

Food safety – public good

Potravinová bezpečnosť – verejný statok

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Abstract: The paper seeks to analyse the understanding of food safety by consumers of agro food products in the Nitra region. The food safety is here understood as the complex of precautions concerning the plant health protection, veterinary problems, animal health protection and animal welfare, concerning the foodstuffs and feeds. Realization of these precautions leads to the safety of all the parts of the food chain and the final foodstuff. Health, good living level and the protection of economic and social interests of people are the basic attributes for the evaluation of the role of foodstuff. That is why the food policy of the SR and the EC is also subordinated to these attributes. General principles and claims concerning food safety are set in the decree of the European Parliament and the Commission (EC) No. 178/2002. Relevant claims of this key horizontal regulation are already in use since January the 1st 2005, and create the common basement for precautions concerning foodstuffs and feeds, and legally ensure the complex approach to the food safety including all the direct and indirect impacts on food safety, animal health and some environmental issues. The food safety is a public good in the SR as it is characterised by non-excludability from consumption and non-existence of rivalry in the consumption.

Key words: food safety, consumer, policy, questioner, foodstuffs

Abstrakt: Článok analyzuje vnímanie potravinovej bezpečnosti spotrebiteľmi agropotravinárskych produktov v Nitrianskom kraji. Bezpečnosť potravín je chápaná ako súbor opatrení na úseku ochrany zdravia rastlín, veterinárnej problematiky, ochrany zdravia a pohody zvierat, na úseku potravín a krmív, ktorých realizáciou sa dosiahne bezpečnosť všetkých zložiek potravinového reťazca a tým aj finálnej potraviny. Zdravie, dobrá životná úroveň a ochrana ekonomických a sociálnych záujmov občanov sú základnými atribútmi hodnotenia úlohy potravín. Tomu sa aj podriaďuje potravinová politika SR a ES v zmysle potravinového práva. Tieto všeobecné zásady a požiadavky ustanovuje v záležitostiach bezpečnosti potravín Nariadenie Európskeho parlamentu a Rady (ES) č. 178/2002. Podstatné požiadavky tohto kľúčového horizontálneho právneho predpisu Európskych spoločenstiev sú už od 1. 1. 2005 v účinnosti a vytvárajú spoločnú základňu pre opatrenia, ktoré sa týkajú potravín a krmív a právne zabezpečujú zavedenie uceleného a komplexného prístupu k bezpečnosti potravín vrátane súvisiacich aspektov s priamym alebo nepriamym dopadom na potravinovú bezpečnosť, do ktorých zahŕňajú aj hľadiská zdravia zvierat a niektoré hľadiská životného prostredia. Potravinová bezpečnosť je v podmienkach SR verejným statkom, pretože je charakterizovaná nevytláčiteľnosťou zo spotreby a neexistenciou rivaly v spotrebe.

Kľúčové slová: potravinová bezpečnosť, spotrebiteľ, politika, dotazník, potraviny

Ensuring the food safety in Slovakia is strongly influenced by the failures of the control institutions. These cannot constantly evaluate all the aspects of the production chain, from the primary production, feed production, through processing, production and distribution of foodstuffs, their import and all these parts leading to the final consumer. All of these parts can strongly influence the food safety and the public health.

The complex of food safety includes also different specific issues. These can be the feeds for animals

producing foodstuffs, medical feeds and supplementary substances to feeds, the feed hygiene, foodstuff hygiene, diseases contagious from animals to people through the foodstuffs of animal origin, pesticides residuals, contaminants and veterinary medicals and their control, eradication of animal diseases influencing the health of people, labelling of foodstuffs and feeds, drinking water as the part of foodstuffs, new foodstuffs and the GMO as well as the requests on the quality, ingredients and labelling the foodstuffs to ensure the protection of consumers including their awareness.

