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Analysis of food safety in the aspect of health

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ABSTRACT

Consider and reflect on the topic of broadly understood food safety. This is an issue that is currently arousing wide public interest, is more and more often discussed in the media and on discussion forums of many scientific organizations. This work aims to indicate what standards of international, European and national law regulate issues related to food safety. It is also to bring closer the procedures, instruments and systems to guarantee the preservation of the quality and safety of food products. In addition to the opportunities shown to increase the level of security, it also indicates food hazards and problems. It presents organs and institutions controlling compliance with food laws and supervising product safety systems. The structure of work based on the analysis of literature serves this purpose.

***Keywords*:** food, safety, health, analysis

1. INTRODUCTION

Safety is one of the most important human needs, it is a state that gives a sense of confidence, stability, a guarantee of maintaining existence and freedom, and a chance for improvement. Its absence causes anxiety and a sense of danger. There are various aspects of security, and we distinguish, inter alia, international, national, social, economic, military, public, ecological, energy, information, as well as internal and external security. One of the

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types of security that affects us the most is food safety. We do not realize its seriousness as long as it is guaranteed. An important task on the part of the state is its protection in the private sector, because it is a private entrepreneur who is a food producer and at the same time an entity responsible for its health safety and for any damage caused to the health of the consumer resulting from its inadequate quality. In order to ensure that this security is not violated, it is important to create and implement appropriate legal standards, procedures and mechanisms to control food safety.

Consider and reflect on the topic of broadly understood food safety. This is an issue that is currently arousing wide public interest, is more and more often discussed in the media and on discussion forums of many scientific organizations. This work aims to indicate what standards of international, European and national law regulate issues related to food safety. It is also to bring closer the procedures, instruments and systems to guarantee the preservation of the quality and safety of food products. In addition to the opportunities shown to increase the level of security, it also indicates food hazards and problems. It presents organs and institutions controlling compliance with food laws and supervising product safety systems. This goal is served by a work structure based on three chapters.

The publication describes the concept and characteristics of food safety, analyzes the evolution of protection and measures to ensure security in the food sector. It also indicates factors that threaten food safety related to the use of additional substances, hypersensitivity to certain foods and adulteration of products. A lot of awakening controversy about genetically modified food and threats to human life and health related to the phenomenon of bioterrorism.

The second chapter focuses on legal empowerment and food security administration. International, EU and national legal norms affecting the assurance of consumer health safety were discussed. The ongoing globalization has forced the necessity to standardize the criteria of food quality on the international arena, with particular emphasis on the health aspect. The requirements are presented in legal acts issued by authorized international, EU and national institutions. The second part of the chapter presents specific institutions and administrative bodies supervising the observance of food law and performing official food control [3].

2. THE CONCEPT AND CHARACTERISTICS OF FOOD SAFETY

The role of security in the life of man, society and the state is important, because the feeling of the lack of various threats gives the opportunity to effectively operate and feel safe. They often treat security as a state without any threats or instability. They can be described as a process expressed in the continuous activity of local communities, individuals and states in creating a state of security. S. Dworecki defines and treats security as a "state of internal stability and state sovereignty that reflects the absence or occurrence of any threats". The state, in the form of organs of government, regulates activities in the sphere of security and acts as the greatest guarantor of security.

The task of the state in the sphere of security consists in effective counteracting and excluding threats and its sources. The effects of these activities can be seen in the number of legal acts concerning various aspects of the security sphere. Classically, security is divided into such areas: economic, social, political, military, cultural, energy, social, health, as well as related to food [1]. Food safety in the modern world is the subject of special attention, which translates into concrete actions, the implementation of legal norms in force in Poland, the

European Union countries. In Polish law, food safety is treated as a set of conditions that must be met, in particular regarding:

- additional substances and flavors used,
- levels of pollutants,
- pesticide residues,
- food irradiation conditions,
- organoleptic characteristics,
- actions that must be taken at all stages of production or marketing of food. Determining and defining such conditions positively affects the health and life of the individual.

