

## **FOOD RISK PERCEPTIONS AND PURCHASING BEHAVIOR IN LITHUANIA: TOWARDS A CULTURE OF FEAR?**

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**ABSTRACT** This article describes an investigation into public perceptions of food-related risks and food purchasing behavior in Lithuania. Study results reveal that food-related concerns are prevailing in Lithuanian society over concerns about many environmental, health and technological risks such as global climate change, nuclear power or genetic engineering. The authors argue that modern food-related risks can be characterized as ‘out of personal control’ risks, and their predominance in the public attitudes of Lithuanians denotes that food cultures are becoming cultures of fear on the level of perception. Research revealed that the inhabitants of Lithuania are highly concerned about food safety compared to other European countries; however, these concerns are not reflected in patterns of food purchasing behavior.

**KEYWORDS** Food Risk Perception, Food-purchasing Behavior, Culture of Fear, Lithuania.

### **INTRODUCTION**

Contemporary societies provide individuals with a variety of choices in their everyday lives. People feel comfortable when they are certain about the consequences of their choices. However, there exist various levels of uncertainty about the consequences of choices, whether they are related to the technologies we use, places we go, or food we eat. Every day, individuals are

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confronted with choices about food, and in order to make informed decisions about these choices, complex knowledge is required.

As Ward *et al.* (2010) point out, globalization has increased access to information and contributed to an increase in risk consciousness concerning food. The emergence of new technologies (such as GM food) further raises insecurities and anxieties about the food system (Ward *et al.* 2010:347-348). Beck (2009) describes the state of contemporary society as a ‘world risk society’ and Svendsen (2008) talks about the omnipresence of various types of scares in the everyday lives of individuals. A culture of fear is forming in response to everyday scares. As Svendsen (2008: 12) puts it: “Today’s society can best be described as a ‘culture of fear.’ Fear has become a culturally determined magnifying glass through which we consider the world.” Can we say that food cultures are also becoming increasingly characterized by the presence of concerns and anxieties, and can we talk of food cultures as risk cultures?

In this paper we understand culture in a traditional way as a collectively-held set of perceptions which is dynamic and changing over time, and gives meaning to social situations, generating social roles and normative behaviors (Dahl, 2001; Matsumoto, 2007). Culture, as well as risk, is “part of the product of social construction, an imaginary vision we have of a society and of the values and traditions that society should embody” (Ferrari, 2009:25). Thus, food is an example of how safety concerns are embedded in different cultural patterns, and are reflected in consumer behaviors.

The aim of this article is to analyze food risk perceptions of the Lithuanian population in relation to other environmental and health risks and in comparison to other European countries and to explore if risk perceptions are reflected in food purchasing behavior. The Lithuanian case here is significant, as Lithuania’s inhabitants express the highest level of food-related concern when compared to European averages (Special Eurobarometer 354, 2010). As Eurobarometer data indicate, 20% of respondents from Lithuania state that they are very concerned about the risk of damage to health from food and the percentage of ‘very concerned’ respondents is almost twice as high as the average of the EU27 (11%). The level of concern about food-related risks in Lithuania has also increased more than in other European countries (from 10% in 2005 to 20% in 2010) (Special Eurobarometer 354, 2010).

Research questions for this article were developed after encountering some contradictory and extraordinary results while preparing an International Social Survey Programme (see [www.issp.org](http://www.issp.org); further in the text – ISSP) national report for Lithuania. The high risk perception of GMOs used in food and the high risk perception of pesticide/chemicals used in agriculture

(characteristic of the Lithuanian population) stood out as exceptional cases in international comparative analyses. Thus the authors decided to undertake more thorough analysis into food risk perceptions and explore any links with food purchasing/consumption behaviors.

Food-related risk perception has not been the subject of great scientific attention until recently. Knox (2000) argues that for many years food (and eating) were perceived as low risk activities, and risks were mainly related to matters of hygiene or a lack of food. However, “food scares” shifted the attention of risk researchers from the macro-level environmental and technological hazards towards the study of food risk (Knox 2000:97). She also notes that very few studies of risk have been applied to food specifically, despite the importance of risk perceptions in determining food choices (Knox 2000:106).

Risks in regard to food and food safety are regularly a point of public concern, with food consumption often being linked to “risk” (Buchler *et al.* 2010:354). Renn (2008:374) defines risk perception as “the outcome of the processing, assimilation and evaluation of personal experiences or information about risk by individuals or groups in society”. The key notions in our analysis of food risk perceptions that follow this definition are *experiences* and *information*. Buchler *et al.* (2010:354) argue that food consumption in present times is associated with the extremes of “food as risk – taking” or “food as health – giving” that raises the complexity of values and choices. Public concerns over food safety and food quality issues have been shaped by the industrialization of food production and manufacture, and the complexities and anonymity of modern supply chains (Coff *et al.* 2008). In contemporary times, personal experience is not a sufficient basis for making choices about food that can reduce risks to an acceptable level.

Food-related risks can be both “traditional” and “modern” (Buchler *et al.* 2010). Traditional food risks are defined as related to food poisoning or contamination, while modern food risks are related to food additives and regulation. Types of modern food risks include the adding of hormones, preservatives and artificial and chemical additives to food. It is harder to make personal decisions about and to avoid these types of modern food risk (Buchler *et al.* 2010:354). Our study analyzes perceptions of food-related risks as revealed in attitudes towards the use of preservatives and chemicals in food and genetically modified organisms. Thus we deal in this article with what are conceptualized as being ‘modern’ food risks.

Food risk perceptions are not necessarily reflected in individuals’ everyday lives when it comes to food choices and purchasing behaviors. People can indicate a high level of concern about food choices yet still buy food with

preservatives, additives, or low-quality food for various reasons, such as a lack of information, habits, tradition, etc. Thus we also explore the links between food risk perceptions and purchasing behaviors.

This article begins with a short theoretical discussion and an operational definition of food-related risks and their perceptions, and food-related purchasing behavior. The main research questions of this article are discussed at the end of this section. The empirical part of the article is structured according to the research questions. There are three empirical sections: food safety concerns in an international comparative perspective<sup>2</sup>, food risk perceptions and the food purchasing behaviors of the Lithuanian population.

Data for this paper come from a cross-national public opinion survey ‘International Social Survey Programme’ conducted in 2010 (module ‘Environment’), a representative Lithuanian population survey conducted in 2008 under the national research project RINOVA and Eurobarometer surveys conducted in 2010 and 2011.