THEORETICAL ASPECTS OF CONSUMER'S BEHAVIOUR AND DECISION-MAKING PROCESS

Each consumer is different and for that reason he/she makes different decisions within the process of purchasing. Consumers are much influenced by the concrete situations and concrete offers. However, in spite of this, marketing experts use more general models of behaviour and decision-making of customers and try to identify the essential effects and factors influencing this process. At present, the most accepted is the model of the consumer buying decision process, which divides consumer's behaviour and decision-making into five subsequent stages (Dibb et al. 1994; Sheth et al. 1999):

1. The stage of identification of needs. This means that the consumer feels that there is a difference between his/her desires or needs and the actual situation. This process of recognition may be either slow or rapid, depending on the urgency of this need and on consumer's personality. In this stage, significant individual distinctions resulting from different demographic and psychographic characteristics, lifestyle, knowledge, attitudes and motivations of consumers are manifested together with the influences of some macro-environmental factors – socio-economical, cultural and personal (family-related ones). The personal experience and data stored in the memory are important as well.
2. The second stage is the stage of the search for information. The obtained information helps to solve the problem and is acquired from the external environment, mostly from the consumer's surroundings. This means that the information search has two aspects – internal and external. The internal search means that buyers search their memory for data concerning the offer and desired products. However, in this stage, very important and of major importance are the external sources of information, i.e. communication with friends and relatives, comparison of brands and prices, data learned from mass media and sellers, advertisement, etc. At the end of this stage, the consumer has a list of brands and prices that are viewed as the possible alternatives, which are evaluated in the third stage.
3. The third stage is called the stage of evaluation of the individual alternative variant on the base of the buyer's criteria. These criteria involve those product's features that the buyers want (or do not want). Using these criteria, the buyer evaluates and ranks the brands and/or products. If the evaluation

is successful and helps to define one or several acceptable brands that the consumer is ready to buy, he/she is ready to move on to the next stage, i.e. the purchase. If not, a repeated information search is necessary.

4. The purchase stage means that the consumer chooses one product to be bought. Before doing so, some other aspects can be also considered (seller, price, delivery, warranty, service etc.). Finally, the buyer decides to buy the product and the purchase takes place.
5. Very important is also the stage of post-purchase evaluation. After the purchase, the buyer begins to evaluate the product and to check if its properties and performance meet his/her expectations and desires. The criteria used when evaluating the product before purchase are applied again during the post-purchase evaluation. This stage then determines whether the consumer is satisfied or dissatisfied and will purchase again (Foret, Procházka 2006)

The European Food Law (Decree EP and Commission No. 178/2002) defines when the foodstuff is safe. This cannot be harmful on health, which means it cannot negatively influence the consumer's health even after a long-term consumption, neither the health of the next generations. The foodstuff cannot have the toxic effects in an organism and cannot evoke negative effects in specifically sensitive categories of population as for example suckling and children, diabetics, celiatics and so on. The amounts of foreign substances added to the foodstuffs to increase their durability, improving the technological way of production, aroma, colourings as well as the contaminants from industrial production and their residuals (pesticides) are also limited. The foodstuff has to be produced in a hygienic way, it cannot be the source of microbiological contamination and contaminated by external impacts or other putrid process.

In other words, the criteria of the EU for the safe foodstuffs are well defined. The EU also states in the mentioned decree, that it is necessary to avoid ignoble and illusory production activities, counterfeiting of foodstuffs and so on. Every foodstuff has to be properly labelled, so that it will provide the consumer by sufficient information about the quality, features that could influence the consumer's health. It means, that the foodstuff which is not properly labelled, so that it is not possible to find out the producer or the country of origin (in case of imported foodstuff), is signed as the foodstuff of unknown origin and has to be immediately excluded from sell, because it is considered to be dangerous. Food safety contributes

to the reduction of high disease rate and mortality risk related to food consumption (Serencěš 2006).

MATERIALS AND METHODS

To find out the understanding of “food safety” by the consumers, we used the questionnaire research. This was the part of the VEGA¹ project “Global food market – analyses of the change of supply, demand and food safety”. The Department of Economics, the FEM SAU in Nitra during the period of the months March and April 2007 carried out the project. The questionnaire consists of 37 questions, 14 of them were relevant for the purpose of this paper. 51 respondents of different age and education from the Nitra region answered the questions. The questionnaire was realized via questioners, the recoverability was 100% and there were no problems concerning the answers or the understanding of questions.

