

The impact of biotechnology knowledge on the acceptance of genetically modified food in Serbia

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Abstract

The overall goal of this paper is to identify the perception and attitudes of Serbian consumers toward genetically modified (GM) food. In particular, the relationships between acceptance of GM food and knowledge about biotechnology were analysed. A survey was conducted with 500 consumers in order to analyse respondents' knowledge about biotechnology (true/false 'quiz'), consumers' perceived benefits, consumers' perceived risks, trust and willingness to consume and buy GM food. Data obtained from a survey were analysed using univariate and multivariate analysis using the statistical software SPSS. The knowledge of Serbian consumers about biotechnology is relatively low. This maybe affects the negative attitude about GM food. Rejection of GM food is mostly associated with possible adverse effects on human health, together with moral and ethical issues and distrust in companies which produce GM food. High share of responders also expressed concern for the environment as well as distrust in state authorities and scientific analysis.

Keywords- Serbia, Genetically modified food, questionnaire, knowledge, willingness to consume and buy.

1. Introduction

Genetic engineering is one technology related to food production that has caused the most public debate. Although a large amount of food which is obtained from genetically modified (GM) plants is involved in a food chain market, there is a large disagreement in the lay and professional circles about healthy, ecology and socio-economic consequences of using new food. Proponents are enthusiastic about the ways in which GM can change biotechnology and about the potential of GM applications for increased process efficiencies and new products. Proponents believe that the GM food will save the world from a hunger. Opponents have been sceptical. Concern in matters of health, environmental disaster and economic dependence particularly in developing countries persists.

It is well known that European consumers' attitudes towards GM in food production are negative. Numerous opinion polls, with the Eurobarometer surveys as the most well-known one, have shown that consumers do not like the idea of genetically modified organisms (GMO) in their food. Europeans have consistently been less positive concerning GM foods than Americans BERNAUER [3]; GASKELL & al. [11]; JASANOFF [21]. There are some national differences, though the attitude is the most negative in the Greece and Cyprus and is the most positive in UK and Czech Republic, with Belgium, Sweden and Estonia in a middle position. Across the period 1996-2010 it could be seen a downward trend in the percentage of supporters. Per cent (%) of respondents who agree or totally agree that GM food should be

encouraged fall from 52 % to 44 % in UK, from 66 % to 35% in Spain, from 49 % to 19% in Greece, etc.

Europeans do not see the benefits of horizontal gene transfer; they have strong reservations about safety, they feel that special labelling of food products is necessary, and do not feel that it should be encouraged. The Eurobarometer 2010 shows that to develop an emerging technology we should listen to citizens' opinion. There are five criteria that must be considered: sustainability, benefits, proper regulation, security and fair distribution of risks and benefits (EUROPEAN COMMISSION [8]).

SIEGRIST [31] suggest that perceived benefits, perceived risks and perceived naturalness are important factors for the acceptance of new food technologies. Lay people may not only have difficulties in assessing risks associated with novel food technologies, but the benefits of such technologies may also not be obvious. Trust, therefore, is important for the acceptance of new food technologies. Several studies in EU and US pointed out that trust in government could play an important role in shaping public attitudes towards GM food, largely via its links to risk perception (CURTIS & *al.* [6]; HOSSAIN & ONYANGO [17]; WOLF & *al.* [38]). Numerous studies showed a direct relationship between distrust in the actors relevant to the food production chain and regulatory agencies and risk perception (SLOVIC [34]). There are clear national differences in this regard. In Japanese survey, government endorsement of safety did not increase acceptance of GM soybeans HOBAN [15] and contrary US survey showed that greater trust in state food agencies was related to less concern about the adverse health effect from GM hormone (GROBE & *al.* [12]).

All findings seem to point to the concern for healthiness as an important criterion for food purchase (MAGNUSSON & *al.* [22]). HOBBS & PLUNKETT [16] found that health, environmental, moral and philosophical concerns about the 'new' practice mainly drove consumer resistance to GM. Assessments of naturalness of food seems to be correlated with sensory appeal (STEPTOE & *al.* [35]). Natural food is associated with better looks and better taste compared with foods containing additives or artificial ingredients.

