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## Labeling of food products on the B&H market and consumer behavior towards nutrition and health information of the product

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### Abstract

Bosnia and Herzegovina is currently undergoing a process that will establish the standards and implementation of a new approach to food safety. The process emphasises the quality of information delivered to consumers, which is part of the new approach on quality and food safety. Therefore, it is important to continue the successful communication with consumers. The Agency for Food Safety and all the other parties involved in the process of the food safety systems are required to adhere to the law and implement the laws and regulations, such as food labeling, which is now the responsibility of the food industry. The aim of this paper is to investigate the extent to which these laws and the regulations are implemented concerning the labeling of food products as well as what type of information is printed on the declarations in the B&H market. We also investigated the behavior of consumers towards food labeling, particularly in relation to nutritional information and health claims. The study included reviews of the declarations from three groups of food products. Random surveys of 208 consumers examined their attitudes towards the information described in the declaration. It was found that the product labels were in accordance with the standards in most cases, however, the declaration is often not visible and/or translated into appropriate languages. The results show that the 43% of consumers review the declaration, and that most of them (62%) pay attention to the shelf life. Only 16% read the nutritional information and 27% the health claims. There were statistically significant differences (ANOVA, Duncan's post-hoc test  $p < 0.05$ ) in the behavior of consumers depending on their gender.

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*Keywords:* consumer behavior, food products, food market, labeling of food, health claim;

### 1. Introduction

The Government of Bosnia and Herzegovina (B&H) has accepted the new Food law (Official gazette B&H, 50/04) which defines existing and introduces novel concepts and organization changes in the control of food products. The new legislation is adjusted with the European Union policy and legislation (General Food Law - EC Regulation No 178/2002) that is based on the principle "from farm to table". This means that throughout the food chain in all food sectors a high level of human health and consumer protection is ensured (Tkáčiková, 2009). It is a voluminous document based on the EU Directives and Regulations and includes the establishment of many bodies the introduction of different standards, Quality management systems, and in general, the mode of food handling

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changed (Hadžiosmanović et al., 2004; Zdolec, 2007; Filipović et al., 2008; Alibabić i Jukić, 2010; Mačkić et al., 2010). For all these changed it is important that all the interested parties are involved in a dialogue (Antunović et al., 2008). Development of communication channels between all stakeholders is in the hand of the coordination bodies, including the Food Safety Agency of B&H at national level, but the food industry itself is responsible for labelling of its food products. Consumers today are interested to know the quality of products their country of origin, whether they come from organic production or if they contains GM components (Radman, 2005; Lea and Worsley, 2008; Kretter et al, 2010) and the best way to give them this information is proper labelling of the products.

The main existing labelling legislative provision in EU is Council Directive 2000/13/EC, as amended by Directive 2003/89/EC and Directive 2007/68/EC. The main provisions are related to main information (name, list regarding ingredients, net quantity, date of minimum durability, storage conditions, country of origin, and instruction of use). Specific Directives and Regulations affecting food allergens (Directive 2008/5/EC), GMOs or products containing GMOs (Regulation (EC) No 1830/2003); food supplements (Directive 2002/46/EC) etc. The European Commission has also produced the Nutrition Labelling Directive 90/496/EEC in relation to recommended daily amounts (RDAs), energy conversion factors and definitions. Nutrition and Health Claims are governed by Regulation EC 1924/2006. With the introduction of these new regulations there is a lot of work for B&H institutions and bodies to improve and to implement, also to develop different channels to gather feedback from the consumer's.

In this work we tried to review existing legislation and institutions in B&H, especially considering the food labelling, and also to define some aspects of behaviour of the consumer's toward labelling, especially toward nutrition information's and health claims. Also, we checked the labels on the two groups of food products and found what kind of information is on the products and whether they were in compliance with EU legislation.

## 2. Methods

The review of existing legislation was done through written communication with the Food Safety Agency of B&H and reviewing the official web sites of government departments and institutions (state and entities). Data about consumer's behavior was obtained using a standard questionair and questioning 208 consumers directly in front of several market in 3 cities of northwestern part of B&H in 2010/2011.