<i>Age structure:</i>	<i>Number of respondents</i>
1–20 years	9
21–30 years	14
31–40 years	6
41–50 years	17
51–years and more	5
<i>Education categories:</i>	
Primary education	0
Secondary education without GCE	8
Secondary education with GCE	34
University education	9
<i>Net income per month:</i>	
Less than 10 000 SKK	2
10 001–15 000 SKK	1
15 001–20 000 SKK	12
20 001–25 000 SKK	14
25 001–30 000 SKK	9
30 001–35 000 SKK	5
35 001–40 000 SKK	2
40 001–45 000 SKK	1
45 001–50 000 SKK	2
50 001–55 000 SKK	1
More than 55 001 SKK	2

We assume that the recognition of consumer’s attitudes will help to solve the problems of safe and healthy foodstuffs, mainly through prevention and education. We come out from the hypothesis, that if the people do not understand the issue of food safety,

than they behave independently from this issue. To find out the influence of other determinants influencing the probability, that the consumer will be able to protect himself, we used the logit model. In this case, it is not adequate to use the linear regression, as the distribution of the random error is not normal and the estimated probabilities can occur out of the interval 0–1. Logit model assures that the estimated probabilities are within the interval 0–1.

RESULTS AND DISCUSSION

11 from the 51 questioned respondents have not chosen any answer to the question “Could you say the name of some institution, which you think is responsible for the food safety?” This group of respondents represented 21.5% of all the questioned. Most of the respondents, (60.7%) indicated the Slovak Trade Inspection, 25.5% of all the questioned mentioned the State Veterinary and Food Office of the Slovak Republic even if they did not know the proper name of this institution. 7.8% of the questioned stated the Office of Public Health Service, 1.9% stated the Ministry of Economy of the Slovak Republic and the same percentage stated the Ministry of Agriculture of the Slovak Republic (Figure 1).

This question was analysed also from the view of the education structure. We found out that the consumers are not willing to risk the disease arising from dangerous foodstuffs but they are willing to inform about possible risks only their own relatives. This is shown in the Table 1.

The question “Chose the institution you think should guarantee the food safety (protection of consumer’s health)” was a closed one, and the answers regarding the education structure are shown in the Figure 2.

The aim of the next question “Food safety is only my deal” is to find out, whether the consumers are willing to control the sell-by date of the foodstuff, aroma, colour... The main aim is to find out, whether the consumer thinks that the food safety depends mainly on his/her own control. The research showed that 34% of questioned agree with the statement that the food safety his or her own deal. 58% of the questioned refused this statement, which means, they do not agree that these attributes should be controlled mainly by the consumer. The rest of the questioned (7.8%) do not know who should be responsible to control this problem.

To the question, “Itemise at least three types of foodstuff with which you had bad experience (as for

¹ Vega project No. 295/01120, applicant: Roman Serencěš, SPU Nitra.