Knowledge about gene technology in general and GM foods in particular plays certain role in determining the consumers' benefit and risk perceptions, and eventually in the consumers' attitude toward GM food (CHEN & LI [5]). The findings about this topic are relatively mixed. SORGO & AMBRODZIC-DOLINSEK [32, 33] found that the knowledge is not a predictor of attitudes and acceptability. HURSTI & *al.* [20] found no significant differences in consumer attitudes with respect to the level of education. SHOLDERE & FREWER [30] and ONYANGO & *al.* [24] suggested that good knowledge decreases the level of GM food acceptance, since the high level of knowledge encourages consumers to ask more critical questions about GM, that results with more sceptical attitude (SANDOE [28]). On the other hand, HOBAN [14], GANIERE & *al.* [10] and PROKOP & *al.* [25] reported a significant positive correlation between attitudes regarding GM food and the level of knowledge.

To the best of our knowledge, there were no previous studies that examined Serbian consumers' willingness to consume and purchase GM food products. Serbia is a country free of transgenic production. As a result of the Biotech Law adopted in June 2009, Serbia does not produce GMO crops and no biotechnology varieties are permitted for imports to Serbia. According to this law, biotechnology crops are only allowed for laboratory work, research and field tests. Imports of biotech crops and products (including soybean meal that was allowed for import before this law), is prohibited. In the light of Serbia's candidacy for the membership in the European Union, the aim of this study was to assess consumer preferences for GM food in Serbia.

2. Research methodology

In order to obtain empirical data, survey was carried out in June-September 2011, on a sample of 500 Serbian citizens between 18 and 57 years old. The questionnaire used in the research was consisted of 20 questions. It was organised into four groups of questions: consumers' perceived benefits (in terms of food quality), consumers' perceived risks and ethical issues, trust in the actors relevant to the food production chain and decision-making processes in that chain ('trust in government', 'trust in science', 'trust in NGOs' and 'trust in foreign companies') and acceptance of GM food (in terms of willingness to consume and buy GM food).

All items were measured on a 5-level Likert scale, where the lowest point (1) means fully disagree or fully negative answer; the point (2) means tend to disagree or negative answer; the midpoint (3) means middle degree or neither positive nor negative answer; the point (4) means tend to agree or positive answer; and the highest point (5) means fully agree or fully positive answer.

The contents of each question group in the questionnaire are shown in Table 1.

Table 1. Questionnaire

Group	Items (Questions)
Perceived benefits (B)	B1. GM components enhance the taste of food B2. GM components positively affect the freshness of food. B3. GM components extend the shelf life of foods. B4. GM components enhance the nutritional value of food. B5. GM vegetables, fruits and cereals looks finer from the traditional.
Perceived risks and ethical issue (M)	M1. GM foods affect adversely the health of people. M2. GM foods affect negatively on the environment. M3. GM food is unnatural. M4. It is immoral and unethical to modify the genes of plants and animals. M5. Not enough information about GM food.
Trust (T)	T1. The state of Serbia is competent to make decisions regarding GM food. T2. I trust that the state authorities will take into account the interests of citizens in all future decisions regarding GM foods. T3. I trust the scientific analysis of risks and benefits of production and use of GM foods. T4. I trust the attitude of NGOs (e.g. the Green movement), in conjunction with GM food. T5. I trust foreign private companies, producers of GM foods.
Readiness to accept (R)	R1. How willing are you to consume foods with GM ingredients? R2. How willing are you to consume GM food if they reduce the amount of pesticides applied to crops? R3. How willing are you to consume GM food if they are more nutritive than traditional foods? R4. How willing are you to consume GM food if they would positively influence human health (for example, eliminated the cause of allergies)? R5. Would you buy GM food if it were the same taste as the traditional, but cheaper?

No definition of GM food was given in questionnaire, since we wanted to explore consumers' responses to GMO just after the last anti-GMO campaign which was present on almost daily bases in the most popular daily newspapers and shows on national TV stations in Serbia.

In order to determine actual knowledge of basic biological facts and principles survey participants were presented with a five-question true/false 'quiz' (table 2). This is the basic type of 'quiz' that is asked in many countries (HALLMAN & *al.* [13] GASKELL & *al.* [11], HUANG & *al.* [19]).

