, the majority of the students did not support this statement. In connection with the statement; “I use expired products even when I notice them”, the majority of the students disagreed with it. The item recorded a mean of 1.87 and a standard deviation of .36 which fall under the scale of 2 (disagree) when approximated to the nearest mean indicating that, the respondents do not use expired products when they notice them.

In line with the statement; “I normally forget to check expiry dates of products”, a mean of 1.82 and a standard deviation of .53 was recorded meaning to a large extent, the students disagreed with the statement. Converting the mean to the nearest whole number, it could be seen that the mean falls at 2 which depicts that they disagreed with the statement. Although they disagreed, the extent to which they disagreed was low due to the high standard deviation recorded indicating that there were variations in the responses. However, it still stands that the significant majority of the students did not support this assertion. With respect to whether the students preferred nearly expired products because they were cheaper, a mean of 1.89 and a standard deviation of .40 were obtained clearly showing that the respondents disagreed to that, they did not prefer nearly expired products just because they were cheaper. Concerning whether students check labels of products before they buy them, a mean of 1.17 and a standard deviation of .47 was realised. This means that a greater proportion of the respondents agreed that indeed they check labels of products before they bought them.

From the above, it can be concluded that the students showed a high consideration to expiry dates before purchasing canned products. This is because; the students check expiry date when purchasing a canned product; students indicated that expiry dates are necessary to them; students refuse to buy products that have no expiry dates, and students do not use expired products when they notice them. Again, students always check expiry dates of products and do not prefer nearly expired products just because they are cheaper. Students also checked the labels of products before they bought them.

Consideration is given to expiry dates of canned products before their usage

Research question 2: What consideration do students give to expiry dates of canned products before their usage?

This research question attempts to find out the consideration students give to expiry dates of canned products before their usage. The responses are illustrated in Table 3.

Table 3: Views of students concerning their consideration of expiry dates of canned products before their usage (n=191)

Statement	M	SD
I read information on expiry products before I use them.	1.22	.46
Expired products are returned to seller when I find out.	1.37	.56
I immediately use products when I buy them from the market.	1.56	.63
I throw away expired products.	1.28	.50
Expired products are not harmful.	1.91	.29
I store product for long before I use them.	1.88	.55

Source: Field data, 2016

Scale: 1 = Agree, 2 = Disagree,

3 = Uncertain

Mean of means = 1.54

Mean of Standard Deviation = 0.50

Generally, a careful look at Table 3 shows that the students to a large extent agreed with most of the statements posed to them to find out their consideration to expiry dates of canned products before their usage. In line with this, a mean of means of 1.54 and a mean of standard deviation of 0.50 was achieved for the items designed which clearly indicates that the students agreed to a lot of the statements which were posed to them. The following instances of the individual items attest to that fact.

From Table 3, a mean of 1.22 and .46 standard deviation was attained meaning that majority of the respondents agreed that, they read information on expiry products before they use them. This finding is in agreement with that of Kim (2000) who discovered that consumers who viewed nutrition as important to their lifestyle frequently checked for expiry dates and used diet labels as compared with those who perceived otherwise. It is clearly noticeable from Table 3 that majority of the students support the view that expired products were returned to seller when they find out. With this item, a mean of 1.37 and a standard deviation of .56 which indicate that the mean falls on the scale 1 (agree) looking at the scale under Table 3. The plausible conclusion that could be drawn is that a significant majority of the students supported this view. It is obvious from Table 3 that the students at the Department of Hospital and Tourism immediately use products when they buy them from the market. Concerning this, 1.56 mean and standard deviation of .63 was achieved for this statement. The mean which falls on scale 1 affirms the position that majority of the students supported this view. However, it can be noted that there was variations in the responses recorded for this item due to the high standard deviation which is higher than the mean of standard deviation of .50 which was obtained.