We understand food safety definitions as protection of health and consumer interests, which includes health safety, nutritional value, sensory quality and other food attributes.

The European Group on Ethics in Science and New Technologies as an advisory body in the European Commission in its Opinion Opinion 24 of 2008 states that "food safety includes conditions and practices that guarantee food quality, preventing pollution and various food-borne diseases. This requires protection of the food supply chain against microbial, chemical and material contamination that can occur at all stages of food production: crops, harvesting, processing, transport, distribution and storage. Food safety is therefore a broad and interdisciplinary issue that concerns not only food products as such but also production methods "[2].

It is worth noting that food health safety is the most important characteristic for the individual - the consumer, therefore, in order to meet his expectations, food law acts have been passed to ensure that food is safe for the health and life of consumers, as these are values subject to legal protection in the country. To this end, a food safety structure was created - various official bodies and organizations dealing with aspects of food law, exercising control over the safety and quality of food products, as well as standards, regulations and procedures regarding manufacturing, trade to the extent necessary to protect health, condition and satisfy expectations of the unit.

The genesis of the definition of food safety varied depending on political regimes and the situation in the state. In the 19th century, a given type of security was related to the standardization of the food sector. In these times, the requirements for goods imported from colonies and overseas countries have been harmonized. The main task of establishing these principles was to improve the efficiency of trade, and resulted in wider scope of regulations related to food safety.

There have been important steps taken in the international arena to develop this kind of security - organizations such as the Food and Agriculture Organization of the United Nations - the United Nations Food and Agriculture Organization (FAO), the World Health Organization - the World Health Organization (hereinafter - WHO). These institutions have developed food production standards and handling of food products, and thus play an important role in security operations in the food sector. FAO and WHO joined forces and established a joint Codex Alimentarius commission, which is also the foundation for implementation of quality management systems in global food production.

It is worth noting that an important instrument in the field of food safety was the development of the Hazard Analysis and Critical Control Point system - Hazard Analysis and Critical Control Points (hereinafter - HACCP) by the Pillsbury Company at the turn of the 1960s. This system was created in cooperation with the National Aeronautics and Space

Administration - the National Aeronautics and Space Administration (hereinafter NASA) and US military laboratories to produce absolutely safe cosmonaut food. Officially, the HACCP system was presented in 1971, and in 1985 ideas appeared to implement it in the food industry.

In 1993, the HACCP system was recognized by the European Union and from January 1, 1996, all food production and processing enterprises in the European Union countries became applicable. The HACCP system performed preventive functions, because it was designed to recognize, control and counteract threats that could occur at any stage of the food production process.

In 2000, the White Paper of the European Union was elaborated, containing guidelines for ensuring a high level of food safety. The assumption in this document applied to consumer health, and included food sectors, the internal market of EU countries. An important step was the adoption of the Distribution in the first place [4].

3. THREATS TO FOOD SAFETY

At the beginning, we will define the type of threats such as additional substances. In the legislation of the EU countries, additional substances considered as "any substance that under normal conditions is not consumed alone as food, nor is it used as a characteristic ingredient of food, regardless of its possible nutritional value, which purposeful addition, for technological reasons to food during its manufacture, processing, preparation, treatment, packaging, transport or storage, it is reasonably expected or expected to cause the substance or its derived products to become directly or indirectly part of the food [5].

Additives that are contained in food products reduce the costs of production processes and save the time of this process. Additives in production affect the storage time of products, ie they prolong product life, replace the more expensive component and can change the taste, smell, color and consistency, which significantly affects the attractiveness of products.

Additional substances give the opportunity to produce products with unique, health-promoting properties, such as functional and dietetic foods. Often, consumers have specific requirements for products that can only be obtained through add-ons. One of the reasons for using food additives to food is consumer satisfaction and expectations. Food additives may be a health risk factor, that is why consumers attach more and more importance to food health, which is why in order to ensure the health of society, international organizations and national research on the effects of additives on human health and control their applications to food, based on the adopted legal regulations.

