

MARKET RESEARCH - HOW INTERESTED ARE CONSUMERS IN MEAT PRODUCTS WITH FEWER E-NUMBERS IN THEIR DECLARATION

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ABSTRACT

Market today offers a wide range of meat products. Additives are widely used in the meat industry. Their usage is aimed to make meat products safer to eat, to extend their shelf life, improve their sensory characteristics, etc. The main objective of the paper is to be done market research and how interested are consumers in meat products with fewer E-numbers in their declaration by carrying out a survey. In order to describe the analysed sample statistical analysis is applied and the results are shown in an analytical and graphical form. According to the results obtained from this research it can be concluded that out of 210 respondents, 126 (60.00%) are informed about the meaning of the term "additive", 159 (75.71%) respondents know that the additives are labelled with E-numbers, whereas 122 (58.10%) respondents know the purposes why food additives are used in the food industry. However, competent institutions need to work on educating and informing consumers. Most respondents avoid meat products due to the presence of: flavour enhancers, emulsifiers, preservatives, food colours and stabilizers. 159 (75.71%) of the respondents believe that the market should offer meat products with a reduced presence of E-numbers in the declaration. Today, modern consumers are becoming more health conscious and they are changing their eating habits. Therefore, they are increasingly focused on natural meat products, where E-numbers are less represented in the declaration.

Key words: additives, E-numbers, meat products, consumers, consumption

INTRODUCTION

Additives are not a creation of the new modern age. Humans have always been looking for a way to preserve food surplus. Prehistoric men first used smoke to dry preserve the fish and meat surplus. In the Stone Age, as agriculture developed, new procedures were developed for the processing and conservation of surplus agricultural products. The ancient Egyptians were the first to use additives; they used natural colours to colour cookies.

The additives used in the food industry today are approved and safe. From a technological point of view, the usage and importance of additives during production, preparation, processing, packaging, transportation and storage of food is justified because their proper using improves the quality of products and meets the needs of many consumers. Their usage is legally regulated and clearly defined.

Today, additives are considered to be essential for the production of the required amount of products that meet the food safety requirements. Because of the additives, these products are constantly delivered to the consumers, regardless of the time of the year (Danev, 1999).

Contemporary meat products cannot be imagined without using additives. They are used under precisely determined conditions, for precisely determined reasons, in a precisely

determined product, and with a precisely determined amount for their usage. The number of additives used in the meat processing industry is high. The following functional classes of additives are most often added to meat products: colours, preservatives, antioxidants, emulsifiers, acidity regulators, acids, stabilizers, thickening and gelling agents, packaging gases, etc.

Modern humans are becoming more health conscious and they are changing their eating habits. They reduce the consumption of meat products or they want to consume natural meat products that contain smaller amount and smaller number of additives.

Today, much attention is paid to consumer behaviour, and conducting consumer analysis helps businesses know how to meet the demands, desires and needs of consumers and how to directly affect the company's revenue. In the long run, companies cannot meet their needs and increase their revenue without customer satisfaction (Silovska Nikolova et al. 2019).

The main objective of the paper is the research of the market, how consumers are informed about the subject, the use and safety of the additives and also how interested are consumers in meat products with fewer E-numbers in their declaration.

MATERIALS AND METHODS

The survey was conducted in November and December 2019 in Skopje. The residents of the following five municipalities on the territory of Skopje were surveyed: Centar, Aerodrom, Kisela Voda, Karposh and Gjorche Petrov. Residents of Skopje were the target group of the survey due to the fact that Skopje is a metropolis, the biggest city, and the largest population in the Republic of North Macedonia lives in Skopje. Based on the fact that the number of respondents is directly related to the importance of the answers received, the survey was conducted on 210 respondents, aged 18 and above. In order to obtain decisive results, the respondents were randomly selected and the survey was anonymous.

Statistical analysis was applied in order to describe the analysed sample. First, the answers to each question were shown in a table. The next step was to summarize the data and their statistical processing, supported by development of models in Microsoft Excel, based on scientific methods. The last step was to display the results in analytical and graphical form using diagrams and spreadsheets.

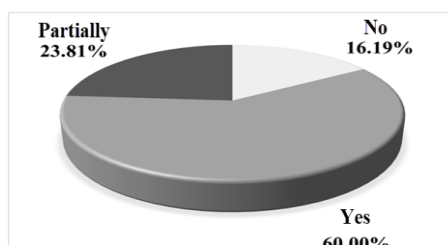
RESULTS AND DISCUSSION

From the demographic socio-economic questions related to the sex, age and level of education of the respondent, realistic idea of the participants in the research is got. Of the 210 respondents surveyed, 115 (54.76%) are women and 95 (45.24%) are men. Most of the respondents - as many as 75 (35.71%) are aged between 41-55 years, followed by respondents aged 25-40 years, i.e. 61 (29.05%) respondents, 52 (24.76%) respondents are over the age of 55, with the lowest representation are the respondents between the ages of 18-24, only 22 (10.48%). Regarding the level of education of the respondents, most of them are with higher education, i.e. 102 (48.57%) respondents, 98 (46.67%) respondents are with secondary education, 10 (4.76%) of the respondents are with master or doctorate degree, and there is not a single respondent with primary education.

