

CONSUMER AWARENESS OF THE USE OF ADDITIVES IN PROCESSED FOODS

Ismail, Balarabe Bilyaminu^{1*}, Fuchs, Richard², Mohammad, Siraj Funtua³

¹Department of Food Science and Technology, Faculty of Agriculture, Bayero University
Kano PMB 3011, Kano state, Nigeria

²Department of Foods and Markets, Natural Resources Institute, University of Greenwich at Medway
Central Avenue Chatham, ME4 4TB, United Kingdom

³Department of Food Technology, School of Science and Technology, Federal Polytechnic, Kaura-Namoda
PMB 1012, Zamfara state, Nigeria

*Email: bbismail.fst@buk.edu.ng

Abstract

This study was carried out to determine the level of awareness about the use of additives in processed foods among the general population. A total of 50 respondents from the Medway area of Kent participated in the face to face interviews which comprised 20 questions out of which 5 questions was used to assess their level of awareness regarding the use of additives in processed foods. The results of the study shows that majority of the respondents could not correctly identify the function of each of the additives with the exception of glucose which was correctly identified as being a sweetener by 66% of the respondents. Furthermore, Vitamin E was correctly identified by 70% of the respondents as being a vitamin, although far fewer respondents (4%) were aware of its use as a preservative. Only 10% of respondents have identified niacin as being a preservative used in foods. Additionally, a significant percentage of the respondents selected the option "I do not know" meaning that they did not know the function of the listed additives as in the case of niacin (46%) and monosodium glutamate (40%). This suggests that there is a general lack of knowledge amongst the respondents about the functions of the commonly used additives in processed foods. The provision of balanced and science based information about food additives conveyed through sources that are trusted by consumers will reduce concerns and increase consumer awareness about the use of additives in processed foods.

Keywords: Consumer awareness, food additives, consumers, questionnaire survey

Submitted: 29.03.2017

Reviewed: 22.05.2017

Accepted: 02.06.2017

1. INTRODUCTION

For many centuries, food additives have served many beneficial functions in a variety of different processed food products. Even though basic foods often contain no additives, processing foodstuffs into different end products has significantly increased the amount of food additives that are commonly used in foods (Branen and Haggerty 2001). Ancient people used salt for preserving meat and fish, enhanced the flavour of some foods by adding spices and herbs, and preserved fruits using sugar and cucumbers by pickling in vinegar. Nowadays consumers demand food products that are nutritious, flavourful, convenient, safe, colourful and affordable. Advances in modern technology and the use of additives in foods have helped to make this feasible [United States Food and Drug Administration (FDA 2010)]. Pandey and Uphadyay (2012) claimed that with the introduction of processed foods in

the second half of the 20th Century, many more additives, both natural and artificial, were developed for various applications in food processing.

Food additives plays a significant role in modern food processing and the supply system allowing for an all year-around supply of wholesome and appealing food products for a growing urban population (Abdulmumeen *et al.*, 2012). There is a growing use of food additives in food processing over the years with about 25,000 different food additives currently being in used worldwide (Wu *et al.*, 2013). Food additives are useful either for facilitating or complementing a wide range of processing methods in a contemporary food supply system by making foods safer by preventing the growth of pathogenic microorganisms, preventing chemical changes such as oxidation and making foods more appealing and acceptable (Emerton and Choi, 2008).

However, in recent times, concerns amongst consumers have increased about the use of additives, particularly artificial additives, in processed foods. Various surveys have indicated that people were concerned about the safety of food additives and they found “E” numbers confusing. This gave rise to anxiety amongst many parents and young children. In addition, most people said that they needed more information about the potential health effects of additives used in foods (Tarnavolgyi, 2003).

Consumers with access to basic education would be expected to have knowledge about food and its relationship with general well-being. Nevertheless, many consumers are confused and do not know what constitutes a healthy diet and which food products can be harmful. Consequently, some of the concerns about food additives may be attributed to the lack of adequate information being provided for the public (Dicks, 2007). The main sources of information about food additives and other food safety issues were identified in a survey on Consumer Attitudes to Food Standards conducted by the Food Standard Agency (FSA) in 2007 as presented in Table 1. Government information was clearly on top of the list (selected by 47%), close behind were Television (TV) news (42%) and advertisements (29%).

