

**POLISH CONSUMERS' PERCEPTION OF FOOD-RELATED RISKS***Irena Ozimek, Sylwia Żakowska-Biemans, Krystyna Gutkowska**Department of Organization and Consumption Economics, Warsaw University of Life Sciences, Warsaw, Poland*

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The purpose of the work was to define the level of awareness of Polish consumers on the existing and potential threats associated with food. Two polls titled "The level of consumer awareness in the scope of food-related risks" were conducted in the years 2003 and 2005. Analysis of the collected data indicates that Polish consumers were aware of the occurrence of certain threats in the food chain, especially associated with the use of bone meal in animal feeds and the use of chemical plant protection agents. So perceived risks were reflected in opinions expressed by respondents on the perceived risk from consuming foods associated among others with the presence of additives and residues of chemical plant protection agents. On the other hand, the respondents were only marginally afraid of bioterrorist attacks in relation to foods. The survey results show the need to improve communication strategies to raise the awareness of Polish consumers in the scope of potential sources of food-related risks and specific production and distribution stages.

**INTRODUCTION**

In the last decades, consumers have been confronted with various food risks, which have been associated with practices that impact the food safety. Food-related risks are defined as the occurrence of a biological, chemical or physical factor in foods or feeds, or a condition of foods or feeds that could have negative health consequences [Regulation..., 2002]. The above-mentioned risks could be identified at all stages of the food chain from "farm to fork". A well-documented example is provided by the case of Bovine Spongiform Encephalopathy (BSE) in cattle which became a global problem in the XXth century. The BSE crisis decreased consumers confidence in food safety and stimulated a debate on appropriate risk management and risk communication to minimize the negative effects associated with food-related hazards.

The cases of BSE noted in various European countries as well as different "scandals connected with the food" [Penning *et al.*, 2002; Verbeke, 2001], caused that the questions connected with the health food safety had become the object of consumers' interest [Kirk *et al.*, 2002; Miles *et al.*, 2004; Poppe & Kjærnes, 2003], which was reflected in European researchers' investigations [Berg *et al.*, 2004; Leikas *et al.*, 2007; Obiedziński & Korzycka-Iwanow, 2005]. The increasing consumer awareness that results among others from the extensive nutritional education, causes that the consumers increasingly take into account the health quality of food products, among others the content of chemical substances in the food products, in their purchasing decisions [Krystallis *et al.*, 2006; Gutkowska & Ozimek 2005].

Hence, the purpose of the research was to define the level of awareness by Polish consumers in the scope of the existing and potential risks associated with the food chain to take into account actual consumer concerns in communicating about food safety issues.

**MATERIAL AND METHODS**

The empirical data was gathered applying quantitative approach. Two survey questionnaires using face to face interview techniques were conducted (in the confines of omnibus type survey), each on a representative sample of 1000 Poles, from 4 till 11 December 2003 and from 17 till 30 December 2005. In order to ensure representativeness of the national population, a random sum sample was applied in both the surveys. Questions concerning food related risks were worded in the form of a sequence of statements, towards which the respondents expressed a set degree of conformance on a five-degree scale. The survey scope also covered the opinions of respondents in terms of the risk they perceived associated with food consumption, concerning questions such as: the presence of food additives, the presence of pathogenic microorganisms in foods, the presence of genetically-modified ingredients, the presence of hormones in foods, a bio-terrorism attack, and mad cow disease (BSE). Data analysis was carried out using SPSS PL 11.5 for Windows and responses were evaluated using descriptive statistics. The proportions of respondents who stated values 1–2 (denoting low/very low risk) and values 4–5 (denoting very high risk) were determined. Mean values were calculated to indicate general tendency and were used as the main determinants of rank.

## RESULTS AND DISCUSSION

### Discernable risks associated with selected stages of the food chain

Analyses conducted have shown that Polish consumers link potential food-related hazards largely with the following stages of production and distribution: use of bone meal in animal feeds, applying chemical plant protection agents, and use of food additives (Table 1).

Even though no differences were found in the sequences of stages of food production and distribution that could generate risks related to food safety, it should be emphasized that lower averages in the evaluation of this risk were noted in 2005. Polish consumers expected an increase in the quality of food as a consequence of Poland's accession to the EU [Gutkowska *et al.*, 2001] hence those surveyed in 2005 could express lesser fears associated with food safety risks. Another explanation could be the fact the Poles were and are confronted with lesser intensity of information in the media regarding cases of BSE, thus it could result in lower conviction as to the reality of risks.