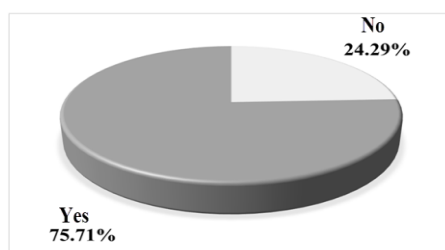
The second part of the questionnaire presents eleven thematic questions related to the research.

From the question: "Are you familiar with the meaning of the term "additive?", it can be concluded (Graph 1) that out of 210 respondents, 126 (60.00%) are familiar with the meaning of the term "additive", 50 (23.81%) are partially familiar, while only 34 (16.19%) respondents are not familiar with the meaning of the term "additive". The obtained data tell us that Macedonian consumers are familiar with the meaning of the term "additive". However, it is necessary and important to develop even more effective consumer education. The Food and

Veterinary Agency has prepared a brochure on "Food Additives and the Consumers" (AHV, 2011), where it informs consumers about the list of permitted additives for food use, the labelling method, their functional application, etc. The brochure is available on their website, and is printed and distributed to consumers at public events. Also, the Consumers' Organization of Macedonia in cooperation with the Food Agency has made informative flyers to inform consumers. It is necessary to continue educating and informing consumers.



Graph 1. Are respondents familiar with the term "additive"?

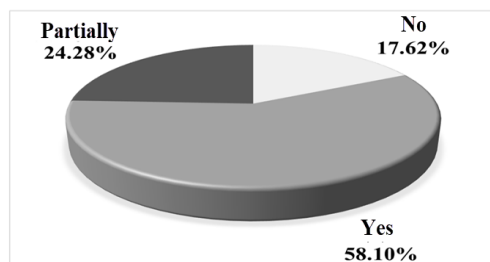


Graph 2. Do respondents know that the additives are labelled with E-numbers?

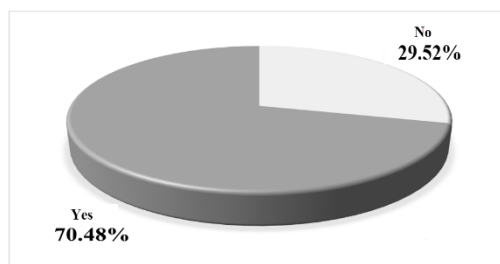
From Graph 2 it can be concluded that out of 210 respondents, 159 (75.71%) know that additives are labelled with E-numbers, as opposed to 51 (24.29%) respondents who do not know that additives are labelled with E-numbers.

As for the question: "Do you know for what purposes are additives used in the food industry?" from a total of 210 respondents it can be clearly concluded (Graph 3) that 122 (58.10%) respondents know for what purposes are additives used in the food industry, 51 (24.28%) respondents know partially and 37 (17.62%) respondents do not know at all. In general, the Macedonian consumer is familiar with the purpose of additives in the food industry, but it is necessary to work on constant informing and education. Kaptan and Kayisoglu (2015) also point out that consumers need to be educated and informed about the function of each category of additives, their safety, declaration, and how they are controlled, as well as the potential effects on their health.

As for the question: "Do you know that the labelling of food additives in food products declaration is with the name of the category, the specific chemical name or the E-number; if the additive belongs to more than one category, the category name given shall correspond to its main function in that particular food?" it can be concluded (Graph 4) that most of the respondents, i.e. 148 (70.48%) know, while 62 (29.52%) respondents do not know how the additives are labelled in the declaration.

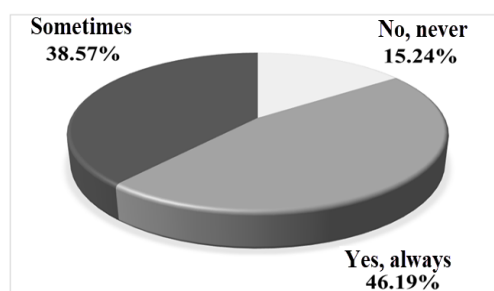


Graph 3. Do respondents know for what purposes are additives used in the food industry



Graph 4. Do respondents know how the additives are labelled on the food products declaration

