

Knowledge and Behaviour of Consumers towards Food Additives in Lagos State

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Abstract

The use of food additives is dated back to agrarian era when substances which are often safe and nutritious were added to food. Food additives are natural or artificial substances used for preservation, improvement of taste and attractiveness of food. The post agrarian period witnessed advancement in food technology with the use of synthetic substances in packaged food which constitute great concern considering its perceived adverse effects on health. The study seeks to determine the knowledge and behaviour of consumers towards food additives in processed food. Descriptive research method was adopted for the study. The study population comprised secondary school teachers and young adults in tertiary institutions in Lagos State, Nigeria. Stratified sampling technique was used to select two hundred and fifty participants. The Health Belief Theory provided a platform for the study. Food Additive Utilisation Questionnaire (FAUQ) $r=1.00$ was used for data collection. Data was analysed using the descriptive statistics of percentages, mean, standard deviation and the inferential statistics of Multiple Regression analysis at 0.05 alpha level. The findings revealed that knowledge of health implications and behaviour of consumers towards food additives significantly influenced consumption of products by consumers. It was recommended that health education should be reinforced as means of reducing the detrimental effect of consumption of foods and drinks with additives. There is also need for regulations concerning the sale of food additives should be modified to require the reporting of adverse effects boldly to the consumer to strictly adhere to positive behaviours towards food additives.

Keywords: Behaviour, Consumers, Food Additives, Knowledge, Utilisation

INTRODUCTION

Food is an essential need for man. It serves various functions ranging from social, political, economical, religious purposes and promotes growth and development of the body cells. Food is of the highest benefit to man and a source of energy for daily activities. It is procured and consumed as products or services which are of great benefits to the health of a consumer and calls to concern the ingredients used during processing and packaging in order to increase the shelf life, flavour and appearance of these products consumed. Otinwa (2010) defined food as any substance normally eaten or drunk by living organisms. Food is the main source of energy and nutrition for human beings and is usually of animal or plant origin. It is therefore, any substance that can be metabolised by an organism to give energy and build tissue. Foods and food related products are processed with additives or preservatives. Lorbee (2009) defined food additives as substances added to food to preserve flavor, improve its taste and appearance. Tuormaa (2006) described food additive as any substance not commonly regarded or used as food, which is added

to, or used in or on food at any stage to affect its keeping quality, texture, consistency, taste, colour, alkalinity or acidity, or to serve any other technological function in relation to food and these include processing aids in so far as they are added to or used in or on food.

Branen and Haggerty (2002) opined that a food additive is any substance or mixture of substances added to foodstuff as a result of any aspect of production, processing, storage, or packaging. Erich and Ger-Wolfhard (2002) described preservative as a substance or a chemical that is added to food, beverages, pharmaceutical drugs, paints, biological samples, cosmetics, wood and many other products to prevent decomposition by micro-organisms or by undesirable chemical changes. Food preservation is implemented using chemical and physical methods. Chemical preservation entails adding chemical compounds to the product, while physical preservation entails processes such as refrigeration or drying. Preservative food additives reduce the risk of food borne infections, decrease microbial spoilage and preserve fresh attributes and nutritional quality of such food. Some physical techniques for food preservation include dehydration, ultra violet (UV-C) radiation, freeze-drying and refrigeration. Occasionally chemical and physical preservation techniques are combined for maximum effects in food processing (Erich & Ger-Wolfhard, 2002).

In Nigeria, only 50 colours are permitted for use as food additives. Most of the colours are of natural origin and these include: saffron, cochineal, carotenes (and the closely related xanthophylls) and anthocyanins, which colour ripe fruit. Other permitted colours are inorganic substances such as the white pigment titanium dioxide and finely divided aluminum, silver and gold which are used in cake decoration. The list of permitted colours includes some synthetic dyes. Thousands of such substances are known but most of them are too toxic to be used in foods while some are known to be carcinogenic (able to cause cancer). For this reason, only 15 have been approved for use in food. Colouring matter must not be added to meat, fish, poultry, fruit, cream, milk, honey, vegetables, wine, coffee, tea and condensed or dried milk. Also, by agreement with the manufacturers, colours are not used in foods made for babies and infants (Lorbee, 2009).

