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The Importance of Consumers' Knowledge About Food Quality, Labeling and Safety in Food Choice

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Abstract

With the aim to investigate existence of difference between responses of selected groups of young consumers representatives toward information associated with knowledge about food quality, labeling, safety and conditions of the product use, the results of survey were analyzed crossing the groups of consumers regarding: (1) education and (2) gender, with the other variables: (i) information related to food quality, labeling and food safety; (ii) information related to food safety; (iii) information associated with individual experience in food purchasing, preparing and consuming. The questionnaire offered answers with three grade of importance. Our research showed that groups of students formed on the basis of their education and gender, in our survey considered as representatives of young adults, had different interest for selected set of information included in the statements connected with food quality, safety and food choice. The results showed that there is a need for better informing and education of consumers about food quality and safety, labels and labeling, and how to use and interpret labels content. The results of research represent a qualitative set of information related to the food preference, which could be useful for creation and development guidelines for consumers' better informing and education.

Keywords: consumers, food quality, safety and choice

1. Introduction

With important changes in lifestyles, demographic composition of the various social groups and with globalization of food markets, the food supply is growing rapidly in size and diversity. When decide to purchase some food product, consumers often base their first decisions on the products value, on visual appearance and product presentation or advertising (Bahamonde, Diez, Quevedo, Luaces, & del Coz, 2007; Becker, van Rompay, Schifferstein, & Galetzka, 2011), but most people make food choice decisions based on rational grounds. The perceived quality of a food product is determined by many factors. Different external information are available on the package or label, as composition, food quality indicators, trademarks and its logos (Bernués, Olaizola, & Corcoran, 2003; Blades, 2009; Grujić, Petrović, & Gajić, 2013) symbol of business quality systems compliance with food safety standards and traceability (Jevšnik, Hlebec, & Raspor, 2008; Dickson-Spillmann, Siegrist, & Keller, 2011; Grujić, Keran, Vujadinović, & Perušić, 2012; Grujić, & Grujić, 2012).

Numerous surveys have shown that consumers research is difficult for realization because of the subtle and complex nature of food products stimuli at the point of purchase, during preparing and consumption (Connors, Bisogni, Sobal, & Devine, 2001; Garber Jr., Hyatt, & Starr Jr., 2003; Bahamonde et al., 2007; Al-Khamees, 2009). It was found that food accessibility, eating locations, present persons, food color, ambient temperature and lighting, temperature and smell of food, time of consumption, and ambient sounds also affect food choice and intake (Gibbert, Leibold, & Probst, 2002; Allison, Gualtieri, & Craig-Petsinger, 2004; Stroebele & De Castro, 2004; Cervellon & Dube, 2005). Consumers' knowledge on food quality, nutrition and food safety is related to the level of their education, economic status and concern about exposure to additives and contaminants (O'Key & Hugh-Jones, 2010; Heiman & Lowengart, 2011; Grujić et al., 2013).

Food production and quality control, together with sensory science, has a multidisciplinary character that unites people from very different fields such as food chemistry, food technology, nutrition physiology and psychology in their search for understanding consumers eating behavior and applying this knowledge to make better and

more accepted food products (Garber et al., 2003; Eertmans, Victoir, Notelaers, Vansant, & Van den Bergh, 2006; Grujić & Grujić, 2012). There is a lack of information regarding researches on young consumers purchasing behavior and decision making process in food choice (Costa, Schoolmeester, Dekker, & Jongen, 2003; Unusan, 2006; Kowalczuk, 2007; Al-Khamees, 2009).

Young people are population of consumers faced with many food products and diverse eating situations that can make very complicated food-choice. The aim of our research was to investigate and quantify, if exist, the difference in the attitude of specific groups of consumers toward selected information related to the food quality and safety, which can be found on the label of packed products, during selection between products offered on the market, and which are associated with the knowledge about the quality, safety and conditions of the product use.