## **FOOD RISKS, CONSUMER BEHAVIOR AND A CULTURE OF FEAR: THEORETICAL DISCUSSION**

Food-related risks, together with other types of risks, have recently been put under the microscope of widespread discursive practices as practiced by lay public, scientists, NGO activists, public officials and the media, and all contribute to what Ulrich Beck refers to as “risk society”. According to Beck (2009:8), “fear determines the attitude towards life. Security is displacing freedom and equality from the highest position on the scale of values. The result is a tightening of laws, a seemingly rational ‘totalitarianism of defense against threats’”.

Risk awareness is growing and the distinguishing feature of contemporary social order is the omnipresence of various risks and risk-related acts of speech. The risk awareness of citizens is not only based on personal experiences and on second-hand information but also on “second hand non-experiences”; it is not only based on things that have actually happened to someone but also on conceptions about everything that could happen (Svendsen 2008:48). Svendsen (2008) further argues that “in this risk society, citizens live their lives with fear as a way of looking at the world”. Risk society can thus be understood as a society penetrated by a culture of fear. Within this article

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<sup>2</sup> Food risk perceptions and purchasing behaviours in Lithuania are compared to other Baltic states and other European countries where applicable.

we argue that food-related risks are taking up more and more of society's attention and food cultures are increasingly become related to cultures of risk.

Food contamination and similar incidences have begun to be perceived as permanent companions to our daily dietary behaviors instead of single incidences (mainly due to omnipresent risk discourses, channeled through the media). This is similar to how Zygmunt Bauman spoke of illness in the post-modern state: illness has begun "to be perceived as a constantly present threat: it calls for permanent alertness and must be put down and held at bay day and night, seven days a week" (as cited in Svendsen 2008:61).

Everyday decisions about food today are rather about *what not to eat*, than *what to eat* (Allan 2002:146). As Allan (2002:146) put it, "public perceptions of risk, trust and uncertainty where food is concerned are inextricably entwined with moral issues". As Allan argues, on the one hand food consumption has never been such a hazardous activity as it is today, yet thanks to scientific innovations it has never been safer.

Within a risk society scientists and political institutions are not trusted to be able to deal with ever-emerging types of risks. Thus the media becomes the main social force that shapes public understanding about risk (Beck 1999). Beck (1999) argues that in a risk society scientists and political institutions are distrusted for not being able to deal with emerging types of risks. Lay people often do not have access to the original sources of scientific information; they therefore receive information about risks that is mediated through media sources.

Sometimes the media presents stories about scholarly debates with contradictory results. The media loves to play with contradictions and tends to dramatize negative effects. "Much fear is connected with food. Food safety is a constant source of media coverage, and if someone really believed all we are told about the dangers connected with food, they would presumably never eat anything again. There is scarcely an item of food that has not been linked to some health hazard or other" (Svendsen 2008:61). Food scares and newsworthy stories about risks associated with food often receive a high level of attention in news media (Lupton 2004). Media reporting about some food risks can cause dramatic shifts in buying and eating behavior (Reilly 2006). Concerns over food risks are products of globalization: the constant public debates, as channeled through media, construct the global food risk discourse. An exemplary instance of such a "food risk discourse event" is the debate over *E.coli* bacteria supposedly found (later disproved) in Spanish cucumbers in 2011.

The media has played a crucial role in informing the public about food risks and food-related accidents, especially those related to food contamination.

As Allan (2002) notes, accidents related to food risks or poisoning are now likely to be reported in front-page news, while in the past they may have gone unreported and unknown to the public. On the other hand, the media sometimes tends to frighten the public by overstating the severity of food accidents and also it often provides information uncritically, relying on the opinions of non-experts or politically-motivated interest groups (Allan 2002:148). The accessibility of information ensures growing public awareness and thus increases consciousness of food choices.

Through the lenses of public discourse, the quality of daily life in Lithuania seems to be consistently under threat in terms of the need to accept risks when making food-related choices. The sources of this threat in Lithuania are many, and include (but are not limited to) animal diseases such as “mad cow” disease, flu and *E. coli* bacteria, emigration and, the standardization and homogenization that come with modernization and Europeanization (Wilson 2006:24).

We now briefly introduce the context of Lithuania in regard to food culture and food-related concerns.

## **FOOD CULTURE IN LITHUANIA: BETWEEN TRADITION AND MODERNITY**

Historical retrospective leads to the conclusion that Lithuanian society has a deep-rooted agriculturalist mentality. Lithuania was historically an agricultural country where food (milk, cheese, butter, meat, etc.) was usually produced by families on their own farms, thus even now the popular perception of healthy nutrition is related to food products produced in Lithuania, especially by Lithuanian farmers.

In the pre-war period, after gaining an independence from Russia, Lithuania mainly remained an agricultural country. Just after the annexation of Lithuania by the Soviet army and its inclusion into the Soviet Union, the rapid processes of industrialization started. Thus, Lithuania was forced out of an agricultural into an industrial stage of societal development after the Soviet Union’s rule in the mid-XX century. The shift was rapid. But even after the processes of industrialization began Lithuania still kept its traditions as a producer of agricultural products. During Soviet times, Lithuania was one of the main suppliers of sausages, meat, and milk products to all the Soviet Republics, especially Soviet Russia. At that time the use of preservatives in food was minimal and almost no genetically-modified food products were produced. Thus, in modern Lithuania the myth still exists that food products produced

during Soviet times were very healthy and safe and this association has been exploited by contemporary food producers: they offer on the Lithuanian food market products with labels such as ‘Soviet sausage’ to indicate that the product has been produced as it was in ‘old Soviet times’ (i.e. is safe, without preservatives or other food additives or genetically-modified organisms). To tell the truth, this marketing trick works.

The importance of agriculture and food to Lithuanian culture can be illustrated by the fact that right before the Velvet Revolution in Lithuania started in 1989, boycotts against milk producers were initiated by the Green movement. The idea was to refuse to buy milk that was not organic. This boycott spread all over the country and had much popular support.

The emphasis on a pro-agricultural mentality and a desire to consume organic food from “grannyie’ house” is deeply rooted in Lithuanian culture. Everything that is related to tradition in food production is perceived as positive and healthy, thus the use of GMOs, food preservatives and additives in food production has been met with more negative than positive attitudes from the consumers’ side

Concerning values, Lithuania (as with other post-communist countries) belongs to the cluster that emphasizes survival values (materialist values over post-materialist).