Table 1: Consumer main sources of information about food safety issues

Main source of information	Percentage (%)
Government information	47
TV news	42
Advertisement	35
TV programmes	29
Friends and family	15
Internet	13
Radio programmes	13
Leaflets and signs in the supermarkets	12

Source: (Food Standards Agency, 2007)

The channel of information could be used to strengthen the awareness level of consumer and reduce their negative perceptions of food additives. What is really important to know is whether with the information being provided over the years, the awareness level has increased significantly and that consumers are informed about the functions of the commonly used additives in foods.

2. MATERIALS AND METHODS

The aim of this study was to determine the level of awareness about the use of additives in processed foods. Data were collected using a questionnaire survey conducted through face to face interviews. This enabled the collection of qualitative data on the level of consumer awareness about the use of additives in processed foods.

The questionnaire consisted of 20 questions out of which five was used to determine the awareness level of the consumers. The respondents’ demographic information was also collected for building a profile of the respondents and when using the data to see whether these characteristics have affected their responses to questions. A total of 50 respondents mostly adults over the age of 18 participated in the face to face interview carried out in public places such as cafes, parks, kiosks and other public gathering centres in the Medway area of Kent, United Kingdom.

The type of questions and their justification is presented in Table 2.

2.1 Analysis of data

The responses were calculated in percentage for each question and the results are presented in tables and figures and discussed.

2. RESULTS AND DISCUSSION

3.1 Demographic information

Demographic data were collected for the respondents and their influence on responses was determined. The data are only discussed where they influenced responses.

Table 2: Awareness of food additives

Question	Justification
(1) Please indicate the function of each of the following list of additives?	The rationale for this question was to understand whether consumers understood the functions of the listed additives commonly found on the labels of processed foods.
(2) Which of the following is your main source of information on the potential hazards of food additives?	This question was used to determine what the most effective channels would be for getting information to consumers.
(3) What do you believe the roles of additives are in processed foods?	This was asked to determine whether the respondents were aware of the roles of additives in foods and whether they were able to correctly identify some commonly used additives.
(4) When reading food labels which information do you review most often?	This was to determine how important the list of additives was in comparison to the other information presented on food labels.
(5) How good do you think your knowledge is about food additives?	The rationale of this question was to determine how respondents assessed their own level of understanding of food additives.

Table 3: Knowledge amongst respondents about the function of common additives used in foods

Additive/Class	Preservative	Sweetener	Flavour enhancer	Colour	Vitamins	I do not know
Aspartame	20%	46%	4%	4%	2%	24%
Sodium Nitrite	42%		24%	2%	2%	30%
Caramel	2%	30%	16%	20%		32%
MSG	22%	6%	10%	30%		40%
Glucose	2%	66%			8%	24%
Niacin	10%		8%	10%	26%	46%
Vitamin E	4%			2%	70%	24%
Beta carotene	10%	2%	4%	32%	20%	32%

Of the people who took part in the survey, 54% were male and 46% female. For the level of education, 24% have secondary level, 24% vocational training/college, 18% undergraduate and 24% postgraduate levels of education.

3.2 Awareness of food additives

In order to determine the awareness level of the respondents regarding the function of some

common additives in foods, a number of additives were presented, and the respondents were asked to indicate the function of each additive. Table 3 shows that the majority of consumers could not correctly identify the function of each of the additives with the exception of glucose which was correctly identified as being a sweetener by 66% of the respondents. Additionally, Vitamin E was correctly identified by 70% of the respondents

as being a vitamin, although far fewer respondents (4%) were aware of its use as a preservative. Only 10% of respondents identified niacin as being a preservative used in foods. Additionally, a significant percentage of the respondents selected the option “I do not know” meaning that they did not know the function of the listed additives as in the case of niacin (46%) and monosodium glutamate (40%). This suggests that there was a general lack of knowledge amongst the respondents about the functions of the commonly used additives in processed foods.