In relation to the statement, "I throw away expired products", the majority of the students agreed to it. A mean of 1.28 and a standard deviation of .50 was obtained for this item. The mean when converted to the nearest whole number falls on scale 1 which represents the option agreement. This finding is in agreement with Satia (2005) and Kempen (2012) who found that consumers who often look out for information on pre-packaged foods were very mindful of their health and ensured that they keep up a healthy dietary and lifestyle behavior such as eating fresh exercising regularly and consuming fresh vegetables and more often improved their nutrition knowledge than those who do so less often. In line with the statement "Expired products are not harmful", 1.91 was attained as mean and 0.29 as standard deviation. The majority of the students disagreed to the statement since the mean falls on scale 2 (disagree). It is worthy to note that the measure of spread as stated above is lower than the mean of the standard deviation of 0.50 depicting that the respondents disagreed to this view to a high extent as there were little variations in the responses. From Table 3, the majority of the students disagreed to the statement: "I store product for long before I use them". In connection with this, 1.88 was obtained as a mean and .55 as the standard deviation. It could be seen from the scale under Table 3 that the mean could be placed on the scale 2 (disagree).

From the abovementioned points, it will suffice to concede that, the students showed a high consideration to expiry dates of canned products before their usage. This is because; students read information on expiry products before they use them; students returned expired products to seller when they find out; students immediately use products when they buy them from the market, and students throw away expired products. Again, students disagreed that, expired products are not harmful and students do not store product for long before they use them.

Conclusions

These conclusions were drawn as a result of the findings realised for the study. In terms of the considerations students gave to expiry dates before purchasing canned products, the students showed a high consideration to expiry dates before purchasing or using canned products. With this, students checked expiry date when purchasing a canned product; students read information on expiry products before using them, and students refused to buy products that had no expiry dates. Although the situation about the larger Ghanaian community where the majority remains uneducated remains unknown, it was evident that the students showed a high level of consideration for expiry dates before purchasing or even using canned products. This could be due to the fact that the respondents (students) being literates were naturally inclined to read and placed a high level of importance to matters relating to their health.

Policy Recommendations for Management

The following recommendations were made for policy makers:

1. Stakeholders such as the Ministry of Health and the Food and Drugs Authority should make special efforts to enhance awareness and consideration for expiry dates of various food products before purchasing them especially among the low educated by encouraging them through public education. Even though most of the students considered expiry dates before purchase and usage, more needs to be done since some of the students at their level still fall prey to expiry dates.
2. Health professionals should educate consumers especially those who buy in bulk for consumption to ensure that, the canned products are kept at temperatures of 75° Fahrenheit and below to ensure that they are in good condition before the expiry date. To ensure that these canned foods are still edible, consumers should crack those suckers open and use their senses to determine if they are still good for consumption and not only depend on the expiry dates.

References

- Abbott, R. (1997). Food and nutrition information: A study of sources, uses, and understanding. *British Food Journal*, 99(2), 42-44.
- Alvarez, P. A., & Boye, J. I. (2012). Food production and processing considerations of allergenic food ingredients: A review. *Journal of Allergy Volume*, 2(4), 14-25.
- Amedahe, F. K. (2002). *Fundamentals of educational research methods*. Cape Coast: UCC
- Amedahe, F. K., & Gyimah, E.A. (2005). *Introduction to educational research*. Cape Coast: Centre for Continuing Education.
- Bayar, E. (2009). The importance of nutrition label usage in the context of obesity: A cross country study of the U SA and Turkey. *Masters Theses*. Paper 598. Retrieved from <http://uknowledge.uky.edu>
- Bhandarkar, P.C. & Wilkinson, T. S. (2010). *Methodology and Techniques of Social Research*. Mumbai: Himalaya.
- Burton, S., & Andrews, A. M. (1996). Implications of Accurate Usage of Nutrition Facts Panel Information for Food Product Evaluations and Purchase Intentions. *J Acad Mark Sci*, 27, 470–480.
- Campos, S. (2011). *Nutrition labels on pre-packaged foods: A systematic review*. Retrieved from <http://www.fao.org/docrep/015/mb061e/mb061e00.pdf>.
- Cowburn, G., & Stockley, L. (2005). Consumer Understanding and Use of Nutrition Labelling: A Systematic Review. *Public Health Nutr*, 8, 21–28.
- Davey, R.C. (2004). The Obesity Epidemic: Too Much Food For Thought? *Br J Sports Med*. 38, 360–363.
- De Magistrisi, T. (2010). Effects of the nutritional labels use on healthy eating habits in Spain Agric. *Econ. – Czech*, 56, (11): 540–551.
- Deng, H. (2010). Emerging patterns and trends in utilizing electronic resources in a higher education environment: an empirical analysis. *New library world*, 111(3-4), 87-103.
- Dictionary of Food Science & Technology (2005). *International Food Information Service*. Oxford: Blackwell Publishing, p.269.
- Donna, P. B. (2001). Food labeling issues- consumer qualitative research. *Public Health Nutr*, 7, 801–811.