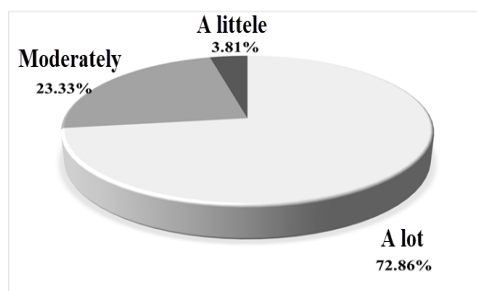
When choosing meat products, as many as 97 (46.19%) of the respondents always notice which E-numbers (additives) from the declaration are present in them (Graph 5). 81 (38.57%) respondents notice sometimes and only 32 (15.24) never notice that. It can be concluded that today consumers have a large number of meat products available, but their choice is influenced by a number of factors. One of those factors is the presence of additives in them. The results show that the presence of E-numbers in the declaration of meat products is an important factor in their selection. Bearth et al., (2014) believe that when educating consumers, it is necessary to emphasize that they should choose food according to all the ingredients and not just according to the absence of additives. Only by properly informing the consumers, the right decision could be made in choosing the food; and that should be based on knowledge of the risks and benefits of the presence of food additives.



Graph 5. Do respondents avoid certain meat products because of the presence of certain E- numbers (additives) in them

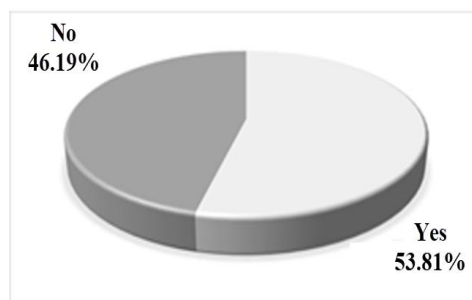
Out of the total number of respondents, 153 (72.86%) believe that E-numbers (additives) are too present in meat products, 49 (23.33%) believe that additives are moderately present and 8 (3.81%) considered that additives are not so much present in meat products (Graph 6). The results show that consumers think that meat additives are too present in meat products. The results of the research carried out by Ismail and Yusuf (2014) indicate that most respondents

are concerned about the use of food additives because of the occurrence of many health problems, such as: development of allergies, hyperactivity, asthma, cancer, etc.



Graph 6. How present are E-numbers in the composition of meat products

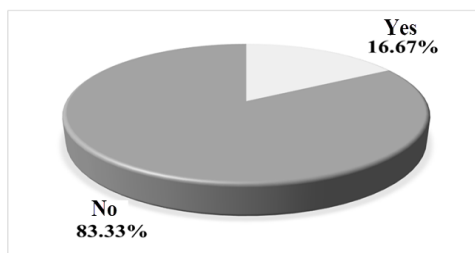
As for the question: "Are there any meat products that you avoid due to the presence of certain E-numbers in them", out of a total of 210 respondents (Graph 7), 113 (53.81%) avoid meat products due to certain E-numbers, while 97 (46.19%) of the respondents do not avoid meat products due to the presence of certain E-numbers in them. In general, consumers avoid certain meat products precisely because of the additives they contain. Today, modern consumers are becoming more health conscious and they are changing their eating habits. For this purpose, meat processors should reduce additives or replace them in order to meet the desires and needs of the consumers.



Graph 7. Are there any meat products that you avoid due to the presence of certain E-numbers (additives) in them?

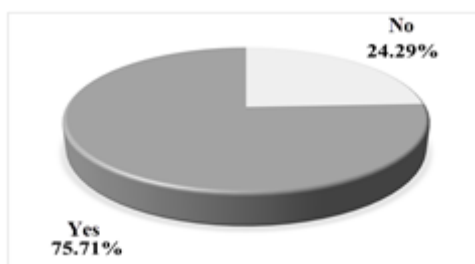
Respondents who gave positive answers to the question "Are there any meat products that you avoid due to the presence of certain E-numbers (additives) in them?" stated that they avoid meat products due to the presence of the following functional classes of food additives: flavour enhancers such as: monosodium glutamate (E621), monopotassium glutamate (E622), calcium diglutamate (E623); then the emulsifiers (they did not specify which emulsifiers). As for preservatives they indicated only sodium nitrite (E250); when it comes to the colours they pointed out: Cochineal (E120) and Ponceau 4R (E124) and they did not indicate any specific stabilizer. Szűcs (2014) points out that consumers perceive different categories of additives, such as: preservatives, flavour enhancers, colours and sweeteners. Consumers' perception of food additives is based on their subjective assessment of the potential harm to one's health and it can be noticed that consumers from different countries have different perspectives. The reason for the different types of additives is mainly due to their different uses. For example, consumers in Switzerland consider colours and sweeteners to be the most controversial additives because their goal is not to ensure food safety, as preservatives do. In their opinion, all consumers benefit from the addition of preservatives because they ensure product safety. In

contrast, Shim et al. (2011) state that Hungarian and Korean consumers consider preservatives to be the highest risk to consumer health.