Tab.1. Socio-demographic status of the examinees

<b>Gender</b>	<b>(%)</b>	<b>Employment status</b>	<b>(%)</b>
Male	37.6	Employed full time	54.8
Female	62.4	Unemployed	41.1
Age (average total sample)	43	Pensioner	4.1
<b>Education of respondent</b>	<b>(%)</b>	<b>Average household income</b>	<b>(%)</b>
Without education	3.3	Below 400 €	47.4
Elementary school	7.1	Between 400 and 800 €	48.1
High school	61.4	More than 800 €	4.5
University	28.2	<b>Sample size</b>	<b>208</b>

The survey was prepared by the authors and provides answers to consumer behavior toward information provided on food products concerning nutritional information and health claims. A One-way analysis of variance (ANOVA) and multiple comparisons (Duncan's *post-hoc* test) were used to evaluate the significant difference of the data at  $p < 0.05$ . Data was expressed as the mean values of the all analysed responses of consumers. Finally, the kind of information was checked on the dairy products, meat products and honey and bee products and given as both main and specific labels (nutritional information's and health claims). Table 1 shows the socio-demographic characteristics of the investigated consumers.

## 3. Results and Discussion

After the adoption of the Food law (Off. gazette B&H 50/04), the Council of Ministers adopted a decision to establish a Food Safety Agency of B&H (FSABH), the same year (2004). The establishing of FSABH lasted 2 years (decision makers in B&H are very slow because of different attitudes, especially on the entity level), but after that

the FSABH started to prepare the implementation of the legislation. In 2008 9 by-laws were adopted, in 2009 a further 9 and 5 in 2010. Regulation on general labeling or marking of packaged food (Official gazette 87/08) was adopted in 2008 and also the regulation about additives, sweeteners, colors, and regulations on labeling of the nutritional value of packaged food (Official gazette 85/08). The Law on Genetically Modified Organisms (Official gazette 23/09) was adopted in 2009, and in the 2010 regulations on labeling originality, geographically origin and traditional food were adopted (Official gazette 27/10). There is no other legislation in B&H considering the labeling of food products. FSABH has established contact and become a contact point to Codex Alimentarius Committee in 2007, to RASFF (Rapid Alert System for Food and Feed) and INFOSAN (The International Food Safety Authorities Network) in 2009. Except this, over 50 laboratories from the public health, agriculture, veterinary, food control sector and universities are connected over the FSABH network. All these documents can be found on the official web sites of the government (state and entities level) and FSABH. But, if we check official web sites at cantonal level (the BH consist of two entities, and one of them – Federation is divided in 10 Cantons; every Canton has own jurisdiction and public institution in food safety system) it can be noted that websites are not updated; there is no information available for consumers. The publications for consumers are also very poor and by reviewing web sites it can be found just information's about meetings, workshops but no concrete information about food products. The RASFF system is in function and the public is informed about the abuses in the market.

### 3.1. Labeling of food products on the market

The market of food in B&H is similar to European countries. There is more and more large shopping centers and a fewer small shops. The market is represented more by imported products and the import of food products is a growing trend. Labeling of food products is required by the Regulation on general labeling or marking of packaged food (Official gazette 87/08) and Regulation on labeling of the nutritional value of packaged food (Official gazette 85/08). These regulations are not for mineral water and dietetic products. The proper marking of products is the producers or distributors responsibility. General labeling should contain the products name, list of ingredients, net quantity, date of minimum durability, storage conditions, instruction of use, name and address of producers, country of origin, for alcoholic beverages (i.e. the degree of alcohol if the drink contains more than 1,2% of alcohol) and other data such as nutritive value, batch feed, class of product or bar code can also be included. Special regulations are for GM food or ingredients, special dietary needs (baby food, product for sportiest), additives, allergens and staff in contact with food. For illustration the labels on the food products in the B&H market we reviewed 380 food products of which 160 dairy products from 10 domestic companies and 9 from abroad, from which the highest range came from Croatia companies (40%). Meat products are presented with a total of 181 products (11 B&H and 8 foreign companies'). Offer of honey and bee products is poor, consist only 4 companies, although the USC is a great producer of honey. Three companies are domestic. The reviewed products, number and group are presented in table 2. Of course, there are a lot of more products on the market.