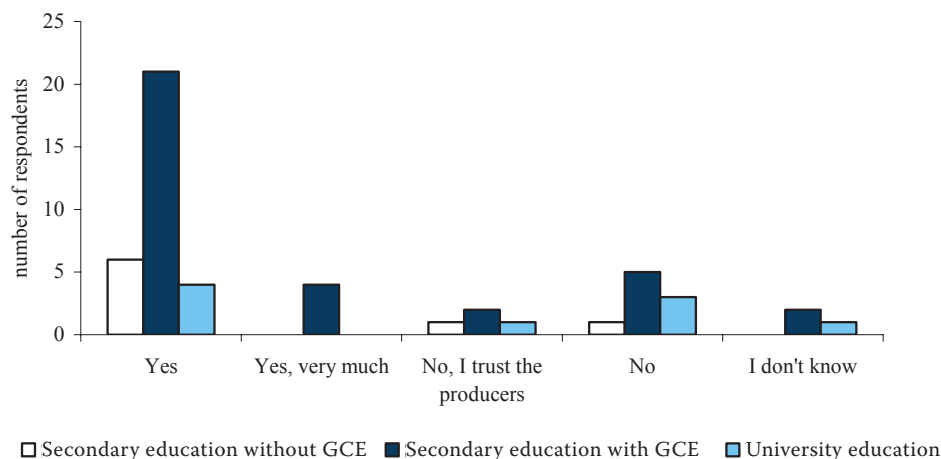


Figure 1. Concerns about the health from the view of the content of different substances in foodstuffs

Source: research via questionnaire

the colour, sell-by date, aroma, quality...)” all of the questioned itemised at least three such products. There were many different answers, but the most commonly used were meat and milk products, fruit and vegetable. From the group of meat products, the most mentioned were sausages, salami and ham. From the milk products, the respondents itemised the yoghurts, cheese, mayonnaise salads and paste. The consumers met very often also with rotten fruit or vegetable as well as with green fruit or smelly fruit preserves.

The research showed that the consumers leave the responsibility of their own health on the other institutions, even if they can influence it or control it by themselves. This observation was proved also by the other question concerning the trust in the institutions of market control. 50% of the questioned younger than 20 years do trust these institutions. 12.5% of this age category does not trust them and 37.5% do not know, whether they can trust or not. In the age category of 21 to 30 years, 43.7% of the questioned trust the institutions, 18.7% of the this

group of people answered negatively and 37.5% of the questioned do not know if to trust or not.

83.3% of the respondents in the age of 31 to 40 years trust mentioned institutions and the rest of the group does not know or does not trust them. In the group of 41 to 50 years old consumers, 41.2 of them trust the institutions, 29.4% do not trust and 29.4% of the respondents do not know if to trust or not. In the last age group of respondents, the trust in the institutions was observed in 20% consumers, 40% of this group do not trust and 40% of them do not know what to think.

Later on we asked the question “If your favourite foodstuff is damaged, are you willing to change it to another one?” This question was analysed also according to the different net monthly income of respondent. The answers in percentages are shown in the Table 2.

Most of the questioned (46.1%) without reference to the net income answered positively, that means if their favourite foodstuff is damaged, they are willing to change it for another foodstuff. 44.2% of all the

Table 1. The answer regarding the age structure

Age of respondents (years)	Yes, I will tell it to my family and friends	Yes, I will publicise it on internet	No, it has no sense	I do not care	I do not know
Less than 20	5	1	1	2	1
21–30	11	1	1	1	1
31–40	4	0	0	0	1
41–50	12	0	3	0	1
50 and more	4	0	0	0	0

Source: Research via questionnaire

respondents would rather change the foodstuff even if they are not so decisive as the first group. There were only 1.7% of all of the questioned consumers who are not willing to change the damage foodstuff. This means that together 90.3% of the questioned respondents are more or less willing to change the damaged foodstuff.

The next question was “When you find a damaged or old foodstuff in the grocery, do you inform the shop assistant?” This question is connected to the previous one and shows that the consumers are usually willing to change the damaged foodstuff but they are not always willing to inform the shop assistant about such a foodstuff. The analysis was provided regarding the different age of the respondents. The willingness to inform the shop assistant about the

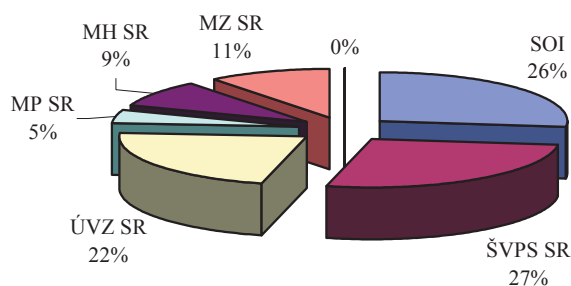


Figure 2. The answers of respondents with secondary education without GCE (in %)