Regulatory bodies such as Food and Agricultural Organisation, World Health Organisation, National Agency for Food Drug Administration and Control and Food Drug Administration regulate food additives using codex standard. In Nigeria, National Agency for Food and Drug Administration and Control (NAFDAC) and Institute of Public Analyst of Nigeria regulate and take health interventions on risk assessment and situation on analysis of food contamination and chemical additives respectively. Food Additives Regulation of 2004, Section 8 of the Drug and Related Products (Registration, etc) Act (as amended) gives NAFDAC authority over food and drug ingredients and defines requirement for truthful labelling of synthetic colour and mixtures of colours in foods, prohibition against sale of food containing non permitted food additives, condition for a request to add or change food additives, conditions for allowing more than one preservative, penalty, forfeitures, interpretation and citation as

2004 Food Additives Regulations.

The use of food additives is highly regulated by law. In Nigerian, food additive regulations are specified in the Government of Nigeria's (GON) Decree 15 of 1993 and enforced by the National Agency for Food and Drug Administration and Control (NAFDAC). The latter agency has not developed a positive additive list. A very short negative (prohibited) list however, does exist. Specific food additive regulations of NAFDAC tend to focus on the usage of non-nutritive sweeteners and on ingredients in wheat flour products. The food additive and contaminant regulations of CODEX ALIMENTARIUS COMMISSION are applied by NAFDAC in its assessment of food safety. Other regulations are also enforced as follows;

“Non- nutritive sweeteners are not permitted in any food or beverage to be consumed by infants or children. Non-nutritive sweeteners, including saccharin and cyclamates, may be used in low-calorie, dietary foods/beverages.

Potassium bromate as a bread improver is not permitted.”

Codex Alimentarius Commission Regulations are regulations for indicating permitted food additives. There are set based on the E – system of number food additives used in Europe and are known as the international numbering system (INS) for food additives (Branen & Haggerty, 2002).

Despite the high rate of consumption of food additives and preservatives in foods and food related products by most Nigerians little information on its health effects is available to consumers to enable them take positive decisions concerning their personal health. This lack of information has further exposed consumers of food products to inestimable health hazards in relation to the extent of consumption of either physical or chemical additives and preservatives and the inherent dangers which include obesity, allergies and intestinal disorders.

Hackworth (2007) asserted that there are various synthetic preservatives and artificial compounds present in the foods in the market today. Studies have evidence that a large number of food additives and preservatives produce harmful effects upon ingestion, especially among children is extremely difficult to remove many of these compounds from the body, and the cumulative effects of food additive consumption through a lifetime can lead to a build up of toxins over the years, similar to how a septic tank collects grime. This study therefore examined the knowledge and behaviour of consumers in Lagos State towards food additives in packaged and processed food. The research tested two major hypotheses in this study and these are:

1. The knowledge of health implications of food additives would not significantly influence consumption of products by consumers and
2. The behaviour of consumers towards food additives would not significantly influence consumption of such products by consumers.

THEORETICAL FRAMEWORK

The Health Belief Model provided a platform for the study. This is a recognized socio-cognitive framework of health behaviour and intervention that focuses on behavioural change at the individual level. It suggests that decision-makers perform a mental assessment of the benefits of an intended behaviour change, if it outweighs its practical and psychological costs and decide whether or not to act. The Health belief model has four main components: perceived susceptibility to ill-health (risk perception), perceived severity of ill-health, perceived benefits of behaviour change, and perceived barriers to taking action. The model explains the maintenance of health related behaviour. The concept of self-efficacy, or the perceived ability to actually take a recommended action, (Champion & Skinner, 2008; Edward & Murphy, 2014).