3.2.1 Source of information on the potential hazards of food additives

Respondents were asked to identify the main sources from which they obtained information about potential hazards associated with food additives (Table 5). They were allowed to select more than one option. These were based on the sources of information listed in the 2007 survey conducted by the FSA in the UK on Consumer Attitudes to Food Standards, the aim of which was to determine consumer attitudes, knowledge, and awareness with regards to food related issues (Food Standards Agency, 2007).

Table 4 shows that the majority of respondents (56%) obtained information from Radio and Television programmes, closely followed by the Internet (42%) and Government information (36%). Advertisements were only used by 12% of respondents. “Other sources” mentioned by a small number of the respondents (4%) included scientific journals and training in schools.

A further breakdown of the results based on the demographic groups of the respondents is presented in Table 5. The results indicate that Radio/TV programmes were a source of information for the majority of the female respondents (70%) whereas for 62% of men, the Internet was a source of information. When it comes to age it is clear that the youngest age group (18-29) found most of its information on the Internet while older respondents used radio and TV programmes as their main sources of information. Likewise looking at the educational level it seems that the most highly educated group obtained its information from the Internet (67%) while on the contrary the majority of the respondents with secondary (58%), vocational (64%) and undergraduate (67%) qualifications got information from Radio/Television programmes.

Table 4: Main source of information about the potential hazards of food additives

Main source of information	Percentage (%)
Radio and Television programmes	56
Internet	42
Government information	36
Friends and family	24
Leaflets and signs in the supermarkets	24
Advertisement	12
Others	4

Table 5: Impact of the demographic group on the source of information about the potential hazards associated with food additives

Demographics	Source of information	Highest percentage of respondents
Gender		
Male	Internet	62%
Female	Radio/ Television programmes	70%
Age		
18-29	Internet	70%
30-39	Radio/ Television programmes	71%
40-60 and above	Radio/ Television programmes	54%
Level of education		
Secondary	Radio/ Television programmes	58%
Vocational	Radio/ Television programmes	64%
Undergraduate	Radio/ Television programmes	67%
Postgraduate	Internet	67%