2. Research Methods

2.1 Participants

The study included 109 students (54.13% or 59 were female and 45.87% or 50 were male) ages 22-33 years (mean age = 25 years), in the final years of undergraduate study at the University of Banja Luka, Bosnia and Herzegovina (BA), grouped based on education and on gender. A-group had 47% of surveyed or 51 (68% female and 32% male) all available students of the third and fourth year of undergraduate study on Faculty of Food Technology and Nutrition, as young consumers with fundamental knowledge and education on the food quality, labeling and food safety. The number of students in A-group limited number of students that were selected as average consumer representatives included in B-group, to have a representative sample of age and genders range included in the research. Formed B-group was similar size, with 58 students of other faculties with different fields of education (42% female and 58% male) or 53% of surveyed, of whom, none of them had Nutrition or Food science course. They were included in the research regarding their interest in cooperation, and also as representatives of average young consumers. It was not possible to influence the number of females and males included in the research, so that status was only registered.

2.2 Procedure

The study was realized on the University of Banja Luka (BA), offering to the students printed form with list of prepared questions, statements, and possible answers: 0 = not important; 1 = important; 2 = very important. Students spent approximately 10 minutes for answering. The questionnaire consists of 22 questions and statements divided into the groups, similar to the Food Choice Questionnaire used by other researchers (Bernués et al., 2003; Eertmans et al., 2005; Eertmans, Victoir, Vansant, & Van den Bergh, 2006).

Table 1. Statements related to the knowledge about food products quality, labeling, and food safety, as factors with impact on consumers' food choice, offered in the questionnaire

Statement number	Statements with information related to the knowledge about food as factors with impact on consumers' food choice
1.	Manufacturer is known on the market.
2.	Country of origin of food products.
3.	Instructions for preparation and use of the product.
4.	Nutritional composition of the product (content of protein, fat, carbohydrates ...).
5.	The composition and ingredients used for food production.
6.	The product is manufactured from natural ingredients.
7.	The product does not contain synthetic ingredients.
8.	The product does not contain additives.
9.	Method used for food product preservation.
10.	Shelf life of the product - the date until it is usable.
11.	Implemented a Quality Control System and enabled the traceability of products.
12.	Appearance, color, smell and taste of the products.
13.	It is a product that I have already consumed.
14.	The product can be easily and quickly prepared.
15.	Sale price is lower than the price of other similar products.
16.	Product price is proportional to the product quality.

The questionnaire contained 6 questions with personal data (name of faculty, year of study, age, gender, health and economic status) and statements related to the food quality, labeling, and food safety, as individual factors with impact on consumers' food choice, as follows: (i) 11 statements related to the information about food quality, labeling and safety, contained on the product label (no. *1-11*); (ii) 7 statements related to the food safety contained on the product label (no. *5-11*); (iii) 5 statements related to the sensory quality characteristics, experience in the product consuming, conditions for preparation for consuming and price (no. *12-16*), as information associated with individual experience in food purchasing, preparing and consuming (Table 1). Respondents' answers were analyzed grouped regarding: (1) education, on subjects with knowledge on food quality, labeling and food safety (A-group) and average consumer representatives (B-group); (2) female and male gender.

2.3 Data Analysis

The results of the survey were grouped accordingly. We stated statistical hypothesis that there is no difference in the attitude toward specific information related to the food quality and safety crossing the groups of consumers regarding: (1) education and (2) gender with the other variables: (i) information related to the food quality, labeling and food safety; (ii) information related to the food safety; (iii) information associated with individual experience in food purchasing, preparing and consuming. After answers analyzing, the Statistical Chi-square Analysis ($\chi^2_{1;0.05} = 3.841$; $p < 0.05$; $\chi^2_{2;0.05} = 5.991$; $p < 0.05$) (StatistiXL Toolpak SPSS 1.8 for Microsoft Excel Analysis) and hypotheses testing were performed.