It is worth noting that the additives were used in food before the Second World War. After the war, in the 1950s, the law was changed in the sphere of the use of additional substances.

Internationally, the FAO and WHO have been established as "UN family" institutions whose task was to increase the health safety of the population. In addition, the international community as part of the conference of the FAO Expert Committee, WHO on Food Additives (JECFA) discusses and works on the scope and requirements for the use of additives every year, assesses threats, hazards and performs toxicological tests.

The introduction of the principles of harmonization of EU member states' legislation with regard to additives was carried out as a result of the framework Directive Directive 89/107 / EEC of December 21, 1988, which specifies the rules for the use and classification of additives and symbols. The current legal act is Regulation of the European Parliament No. 1333/2008 of

December 16, 2008 on food additives and Commission Regulation No. 1129/2011 of November 11, 2011 amending Annex II to the Regulation of the European Parliament No. 1333/2008 through establishing an EU list of food additives. The last legal act gives a list of allowed additives and conditions for their use along with the food categories to which they can be added.

It is worth mentioning the Ordinance of the Minister of Health of November 22, 2010 regarding the permitted additional substances in domestic sources of law. Food additives that they use in EU countries before being allowed to use are subjected to thorough control analysis to ensure that they are safe for the health of consumers. An individual license is required for each additive, the ones that are authorized can usually be used only in certain quantities, in appropriate food products. Additives should be indicated in the list of ingredients on the packaging of products and marked with the name of the category, followed by their specific name or E number, which serves to simplify the declaration on the label, as some of the additives have complicated chemical names.

The list of authorized additives used for food in the EU countries is around 320. Compared to other countries, it is relatively small, for example in the United States this list is about 2,800 permitted additives, of which 1600 are GRAS certified (Generally Recognized As Safe) proving that the product is generally recognized as Safe.

According to the Act of August 25, 2006 on food and nutrition safety, additives may be used in food if, at the permitted level, they pose no threat to human health or life, their use is technologically justified and the purpose of their use can not be achieved in another way, practically possible from a technological and economic point of view, and when their use does not mislead the consumer. The use of additives must be beneficial for humans, and must preserve the nutritional value of food, constitute the necessary ingredients of food produced.

Recently, more often talked about GMO (genetically modified organism). In theory and practice, we understand this as an organism other than the human body in which the genetic material has been altered in a non-natural way by crossbreeding or natural recombination.

In 1984, the genetic material of tobacco was modified, this fact was positively received in the field of biotechnology. Over time, GMOs have been marketed on a large scale. Mainly on the plants are carried out modifications, because they are more resistant to diseases, pests. This modification involves changing DNA fragments, ie changing one or more genes or introducing a completely new gene from another species, which results in the creation of a new protein. Such changes are hereditary and the descendants of the modified organism have a new feature [6].

In the economy, they use genetically modified plants because in this way researchers give them the desired properties, eg taste, consistency. Modifications carried out on animals are not as popular as in plants, which was caused by a difficult and complicated time-consuming modification process. On the food market, animals undergoing genetic manipulation have an unremarkable position. Currently, there are no registered genetically modified animals on the world market for consumption. Animal modifications most often involve the introduction of a gene associated with growth hormone, which causes them to grow faster, resistance to disease, or, for example, greater goat / cow milkiness.

In the international arena, the most production of genetically modified food is the United States, Argentina, Canada, Brazil, China and South Africa. For an economy that is rapidly growing, crop yields and resistance to disease are important. According to the data of the US Department of Agriculture, about 75% of foodstuffs contain some genetically modified organism, usually soy. In Europe, where there are strict procedures for commercializing genetic

engineering achievements, about 60 modified varieties have been approved so far. In the 90s of the twentieth century, there were discussions about the safety of this type of food. Ethical and legal issues were also raised. All the time there are opponents of adding ingredients modified to food and people who are for such modifications.