METHODOLOGY

Descriptive survey research method was adopted for the study. The study population comprised senior secondary school teachers and young adults in tertiary institutions in Lagos State, Nigeria. Convenience sampling technique was used to select two hundred and fifty participants. Three (3) out of twenty (20) Local Government Areas were selected using simple random sampling technique. The local government areas were Mainland, Ikeja and Apapa. Simple random sampling technique was also used to select four (4), three (3) and three (3) senior secondary schools from each of the Local Governments respectively while convenience sampling technique was used to select ten (10) teachers from each schools to make a total of one hundred (100) teachers. Simple random sampling techniques was also used to select six (6) tertiary institutions namely: Yaba College of Technology, Federal College of Education, Akoka, University of Lagos, Lagos State University Ojo, Adeniran Ogunsanya College of Education Ijaniki and Michael Otedola College of Primary Education, Epe all in Lagos State while convenience sampling technique was used to select 25 young adults from each of the schools making the total of one hundred and fifty (150) participants. Convenience sampling was used in order to administer the instrument to participants that were available, willing and ready to respond to the items of the instrument.

Food Additive Utilisation Questionnaire (FAUQ) was developed and validated. The questionnaire was divided into two sections. Section A consists of demographic variable of the respondents while section B elicited information on the variables stated in the hypotheses which are; knowledge and behaviour of the consumers. To ensure content and construct validity of the instrument, the research instrument was validated with the help of experts in the field of Human Kinetics and Health Education and also the National Agency for Food Drug Administration and Control (NAFDAC). All necessary corrections, modifications and suggestions were re-incorporated before administration of the instrument. The test, re-test method was used to establish the reliability of the instrument while the data was subjected to statistical analysis of Pearson's Product Moment Correlation (PPMC) and a correlation coefficient of $r=1.00$ was obtained. The validated questionnaire was administered to the participants by the researchers

with the help of two trained research assistants and retrieved immediately to avoid loss of the questionnaire. The researchers interpreted questionnaire items to participants and assured them of confidentiality. Data was analyzed using the descriptive statistics of frequency counts and percentages, mean, standard deviation and the inferential statistics of Multiple Regression analysis at 0.05 alpha level.

RESULTS

Results are presented as graphs and tables.

Figure 1: Distribution of Respondents by Gender

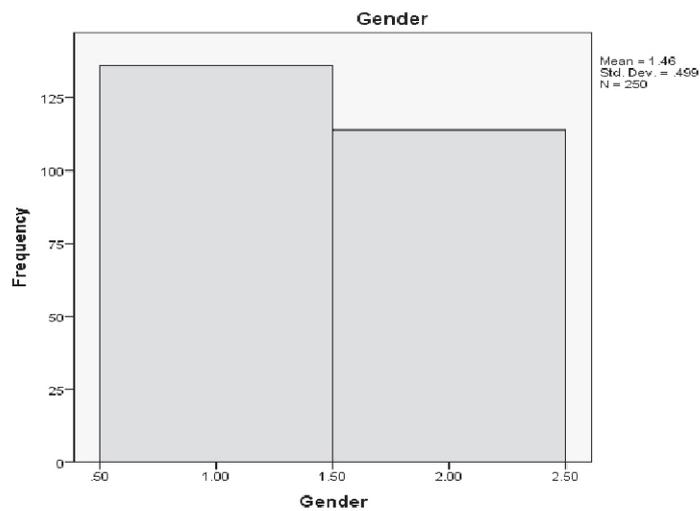


Figure 1 shows that out of the 250 participants there were, male were 136 (54.4%) and female 114 (45.6%).