3. Results and Discussion

Undergraduate students can be considered as a specific category of consumers who independently decide about their diet and have ability to choose and consume food according to their individual criteria, needs and preferences. It is important to determine which factors are involved in consumer's food choice and decision making process.

3.1 Impact of Health and Economic Status on Food Choice

Individual health related problems could impact on interest for food quality characteristics and available information related to the food products on the market. That was a reason for asking respondents about possible impact of health on their nutrition. In our survey, the most respondents of the total population (92.66%) answered that health status had no impact on their nutrition, and for 7.34 % respondents of the total population, health had impact on nutrition. Comparing their distribution between formed groups of consumers regarding education and gender with their responses regarding health status impact on their nutrition, it was concluded that there was no statistically significant difference ($\chi^2_{1;0.05} = 0.856$; $p < 0.05$) between the responses related to the need for a special diet. Due to the large differences in the number of respondents in group without and with the impact of health on nutrition, further breakdown regarding health status was neglected during the test.

In the first part of the questionnaire in our study, students answered on questions with personal data, as name of their faculty, years of study, personal age, gender, health and economic status. Based on the data, breakdown by economic status was neglected during the test, because of unequal relations between subjects: a greater number of respondents (86.24%) answered that they had satisfactory, and a small number (13.76%) that they had a low standard of living.

3.2 Importance of Information Related to Food Quality, Labeling and Safety in Food Choice

It is clear that the basic information with influence on consumers' preference and food purchasing are data on the food products' labels (Connors et al., 2001), but producers also should considered other various factors (Bernués et al., 2003; Lobb et al., 2007; Al-Khamees, 2009) when work on new food product for younger consumers (Kowalczuk, 2007; Grujić & Grujić, 2012). As part of the study we tested the hypothesis that there is no difference in the attitude toward specific information related to the food quality and safety crossing the groups of consumers formed within the population regarding: (1) education about food quality, labeling and food safety and (2) gender, with the other variables.

Through the survey, respondents marked the level of importance for each offered statement (11 statements number *1-11* in Table 1) using the scale with three categories of importance. Results were analyzed (Table 2) and compared to investigate is there difference in importance of information contained on the product label related to the food quality, labeling and food safety (i). Based on comparing of A-group (n= 555) and B-group (n= 623) responses for each level of the importance for grouped information (i) contained on the product label (Table 2), it

can be concluded that there was a statistically significant difference (χ^2= 15.942; p< 0.05) in the attitude between compared groups, the same as between female (n= 646) and male (n= 532) subjects answers, when compared on the level of total tested population (χ^2= 23.647; p< 0.05), showing that our stated hypothesis should be rejected. Some of surveyed respondents had not assigned answer on offered statements, as consequence of uncertainty in their own opinion or lack of knowledge, and they were omitted from calculation.

Table 2. Grouped responses (n) on importance of information related to food products quality, labeling and food safety for consumers' food choice, compared between groups based on education and based on gender level

Grouped statements	Compared groups and total (N)	Responses on importance and frequencies (n)							χ^b
			Importance of individual factors for consumers' food choice[a]						
			0		**1**		**2**		
		(n)	(n_0)	(%)	(n_1)	(%)	(n_2)	(%)	
(i)	A-group	555	82	15	293	53	180	32	
	B-group	623	145	23	273	44	205	33	
	N=1178								**15.942***
	Female	646	93	14	319	50	234	36	
	Male	532	134	25	247	47	151	28	
	N=1178								**23.647***
(ii)	A-group	352	47	13	171	49	134	38	
	B-group	393	77	20	167	42	149	38	
	N=745								5.862
	Female	411	49	12	191	46	171	42	
	Male	334	75	23	147	44	112	33	
	N=745								**15.689***
(iii)	A-group	254	70	28	108	42	76	30	
	B-group	285	62	22	116	40	107	37	
	N=539								4.253
	Female	294	80	27	122	42	92	31	
	Male	245	52	21	102	42	91	37	
	N=539								3.303