- Drichoutis, A. C. (2005). Nutrition knowledge and consumer use of nutritional food labels. *European Review of Agricultural Economics*, 32(1), 93-118.
- FAO (2009). *United Nations Food and Agriculture Organisation*. Rome: FAO
- FAO (2011). *Appropriate Food Packaging Solutions for Developing Countries*. Retrieved from <http://www.fao.org/docrep/015/mb061e/mb061e00.pdf>.
- FDA (1994). *Guide to Nutrition Labelling and Education Act (NLEA) Requirements*. US Food & Drug Administration: Silver Spring.
- Fraenkel, J. R. & Wallen, N. E. (2003). *How to design and evaluate research in education*. (5th ed.). New York: McGraw-Hill.
- French, S. A., Story, M., & Jeffery, R. W. (2001). Environmental Influences on Eating and Physical Activity. *Annu. Rev. Public Health*, 22, 309–335.
- French, S.A. (2003). Pricing Effects on Food Choices. *J. Nutr.*, 133, 841–843.
- Gay, L. R. (1992). *Educational research: Competencies for analysis and application* (4th ed.). New York: Merrill/Macmillan.
- Guthrie, J. F. (1995). Who uses nutritional labelling, and what effect does label use have on diet quality? *Journal of Nutrition Education*, 27(4), 163–172.
- Health Canada (2010). *Nutritional Labelling*. Retrieved from <http://www.hcsc.gc.ca/fnan/labelletiquet/nutrition/index-eng.php> (accessed December 2010).
- Huang, T. T. (2004). Reading Nutrition Labels and Fat Consumption in Adolescents. *Journal of Adolescent Health* 35, 399–401.
- Kasapila, W., & Shawa1, P. (2011). Use and understanding of nutrition labels among consumers in Lilongwe (Malawi). *Ajfang*, 11(5), 74-84.
- Kempen, E. L. (2012). A study of the relationship between health awareness, lifestyle behaviour and food label usage in Gauteng. *South African J Clin Nutr*, 25(1), 15-21.
- Kim, S. Y. (1999). Health knowledge and consumer use of nutritional labels: The issue revisited. *Agricultural and Resource Economics Review*, 30(1), 10-19.
- Kim, S. (2000). The effect of food label use on nutrient intakes: An endogenous switching regression analysis. *Journal of Agricultural and Resource Economics*, 25(1), 215–231.
- Kim, S. (2001). Food label use, self-selectivity, and diet quality. *Journal of Consumer Affairs* 35(2), 346–363.
- Kumar, S., & Pandit, A. (2008). *Food labels: Assessing awareness and usage level of Indian consumer and influences on food buying behavior*. Oxford: Blackwell Publishing.
- Levy, A. S., & Fein, S. B. (1998). Consumers' ability to perform tasks using nutrition labels. *Journal of Nutrition Education*, 30(4), 210-217.
- Lewis, J. E. (2009). Food label use and awareness of nutritional information and recommendations among persons with chronic disease1–3. *Am J Clin Nutr*; 7(90), 13-57.
- Lin, C. T., & Lee, J. Y. (2003). Dietary fat intake and search for fat information on food labels: New Evidence. *Consumer Interests Annual*, 49, 55-61.
- Loureiro, M. L. (2006). Do consumers value nutritional labels? *European Review of Agricultural Economics*, 33(2), 249–268.
- Mahgoub, S.E. (2007). Awareness and use of nutrition information on food packages among consumers in Maseru (Lesotho). *African Journal of Food Agriculture, Nutrition and Development*. 7(6), 3-5.
- Mannell, A. (2006). French consumers' use of nutrition labels. *Nutr Food Sci*, 36, 159–168.
- Mayer, J. A. (1998). Misleading nutrition claims on cracker packages prior to and following implementation of the nutrition labeling and education act of 1990. *American Journal of Preventive Medicine*, 14, 189-195.
- McBurney, D. H. (2007). *Research methods*. New York: Matrix Productions.
- McLean-Meyinsse, P. E. (2001). An analysis on nutritional label use in the Southern United States. *Journal of Food Distribution Research*, 32, 110–114.
- Misra, R. (2007). Knowledge, Attitudes, and Label Use Among College Students. *J Am Diet Assoc*, 107, 2130–2134.