Röhr *et al.* [2005], who investigated German consumers' perception of food safety and health risks in the years 1997-2002, indicate that the consumers seem to be less uncertain and that the relative importance of risk have changed. BSE, pesticide residues and preservatives have lost relevance as health risks from 1997 to 2002. However, Jensen & Sandoe [2002] have observed that the decline in public confidence in food safety matters continues, despite establishing such institutions as European Food Safety Authority (EFSA). The results of an Eurobarometer survey of 2005 show that for 38% of the respondents food safety has improved in the last ten years, for 29% it has stayed about the same and an almost equivalent proportion of 28% claim that it has gotten worse [European Commission..., 2006]. The countries with the most negative impression of the evolution of food safety over the past decade are Latvia (65%), Greece (61%) and Poland (59%) where close to or over three in five consider that food safety has deteriorated. Despite the high expectations concerning possible improvements of food safety after the ac-

cession to EU, the Poles seem to be very skeptical about food safety in general.

Half those surveyed indicated also the use of chemical plant protection agents as the food production stage that carries a high risk. Slightly fewer respondents indicated the use of food additives as a potential source of risk associated with food safety, whereby respondents from 2003 expressed the latter much more frequently.

Respondents were less likely to indicate risks in the food chain associated with the manner of storing food and the selling conditions of food. Additionally, the transport of foods, rated by respondents only in the 2005 survey, was not perceived as a stage in the food chain associated with a high risk although inspection data of persons conducting food controls in Poland indicate that hazards do exist in relation to certain kinds of food retail points and food transport [Ochrona ..., 2006].

The consumers who were more concerned about risk associated with the way the food is stored and the selling conditions of food were also indicating that they were more afraid of pathogens in food, such as *e.g. Salmonella*.

### Perceived risk associated with food consumption

The survey examined also respondents' opinions on the subject of the perceived risk associated with the consumption of foods containing additives, or residues of chemical plant protection agents, or food pathogens (Table 2).

Despite the existence of legal regulations that strictly define the principles of use and level as well as types of permissible additives in the food production process, data obtained indicated that the persons surveyed were most afraid of food additives. Variables such as age, average household monthly income per person and the educational status of the respondents evoked statistically significant differences in this opinion in 2003. In relation to the age of the surveyed, the results showed that the youngest persons surveyed were the least likely to fear additives. The respondents with primary education expressed the lowest fear of food additives while those with vocational education expressed the greatest fear. In 2005, variables such as age, average household monthly income per person and the educational background of respondents,

TABLE 1. The level of perceived risk associated with selected stages of food production and distribution in the opinion of the surveyed consumers.

Specification	2003 Survey			2005 Survey		
	Mean score / Standard deviation	Share (%)		Mean score / Standard deviation	Share(%)	
		1 & 2	4 & 5		1 & 2	4 & 5
Use of fodder with bone meal in animal feeding	4.01±0.99	9.1	68.5	3.45±1.33	21.9	50.3
Use of chemical plant protection agents	3.73±1.17	14	57.4	3.40±1.31	22.6	49.4
Use of antibiotics in animal medical treatment	3.65±1.12	12.2	52.4	3.14±1.31	28.7	37.8
Use of food additives	3.65±1.11	13.4	54.3	3.26±1.25	23.3	40.5
The way the food is stored	3.42±1.24	20.8	45.8	3.00±1.31	33.2	34.9
Food sale conditions	3.41±1.25	23.4	45.9	3.05±1.24	30.2	35.2
Food transport **	-	-	-	3.05±1.27	28.9	33.9

\* Rating made on a 5 degree scale where 1 – means a minimum risk and 5 – maximum. \*\* This category was not present in this survey. Source: research by the authors 2003, 2005. The results of the research conducted in 2003 were published in Ozimek *et al.* [2004] and Ozimek *et al.* [2005].

TABLE 2. Respondents' opinions on the occurrence of food consumption risks in terms of the referenced issues.

Specification	2003 Survey			2005 Survey		
	Mean score / Standard deviation*	Share (%)		Mean score / Standard deviation	Share (%)	
		1 & 2	4 & 5		1 & 2	4 & 5
The presence of additives in food products	3.10±1.39	33.4	39.4	2.87±1.45	39.4	36.4
Residues of chemical plant protection agents	3.07±1.38	35.3	39.6	2.78±1.43	42.1	33.6
Presence of pathogens in food (e.g. <i>Salmonella</i> )	2.93±1.38	40.3	34.4	2.69±1.44	47.5	30.1
Presence of GMO	2.92±1.47	41.3	34.6	2.65±1.46	47.8	30.7
Presence of hormones in food products	2.89±1.41	40.9	34.2	2.58±1.42	49.3	28.6
Bioterrorism (e.g. adding contaminants into food products)	2.71±1.55	50.4	31.7	2.44±1.49	55.9	25.4
Mad cow disease – BSE	2.51±1.55	55.2	27.9	2.47±1.48	54.9	27.0

\* Rating made on a 5 degree scale where 1 – means no fear and 5 very much afraid. Source: research by the authors 2003, 2005. The results of the research conducted in 2003 were published in Ozimek *et al.* [2004] and Ozimek *et al.* [2005].

also caused statistically significant differences in these opinions. Similarly to 2003, it was found that the respondents with primary education were the least likely to fear food additives. Nevertheless, it was noted in this survey that not only the youngest, but also the oldest persons surveyed were the least likely to fear food additives.