Table 2. True/false 'quiz'

	Items (Questions)
Q1	'It is impossible to transfer animal genes to plants'(False)
Q2	'The mother's genes determine whether the child is a
Q3	girl'(False)
Q4	'If a person eats a GM fruit, their genes could be modified as
Q5	a result'(False)
	'Tomato genetically modified with fish genes would taste
	'fishy'(True)
	'There are some bacteria which live on waste water'(False)

3. Results

As presented in Table 1, a survey was conducted in order to assess the consumers' beliefs and fears regarding GM food, consumers' trust in institutions relevant to the food production chain, and willingness to consume and purchase GM food. In addition to the above, a true/false 'quiz' was used to estimate the consumers' knowledge about biotechnology. The results are presented in the following sub-sections.

The data obtained from a survey on a random sample of 500 Serbian citizens were analysed with univariate and multivariate analysis, using the statistical software SPSS. The questionnaire model and data are validated as follows. As a first step, data were analysed for outliers and no apparent outliers were detected among collected data. Then, the skewness and kurtosis of all items (questions) in a questionnaire were analysed and it was concluded that all items data obey normal (Gaussian) distribution. Further, since the questionnaire was evaluated using multiple-item additive scale, the reliability of the questionnaire model was tested using Cronbach's alpha coefficient. The overall Cronbach's alpha value of the model presented in the questionnaire was 0.726, which is higher than a minimal required value of 0.7. The goodness of a fit of the model was evaluated using the ratio of the chi-square statistic (X^2) to the degrees of freedom (d.f.) that equals 2.76 and meets the required range ($X^2/d.f. \leq 3.00$).

3.1. The consumers' beliefs and fears regarding GM food, and consumers' trust in institutions relevant to the food production chain

Table 3 and 4 present data about consumers' beliefs and fears regarding GM food, and Table 5 presents consumers' trust in institutions relevant to the food production chain.

In order to easier analyse the response data, points 1 (fully disagree) and 2 (tend to disagree) of a 5-level Likert scale were merge together to present generally negative answers, and points 4 (tend to agree) and 5 (fully agree) were merged to show generally positive answers.

As it could be seen from Table 3, the majority of respondents (71.93%) believe that GM vegetables, fruits and cereals looks finer than the traditional (question A5) as well as that GM component improve shelf life of food product (55.09%) (question A3). On the other side, minority of respondents believes that GM components in food improve taste, nutritional value and freshness, 20.70%, 21.75% and 30.88 % respectively (questions A1, A4 and A2, respectively).

Over two-thirds of respondents (77.2%) think that GM food is unnatural (question M3) and 73.33% is concerned regarding the lack of information about GMO (question M5). More than half (57.02%) of respondents are convinced that GM foods negatively affect the health of

people (question M1) as well as that is immoral and unethical to modify the genes of plants and animals (55.44%) (question M4). Respondents also expressed concern for the environment, 46.66% believe that GMO affect it negatively (question M2) (Table 4). From Table 5 it could be seen that 42.46% of respondents believe that the state of Serbia is not competent to make decisions regarding genetically engineered food (question T1). Nearly half (47.02%) of respondents has no trust in the state authorities to take into account the interests of citizens in all future decisions regarding GM foods (question T2). Lower level of distrust was displayed in relation to the science and NGOs, 42.11% and 30.89% respectively (questions T3 and T4, respectively). The highest level of distrust has been expressed in the case of foreign companies - producers of GM food, even 74.04% (question T5).