The Lithuanian population tries to avoid GM food products through policy-making as well. In 2007 the Lithuanian parliament discussed the possibility of establishing experimental GMO crop fields (in relation to the activities of the corporations MONSANTO, BASF, etc.) and this event attracted significant media attention. Rimaitė (2009) studied the media discourse about GMO in the period from 1999 to 2008 in Lithuania and concluded that in 2007 there was a surge of GMO-related articles in popular Lithuanian printed and online media (Rimaitė, 2009). In the popular discourse in Lithuania, GMO is usually associated with food products (and less often with medicine or other fields of application). The media presents illustrations that foster concerns about GMOs (e.g. in the newspaper *Respublika* there was an illustration with the heading “Reality... If we believe the saying: “you are what you eat“ we are turning into modified generation“<sup>3</sup>. Thus discussions about GMOs primarily provoke certain reactions and changes in public concerns over food safety. Food safety concerns in Lithuania have increased in the past decade in relation to the number of food scares and increased media attention about these scares.

The individual is immersed in public risk discourses, where various risks and contradictory pieces of information are constantly communicated. Still,

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3 *Respublika*, 2008-07-22, article “To the shop – with a magnifying glass”

many of these risks are not relevant to the everyday lives of individuals. An individual may find him/herself trapped: he is confronted with contradictory and plentiful information about possible food risks but lacks confidence in his personally-acquired knowledge that could guide him when making choices about food (yet he still has to make these choices on a daily basis). In such a situation individuals tend to look for strategies that simplify food choices. Whether perceptions of a high level of risk have an impact on consumer behavior will also be discussed further in this article.

The perceptions that there are high risks from food, and a lack of ability to critically cope with contradictory information may pave the way for elimination (avoidance, exclusion) as a strategy for simplifying food choices (Sobal et al. 2006:12). That is, individuals will not attempt to make thoroughly-thought through decisions, but will rather try to avoid products whose images have haunted the public risk discourse. It is therefore interesting to ask whether these elimination strategies may be sustained for a prolonged period and whether they will become a significant part of future food choices.

## **OPERATIONAL DEFINITIONS, EMPIRICAL BASIS, AND RESEARCH QUESTIONS**

In order to analyze food safety concerns and purchasing behaviors in Lithuania, we conducted a secondary data analysis. This article is problem-oriented and thus presents a theoretically-informed analytic endeavor, based upon empirical data from multiple sources. The empirical analysis in this article is based upon data sets from the national research project RINOVA, conducted in 2007-2009, the International Social Survey Programme module “Environment”, conducted in 2010 and Eurobarometer surveys conducted in 2010 and 2011. We here present the research questions and short descriptions of the variables and data sets that we used.

Based on empirical data, we analyzed three research questions:

*Q1. How are Lithuanian food safety concerns different / similar to those of other European countries and the contextually close group of Baltic countries?*

*Q2. How are food-related risks perceived by Lithuanian society when compared to other health, technological and environmental risks? What are the differences, if any, in the socio-demographic determinations of food risk perception?*



*Q3. What behavior is characteristic of the Lithuanian population regarding food purchasing and consumption practices? Are food safety concerns related to these behaviors, and if so, how?*

Data sets and variables presented later in the text and employed in this article were chosen on the basis of applicability and availability. The authors applied information source triangulation and analyzed the data available from different data sets. We had to use existing datasets with given questionnaires so the selected variables from different surveys are not comparable. We acknowledge that this approach presents some limitations to the study. However, data about food-related attitudes/perceptions and food-related behavior in Lithuania are scarce, and this article is the first attempt to put Lithuanian food risk perceptions into a broader European context.

The research questions were analyzed by referring to three sets of data.

(1) The first set of data was generated under the national research project “Risk Perceptions, Public Communication and Innovative Governance in Knowledge Society” (RINOVA), which was funded by the Lithuanian Science and Studies foundation and was conducted during the period 2007-2009. The main aim of the project was to study social perceptions, public communication and modes of governance of significant risk issues and areas in Lithuania. The project research team developed an original questionnaire that, among other issues, also explored public attitudes towards food risks and food purchasing / consumption behavior. All the authors of this article were members of the RINOVA research team. During the construction of the survey instrument, the RINOVA research team faced the challenge of compiling a list of risks for measuring risk perception (understanding that such a list cannot be exhaustive by any means). First, the list of risk items was restricted to those risks that are related to technology, environment and health. This enabled us to analyze these risks more comprehensively and to group subjective configurations of risk items that were close in meaning. This quite-extended list was the first attempt in Lithuania to reveal public opinion about technogenic risks, as other surveys usually incorporate environment and technology-related concerns into other social, economic and political issues. Secondly, only ‘man-made’ risks were included. Giddens (2000:26) makes the distinction between *external* risks that are not related to human activities (for example, forces of nature) and *manufactured* risks that are created by the impact of man’s developing knowledge about the world. Following the assumption that a risk society is dominated by anxiety about manufactured risk, the research team restricted the list of risks to only these types. A representative public

opinion survey of 1000 respondents was carried out in Lithuania in June 2008 using face-to-face interviews. In order to answer the research questions, the authors of this article also used another variable from the RINOVA project. Food purchasing behavior in the RINOVA questionnaire was explored by asking about the use (purchasing) of genetically modified food, food with preservatives or colorants, and ecological products. The questionnaire also included a question about reading food product labels. Food risk perception and food purchase behavior items were measured using *5-point Likert scales* (from “completely disagree” to “completely agree”).

(2) The second data resource for the empirical analysis was the International Social Survey Programme (ISSP; see [www.issp.org](http://www.issp.org)). ISSP is an ongoing annual program that involves cross-national collaboration on surveys that cover topics important for social science research. The ISSP survey module “Environment”, consisting of 62 items, was implemented in all program member countries in 2010. The ISSP surveys in Lithuania are being conducted under the research project “Monitoring of social problems: implementation of International Social Survey Program (SPS)” and the research project “International Social Survey Programme: Monitoring of Lithuanian social problems (ISSP-LT)”, funded by the Research Council of Lithuania. This article presents some results of the analysis of the cross-national comparative data. The authors of this article are members of the ISSP-LT project research team. A representative public opinion survey was carried out in Lithuania in December 2010 (completed in early January 2011). The empirical data were gathered from 1023 completed interviews. The ISSP module “Environment” was conducted in 32 countries all over the world; in this article, however, we only use data from European countries, thereby aiming to place Lithuania in a European context.

We used several variables from the ISSP “Environment” dataset to analyze food risk perceptions and consumer behavior, particularly with regard to perceptions about and use of GM food. First, we analyzed whether people perceive chemicals and pesticides and genetically-modified foods to be among the most important problems for the country as a whole, and on the other hand, as one of the most important problems to affect individuals and their families. The analysis also uses questions about the perception of risk (to the environment) associated with pesticides and chemicals used in farming, and the perception of risk (to the environment) associated with modifying the genes of certain crops, as well as a question about whether respondents make special efforts to buy fruit and vegetables grown without pesticides or chemicals.