Table 2. Number and type of the food products which mark has been reviewed

<b>Manufacturer</b>	<b>Dairy products</b>	<b>Meat products</b>	<b>Honey and bee product</b>
B&H	80	160	34
	(*Meggle, 19%)	(*Ovako, 15%)	(*P.I.P., 66%)
Import	80	21	5
	(*Dukat, Croatia 40%)	(*Big Bull, Serbia 3%)	(*Res-Com, Macedonia)
Food products	160	181	39

(\* ) The companies with the highest range in the market

The label contained the main information in all checked products, but the visibility of data is questionable. On larger packages the information is visible, but when the product is smaller the information is not visible enough. Also, a lot of products have information in several languages, written in small print. Imported products are covered with a label of the importer and it is difficult to see the information concerning these products. In this work we tried to give a percentage of products who had the correct mark and it's seems that the main information is written on all dairy products, but 31% meat products and 34% of honey packages don't have information about their ingredients. Expanded basic information such as the number of servings or the way of use or storage is present in all products, if

necessary. Special attention in this work was given to nutritional information and it seems that dairy products are marked well, 84% of them are marked correctly. Nutritive value is presented by the table for energy, fat, saturates, carbohydrates with specific reference to sugars and salt expressed as amounts per 100g or per 100 mL or per portion in the principal field of vision (front of pack). Also, the term "light" may only be made where the reduction in content is at least 30% compared to a similar product and shall be accompanied by an indication of the characteristic, which makes the food "light" (i.e., fat). The marking in case of "light" products is correct. If the products added vitamins or minerals, the marking is correct and highlighted.

Meat products are not well labeled, especially domestic products of which only 23% contained nutritive information. In general, domestic products are marked poorly, but on almost all products there is some type of certification (HACCP, ISO 9001) which should guaranteed the quality of production and the product. On 7.7% of meat products (cans) is highlighted no preservatives, and on several domestic products "guaranteed without pork". Honey has nutritive information on 66% of packages. The content of declarations is presented in table 3.

Table 3. The type of information's on the reviewed food products

Type of information	DP*	MP*	HP*	Visibility
<b>Main information's on the food products (%):</b>				All products visible
Name of the products,	100	100	100	
Name of producers (importer), Address, Weight,	100	100	100	
Main ingredients,	100	69	66	
Date (of production...use to..)	100	100	100	
<b>Expanded basic information's on the food products</b>	If necessary have been written			On small packages not visible
The way of storage, the way of use				
Number of serving, recipes				-
Telephone number of manufacturer		No		
<b>Nutritive information's (%)</b>				
Nutritive value of main ingredients showed with table	84	23	66	On larger packages, visible
"Light" products	100	-	-	Highlighted
Vitaminized	100	-	-	Highlighted
No sugar, less fat	15	2,2	-	Yes, no highlighted
No preservatives	3,1	7,7	-	Highlighted
<b>Information's about cultivation, breed, GM</b>				
If, those information are not visible	-	-	-	No
<b>Health claims (%)</b>				
General health conditions and suggestion	60	-	7,6	Prominent
Health claims	1,8	-	7,6	Prominent

(\*) DP: dairy products; MP: meat products; HP: honey products

The Regulation EC 1924/2006 provided the rules of the use of health or nutritional claims (such as "low fat", "high fibre" and "helps lower cholesterol") on foodstuffs based on nutrient profiles. This should contribute to a higher level of human health protection, to ensure information for consumers that they know exactly what they are consuming and fair competition and promote and protect innovation in the area of food. In B&H there is still no regulation for the health claims. However, we found some kind of health suggestion or instructions connected with health on dairy products and honey. 60% of the reviewed dairy products had health suggestions such as "excellent source of calcium for children, teens, pregnant women and lactating", "for better condition drink a glass of milk daily", "our milk contains a large number of vitamins and minerals important for life, it is precious drink for healthy eating", "enriched with vitamins". All of those written messages can be classify in nutritional claims, but one "assist binding of calcium in the bones" can classify in health claims. It is present only on one company from Croatia (1,8% of all reviewed products). The requirements regarding nutrition and health claims are described in Chapter III of the EC Regulation and laid down procedures by which application for approval should be made. There is a special case for domestic honey. 7,6% of reviewed products had a health claims such as "solve urological problems", "treat coughs and respiratory problems". It is important to say that honey produced by domestic beekeepers is sold on the open market (without official control) and consist a large number of health claims. All of them stem from the traditions and experience handed down from generation to generation or from domestic herbalists, who use honey in many products. These claims are not based on generally accepted scientific evidence.