Table 3. Consumers' beliefs about influence of GM characteristics on food characteristics

	Percentage of respondents					
	Fully disagree	Tend to disagree	to Unsure	Tend to agree	to Fully agree	Fully agree
Enhance the taste of food (B1)	9.82	38.25	31.23	20.35	0.35	
Positively affect the freshness of food (B2)	7.02	29.47	32.28	30.18	0.70	
Extend the shelf life of foods (B3)	2.81	12.28	29.47	51.23	3.86	
Enhance the nutritional value of food (B4)	10.88	40.70	26.32	21.05	0.70	
Enhance external appearance (B5)	3.16	9.47	15.09	56.49	15.44	

Table 4. Consumers' fears regarding GM in food

	Percentage of respondents					
	Fully disagree	Tend to disagree	to Unsure	Tend to agree	to Fully agree	Fully agree
Affect adversely the health of people (M1)	2.81	9.47	30.18	42.11	15.09	
Affect negatively on the environment (M2)	2.81	17.89	32.28	36.84	9.82	
It is unnatural (M3)	2.46	9.47	11.23	58.95	18.25	
It is immoral and unethical (M4)	5.96	14.74	21.75	43.16	12.28	
Lack of information (M5)	2.46	7.37	14.74	56.49	16.84	

Table 5. Trust

	Percentage of respondents					
	Fully disagree	Tend to disagree	to Unsure	Tend to agree	to Fully agree	Fully agree
Competency of Serbia (T1)	11,23	31,23	34,04	18,60	2,81	
Interests of citizens (T2)	12,28	34,47	20,00	26,67	4,21	
Scientific analysis (T3)	7,02	35,09	21,75	30,88	3,51	
NGOs (T4)	4,91	25,96	29,47	35,44	2,46	
Trust in foreign private companies (T5)	18,95	55,09	13,33	9,82	0,70	

3.2. Knowledge about biotechnology

Among the findings of the true/false 'quiz' (Table 6) the following conclusions could be shown:

- 25% of Serbians incorrectly believe 'it is impossible to transfer animal genes to plants' (question Q1); 12 % incorrectly believe 'the mother's genes determine whether the child is a girl (question Q2); 15 % incorrectly believe 'if a person eats a GM fruit, their genes could be modified as a result' (question Q3); 5% incorrectly believe 'tomato genetically modified with fish genes would taste 'fishy' (question Q4); and 2 % of

Serbians failed to agree with the statement 'there are some bacteria which live on waste water' (question Q5);

- 5.28% of respondents did not answer even one question correctly, 6.69% gave the correct answer to one question, 19.72% to 2 questions, 33.10% to 3 questions, 28.17% to 4 questions and 7.04% gave the correct answers to all questions (Figure 1).

International comparisons show that the consumers' limited knowledge about biotechnology was universal. In general, Serbians consumers' knowledge on biotechnologies was as good as that in US, EU and China (Table 6). For the questions listed in table 2, the average score of Serbians was 59%. The scores of American, European and Chinese were 66%, 53% and 52% respectively.

Table 6. „Quiz“

	Percentage of Serbian answers			Percentage of persons answered correctly			
	Yes	No	Unsure	Serbia ^a (2011)	US ^b (2003)	EU ^c (2002)	China ^d (2002)
(Q1)	25	42	33	42	48	26	26
(Q2)	12	66	22	66	73	53	58
(Q3)	15	43	42	43	69	49	53
(Q4)	5	58	37	58	48	NA	29
(Q5)	85	2	13	85	94	84	93

Source: In China, instead of asking the question of „the mother's genes determine whether the child is a girl“, they asked „the father's genes determine whether the child is a boy“

^aThe author's survey in 2011

^bHALLMAN & al. [13]

^cGASKELL & al. [11]

^dHUANG & al. [19]

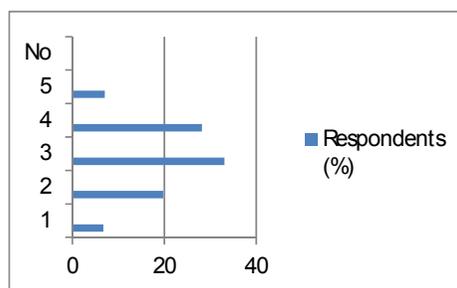


Figure 1. Percentage (%) of correct answers in the „quiz“

3.3. Willingness to consume and purchase GM food

As it could be seen from Table 7, the majority of respondents demonstrated negative attitudes towards consuming and buying GM food. In general, negative were 52.33% of all respondents, 32.62% was unsure, while only 15.06 % of respondents expressed the intention to consume food with GM ingredients (question R1). For a consumption of GM food produced with a lower amount of pesticides (question R2), a large group (44.52%) stated a negative attitude (fully disagree and disagree), while the number of supporters (fully agree and agree) increased by 10.76% compared to the general question. In relation to food produced with fewer pesticides, foods with higher nutrient content had a lower number of potential consumers (question R3). 24.38% of consumers indicated they would consume food modified by biotechnology to increase nutrition amount. The highest percentage of potential consumers was noted in the case of food modified to exhibit positive effects on human health. Almost half of all respondents (48.56 %) said they would consume this type of food (question