(3) The article also refers to the Special Eurobarometer surveys of 2010 (“Food-related risks”) and 2011 (“Attitudes of European citizens towards the

environment”). Firstly, to understand and explain public perceptions about food and food-related risks, we examined; 1) a ranking of potential risks (respondents were asked to assess the likelihood that one of a number of risks would affect them personally: an economic crisis, environmental pollution, getting a serious illness, food-related health impairment, being injured in a car accident and being a victim of a crime), and; 2) associations of food with various everyday life phenomena or risks (respondents were asked to what extent they associate food and eating with the following: selecting fresh and tasty foods, enjoying a meal with friends or family, affordable prices, satisfying hunger, being concerned about the safety of food, checking calories and nutrients). In order to explain public concerns about food-related risks we analyzed a variable describing prompted responses (namely, when respondents were asked to specify risks associated with food). Respondents were asked to tell the researchers about the extent to which they felt worried about seventeen possible specific food-related risks such as the existence of pesticide residues, antibiotics, hormones and other pollutants in food, the cloning of animals for food, etc.

Various statistical tests such as correlation analysis, ANOVA and factorial analysis were used in the empirical analysis and are presented in the remainder of this paper. This paper is rather exploratory than confirmatory, therefore no set of hypotheses were formulated beforehand.

## **LITHUANIAN FOOD SAFETY CONCERNS IN A EUROPEAN COMPARATIVE PERSPECTIVE**

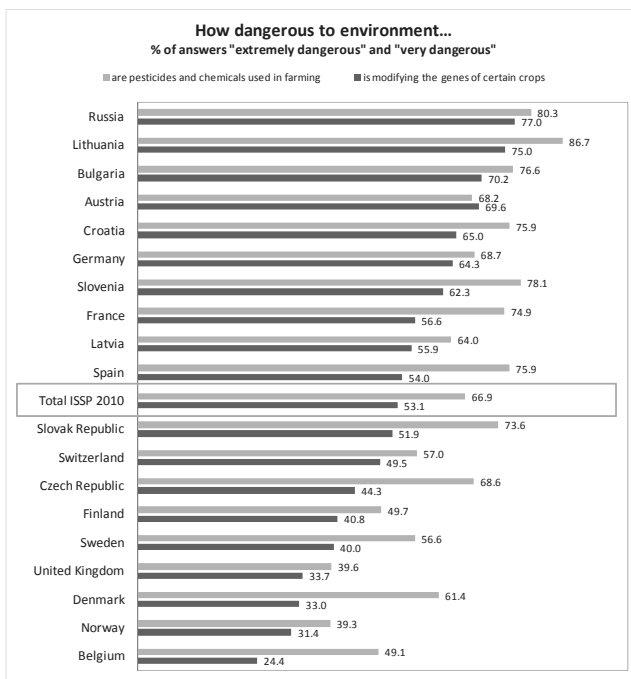
Public understanding of food risk and food safety is multi-dimensional and sophisticated (Green, 2005).

Food-related scares occur from time to time and are not specific to Lithuania – they have happened across the world and include outbreaks of Bird Flu, Bovine Spongiform Encephalopathy (BSE), *Escherichia coli* (*E.coli*) and others. The use of GMOs in food products, food contamination, as well as the excessive use of food additives have also gained media attention. Special Eurobarometer 354 (2010) presented EU citizens with a list of possible social, economic, environmental and food-related risks. EU citizens find it less likely that they will be affected by negative health effects from food in comparison to the economic crisis, environmental pollution or serious illness (Special Eurobarometer 354, 2010). Concern about food ranks fairly low in comparison to the other risks that potentially pose threats to individuals.

Still, when asked about food-related risks as a separate item (with no mention of other types of risks), EU citizens show relatively high concern. According to Special Eurobarometer 354 (2010), from a list of possible issues associated with food, 3 out of 10 Europeans mention chemical residues from pesticides (31%), antibiotics (30%) or pollutants like mercury and dioxins (29%), together with cloning animals for food products (30%).

The ISSP “Environment” survey, conducted in 2010, also revealed the significant concern of Europeans with the environmental impacts of pesticides and chemicals used in farming and the modification of the genes of certain crops (see Figure 1). Questions used a 5-point rating scale, ranging from “extremely dangerous to environment” to “not at all dangerous to environment”. Figure 1 presents the accumulated percentages for the answers “extremely dangerous to environment” and “very dangerous”.

**Figure 1** *The perception of danger to the environment: modifying the genes of crops and pesticides and chemicals used in farming (data for European countries, N = 1023)*



Source: ISSP “Environment”, 2010

According to these data, Lithuanians are among those mostly concerned with both issues when compared to other European countries. Certain tendencies may be identified in the distribution of countries in terms of their concern with these issues. Mostly concerned are people from Eastern Europe (Russia, Lithuania, Bulgaria), and the least concerned are those from Scandinavian countries and other Western European countries such as Belgium or the UK. This tendency could be related to personal experiences with different state regulations about the pesticides and chemicals that can be used in farming.

In general, Europeans are more concerned with the use of pesticides and chemicals in farming than with genetic modification of certain crops. This difference is particularly significant in Scandinavian countries (Norway, Denmark, and Sweden). There is only one country in Europe (Austria) where concern about GM crops is slightly higher than concern about pesticides and chemicals.

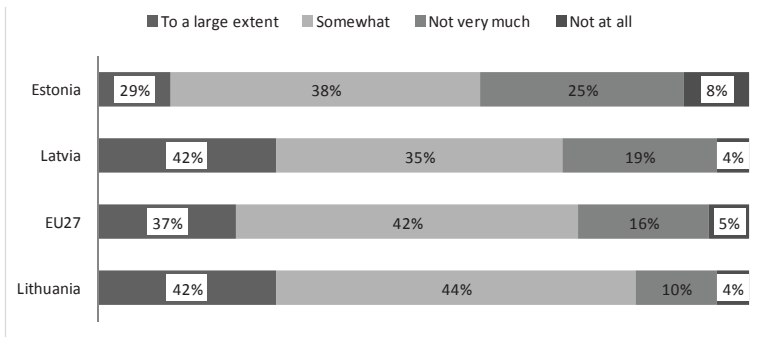
ISSP and Eurobarometer data identify that Europeans are highly concerned about food-related risks and that concern for food safety is growing in EU countries. A comparison of 2005 and 2010 Eurobarometer studies shows that slightly more respondents in 2010 consider it *very likely* that the food they eat may damage their health:(11%, +3 points vs. 2005). The increase is 6 percentage points if we consider both “very” and “fairly likely” responses. Concerns about the other risks have remained about the same (Special Eurobarometer 354, 2010).