### 3.2. Results of consumer's questioners

The average consumer interest in relation to food labeling is not so promising. The results of our survey showed that consumers are mostly interested in the data concerning the duration of its shelf life. 62% of those questioned always checked this information. Many people surveyed were concerned by possible media manipulation of the facts they present and the lack of control over this, in general people were quite suspicious of the food market. But, there is also no real data about control of food products except the data from the inspection system and this data is not available to the public. In 2010 FSABH carried out a survey of about one thousand food products and they inform the public that 6% of products do not meet the required quality. Official data can be found in the Report of the Institute for Public Health of Federation B&H, last data for 2009 ([www.zzjzfbih.ba](http://www.zzjzfbih.ba)). The data shows that 4,94% samples of food was not correct (chemical analysis) and 3,28% (microbiological analysis).

The behavior of consumers toward labels on food products are presented in table 4. The survey involving 208 persons from which 55% were female. Women are more responsible; in all cases they shift more attention to the information on the food products. They always check declarations in 49% and 42% periodically that are almost all women (91%). The men checked the declaration only 37% of the time. On average, male and female monitor the declaration in 43% of cases. Also the women check the lifetime of products 74,5% of the time and 18,2% periodically, that means in 92,7% cases. This is probably a result from people suspicions of the products quality.

Table 4. The consumer behaviour toward information on the food products

Questions	Gender	Behaviour of consumers toward information's on the food products				
		Necessarily	No	Periodically	Never	No answer
Did you review the declaration before purchasing the product?	Male	37	29,4	27	6,6	-
	Female	49	5,4	42	1,8	1,8
Did you control the lifetime of product?	Male	50	11,2	35,6	2,2	-
	Female	74,5	3,6	18,2	-	3,7
Did you control the ingredients of product?	Male	24,4	20	44,4	4,4	6,8
	Female	40	21,9	34,5	1,8	1,8
Did you control the country of origin of product?	Male	28,9	35,5	31,1	2,2	2,3
	Female	23,7	25,4	29,1	5,4	16,4

Data are expressed as mean value of all analyzed responses of consumers

It is interesting to notice that men check the country of origin (28,9%) more than the women (23,7%) of the time and periodically (31,1%), but also there is a high percentage of those who do not check the country of origin (35,5%), or declaration in general (29,4%).

We asked the consumers if they have any suggestions about the declaration for producers and they (62% of all) answered with several proposals:

- That the declaration must be visible
- Lettering must be larger
- The shelf life should be in a visible place and printed in larger letters

In the survey, we asked the consumers do they read nutritional information and we found that 16% of them (both genders) read this information. With health claims the situation is better with 27% of all consumers reading health claims. In both cases the women are again more interested in this information. The results show that there is a statistically significant difference according to interest for nutritional information on the food products (ANOVA, Duncan's *post-hoc* test) between genders in relation to the different questions (Table 5). The same statistical significance was found for health claims.

Table 5. The consumer behaviour toward nutrition's information's and health claims on the food products

Answers	Nutrition information's		Health claims	
	Male	Female	Male	Female
Yes	5,75 <sup>b</sup>	10,25 <sup>a</sup>	7,41 <sup>b</sup>	19,60 <sup>a</sup>
No	62,9 <sup>a</sup>	34,11 <sup>b</sup>	31,91 <sup>a</sup>	13,10 <sup>b</sup>
Sommetimes	22,20 <sup>b</sup>	52,87 <sup>a</sup>	36,13 <sup>b</sup>	63,43 <sup>a</sup>

Data are expressed as mean value of all analyzed responses of consumers

The same letter in the same raw indicates no significant differences (Duncan's test,  $p < 0.05$ )

#### 4. Conclusions

Considering that Bosnia and Herzegovina is politically and administratively a very complex and complicated country, the adoption of the Food Laws and 23 regulations, as well as the formation of institutions in the food safety system can be considered a success. So far, the institutions have not developed all the necessary instruments to communicate with the consumers, but the work of Food Safety Agency of B&H deserve respect, because despite the complicated procedures and poor sources of financing they have managed to include all the necessary institution in a communication network and connect to other international organizations in the system.

The labelling of food product meets the basic requirements of the Regulations and producers and distributors are taking responsibility in most cases. The other question concerns the consumers. There is a lot of work needed to develop communication channels with consumers, and in general the state should provide education to the consumers that will allow them to make better choices and protect them from false claims. It is necessary to point that the consumer does not check the labels on the food products except for the shelf life, probably because they are suspicious of the quality of the food. Also, only 16% of consumers read the nutritional information, and 27% of them read the health claims, which are in general not defined by the national regulations.

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