R4). Lower price has not changed the number of respondents generally negatively oriented (52.12% vs. 52.33%) (question R5). Lower prices have caused an increase in the number of supporters and reduction of undecided (about 4%).

From those who agreed to buy GM foods that taste the same as traditional but it is cheaper (19.37% of the total sample), 29.09% would buy it for a price that is up to 15% lower than the price of GMO free food. Further 27.27% would accept price reduction of 15-30% and 25.45% of respondents would buy GM food if it would be cheaper 30-50%. Even 18.18% of respondents would purchase this food only if it would be cheaper 50-70% than traditional one (Figure 2).

Table 7. Willingness to consume and buy GM food

	Percentage of respondents				
	Fully disagree	Tend to disagree	Unsure	Tend to agree	Fully agree
General (R1)	14.34	37.99	32.62	11.83	3.23
Less pesticide (R2)	10.95	33.57	29.68	20.85	4.95
More nutritive (R3)	9.19	37.10	29.33	21.55	2.83
Improve health (R4)	5.28	19.01	27.11	43.31	5.28
Cheaper (R5)	11.27	40.85	28.52	15.14	4.23

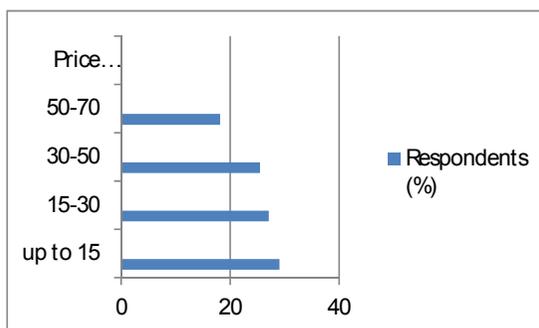


Figure 2. Willingness to pay for GM food with respect to the price reduction

Relation between questionnaire items and willingness to consume and buy GM food.

Multivariate analysis was conducted in order to estimate the statistical significance of questionnaire items that refer to the perceived benefits, risks and trust (as shown in Table 1) for the consumers' willingness to consume and buy GM food. The results are presented in Table 8, where the confidence level was 95% ($\alpha=0.05$). As it could be seen from p -values presented in Table 8, the issues of the most importance for the readiness to consume and buy GM food are: M1, M4 and T5.

- M1 ('GM foods affect adversely the health of people');
- M4 ('It is immoral and unethical to modify the genes of plants and animals');
- T5 ('I trust foreign private companies, producers of GM foods').

The above three questions are statistically significant for all five items related to the readiness to accept GM food (R1 to R5), with the level of confidence 95% ($\alpha=0.05$).

On the other hand, the issues of the least significant for the readiness to consume GM food are:

- T4 ('I trust the attitude of NGOs (e.g. the Green movement), in conjunction with GM food'), that is insignificant for all five items related to the readiness to accept GM food since its p -values for R1 to R5 are higher than 0.05;
- B3 ('GM components extend the shelf life of foods') that is significant only for the item R3, but at the very limit since the corresponding p -value equals 0.49;
- T1 ('The state of Serbia is competent to make decisions regarding GM food') that is significant only for the item R5, but at the limit of significance (the corresponding p -value equals 0.47).

These are followed by questions B4 ('GM components enhance the nutritional value of food') and M2 ('GM foods affect negatively on the environment') that are highly significant for the item R2 ('How willing are you to consume GM food if they reduce the amount of pesticides applied to crops?') but insignificant for R1, R3, R4 and R5.