Legal standards in the EU deal with issues related to GMOs extensively. In accordance with EU regulations, EU countries have the obligation to supervise compliance with legal provisions in this respect.

In Poland, supervision for GMOs is performed by the State Sanitary Inspection and the Inspection of Trade Quality of Agricultural and Food Products. Important documents regulating issues related to genetically modified food are Regulation No 1829/2003 of the European Parliament of 22 September 2003 on genetically modified food and feed, Regulation 1830/2003 of the European Parliament of 22 September 2003 regarding traceability and the labeling of genetically modified organisms and the traceability of food and feed products produced from genetically modified organisms and amending Directive 2001/18 / EC, Commission Implementing Decision 2013/287 of 13 June 2013 amending Implementing Decision 2011/884 / EU concerning measures extraordinary for unauthorized genetically modified rice in rice products originating in China [7].

It is important that the law indicates that food placed on the market can not mislead the consumer, hence the provisions include the requirement of proper labeling of food with the genetically modified ingredient used, so that the consumer can make an informed choice.

According to Regulation No. 1829/2003, food and feed are marked as containing GMOs, if such product contains, consists of or is produced from GMOs, unless the content of GMO does not exceed 0.9% of each food ingredient considered separately, provided that the occurrence of GMOs is accidental or technically unavoidable. As is known, producers sometimes dishonestly indicate the following: "on the packaging of various insulators and soy concentrates, the information" product free of GMOs "appears, because they contain less than 0.9% of genetically modified protein. Thanks to this, GMO soy is present in sausages, sausages, cold meats, meat, pate and other foods." The producer is required to provide reliable evidence that all measures have been taken to avoid the use of GMOs.

EU countries can not prohibit the marketing of genetically modified food that has been placed on the EU market in accordance with legal standards - Decisions of the European Commission, because they are bound by the treaty principle of the free movement of goods. GMOs and their impact on health are a lot of discussions, as until now it has not been possible to fully dispel any doubts about the impact of GMOs on human health.

Data from the White Book of Allergies show that allergic diseases affect about 10-40% of the population. Allergy is a very dangerous disease, in extreme cases there is the possibility of anaphylactic shock, which is dangerous for human life. Recently, the incidence of allergic symptoms in children and adults has increased, hence the need to clarify food law provisions in order to increase consumer protection by providing them with adequate information about the food they buy. In accordance with Regulation No. 1169/2011, changes in food labeling have been introduced, and one of the most important ones is the provision of information on allergens. In this legal act 14 allergenic ingredients were given, which include:

- cereals containing gluten, i.e. wheat, rye, barley, oats, spelled or their hybrid varieties, as well as derived products,
- crustaceans and products derived thereof,
- eggs and derived products,

- fish and derived products,
- groundnuts (peanuts) and derived products,
- soya and products thereof,
- milk and derived products (including lactose), nuts, i.e. almonds, hazelnuts, walnuts, cashews, pecans, brazil nuts, pistachios / pistachios, macadamia nuts or Queensland nuts, and related products,
- celery and derived products,
- mustard and derived products,
- sesame seeds and derived products,
- sulfur dioxide and sulphites in concentrations above 10 mg / kg or 10 mg / liter based on the total SO_2 content,
- lupins and derived products,
- molluscs and derived products.

In general, any product can provoke an allergic reaction, but the 14 above-mentioned food allergens are recognized in the EU. In different geographical areas the list of allergens may be different, but it is generally stated that there are over 120 food allergens in the world. EU legal standards did not specify threshold doses acceptable for specific allergens, only what was established is the acceptable level of gluten - 20 ppm and sulfur dioxide - 10 ppm. There are limitations in the detection and determination of allergen content in food products in research methods [8].