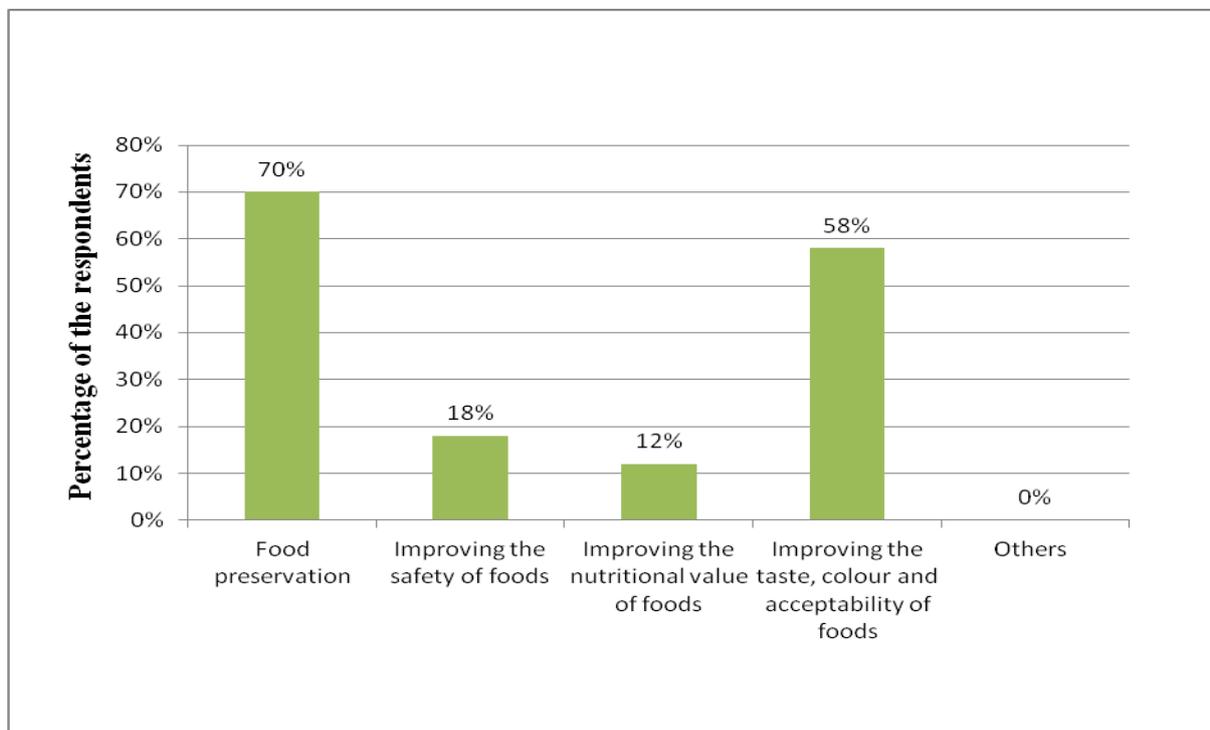


Fig. 1: Distribution of the respondents based on their response on the role played by additives in processed foods

3.2.2 Role of additives in foods

This question was asked to find out what respondents understood about the role played by food additives in processed foods (Figure 1). Respondents were permitted to select more than one option.

The vast majority of the respondents (70%) indicated that additives are used for food preservation followed by 58% who said that they are used to improve the taste, colour and acceptability of food. The smallest percentage of respondents (12%) said that additives play a role in improving the nutritional quality of food example through fortification. Although preservation of foods using additives is an important method used to protect foods against deterioration by microbial activity thereby extending the shelf life and ensuring its safety, preservatives are viewed negatively by consumers and foods containing preservatives are regarded as being unsafe or of inferior quality and rather a way of increasing profits for food manufacturers (Saltmarsh and Insall, 2013). The results from the current survey suggested that the respondents viewed the use

of additives as something negative and did not recognise the positive roles that additives can perform, including improving the safety and nutritional content of foods.

3.2.3 Information on a food label reviewed most often by the respondents

Figure 2 shows which information on food labels was looked at most often by the respondents. The result shows that the information that was referred to by most respondents was the “use by date” (42%) followed by the “nutritional information” (32%). The “use by date” is an indicator of the safety of foods as food should not be sold or consumed beyond this date to avoid potential health risks. The nutritional information provides them with information about the levels of various nutrients in the products as so that they can make an informed choice concerning their diet. Ingredient information was looked at by only 16% of respondents, but from a safety point of view this may only be relevant to consumers that suffer from food allergies or for those purchasing food for allergy sufferers.