The survey results clearly indicate the relatively low level of fear expressed by respondents associated with mad cow disease. Possibly, this is due to a declining trend of BSE incidence noted in Europe, and, the subsequent lesser intensity of this kind of information in the media [Popowski, 2001; Mapa ..., 2005].

About 40% of the respondents, both in the 2003 and 2005 consumer surveys, indicated residues of chemical plant protection agents as the second most relevant safety risk in foods they consume. Although there were no crisis regarding pesticides residues in the last years, the consumers tend to express concerns about pesticide residues in vegetable and fruit. Furthermore, according to the results of the Eurobarometer survey, chemicals, pesticides and toxic substances in food rank second after food poisoning as potential risk associated with food in general [European Commission..., 2006].

Verbeke *et al.* [2007] emphasize that consumers systematically overestimate some risks relative to technical probability of harm occurring whereas other are largely underestimated. Consumers are much more concerned with the risks caused by external factors over which they feel to have no control, while being much less concerned about personal factors or factors linked to their own behaviour or lifestyle [European Commission..., 2006].

The risk associated with the presence of disease-inducing microorganisms in foods was ranked third by the persons surveyed, regardless of the year in which the surveys were conducted. The age and educational status of the respondents led to statistically significant differences of opinion. Hence, the youngest persons surveyed were the least afraid of the presence of pathogenic microorganisms. It was noticed that the higher the educational background the respondents possessed, the less likely they admitted to fears of disease-inducing microorganisms in foods. Rating the presence of food pathogens only on the third place does not reflect

the importance of this type of hazard, confirmed at least, by data from the European Commission included in the register of the Rapid Alert System for Food and Feed (RASFF) [RASFF..., 2006].

The persons surveyed perceived the risk of a bioterrorist attack and mad cow disease to the least extent. Analysing data from the 2005 survey it was also revealed that consumers who perceived the highest risk associated with the use of bone meal were more afraid of beef consumption. Once the consumers were more afraid of BSE they were also more likely to perceive beef meat as a source of potential food risk.

However, the age of respondents and their educational background evoked statistically significant differences in opinions on fears of a bioterrorist attack. In the 2003 survey, a positive correlation was found between the age of respondents and the proportion of persons declaring fears in this scope (25.8% among the youngest respondents and 38.2% among the oldest). On the other hand, the higher the educational level of the respondents, the lower their fear of bioterrorist attack. Additionally, the 2005 survey revealed the impact of gender on perceiving this type of fear (women were slightly more likely than men to state this type of fear), while differences in age had no statistically significant impact on the opinions of the respondents on this subject. Nonetheless, it was found that the respondents with university education were the least likely to express fears of this risk.

The opinions of the surveyed on the subject of BSE fears showed also a statistically significant variation by age of the respondents. In the 2003 survey, it was determined that the proportion of persons declaring fears in this scope increased with age. In turn, in the 2005 survey, the respondents with university education were the least likely to fear this risk.

## CONCLUSIONS

Polish consumers are conscious of the occurring threats associated with food safety that are likely to be generated by all links of the food chain. Although according to the respondents the most important is the production stage since it most frequently points to the use of animal feeds containing bone meal, the use of chemical plant protection agents, and the use

of food additives; the relative perception of these risks was observed increase in direct proportion to the age of consumers, and fell along with descending educational status.

In respect of discernable risk associated with the consumption of foods they were most afraid of food additives, despite the existence of legal regulations that strictly define the principles of use, level and types of additives that can be used in the food production process.

The results of the surveys confirm the need for consistent actions to improve the strategy of communication of issues relating to the food safety. The concerns expressed by the Polish consumers should be more pronounced in the food risk communication strategies developed in Poland. The results of the comparative data from both surveys conducted in the year 2003 and 2005 showed that consumers to a lesser degree perceive the risk connected with the food related threats, which is likely to result from the fact that they are more and more aware of measures undertaken by national and EU institutions monitoring the level of contaminations in food. The presented results may also point to the need to improve communication strategy to raise the consciousness of Polish consumers in the scope of potential sources of food-related threats and specific production and distribution stage, thus to eliminate the mistaken conviction resulting from non-informal sources of knowledge on the subject of food and diet, reflecting the right place to formal sources of knowledge on this subject, especially to experts in the scope of comprehensively understood knowledge on human nutrition.

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