The greatest increase in levels of concern about food-related risk over the 5 year period is found in Lithuania (from 10% in 2005 to 20% in 2010), Slovenia (from 7% to 15%), Greece (from 19% to 26%) and Latvia (from 12% to 19%), and although still comparatively low, concern in Estonia has also increased from 4% to 11% (Special Eurobarometer 354, 2010).

Generally, residents of South European countries (e.g. Cyprus, Spain, Greece, Italy and Portugal) expressed greater concern about food safety than the EU average. Residents of Germany, the Netherlands and Austria expressed least concern about food safety. Many Central and East European countries (e.g. Slovakia, Poland, Estonia and Hungary) express a moderate level of concern for food safety. Compared to the EU average, Lithuanians are among those with highest concern for food-related risks (Special Eurobarometer 354, 2010). About 60% of EU citizens are worried to some degree about various food-related risks (such as pesticide residues in fruit, vegetables or cereals, the quality and freshness of food, GMO's, food poisoning from bacteria and other risks). On average, 72% of Lithuanians expressed concern to some degree about those food-related risks. Here again, the Lithuanian case stands out, proving that Lithuanians have one of the highest levels of food safety concerns in Europe.

As the data of Special Eurobarometer 354 (2010) indicate, Lithuanians associate food safety with food and eating rather often. Respondents were asked to what extent they associate food and eating with a series of statements such as “Being concerned about the safety of food”. There is a clear difference between the Lithuanian and the EU average in this regard (79% of respondents from the EU, on average, said they are ‘to a large extent’ or ‘somewhat’ concerned about the safety of food, while 86% of Lithuanians said the same). 42% of Lithuanians indicate that they are concerned about the safety of food to a large extent (compared to the average EU27 figure of 37%) (see Figure 2).

Figure 2 Associations with food and eating: Being concerned about the safety of food (EU average N= 26691; N(LT)= 1036; N(LV)= 1016; N(EE)= 1000)



Source: Special Eurobarometer 354, 2010

As can be seen from Figure 2, people in Lithuania tend to associate food and eating with risks more than the EU average. The distribution of the EU 27 countries indicates that it is not only the level of development that explains the differences but also that there are other influences of a historical–cultural nature which affect household consumption (Martín-Lagos López 2011). As the collective consciousness in risk societies becomes predominantly dependent upon public discourses (Beck 1992, 1994, 1999), we can attribute the Lithuanian response to the media discourses that took place in the country during the period analyzed. As mentioned before in the section about the Lithuanian context, in 2007 there was a surge of articles about GMO issues in popular Lithuanian printed and online media. This surge was influenced by a dislocative, discursive event (Sørensen – Torfing 2003) – discussions in the Lithuanian parliament about the possibility of establishing experimental

GMO crop fields. This event attracted media attention. Thus discussions about GMOs primarily provoked certain reactions and changes in public concerns over food safety. The specific media discourse in Lithuania in 2007 influenced public perceptions and this explains the stand-out Lithuanian data in the 2010 Eurobarometer survey and the significant increase in concern about food-related risk in Lithuania in the period 2005-2010.

Further analysis of Special Eurobarometer 354 (2010) data suggests that there is a strong relationship between trust in information, positively evaluating the performance of national and European food safety agencies and perceptions of possible food-related risks. There is therefore a need for further research into the relationship between trust in information sources, confidence in public authorities and perceptions of food-related risks. According to the findings of previous research, risk communication strategies are likely to be most effective if they resonate with public concerns and reflect the sophistication of public knowledge about the complexities of risk and safety (Green et al. 2005). As Green et al. (2005) argue, risk information strategies that are open about uncertainty are more likely to be effective than those with simplistic messages about safety. Information is an important risk reliever (Yeung – Morris 2001:181).

## **PERCEPTIONS OF FOOD-RELATED RISKS IN RELATION TO OTHER RISKS**

The second research question was designed to help with analyzing how food-related risks (namely, food preservatives and genetically -modified organisms) are perceived by the Lithuanian population in comparison with other risks related to health, technology and the environment.

“Modern risks” are often related to food additives that are often unpredictably added and are thus unavoidable (Buchler et al. 2010), as opposed to “traditional risks” such as food contamination that is more closely related to the actions of the individual. As mentioned in the description of variables earlier in this article, our research focused upon modern food risks and other man- made risk.

Results from the survey of Lithuanian public opinion that revealed attitudes towards risks related to the environment, science, technology and health issues are presented in *Table 1*.

**Table 1** Attitudes towards risks related to environment, science, technology and health issues in Lithuanian population, (%)

	Causes high risk* %	Medium %	Does not cause risk** %
Preservatives and other biochemical materials in food (n=947)	89.3	8.8	1.9
Ozone layer depletion (n=908)	79.8	14	6.2
Extinction of species (n=926)	75.4	18.9	5.7
Climate change (n=942)	72.7	21.7	5.6
Human cloning (n=808)	70.9	15.6	13.5
Bird flu (n=956)	70.4	17.4	12.2
Genetically modified organisms (n=858)	69	23.2	7.8
Cattle rabies (n=953)	68	19.7	12.3
Nuclear power (n=940)	57.9	25.3	16.8
Cloning of plants and animals (n=862)	51.9	30.4	17.7
Abortions (n=918)	35	29.7	35.3
Euthanasia (n=886)	16.3	25.2	58.6
Donation of organs (n=916)	15.2	20	64.8
Artificial insemination (n=892)	14.1	28.4	57.5

Source: RINOVA survey, 2008 June 19-30, N=1000

\* combined categories "causes risk" and "causes high risk"

\*\* combined categories "does not cause risk" and "does not cause risk at all"

Food-related risks are at the top of the table (see Table 1). The Lithuanian population is mostly concerned about preservatives and other biochemical materials in food, compared to other environmental, technology and health related issues.

The perception of risk from food preservatives differs by gender. Women tend to more highly evaluate threats from food risks (M= 4.41) than men (M=4.30) (using a scale from 1 to 5, where 1 means "no risk at all", and 5 means "high risk", t-test:  $p = 0.023$ ). The mean score for the total population is 4.36. Nonetheless, there are no significant differences in perceptions about the risk of food preservatives by other socio-demographic characteristics, such as education (Spearman rho,  $p > 0,05$ ), age (Spearman rho,  $p > 0,05$ ), or income (Spearman rho  $p > 0,05$ ).