Table 8. Willingness to consume and buy GM food in correlation with questionnaire items

Items	p-value				
	R1	R2	R3	R4	R5
B1	0.041	>0.05*	0.040	>0.05*	>0.05*
B2	>0.05*	>0.05*	0.050	0.039	>0.05*
B3	>0.05*	>0.05*	0.049	>0.05*	>0.05*
B4	>0.05*	0.012	>0.05*	>0.05*	>0.05*
B5	>0.05*	0.043	0.001	0.046	>0.05*
M1	0.009	0.048	0.000	0.000	0.000
M2	>0.05*	0.011	>0.05*	>0.05*	>0.05*
M3	>0.05*	0.001	>0.05*	0.005	0.003
M4	0.023	0.002	0.000	0.003	0.000
M5	0.048	>0.05*	>0.05*	>0.05*	0.049
T1	>0.05*	>0.05*	>0.05*	>0.05*	0.047
T2	>0.05*	>0.05*	>0.05*	0.049	0.032
T3	0.046	0.009	0.007	>0.05*	>0.05*
T4	>0.05*	>0.05*	>0.05*	>0.05*	>0.05*
T5	0.011	0.012	0.040	0.024	0.001

* not significant

Relation between a level of knowledge and willingness to consume and buy GM food.

Three groups of respondents have been formed, according to the knowledge level: Group I - insufficient level of knowledge (0 and 1 correct answer), Group II - intermediate level of knowledge (2 and 3 correct answers), and Group III - high level of knowledge (4 and 5 correct answers). As previously explained, we have merged together points 1 and 2 of a 5-level Likert scale to present generally negative answers, and points 4 and 5 to show generally positive answers. The corresponding results are shown in Table 9 and Figure 3.

Generally, it could be concluded that respondents from Group III are the most willing to consume and buy GM food. All three groups, regardless of the level of knowledge of biotechnology, are the most willing to consume GM foods that have positive effects on human health (item R4). Respondents with insufficient and intermediate level of knowledge prefer GM food produced with fewer amount of pesticides (item R2) than GM food with more nutrients (item R3). On the contrary, respondents with high level of knowledge prefer GM

food with more nutrients. Price factor (item R5) has the greatest influence on the Group III and the lowest impact on the Group I (Table 9).

Table 9. Relation between a level of knowledge and willingness to consume and buy GM food (%)

Answers	I Group		II Group		III Group	
	negative	positive	negative	positive	negative	positive
R1	49.65	20.52	51.54	12.33	48.85	18.91
R2	50.35	19.83	42.85	25.44	43.38	28.29
R3	50.35	17.20	38.77	23.84	49.11	30.15
R4	20.52	25.79	24.56	43.75	21.88	62.50
R5	60.35	5.26	53.21	16.54	43.75	30.62

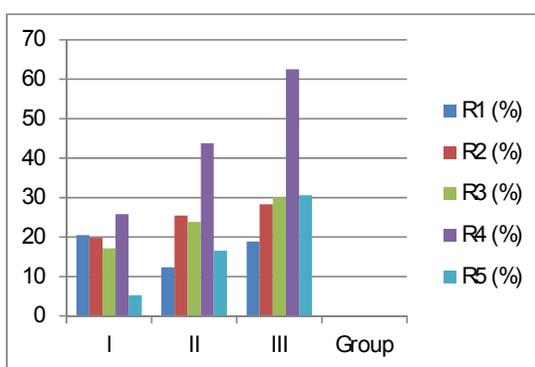


Figure 3. Relation between a level of knowledge and a percentage (%) of generally positive responses regarding the willingness to consume and buy GM food (items R1 to R5)

Looking at the number of undecided respondents in groups, it can be concluded that the highest percentage of undecided is from Group I (average value 36%) followed by Group II (33.43%). The least indecisive are those with the highest knowledge level (24.51%) (Figure 4).