(i) Statements (no. *1-11*) related to information on food quality, labeling and food safety, contained on label

(ii) Statements (no. *5-11*) related to food safety, information contained on label

(iii) Statements (no. *12-16*) related to food quality, information not contained on label

[a] 0 = Not important; 1 = Important; 2 = Very important

[b] $\chi^2_{2;0.05} = 5.991$; p< 0.05

Table 3. Responses (%) on importance of information related to food products quality, labeling and food safety for consumers' food choice, grouped based on education at the level of the total observed population

Grouped statements	Statement number	Responses[a] of A-group and B-group at the level of the total observed population					
		A-group (%)			B-group (%)		
		0	**1**	**2**	**0**	**1**	**2**
(i) Statement no. *1-11* (ii) Statement no. *5-11*	***1.***	14	78	8	28	48	24
	2.	14	67	19	29	41	30
	3.	25	47	25	27	47	22
	4.	16	47	37	33	46	21
	5.	0	39	59	12	34	52
	6.	0	53	45	17	41	40
	7.	10	61	25	21	45	31
	8.	51	47	0	24	52	19
	9.	20	65	15	28	47	19
	10.	4	18	78	9	15	76
	11.	8	53	39	22	53	21
(iii) Statement no. *12-16*	***12.***	0	14	86	7	19	72
	13.	43	39	18	16	55	26
	14.	59	39	2	53	34	10
	15.	35	55	10	26	48	26
	16.	0	65	35	5	43	50

[a] 0 = Not important; 1 = Important; 2 = Very important.

Table 4. Responses (%) on importance of information related to food products quality, labeling and food safety for consumers' food choice, grouped based on gender at the level of the total observed population

Grouped statements	Statement number	Responses[a] of female and male subjects at the level of the total observed population					
		Female (%)			Male (%)		
		0	**1**	**2**	**0**	**1**	**2**
(i) Statement no. *1-11* (ii) Statement no. *5-11*	***1.***	20	64	15	22	60	18
	2.	19	56	25	26	50	24
	3.	17	52	29	38	40	18
	4.	19	44	37	32	50	18
	5.	3	36	61	10	38	48
	6.	8	51	41	10	42	46
	7.	14	51	35	18	54	22
	8.	35	54	10	38	44	10
	9.	17	63	20	32	46	14
	10.	0	10	90	14	24	62
	11.	5	59	36	28	46	22
(iii) Statement no. *12-16*	***12.***	5	15	80	2	18	78
	13.	29	46	24	28	50	20
	14.	57	34	7	52	40	6
	15.	39	49	12	20	54	24
	16.	3	63	34	2	42	54

[a] 0 = Not important; 1 = Important; 2 = Very important.

If we analyze respondents' attitudes toward each of the listed statements individually, could be concluded that various elements of the packed product label are used as information in the process of product evaluation before final choice and purchasing. Differences between respondents' answers (Table 3 and Table 4) are related to their level of knowledge on food labeling, food quality and safety. Based on results of our research, we concluded that respondents understand and use major information given on the label, but students with higher level of the knowledge (A-group) the same as female respondents group, expressed higher interest for data related to the manufacturer, food product origin, nutritional composition, instructions for preparation, product use or shelf life, than students assigned to B-group and male group. Analysis showed that respondents have interest for food quality and safety, but understanding of information on food labels is mainly related to their individual knowledge. A familiar brand name demonstrates a great potential for influence on the consumer to remember and repeat purchasing of the food product. Instructions for preparation and use of the product could be helpful and important for consumers in food choice. For example, some products need extra preparation for consuming, or after opening the product should be stored in the recommended conditions and consumed in a certain period of time for safety reasons. The results of our investigation showed that respondents in both compared groups had similar interest related to the nutrition information on food labels and nutritional composition of food.