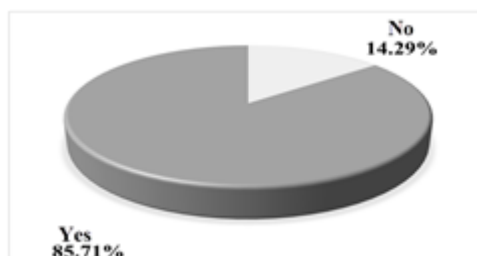


Graph 8. Are food additives safety for the human health?

When it comes to whether food additives are safe for human health, it can be seen (Graph 8) that most of the respondents - 175 (83.33%) believe that food additives are not safety for human health, while 35 (16.67%) respondents believe that food additives are safety for human health. The usage of additives is not left to the free will of the manufacturers. The legislation determines the positive list (list of permitted additives), the production, the trade, the quality (purity), the limited use, the labelling and more. Boga and Binokav (2010) point out that food additives are one of the safest chemicals because of their low toxicity, the strict safety testing, and their usage in a controlled manner. If humans consume a varied and moderate amount of industrially processed food in their daily diet, they avoid consuming a larger amount of food additives than the acceptable daily amounts. These amounts do not affect human health only if they are consumed by healthy individuals.



Graph 9. Is it necessary to offer meat products on the market with a reduced presence of E-numbers in the declaration?



Graph 10. If you are offered meat products in which additives are completely or partially replaced with natural alternative sources, would you buy them?

Graph 9 shows that as many as 159 (75.71%) respondents believe the market should offer meat products with a reduced presence of E-numbers in the declaration, as opposed to 51 (24.29%) respondents who do not consider it necessary to reduce the content of additives in

meat products. The data obtained tell us that consumers want to have products on the market that contain as few additives as possible, they want more natural meat products.

As for the question: "If you are offered meat products in which additives are completely or partially replaced with natural alternative sources, would you buy them?" - many of the respondents 180 (85.71%) stated that they would buy them; while a small proportion of respondents 30 (14.29%) stated that they would not buy them (Graph 10). Manufacturers should follow the consumers' requirements in order to meet their needs and desires. The modern consumer is increasingly focusing on natural products, i.e. products that contain as few additives as possible or products where additives have been replaced by natural alternative sources.

Table 1. Display of the correlation between the two variables

Display of the correlation	Value of the correlation coefficient r (effect size)	Description
Are you familiar with the meaning of the term "additive"? Answer: Yes	0.97	The correlation is strong
Do you know for what purposes are food additives used in the food industry? Answer: Yes		
Do you know that additives are labelled with an "E-number"? Answer: Yes	0.95	The correlation is strong
Do you know that the labelling on the food product declaration is with the name of the category, the specific chemical name or the E-number? If the additive belongs to more than one category, the category name given shall correspond to its main function in that particular food? Answer: Yes		
Do you think additives are safety for human health? Answer: No	0.97	The correlation is strong
Are there any meat products that you avoid due to the presence of certain E-numbers (additives) in them? Answer: Yes		
Should the market offer meat products with reduced presence of E-numbers in the declaration? Answer: Yes	0.98	The correlation is strong
If you are offered meat products in which additives are completely or partially replaced with natural alternative sources, would you buy them? Answer: Yes		

Table 1 shows four correlations between two variables in order to measure the strength of the relationship between them. These correlations are obtained through a developed model for linear correlation, where the input are two variables, i.e. two responses from the survey research, and the output is the correlation factor (r) and the description of the relationship. From the results shown in Table 1, it can be concluded that the respondents who are familiar with the term "additive", known for what purposes it is used in the food industry. Respondents who know that additives are labelled with "E-numbers" know how additives are labelled in the food product declaration (with the name of the category; the specific chemical name or E-number; if the additive belongs to more than one category, the category name given shall correspond to

its main function in that particular food). Respondents who believe that additives are not safety for human health avoid meat products due to the presence of certain E-numbers in them. There are respondents who would buy meat products if they are offered on the market with a reduced presence of E-numbers in the declaration.

CONCLUSIONS

Based on the results of the research, the following conclusions can be drawn: consumer education should be focused on the function of food additives, the way they are labelled in the declaration and their control in order to prevent misunderstandings about additives. Consumers believe that meat products contain too many additives and therefore avoid them. They avoid meat products due to the following functional groups of additives: flavour enhancers, emulsifiers, preservatives, colours and stabilizers. The usage of additives in the meat industry is justified only if they are used in quantities that are legally approved. The consumers, when properly informed, can make their own choices about which meat products they want to consume. They choose whether they want to consume industrially processed meat or traditionally processed meat, whether they want processed meat that has a reduced presence of E-numbers or not. Modern consumers would like to see meat products on the market with a reduced presence of E-numbers in the declaration. For this purpose, meat processors need to work in that direction, in order to meet the desires and needs of consumers.

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