- Moorman, C. (1998). Market level effects of information: Competitive responses and consumer dynamics. *Journal of Marketing Research*, 35, 82-98.
- Nayga, R. M. (1996). Determinants of consumers' use of nutritional information on food packages. *Journal of Agricultural and Applied Economics*, 28(2), 303-312.
- Nayga, R. M. (1999). Toward an Understanding of Consumers' Perceptions of Food Labels. *International Food and Agribusiness Management Review*, 2(1), 29-45.
- Neuhouser, M. L. (1999). Use of food nutrition labels is associated with lower fat intake. *Journal of the American Dietetic Association* 99, 45-53.
- Pendergrast, M. (2000). *For God, country and coca-cola: The definitive history of the great American soft drink and the company that makes it*. New York: Basic Books
- Philip, D. (2010). *Evidence review of public attitude towards and use of general food labelling final report*. Available:http://www.food.gov.uk/multimedia/pdfs/re_llatitudeslabel.pdf [Accessed on 13th May 2012].
- Post, R. E. (2010). Use of the nutrition facts label in chronic disease management: Results from the National Health and Nutrition Examination. Survey *J Am Diet Assoc.*, 110, 628-632.
- Prathiraja, P. H. K., & Ariyawardana, A. (2003). Impact of nutritional labelling on consumer buying behavior. *Sri Lankan Journal of Agricultural Economics*. 5(1),87-96.
- Rasberry, C. N. (2007). Determinants of nutrition label use among college students. *Am J Health Educ* 38, 76-82.
- Reid, D. J. (1996). Tracking Nutrition Trends, 1989-1994: An Update on Canadians' attitudes, knowledge and reported actions. *Can J Public Health*, 87, 113-118.
- Sarantakos, S. (1997). *Social research* (2nd ed.). New York: Palgrave Publishers Ltd.
- Satia, J. A. (2005). Food nutrition label use is associated with demographic, behavioral, and psychosocial factors and dietary intake among African Americans in North Carolina. *J AmDiet Assoc* 105, 392-402.
- Schupp, A. (1998). Consumer awareness and use of nutrition labels on packaged fresh meats: A pilot study. *Journal of Food Distribution Research*, 29(2), 24-30.
- Smallwood, D. S., & Blaylock, J. R. (1994). Fiber: Not Enough of a Good Thing? *Food Rev.* 17, 1, 23-29.
- Summers, L. (2008). Perceptions of New Zealand nutrition labels by Maori, pacific and low income shoppers. *Public Health Nutrition*. Published online 2 January.
- Szykman, L. R. (1997). A Proposed Model of the Use of Package Claims and Nutrition Labels. *Journal of Public Policy and Marketing*, 16(2), 228-241.
- Yin, R. K. (2001). *Qualitative research from start to finish*. New York: Guilford Press.
Retrieved on 20th November, 2015. Available at:<http://www.mylibrary.com.oasis.unisa.ac.za?id=288651>.
- Young, L. R., & Nestle, M. S. (1995). Portion size in dietary assessment: Issues and policy implications. *Nutr. Rev.* 53: 149-158.
- Young, L. R., & Nestle, M. (2002). The contribution of expanding portion sizes to the US obesity epidemic. *Am. J. Public Health*. 92, 246-249.
- Wandel, M. (1997). Food labelling from a consumer perspective. *Br Food J* 99, 212-219.
- Washi, S. (2012). Awareness of food labelling among consumers in groceries in Al-Ain. *International Journal of Marketing Studies*, 4(1), 65-67.
- Welman, C., Kruger, F. & Mitchell, B. (2005). *Research methodology*. (3rd ed.). London: Oxford University Press.
- Wiles, N. L. (2009). What factors determine the use of the nutrition information on the food label when female consumers from Pietermaritzburg select and purchase fat spreads? *S Afr J Clin Nutr*; 22(2), 69-73.
- Worsley, A. (2003). Consumers' personal values and sources of nutrition information. *Ecol Food Nutr*, 42, 129-151.
- Zikmund, W.G. (1994). *Business research method*. (4th ed.). Harcourt: The Dryden Press.