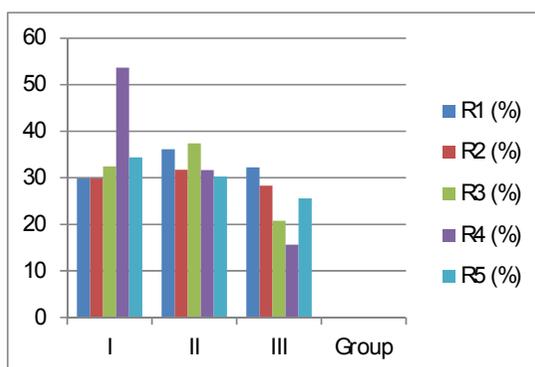


Figure 4. Undecided respondents (%)

4. Discussion and conclusions

In this paper we have tested willingness to consume and buy GM foods among Serbian population. Also, we have analysed the influence of the level of knowledge of biotechnology on the acceptance of GM food. Respondents are asked 20 questions in questionnaire and 5 questions in 'quiz' that was used to assess the knowledge level.

Our results generally provided three major factors that consistently affect Serbian consumers' acceptance of GM food: perceived risk on human health (M1), ethical and moral issues (M4) and distrust in companies which produce GM food (T5). The issues of the least significant for the readiness to consume GM food are: trust in NGOs (T4), shelf life of food (B3) and competency of Serbian government (T1).

This study showed that most Serbian participants had negative opinion about GM in general, which is in accordance with Croatian, Swedish, Italian and Greek results (RENKO & *al.* [26]; CERJAK & *al.* [4]; HURSTI & *al.*, [20]; SABA & *al.* [27]; BATRONOU & *al.* [2]). Majority of Serbian consumers believe that genetically engineered components extend the shelf life of food and enhance external appearance, but reduce its taste, freshness and nutritional value. They consider GM food potentially harmful to human health and environment. They believe that it is immoral and unethical to modify the genes of plants and animals, and are frightened by the lack of information. The majority of the respondents have no confidence in the state of Serbia and in scientific analysis or in multinational companies.

Furthermore, this study showed that Serbian consumer' knowledge about biotechnology is relatively low, which maybe affects their negative attitudes about consumption of GM food. Consumers with a high level of knowledge are the most willing to consume and buy GM food. This is followed by the consumers with intermediate level of knowledge. Finally, the least ready to accept GM food are consumers with insufficient level of knowledge. This finding about knowledge and attitudes is in line with PROKOP [25] findings among Slovakian students, and it is contrary to the Spanish work which showed that the more knowledge the respondents have the greater the consumer-perceived risk is (MARTINEZ-POVEDA & *al.* [23]).

Consumer surveys demonstrate that the major motivation for buying GM food seems to be health related. Almost half of all respondents (48.56 %) said they would consume GM food if it positively influences the human health, which makes a threefold increase compared to 15.06% who generally accept this food. The same motive for the purchase has been recorded many times in the case of organic food ALVENSLEBEN [1]; EKELUND [7]; HUANG [18]; SCHIFFERSTEIN & OUDE OPHUIS [29]; TREGGARD & *al.* [36]; WANDEL & BUGGE [37]. Other motives for purchase, with roughly similar importance, are the reduced amount of used pesticides and increased nutrient content in food. These findings are in line with previous work which indicated that the consumers are more willing to accept application of GM that offers tangible benefits to the consumer FREWER & *al.* [9].

The question 'Would you buy GM food if it were the same taste as the traditional, but cheaper?' was used to assess how price affects purchase criteria and how important consumers perceive that the price is. Respondents' results showed that the price reduction issue does not have a dominant role in making buying decisions. Only 19.7% of respondents would buy GM food if it tastes the same as a traditional food, but cheaper. Lower price plays a smaller role than in the neighbouring state of Croatia where GM food was accepted by 33% of respondents CERJAK & *al.* [4]. The price has no effect on the respondents that did not correctly answer any questions in the 'quiz'.

Our results may generally imply that consumers who disapprove of buying GM food products cannot be easily persuaded to change their mind even with the additional nutritional enhancement in the product and a lower price. The main conclusion from this research is that

the introduction of GM food into agro-food markets in Serbia should be accomplished by adequate policies to guarantee consumer safety, since some of the most influential factors in consumer perceived risk from these foods are distrust in multinational companies and concerns about health. Our findings suggest that nearly half of Serbian consumers have no trust in government, what means that similarly to Japanese case HOBAN [15] possible GM food production approval of the State will not significantly increase its acceptance.

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