DeJonge et al. (cited in Buchler et al 2010, p. 368) claim that perceived personal control is significantly associated with public perceptions of food



safety. Slovic (2000) also highlighted the role of personal control and voluntary involvement in explaining risk perceptions (among many other factors). People tend to perceive higher risks from activities or objects about which they have less personal control. Our findings (see Table 1) support this thesis. People have less personal control and voluntary involvement with risks such as preservatives in food or ozone layer depletion than, for example, artificial insemination or abortions.

In trying to understand the individual subjective classification of risks more comprehensively, we used exploratory factor analysis and identified three types of risks (see Table 2). The results of factor analysis indicate that certain mental models exist that let people group various issues according to the nature of their risks.

The factor analysis allows for the grouping of risk perception-related items into three categories. Following the theoretical analysis and some interpretation, we labeled the risks “out of personal control” risks (Factor 1 in Table 2), “body related” risks (Factor 2 in Table 2) and “gene engineering” risks (Factor 3 in Table 2). These terms are explained in more detail in the following text.

- Factor 1: “*out of personal control*” risks. This factor covers environmental risks such as ozone layer depletion, climate change, extinction of species, nuclear power, and also health and food-related risks such as cattle rabies, preservatives and other biochemical materials in food and bird flu. These risks are mainly out of an individual’s personal control and are thus associated with involuntary involvement.

- Factor 2: “*body related*” risks. This factor covers risks such as abortions, artificial insemination, euthanasia and donation of organs and is exclusively related to voluntary involvement. These risks are perceived by respondents to represent the lowest threat level to health and environment (Euthanasia  $M=2.41$ ; artificial insemination  $M=2.37$ ; and donation of organs  $M=2.24$ ).

- Factor 3: “*gene engineering*” risks. This factor covers risks such as genetically modified organisms and the cloning of humans, plants and animals. From these risks, human cloning is perceived to pose a greater threat ( $M=3.93$ ) than GMOs ( $M=3.86$ ) and the cloning of plants and animals ( $M=3.46$ ).

In interpreting the results of the factor analysis we drew upon research by Miles and Frewer (2003) which studied how people react to statements that express risk uncertainty information in the context of a commonly experienced potential hazard (food-related risks), and which argued that:

Table 2 Factor analysis of perceived risk items, Lithuanian population

Variables	Loadings			Communalities
	Factor 1	Factor 2	Factor 3	
Nuclear power	0.49			0.41
Cattle rabies	0.68			0.50
Extinction of species	0.55		0.43	0.48
Climate change	0.72			0.54
Preservatives and other biochemical materials in food	0.55			0.34
Bird flu	0.73			0.55
Ozone layer depletion	0.72			0.57
Abortions		0.58		0.41
Artificial insemination		0.81		0.67
Euthanasia		0.74		0.57
Donation of organs		0.70		0.49
Cloning of plants and animals			0.81	0.71
Genetically modified organisms			0.73	0.60
Human cloning			0.78	0.65
Eigenvalues	4.3	1.9	1.2	
Cronbach's alpha	0.78	0.70	0.75	
Explained variance	22.01%	16.335	15.6%	
Total variance	53.9%			

Source: RINOVA survey, 2008 June 19-30, N=1000

Notes:

- a) Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
- b) KMO score is 0.821, Bartlett's test: sig. =0.000, thus factor analysis is well applicable to given data
- c) Rotation converged in 5 iterations.
- d) For further analysis we use components with eigenvalues > 1.
- e) Table presents factor scores with value  $\leq -0,40$  or  $\geq 0,40$
- f) item 'extinction of species' was attributed to factor 1 as its factor loading is higher in factor 1 than in factor 3

*“Under circumstances where people feel they have little personal control over their exposure to a particular hazard, and those social institutions that are perceived to be in control of protecting the public indicate that there is uncertainty*

*associated with risk estimates, the hazard may appear to be 'out of control', which is associated with a perception of serious risk.*" (Miles – Frewer 2003:267)

Svendsen (2008) argues that the source of risk awareness in a risk society is no longer illiteracy or ignorance. In risk cultures there are broad scientific discussions and thus an individual is presented with numerous pieces of knowledge and information about various threats. A risk culture is rich in expert knowledge, but also in quasi-expert knowledge and myths, and the individual is flooded with information. But there is much more to it – risks/threats have become involuntary. As Starr, Rudman, and Whipple put it back in 1976:

*"When individuals have "voluntarily" taken risks for personal pleasure or profit, they appear to be willing to accept relatively high risk levels in return for rather modest quantifiable benefits. [...] The situation changes markedly when the individual no longer believes he can control his risk exposure. [...] Major societal technical systems create such "involuntary" risk exposures – for example, transportation systems, energy supply systems, public utilities, and food supply systems. [...] An individual exposed to an involuntary risk is careful of the consequences, makes risk aversion his goal, and therefore demands a level for such involuntary risk exposure as much as one thousand times less than would be applicable on a voluntary basis."* (Starr et al 1976:629)

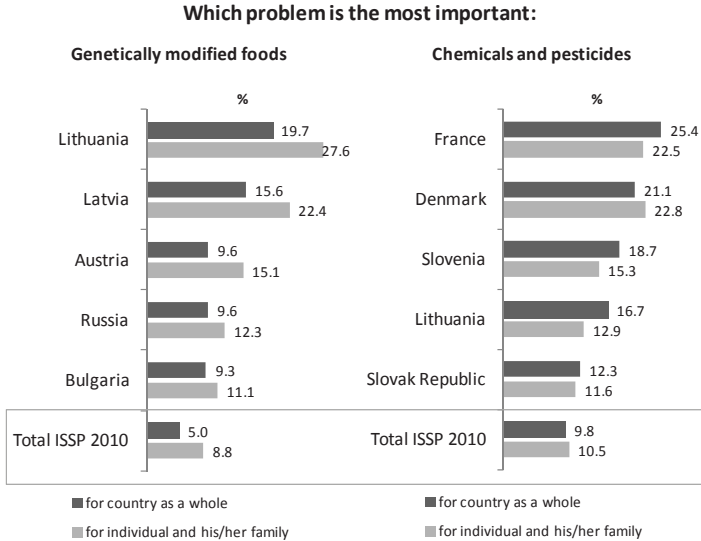
The argument, as made by Miles and Frewer (2003) and by Starr et al. (1976), explains why Lithuanians perceive cattle rabies, bird flu, preservatives and other biochemical materials in food to pose a greater threat to health and environment than personal body-related threats. The lack of a chance to control risk and great uncertainty explains the growing concern for food safety in Lithuania.