SOI = Slovak Trade Inspection, ŠVPS SR = State Veterinary and Food Office of the SR, ÚVZ SR = The Office of Public Health Service, MP SR = Ministry of Labour SR, MH SR = Ministry of Economy of the SR, MZ SR = Ministry of Agriculture of the SR, Obvodné úrady = District Authorities, Mestské a obec. úrady = Municipal and Local Authorities, Policajný zbor = The Police, Rôzne združenia občanov = Various civic associations

Source: research via questionnaire

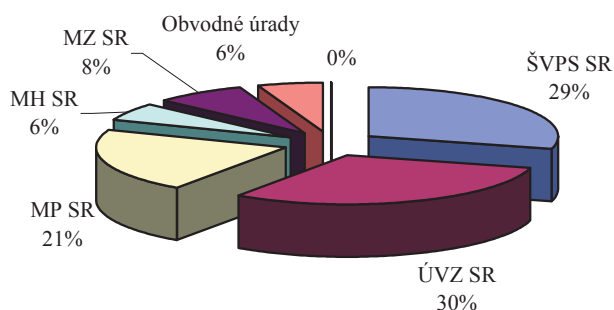


Figure 3. The answers of respondents with secondary education with GCE (in %)

Explanation see Figure 2

Source: research via questionnaire

damaged foodstuff is very small especially in the first group of respondents younger than 20 years, they answered more negatively than positively. The respondents older than 21 years but younger than 30 years answered this question more positively than negatively but the majority of them is not always willing to inform the shop assistant. In the group of respondents between 31 and 40 years, there was the most commonly used the answer “not always”. Most of the respondents older than 41 years and younger than 50 years answered positively, as they would inform the shop assistant about the damaged foodstuff. Finally, in the last group of respondents older than 50 years, all of them would inform the shop assistant if they found some damaged foodstuff. Without reference to the age, 41.2% of all the respondents would surely inform the shop assistant and 15.7% are not willing to do that. 39.2% of the respondents is not always willing to inform the shop assistant and 3.9% of the respondents do not matter at all.

The question “Do you know at least one consumer association” was answered by 31.3% of the respondents negatively. They do not know even one such association for consumers. 25.5% of the questioned respondents know some consumer association but they do not know the name and the same percentage mentioned some of these associations (Coop-Jednota, Agromilk...) 17.7% of the respondents do not know whether they know some association.

The answers to the question “Do you know where to find the information about safe foodstuffs?” are listed in the Table 3.

66.7% of the consumers younger than 20 years do know, where to find the information about healthy safe foodstuff, the rest of them (33.3%) does not know it. In the group of consumers between 21 to 30 years, 33.3% of the group answered positively but the rest of the group (66.6%) answered negatively.

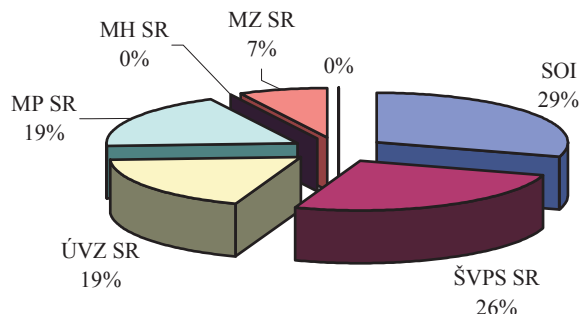


Figure 4. The answers of respondents with university education (in %)

Explanation see Figure 2

Source: research via questionnaire

The opposite result was observed in the group of consumers between 31 to 40 years. In the group of respondents between 41 to 50 years, only 17.6% of the respondents do know where to find the information and the rest 82.4% do not know. None of the

Table 2. Answers of the respondents regarding the net income per month (%)

Net income per month (SKK)	Yes	Rather yes	No	I do not know
Less than 10 000	50	50	0	0
10 001–15 000	100	0	0	0
15 001–20 000	58.3	41.6	0	0
20 001–25 000	64.3	21.4	7	7
25 001–30 000	44.4	33.3	11.1	11.1
30 001–35 000	40	40	0	20
35 001–40 000	50	0	0	50
40 001–45 000	0	100	0	0
45 001–50 000	50	50	0	0
50 001–55 000	0	100	0	0
55 001 and more	50	50	0	0