Figure 2: Distribution of Respondents by Age

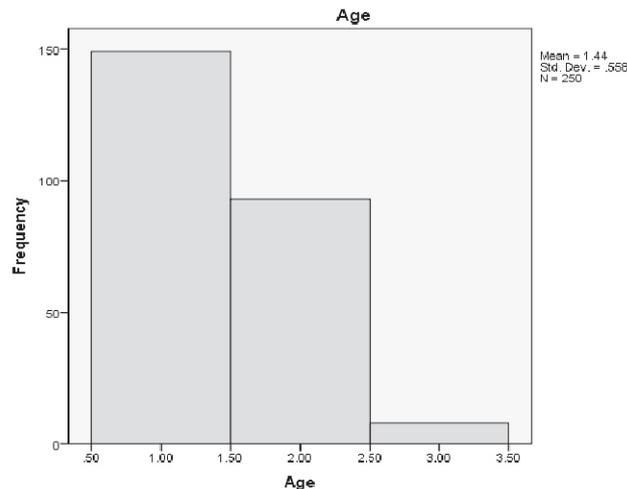


Figure 2 shows that respondents between 16-30years are the highest (n=159, 63.6%) while respondents between the age of 31-45years =83(33.2%) and 46-50 years are the lowest 8(3.2%).

Figure 3: Distribution of Respondents by Marital Status

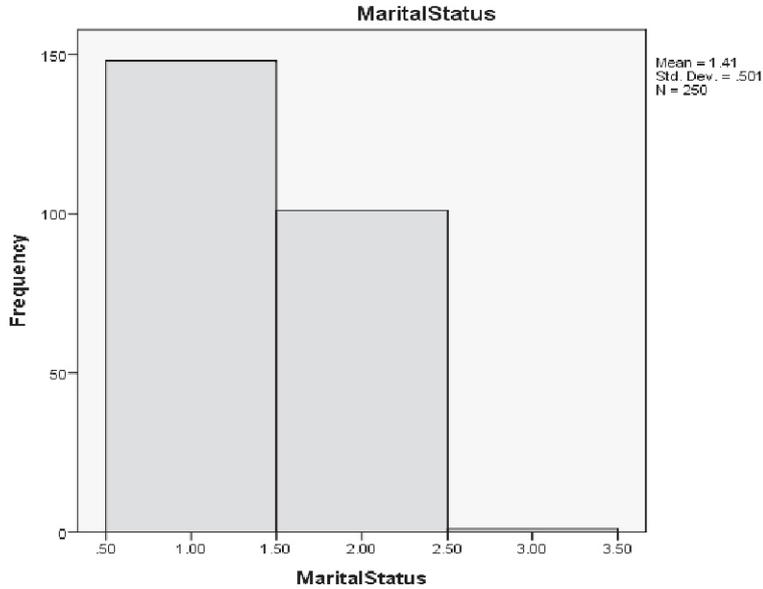


Figure 3 shows that most of the respondents are single 160(64%), Married 87(34.8%) while the lowest are the divorced 3 (1.2%).

Figure 4: Distribution of Respondents by Educational Qualification

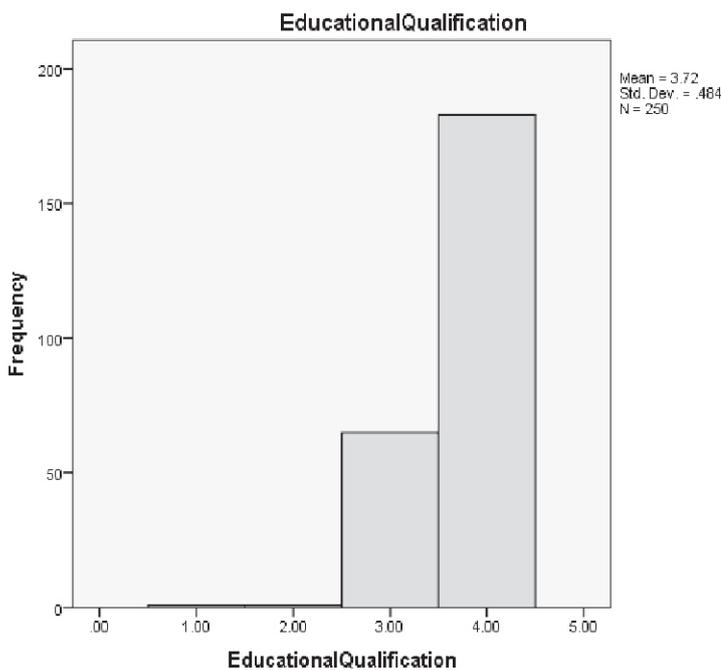


Figure 4 shows that the highest number of respondents had tertiary school undergraduates (150 (60%) while the lowest is no NCE/B.Sc 100 (40%).