These findings are in line with theories about women's higher health consciousness and that they learn more about food quality and safety than men, and confirm the results obtained by other authors when conducting similar studies. Wandel (1997) have shown that many consumers pay attention to the food labels, presentation of food composition and additives content that creates some uncertainty. Consumers express concerns about food safety regarding chemicals in their diet and women are more sensitive than men to risk of contaminants and additives, as chemical exposure hazards. Their general attitudes toward risk perception of chemicals in the food are positively correlated with preference for natural food (Dickson-Spillmann et al., 2011).

Relative similar published surveys showed a positive impact of consumers' gender on purchasing behavior, and that women significantly more often than men, when shopping checked the date of durability, destination of origin and packaging related information (Bernués et al., 2003; Jevšnik et al., 2008), food quality, nutritional composition, look for familiar brand name or logo as a sign of confidence with influence on overall liking of food product (Salaun & Flores, 2001; Noble, Corney, Eves, Kipps, & Lumbers, 2003; Allison et al., 2004), consider health impact of natural or synthetic ingredients and additives used in production (Behrens et al., 2010; Grunert, Wills, & Fernandez-Celemin, 2010; Dickson-Spillmann et al., 2011; Grujić et al., 2013). Consumers should be better informed and educated about food production, ingredients, food additives and methods of food preservation.

3.3 Importance of Information Related to Food Safety in Food Choice

The food labels are viewed as an important source of information for the consumers, indicating general food composition, which ingredients and additives are used, or are they safe for consumption from health point of view (Wandel, 1997; Dickson-Spillmann et al., 2011). As a consequence of food safety incidents, consumers trust in food quality and safety management has also diminished. Most consumers are subject to masses of information about food from different sources, such as the media, retailers and consumer organizations (Lobb Mazzocchi & Traill, 2007; Behrens et al., 2010). However, some of the available information on food quality control and safety are not interesting for consumers, because they do not understand their meaning, sometimes superficially look at it, or have no time and patience for searching through the mass of information to find some data. Consumers have a preference for packaged food products labeled with clearly and understandably presented information on food safety, certification of food production system and traceability (Salaun & Flores, 2001; van Rijswijk, Frewer, Menozzi, & Faioli, 2008).

As the consumers become more interested in and informed on the importance of healthy eating and living, it could be interesting to know young consumers concern on food composition. Information related to used ingredients, method of preservation, traceability and quality control of products can be recognized as indicators for credence in food safety. Some consumers tried to avoid synthetic ingredients and additives in their diet. That was the reason why in our investigation we separately check level of importance of grouped information (ii) on food safety, including nature of used food ingredients, method of food product preservation, implemented food quality control system and enabled traceability of food products (7 statements number *5-11* in Table 1) for selected population of consumers. Comparing the responses from A-group (n= 352) and B-group (n= 393) related to the importance of the information, confirmed stated hypothesis that there was no a statistically significant difference (χ^2= 5.862; $p< 0.05$) among subjects responses (Table 2). The quality of raw materials and ingredients used for their production directly affects on acceptability and safety of food products, the same as technological process applied to achieve stability and preserve the quality of products. For most of respondents included in our research,

those information were marked as 'important' or 'very important' (Table 3) showing that participants are considering information related to the food products' quality and safety in food choice.

Consumers can judge naturalness of foods based on information available on the label that is officially recognised and controlled. Comparing female (n= 411) and male (n= 334) respondents' answers related to the 7 grouped information (ii) offered as statements on food safety, on the level of the total tested population, contrary to our hypothesis, showed that there are statistically significant difference (χ^2= 15.689; p< 0.05) in subjects opinion (Table 2). Gender difference in perception of information on the product, indicated that men had lower risk perception, knowledge and interest related to food safety than women respondents (Table 4). For female respondents, examined group of the information are more important and could be viewed as indicators of food products quality and safety control. Women expressed interest for food that contain natural ingredients and do not contain synthetic substances added during processing. It is general opinion that there is no enough knowledge in the public about food additives whose use is permitted. It could be reason that some consumers showed an aversion to food additives and avoid them. Benefits of traceability they associate with products' quality characteristics and meaning like health, quality, safety and control, trust and confidence (van Rijswijk et al., 2008). Jevšnik et al. (2008) suggested that educational material on food safety messages should focus on the younger members of a population and that safety-conscious consumers, with relevant training, can become active partners within the food safety circle.