We found that Lithuanians are the most concerned about GM food compared to the other countries in Europe, relying on ISSP "Environment" 2010 data (*see Figure 3*). Figure 3 presents the answers to the questions: "Which problem, if any, is the most important for your country as a whole", and "Which problem, if any, affects you and your family the most?" (the 5 countries with the highest scores are represented in the figure).

A list of various environmental problems was presented, including water and air pollution, climate change, nuclear waste and others. Air pollution was indicated as the most important environmental problem across the ISSP

sample. Chemicals and pesticides ranked in 5th place and GM foods ranked only in 8<sup>th</sup> place among all the environmental problems listed in the total sample. However, Lithuanians showed exceptional attitudes in this regard.

Figure 3 The most important problem for country and for individual and his/her family: genetically modified food (data for European countries, N=1023)



Source: ISSP "Environment", 2010

Of all the countries that participated in ISSP survey, the greatest share of respondents that indicated that GM foods were the most important environmental problem in the country can be found in Lithuania. Almost one fifth of all Lithuanian respondents (19.7%) believe that genetically modified food is the most important environmental problem for the country, and even more of them (27.6%) consider it to be the most important environmental problem for themselves and their families. GM foods rank as the 2<sup>nd</sup> most important environmental problem for the country according to Lithuanians (the most important environmental problem is considered to be air pollution). In general, GM foods are perceived as being a greater problem for individuals and their families than for the country, and vice versa, pesticides and chemicals are regarded as being a more important problem for the country than for individuals.

## EXPLORING FOOD PURCHASING BEHAVIORS AND THEIR RELATION TO RISK PERCEPTION

The third research question explored food-purchasing behaviors in Lithuania and also addressed the issue of the relationship between food risk perceptions and food risk related behaviors.

According to the results of the RINOVA survey, the Lithuanian population shows established habits of eco-friendly consumption. More than one third of respondents (35.6%) indicated that they often or always use (purchase) eco-friendly food products.

**Table 3** *Purchasing habits of food products, Lithuanian population, %*

	Never/ rarely	On average	Often/ always	Difficult to say
Reading labels about ingredients of products	38.7	22.8	37.2	1.3
Using (purchasing) genetically modified products	48.7	25	7.6	18.7
Using (purchasing) products with preservatives	20.2	34.8	37.1	7.9
Using (purchasing) products with color additives	31.7	32.7	28.2	7.4
Using (purchasing) ecological products	29.5	27.3	35.6	7.6

*Source:* RINOVA study, 2008 June 19-30, N=1000

Other research findings have indicated that women in Lithuania are more likely to buy eco-friendly food products (Banyte et al. 2010). Roos et al. (1998) emphasizes the gender differences in food-related behavior, arguing that a multidimensional framework that includes both structural position and family status is particularly needed when analyzing the food-related behavior of women, whereas educational level and marital status are the primary determinants of men's food-related behavior. When demographic differences in food-purchasing habits were examined in our dataset it was revealed that women tend to read labels more often than men, but no other significant correlations between purchasing habits and socio-demographic characteristics were found.

Further on in our analysis of food-related consumer behavior we found that a considerable part of the Lithuanian population tries to avoid genetically-modified food products. The RINOVA survey results indicate that nearly half

of all respondents (48.7%) never or very rarely use (purchase) genetically-modified food products. However, the use of preservatives in food does not evoke the same consumer response: just one fifth of respondents (20.2%) refuse to buy products with preservatives in, or buy them only occasionally. This appears to be quite low, given the high level of public concern about the food safety that we discussed above.

The ISSP module “Environment” supplied a question concerning the effort respondents make to buy fruit and vegetables without pesticides or chemicals in them. Respondents were asked how often they make special efforts to buy these items. The survey results indicate that more than half of the respondents always (17.1%) or often (34.9%) try to buy fruit and vegetables without pesticides or chemicals. Concerning this finding, it must be stated that Lithuania is not a leader in the European context. Nearly 60% of respondents in Germany, 58.6% of respondents in Switzerland and 58% in Russia indicate that they always or often make efforts to obtain food grown without pesticides or chemicals. On the other hand, people in Spain, Norway, Finland, and the Czech Republic are among those who do not make too much effort to purchase food without pesticides and chemicals (one quarter of all respondents or even fewer reported this kind of purchasing behavior).

The food-purchasing behavior of consumers can be influenced by many factors. One of them is the media. As previous research has shown, there is no agreement between experts and lay-public about the significance of media influence on consumer views. For example, research in four European countries – Denmark, Germany, UK and Greece – showed that most experts agreed (and most consumers disagreed) with the opinion that the media must be blamed for making consumers unnecessarily concerned about food risks (Krystallis et al. 2007).

According to the results of the representative RINOVA survey (2008, N=1000), the Lithuanian population thinks that media is not portraying the actual situation concerning environmental problems and the risks from nuclear power, climate change or the use of genetically-modified products in food. Lithuania’s inhabitants emphasize that the main sources of information about environmental problems and risks are governmental institutions (those mainly responsible for health or environmental protection).

The last research question was designed to explore whether food safety concerns are related to food purchasing behaviors. As we mentioned before in this article, Special Eurobarometer 354 (2010) data shows that significantly more Lithuanians feel worried about various food-related risks than the EU average. Thus, when analyzing the public opinion survey data (RINOVA study), we expected that food risk concerns would be related to food purchasing

behavior; people that perceive food-related risks to be high would supposedly be more conscious of their daily food- purchasing behavior. However, our data revealed that there is no significant correlation between concerns about preservatives in food and buying behaviors such as avoiding preservatives and other additives in food, avoiding GM foods or buying ecological products (Spearman's rho,  $p > 0.05$ ). These findings are quite surprising as they identify a gap between food-related risk concern and food purchasing behavior in Lithuania. A high level of concern about the risks of preservatives and other chemicals in food does not lead to more conscious decision-making when it comes to making everyday food choices.

The findings of the RINOVA study are supported by more recent data from the ISSP "Environment" survey. The data indicates that there is no significant correlation between concerns that pesticides and chemicals used in farming are dangerous for the environment and the efforts that are made to buy fruit and vegetables grown without pesticides or chemicals in Lithuania (Spearman's rho,  $p > 0.05$ ). On the European level the situation is different. In spite of the fact that the correlation is weak, people who think that the pesticides and chemicals used in farming are not dangerous at all to the environment do tend not to make a special effort to buy fruit and vegetables grown without pesticides or chemicals in countries such as Great Britain (Spearman's rho = 0.316,  $p < 0.000$ ), Norway (Spearman's rho = 0.302,  $p < 0.000$ ), Denmark (Spearman's rho = 0.285,  $p < 0.000$ ), France (Spearman's rho = 0.269,  $p < 0.000$ ), Austria (Spearman's rho = 0.217,  $p < 0.000$ ), Croatia (Spearman's rho = 0.216,  $p < 0.000$ ) and Switzerland (Spearman's rho = 0.207,  $p < 0.000$ ).