Figure 5: Distribution of Respondents by Occupational Status

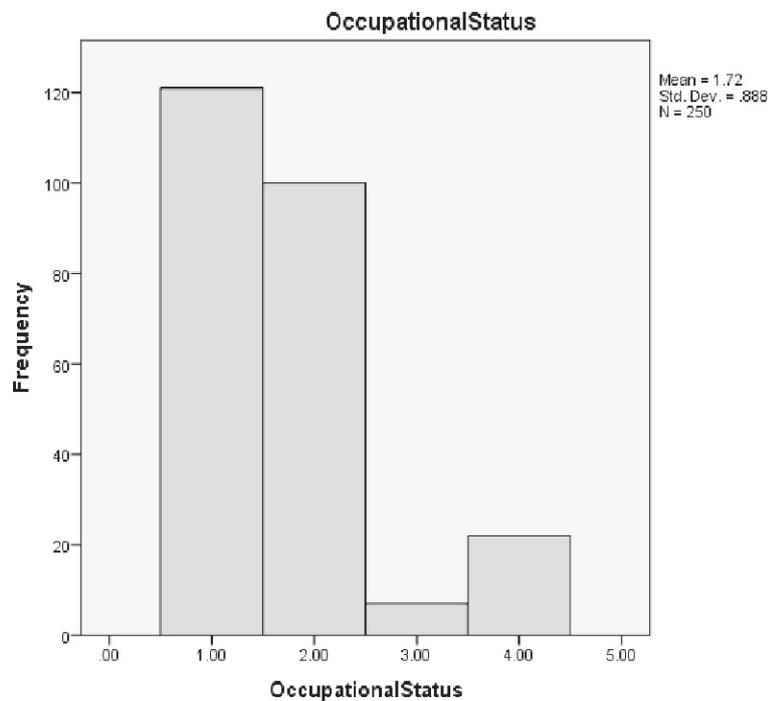


Figure 5 shows that the highest number of respondents are unemployed 129, (51.2%) while the Employed Teachers 100(40%) and Self employed 22(,8.8%).

Table 6: Multivariate Regression Coefficients of the Knowledge of Health Implications of Food Additives on the Consumption of Products by Consumers

	Sum of Squares	df	Mean Squares	F	Sig
Regression	6.781	6	1.130	7.91	0.00
Residual	34.720	243	0.143		
Total	41.501	249			

P<0.05

The table above shows that the F-Value (7.91) was significant at a degree of freedom 6 and 243 at a 0.05 alpha level, hence the stated null hypothesis is rejected. This implies that knowledge of the health implications of food additives will significantly influence consumption of products by consumers at a 0.05 alpha level.

Table 7: Multivariate Regression Coefficients of the Behaviour of Consumers towards Food

	Sum of Squares	df	Mean Squares	F	Sig
Regression	3.009	6	0.501	4.12	0.001
Residual	29.612	243	0.122		
Total	32.621	249			

P<0.05

The table above shows that the F-Value (4.12) was significant at a degree of freedom 6 and 243 at a 0.05 alpha level, hence the stated null hypothesis is rejected. This implies that behaviour of consumers towards food additives significantly influenced food consumed at 0.05 alpha level.

DISCUSSION

Virtually all manufactured foods contain chemicals that are added during production to alter their texture, stability, colour and flavour. For example, vitamins and minerals are added to highly processed white flour to replace nutrient lost in its production. Many so-called functional foods contain added substances that claim to enhance health. Many food additives are nutritionally unnecessary and some may adversely affect health, for example, sugar and salt are added to some foods to intensify their taste and thereby increase sales (Altu & Elmaci, 1995; Gordon & Eric, 2010).