3.4 Importance of Some Other Information in Food Choice

Acceptable level of sensory quality characteristics, brand name and image, packaging, price or promotion interact with product performance and provide the overall product perception, on which consumers preference and choice are largely based (Garber et al., 2003). Consumers collect and use information related to the product quality directly or indirectly observing the behavior of the producer and its marketing activities. The statements offered in our questionnaire are grouped so that 5 of them referred to the importance of some other information not contained on label, as factors that could impact on consumers' food choice (Table 1, statements number *12-16*). The food products' sensory quality characteristics, such as shape, texture, color, flavor and individual experience in the same or similar food purchasing, preparing and consuming conditions, could impact on food choice, the same as sale price and its relation to the expected product quality. Analyzing responses of A-group (n= 254) and B-group (n= 285) on grouped information (iii) related to the food purchasing, preparing and consuming (Table 2, statements number *12-16*), showed that there was no statistically significant difference (χ^2= 4.253; p< 0.05) in their opinion on importance of offered information, and confirmed our hypothesis. The comparison of female (n= 294) and male (n= 245) responses on the level of the total observed population, also confirmed stated hypothesis (χ^2= 3.303; p< 0.05). Results of the survey are indicating that respondents had similar opinion regarding importance of food sensory quality characteristics, experience in food purchasing, preparing and consuming in food choice (Table 3). One of the factors influencing the choice of food, in contemporary life and work, is easy and simple preparation of food for consumption. The attitude of young consumers towards the price of similar products on market and its correlation with expected products quality also should be considered.

The result obtained in the present study confirmed that it is difficult to predict consumer purchase decision (Kowalczuk, 2007; Rybowska & Babicz-Zielińska, 2007; O'Key & Hugh-Jones, 2010), impact of price, food manufacturing conditions (Lange, Issanchou, & Combris, 2000; Salaun & Flores, 2001), or level of importance of information about food safety, health concerns or food quality.

Our research showed that a difference in the interest for information related to food exist between younger consumers and there is a need for better informing and education of consumers about food quality and safety, labels and labeling, and how to use and interpret food labels. As a limitation of this research can be relative small number of students of the third and fourth year of undergraduate study on Faculty of Food Technology and Nutrition that were available, and their impact on number of average consumers representatives included in our research. Undergraduate education in food science and technology provides fundamental knowledge about food quality, food safety and information contained on the food product label related to composition, preservation method, role of the additives in food and other manufacturers' claims. All mentioned data are important and should be understandable and useful tool for each consumer, during the food choice in various contexts. Presented findings also can provide scope for further consumers' research including more age and education groups.

4. Conclusions

It is important to determine which factors are involved in consumer's food choice and decision making process.

The aim of our research was to investigate and quantify the difference, in the attitude of specific groups of consumers toward information related to the food quality and safety, which can be found on the label of the packed products or during selection between products offered on the market, and which are associated with the knowledge about the quality, safety and conditions of use of the product. Our research showed that groups of students formed on the basis of their education and gender, in our survey considered as representatives of young adults, had different interest for selected set of information included in the statements connected with food quality, safety and food choice. Also, there is a need for better informing and education of consumers about food quality and safety, labels and labeling, and how to use and interpret labels content. The results of our research represent a qualitative set of information related to the food preference, which could be useful for creation and development guidelines for consumers' better informing and education. Food producers should monitor market changes and pay special attention to customers, conditions in which food products are offered and purchased in the market, and collected information incorporate into their business policy and marketing plan.

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