A study by Piggott and Marsh (2004) might help to explain the gap between perception and behavior. Piggott and Marsh (2004) examined whether publicized food safety concerns about beef, pork, and poultry (chicken and turkey) have an impact on the consumption of meat. They found that the average consumer response to food safety concerns is minor, although evidence was found for the existence of pre-committed levels of consumption, seasonal factors and time trends. Piggott and Marsh (2004) state that consumers soon forget the adverse publicity generated by food scares and revert back to consuming foods at the levels they did prior to the scares. Thus in Lithuania the highly-publicized threats related to GMO's or pesticide residues in food, as well as global outbreaks of Bird flu and *Bovine Spongiform Encephalopathy* (BSE) have had greater influence upon food safety concerns and risk perceptions rather than on food purchasing and food consumption behavior itself. Buchler et al (2010:369) declare that "there is considerable skepticism that consumers have the necessary resources available to them to make informed decisions about food risks".

## CONCLUDING DISCUSSION

The historical context of food production and consumption differs by country and is reflected in safety concerns. The findings presented in this article indicate increasing levels of food-related fear in Lithuania. Feelings of security and confidence about food safety are being placed by increasing concerns about the risks posed by food.

Lithuania's population is one of the Europeans' that considers food-related risks to be high. Moreover, concerns about the risks posed by food have increased in many countries across Europe, with Lithuania being a case with the most rapid growth of these concerns. The attitudes of the Lithuanian population towards food risks are different from those of other Baltic countries. Lithuanian people have a higher level of concerns about food-related risks than either Latvian or Estonian people. This fact suggests that food risks concerns are not determined solely by the socio-political factors (e.g. transitional economies and new democracies). As Martin-Lagoz Lopez (2011) suggests, economic factors do not have a great influence upon perceptions of food-related risks. Thus our assumption (and suggestion for a further research in this direction) is that situation-based case-specific factors have a significant influence upon food risks perceptions in Lithuania. Some of these hypothetical factors are discussed briefly further in this text.

As Lithuanian society has a deep-rooted, pro-agricultural mentality, a strong tendency to favor safe and natural agricultural products is in Pareto's terms pre-established (Pareto 1935). The higher the demand for natural and safe agricultural products, the higher the food-related safety concerns.

Sociological theory would further suggest looking into media discourses, the role and involvement of regulating/policy bodies and the scientific community in public discourse. These social actors reinforce cultural residues and enrich them with modern narratives. There might also be micro-level explanations. The cultural theory of risk refers to elements of culture (such as low levels of social and political trust) as influential drivers of risk perception. A lack of confidence in being able to personally deal with possible food risks is yet another factor (Lithuanians often express low levels of belief in personal effectiveness). The Special Eurobarometer 354 (2010) report suggests that confidence in public authorities is correlated with food risk concerns. And here again, the Lithuanian population is characterized as having the least confidence in public authorities when compared to the EU average (Special Eurobarometer 354, 2010).

Further, our analysis revealed that the risk from preservatives and other chemical materials in food in Lithuania is perceived as being higher than



other environment, technology and health-related risks. One of the reasons why these risks are regarded as very high is a feeling of a lack of personal control. Pawsey (2000:198) notes that safety is out of the consumer's hands regarding the issue of contamination of food by pesticides, growth hormones or GM foods, while people have more personal control when confronting such issues as artificial insemination or abortion that they tend to perceive as being less of a threat. Risks from pesticides and chemicals are perceived as being higher than risks from GM crops in Europe. Moreover, GM foods are regarded as more of a local problem, while pesticides and chemicals are perceived as more of a global problem.

The attitudes of the Lithuanian population towards the risk of various environmental, technological and health issues (including food-related risks such as pesticides and GM food) can be categorized into three factor-groups (relating to subjective types, as perceived by respondents). We named these groups "out of personal control risks", "body-related risks" and "gene engineering risk". Such a clear distinction in public opinion indicates that there are distinct mental models of perceiving and assessing these different types of risks. Lithuanians clearly differentiate between their attitudes towards body-related risks, gene engineering risks and the more general personally un-controllable risks. The shift away from traditional food (that consumers had some influence over) to the production of modern food (that is no longer under the individual's influence) has led to the emergence of feelings of uncertainty about food and its risks. The identification of uncontrollable risks has fostered the development of food culture into a culture of fear.

Our research identified that there is no single pattern that dominates food purchasing behavior in Lithuania. There are no statistically significant correlations between consumer behavior and food risk concerns in Lithuania. Thus Lithuanians are inconsistent: on the one hand they are highly concerned about food risks, while on the other hand they purchase and use foods with preservatives and other additives. Their high level of concern does not translate into food choice strategies, and food-purchasing behavior stays unaffected. Relying on the data we have, it is difficult to explain this paradoxical finding; nonetheless, these results indicate the need for further research. Several hypothetical assumptions can be made. When investigating the importance of taste, nutrition, cost, convenience, and weight control on personal dietary choices and whether/how they are associated with lifestyle choices related to health, Glanz et al. (1998) and Nayga (2000) found that tastes in food have the most important influence on the food choices of Americans, followed by cost. The influence on Lithuanians' food-purchasing behavior of factors such as price and taste should be further examined by social scientists.

The results presented in this article allow broader theoretical insight. Food purchasing and consuming habits are undergoing changes related to what Beck has called 'risk society'. Food scares are increasingly becoming a matter of public attention. The perceptions of food-related risk of the Lithuanian population have increased over the last five years (since 2005) and we may trace food-avoidance strategies within these food choice trajectories (as related to GM foods). When making food consumption choices, people think about the risks that have to be accepted or avoided. Thus the food consumption in Lithuania is increasingly dominated by features as attributed to a culture of risk (or of fear, as Svendsen (2008) has put it).

The other argument to support this interpretation is the consistency of perceptions of food risks for different social groups within Lithuania. Regardless of the socio-economic or educational background, age or ethnicity, risks are perceived as being equally high (our research revealed no significant or strong correlations). This accords with the risk society thesis that states that risk in modern societies does not discriminate. Risks, according to the current state of social development in industrialized countries, are equitably distributed between various social groups. Thus modern food risks are relevant not only to low status groups, unlike earlier times when traditional food-related risks prevailed. Modern food risks are equally relevant to all of the social groups within society.

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