The result obtained from the tested hypothesis one revealed that knowledge of health implications of food additives significantly influenced consumption of products by consumers which is corroborated by Shim, Sheo, Lee, Moon, Kim and Park (2011) which confirmed that lack of knowledge of the health implications of specific classes of additives such as colorants, preservatives, flavoring agents, antioxidants and sweeteners. sales Gordon and Eric,(2010) confirmed that many so-called functional foods contain added substances that claim to enhance health such as sugar and salt which are added to foods to intensify their taste and thereby increase sales. Also, various synthetic preservatives and artificial compounds present in the foods in the market contain substances ingested as additives and preservatives that may produce harmful effects especially among children. Studies observed that it is extremely difficult to remove many of these compounds from the body and the cumulative effects of such food additives could lead to the buildup of toxins similar to how a septic tank collects grime (Hackworth, 2007).

This observation is consistent with the report of Kozelova, Fikselova, Dodokova, Mura, Mendelova and Vietoris (2012), when majority of consumers in many countries have little or no knowledge about incidence and work of food additives. Individuals consume sweeteners in attempt to reduce sugar intake. However, studies observed that artificial sweeteners are notorious for inducing hyperactivity and increasing blood sugar. One such compound is known as Acesulfame potassium which is a rather potent calorie-free sweetener, similar to Aspartame in sweetness. Also, artificial food colouring and sweeteners have been shown to cause hyperactivity in children. Winter (2004) observed that some identified

sweeteners and food additives such as Acesulfame potassium were placed under close scrutiny by the Food and Drug Administration (FDA) for being a potentially dangerous compound with adverse side effects. Although few studies done on the compound have proved to be incomplete and inconclusive, the results suggest that Acesulfame potassium (Ace K) may have an effect on the insulin pathway in animals, thus resulting in stunted growth. These symptoms are nearly identical to those caused by hyperglycemia (high blood sugar). Despite little information on Acesulfame potassium, it can be gleaned from existing studies that it may be greatly detrimental towards the human body if ingested in small amounts on a consistent basis, potentially affecting the insulin pathway in *Drosophila* by stimulating the pathway responsible for insulin production (Winter, 2004).

The result from hypothesis two revealed that the behaviour of consumers towards food additives significantly determined what they consumed which substantiates the findings of Tarnavolgyi and Molnar (2004) that media can change consumers' shopping and eating habits as result of awareness created by media about potential health dangers of food additives.

CONCLUSION

Food additives and preservation have become necessary components of food especially for packaged and processed foods. However, there is need for individuals to acquire relevant health information concerning the various types of food to enable them make informed choices and remain in good health. Health awareness can be provided through the media, film shows, television, radio, posters and flyers. Health talks at public places in schools, hospitals and markets places for places for wider reach and initiate healthy practices.

RECOMMENDATIONS

Health education is an important means of reducing the detrimental effect of consumption of foods and drinks with additives. There is need to educate consumers about benefits, functions and health risks of chemical additives in packaged foods so that consumers can make informed decisions during their shopping or change their shopping practices that include checking additives contents and avoid such foods completely if possible. Nigerian Government should implement health education as a means of creating awareness using various health education methods and media of communication. Currently, media plays significant roles in many aspects of human daily life. The media in electronic or printed form can be used in disseminating information among consumers regarding health risks of food additives in pre-packaged food items. The Media should create awareness campaign on biochemical implication of Food additives.

Finally, regulations concerning the sale of food additives should be modified to require the reporting of adverse effects boldly to the consumer and the continuing conduct of safety research. A better frame work should be developed for the control and monitoring of food additives to create alertness on the part of consumers to strictly adhere to positive behaviours towards food additives. This will compel consumers to always read the label on packaging of any food product before consumption in order to have idea of constituents, dosage recommended or daily allowance, allergic reactions, restrictions and

biochemical reactions of some additives in foods.

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