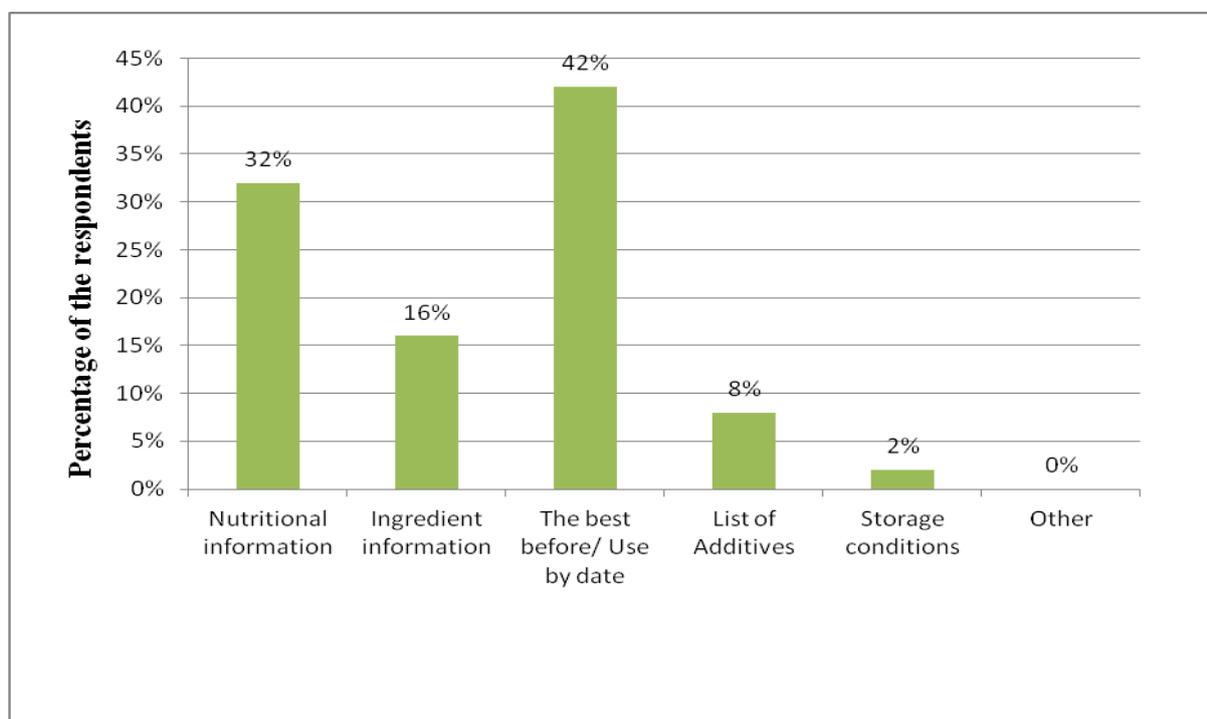


Fig. 2: Distribution of the respondents based on their response to the question on the information reviewed most often when buying foods

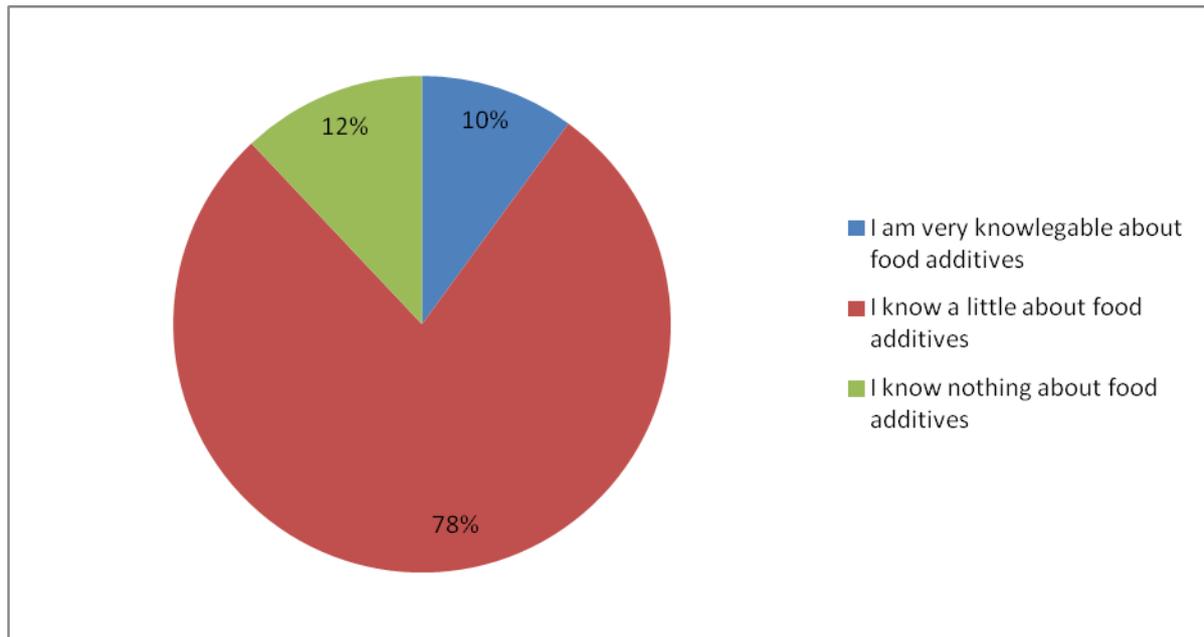


Fig. 3 Distribution of the respondents based on their response to the question about their level of knowledge about food additives

However, in spite of an apparent growing concern about the use of additives in foods, only 8% of the respondents looked at the “list of additives” in the food they buy. This is similar to the findings of [Tarnavolgyi, 2003] which indicated that only a small percentage of people looked at the list of additives when buying processed foods. However, the 2007 survey conducted by the FSA in the UK on Consumer Attitudes to Food Standards showed that respondents were more likely to look at the nutritional value and ingredient information than the “use by date”. The change in attitude is likely to be attributed to the rising concern about food safety in recent years and the importance of the “use by date” as an indicator of food safety.