The above Regulation 1169/2011 applies at all stages of the food chain and is valid in every EU country. This document was created in order to harmonize the requirements for reliable information to every consumer about food, including food offered through catering establishments (restaurants, bars, canteens). The Regulation introduced a lot of confusion on the food producers market, because it was connected with modern requirements regarding the method of providing individual information on the packaging. Stricter legal regulations that require a detailed manner of information were created in order to ensure a high level of protection of health and life of consumers. According to the regulations, allergens should be written on the packaging; on the food labels, allergenic substances were accentuated by using a letter clearly distinguishing them from the list of other ingredients of the product. Allergens must be clearly highlighted by means of a different type of style, font color or background color, so that everyone can read it and that these markings clearly stand out from the other ingredients listed. It is also mandatory to provide information to consumers about allergens for foods sold without packaging or packed at the time of sale. Information in such cases must be easily accessible so that consumers are aware of the existence of allergens in unpackaged food. The application of the allergen distinction method in the list of ingredients should be easily noticeable for people who buy selected goods.

In food law, there is no record of the requirements for dealing with allergenic substances that have entered the product through cross-contamination, where they have been applied to another product. In connection with the increase in the number of people suffering from allergies and the possibility of causing intolerance reactions with low allergen concentration, it is advisable to put on the packaging the information "May contain ..." or "Possible presence ...".

Such data narrows the circle of consumers of a given food, so it is important not to abuse this type of information, but to use only in cases where it is not possible to avoid allergens entering products that do not contain them. Managing allergens is one of the important

directions of food safety management, because it is related to health and protection of human life. The manufacturer must manage allergens in his plant, as well as conduct appropriate measures to eliminate the penetration of allergenic substances into other products [9].

This entity should also provide training in order to raise the awareness and self-discipline of production workers, because improper operation of personnel may increase the risk of cross-contamination with allergens, which is dangerous for the health of others.

The next risk is product falsification. The definition of a falsified product is defined by the Food Safety Act, where it is stated that an adulterated foodstuff is a foodstuff whose composition or other properties have been changed and the consumer has not been informed about it in the manner specified in the provisions of Regulation No. 1169/2011 or a foodstuff in which changes have been made to hide its actual composition or other properties; a foodstuff is an adulterated foodstuff, in particular if:

- added to it substances that change its composition or reduce its nutritional value,
- the ingredient has been withdrawn or the content of one or more ingredients decisive for the nutritional value or other property of the food has been reduced,
- treatments were made that concealed its actual composition or gave it the appearance of a good quality food product,
- its name, composition, date or place of production, expiry date or the date of minimum durability were incorrectly given or otherwise labeled incorrectly - affecting the safety of the food through these activities.

It is known that the consumer, when buying the goods and on the packaging, did not mark any ingredient or the value of the ingredient was hidden, in which case the consumer was misled [16].

Food falsification is related to the issues of food safety and the quality of food products. Food abuse has existed since the use of food in commodity exchange began. Pliniusz the Roman historian from Rome wrote about the falsification of food in the first century AD as far as falsification of the bread, because chalk was added to it, water was poured into the wine, gypsum, lime and marble powder were also added to reduce its astringency. Such facts are found even in ancient times. Significant progress in the fight against food falsification was made at the turn of the 19th and 20th centuries. One of the first actions was the American chemist Harvey Washington Wiley, who is considered the father of the American Act of the Pure Food and Drug Act of 1906, the first legal act combating food fraud in the USA [10].

4. HISTORY AND FOOD AND HEALTHY FOOD

There are several ways of falsifying from history, for example falsification which is not harmful or harmless (substance that does not harm), next - use of unworthy or harmful substances.