Source: Research via questionnaire

Table 3. The answer according to the age structure

Age categories (years)	Yes	No
Below 20	6	3
21–30	5	10
31–40	4	2
41–50	3	14
50 and more	0	4

Source: Research via questionnaire

Table 4. The determinants of consumer behaviour and decision making concerning the auto protection - binary Logit model

	Model 1	Model 2	Model 3
Constant	2.42***	2.54***	2.42***
Income	0.013*	0.021*	0.011
Supermarket	0.92***	0.65**	0.85***
University	0.93**	–	0.83**
General overview	1.58***	1.60***	1.59***
Age	–0.13	–0.12	–0.09

*significant at 10%, **significant at 5%, ***significant at 1%
Source: Research via questionnaire

consumers older than 50 years does know where to find the food safety information.

The Table 4 shows the results of the questionnaire. The income of the consumer increases the probability that the consumer will be able to protect himself (model 1 and 2), however, the influence of consumer's income is not significant. That means the respondents could have incorrectly put the income of the family, or they have tended to put incorrect data about their income.

The place of the purchase (supermarket) increases the probability, that the consumer will be able to protect himself in all of the models, probably because of the negative presentation in the media. The results also show that the education is a strong determinant of the consumer. This can be because the university educated consumer is better informed about his right.

The general overview (measured as knowing the institutions, willingness to substitute the products, inability in consumer behaviour...) significantly increases the probability, that the consumer will be able to protect himself. The age of the respondents has got the supposed significance. That means, the higher is the age of the respondent, the higher is also the probability of the auto protection, but this influence was not significant.

Ihnátová and Bíreš (2005) state, that the control of foreign substances in the food chain is very important also from the view of the free product movement in the European Union. The movement of plant and animal products will be safe, if all of the member states will have the same possibilities to monitor and control the foreign substances. The European food chain is one of the safest in the world. That is why the roles of all of the participants of food chain (primary producers, feed producers, processors...) have to be clearly defined, because they are responsible for the food safety. The competent institutions monitor this responsibility through their control organs and systems.

Kretter and Senbet (2004) say, that the foodstuffs are the basic condition of the men's existence and its healthy development. They are an object of daily purchase and daily consumption. The situation in the food market is characterised by the increasing competitive pressure. On one hand, there is an increasing supply of almost all types of food assortment; on the other hand, the demand reacts to this supply. Under these conditions, it is necessary for producers and trade organisations to define the individual groups of consumers, to know the factors that determine the purchasing decision-making and to react to these needs.

Knowing the consumer and understanding his behaviour offers the information about his decision-making. This is the basement for practical implementation of marketing programs of enterprises. Even if the food safety is the basic condition that has to be fulfilled by all products, we have to keep in mind the cases and situations, when the products do not fulfil this requirement and present a dangerous risk for consumer's health and life. This has to be in mind also because of the free product flow in the large market of the European Union. That is why in the European Union, there was built a system of fast information change – RAPEX (rapid exchange) about the dangerous non-food products, that can appear in the European market. The aim of this system is to inform the European Commission about such an appearance and then all the member states, to ensure immediate recall from circulation in the European market.

CONCLUSION

The aim of the questionnaire research was to find out the consumer's understanding and knowledge in the field of food safety, the institutions of market control, the segmentation of consumers from the view of risk foodstuffs consumption and also to find out the opinions of consumers on their own role in securing their own food safety. The hypothesis we formulated was not confirmed, while most of the consumers of foodstuffs in the Nitra region know the institutions of market control. They are willing to care about their health also through the consumption of healthy, safe and high quality foods. Most of the consumers trust these institutions (except the age category over 50 years). However, the control system cannot avoid the supply of low quality and dangerous agro food products. From the theoretical point of view, it would be better to compare the present

system with the market forces and their possibilities together with the effective judiciary.

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