3.2.4 Respondents’ level of knowledge about food additives

Figure 3 shows the distribution of the respondents based on their perceived level of knowledge about food additives. The results showed that a vast majority of the respondents (78%) said that they had “a little knowledge” about food additives. This was supported by the answers given to questions about awareness

of food additives, suggesting that there that there was a general lack of knowledge amongst the respondents about additives used in processed foods.

3. CONCLUSION

From the survey, that there was a general lack of knowledge among the respondents about the functions of the commonly used additives in processed foods. This was evident in their responses to various questions about the functions of food additives. This can be attributed to lack of adequate science based information conveyed through consumer trusted sources identified in the survey. When sufficient and science based information are provided through consumer trusted sources, the awareness level of the consumers will increase and hence they will be informed about what is in the food that they are buying. Results of this survey may benefit food processors in meeting the consumer requirements, and provide ideas to the relevant authorities for a more effective information dissemination strategy.

Acknowledgement

I wish to acknowledge the generous guidance and support of my MSc supervisor **Dr. Richard Fuchs**, Programme Leader for the MSc programme in Food safety and quality management, University of Greenwich, United Kingdom for his unique guidance and necessary help in the pursuit of this study.

Authors' Contributions

Author a' designed and perfume the study, prepare the first draft of the manuscripts and all the statistical analysis. 'Author b and c' reviews the manuscript and suggests corrections. All authors read and approved the final manuscript."

5. REFERENCES

- [1] Abdumumeen, HA., Risikat, AN., Sururah, AR. (2012) Foods: its preservatives additives and applications. *International Journal of Chemical and Biochemical Sciences* 6, 36-47.
- [2] Branen, A.L. and Haggerty, R.J. (2001) Introduction to food additives. In *Food Additives* ed. Branen, A.L., Davidson, P.M., Salminen, S. and Thorngat III J.H. pp. 1-4, New York, USA: Marcel Dekker, Inc.
- [3] Dicks, E.G. 2007. A model of consumers' perceptions of food additives and consequent Purchasing behaviour. Accessed 24 October 2015). Available:
[4] <https://www.google.co.uk/search?q=A+model+of+consumers'+perceptions+of+food+additives+and+c>
consequentpurchasing+behaviour&rls=com.microsoft:en-gb&ie=UTF-8&oe=UTF-8&startIndex=&startPage=1&gws_rd=cr&ei=RQpwUubHGuLR0QW7zIDwCQ
- [5] Emerton V., & Choi E. (2008). Essential guide to food additives. (3rd ed.). Surrey, UK: Leatherhead Food International.
- [6] Food Standards Agency (2007) Consumer attitudes to food standards: Wave 8 UK Report Final. Accessed 6 July 2015. Available:
[7] http://www.foodbase.org.uk//admintools/reportdocuments/441-1-777_cas2007ukreport.pdf
- [8] Pandey, R.M. and Upadhyay, S.K. (2012) Food additive. In *Food Additive* ed. El-samragy, Y. pp. 1-17, Rijeka, Croatia: Intech web.org.
- [9] Tarnavölgyi, G. (2003). Analysis of consumers. Attitudes towards food additives using focus group survey. *Agriculturae Conspectus Scientificus*, 68,193-196.
- [10] Saltmarsh, M., Insall, L. (2013). Food additives and why they are used in foods, In Saltmarsh, M. & Insall, L.(Ed) Essential Guides to Food Additives. (pp. 2-11), Cambridge, RSC Publishing.
- [11] U.S. Food and Drug Administration and International Food Information Council (April 2010)
- [12] Overview of food ingredients, additives and colours. Available from:
[13] <http://www.fda.gov/Food/IngredientsPackagingLabeling/FoodAdditivesIngredients/ucm094211.htm> (accessed 27 June 2016).
- [14] Wu, L., Zhang, Q., Shan, L., Chen, Z. (2013). Identifying critical factors influencing the use of additives by food enterprises in China. *Journal of Food Control*, 31, 425-432.