Food is adulterated by a category of products in which the ingredient has been replaced with another, most often cheaper equivalent to which water has been added, it has not been declared to have been irradiated by radiation, or a false quantitative composition of the product or an untrue origin has been given. Why it comes to falsification. The main reason - economic, ie looking for savings and the desire to increase profits, which increases with the reduction of

production costs. The reason may also be increasing the product's competitiveness, as well as camouflaging the wrong quality of the product. By falsifying the product, its composition and properties change, from the outside the "fake" is similar or resembles the correct product, however it is not. According to the definition of the Department of Food Analysis, a counterfeit product is a food product that resembles only the appropriate product with its external features, but does not correspond to it in terms of its chemical or nutritional or utility properties.

Increasing globalization processes, prolonged food supply chains, sales via the Internet, which creates some degree of market anonymity and the ever-improving technique of food counterfeiting result in a greater amount of adulterated food. Certain adulterated products can be dangerous to life and health by using unlawful additives to products or the production of waste or spoiled raw materials [15].

No wonder, we usually find counterfeit, high quality, luxury products with a well-known logo on the market (cheese, wine, milk and dairy products and others). Changes in the composition of the product automatically result in false information and information on the packaging of the products. As stated above, the law protects the consumer and the information on the label can not mislead the consumer, in particular as to the characteristics, actions or properties of a given food product, or by assigning non-existent properties to given goods.

Various institutions - international and national - organize and conduct inspections to detect any adulterations and non-compliance with the law. In Poland, such bodies as the State Sanitary Inspection, Veterinary Inspection, Trade Quality Inspection of Agricultural and Food Products ensure compliance with standards in the field of food safety. These units control the product through organoleptic evaluation, physicochemical parameters and product labeling. The results of inspections often show incompatibilities and irregularities in product labeling as well as product falsification. According to data in the Trade Inspection report for 2010, the biggest adulterations included chicken eggs, butter, fresh meat, and the smallest - olive oil. Most of the adulterated meat concerned minced beef, in which the addition of pork was identified.

Often, honey producers use various methods of counterfeiting - a forgery, because this product is natural, but adding sucrose to it in a latent manner by bees with sugar causes the spoilage of its composition and irregularities with incorrect information. Known cases of adulteration include various marmalades, jams, preserves, juices by adding to them substances such as water or organic acids. It is often found that butter is falsified with vegetable fats, the presence of cow's milk in sheep's cheese or the detection of various preservatives, information about which is not given on the label, the use of the name of the product, which does not correspond to the composition of the product, introduces the consumer into error [11, 14].

The legal norms set forth the examples mentioned, such as unlawful acts for which financial penalties, loss of credibility and reputation of the producer are threatened. Despite this, there are all the facts of unfair competition and introducing the consumer into error.

Another example of the threat that will be described in this work will be bioterrorism. The type of terrorism being analyzed is defined as the illegal use of biological agents against people with the intention of forcing action or intimidation of the government, civilian population or any part of it to achieve personal, political, social or religious goals. The agent of destruction are microorganisms, bacteria (rickettsia), fungi, toxins, produced by some microorganisms, as well as plant poisons. Often, the above-mentioned measures are further modified to pose an even greater threat to the health and life of people, animals and plants.

Pathogenic germs can be transmitted by means of missiles, aerial bombs, containers or letter items. The spread of harmful substances is also supported by previously infected, natural

carriers - insects: fleas, ticks, bedbugs, lice, flies, mosquitoes. They can transfer microorganisms directly to people, water or food. "Bioterrorism is defined as deliberate contamination (or threat of contamination) of food and water with biological, chemical or radioactive agents that cause death or disease in a civilian population or disrupt social, economic or political stability The food bioterrorism can be defined as deliberate contamination or the threat of deliberate contamination of food with chemical, biological or radioactive agents in order to cause death or detriment to health of consumers and disrupt the social, economic and political order of the state. Biological weapons are weapons of mass destruction whose missiles are pathogenic microorganisms such as anthrax, anthrax, viruses - for example, a smallpox virus or toxins such as botulinum and ricin. The production of such weapons does not require large financial expenditures, it is an easy-to-use measure by both large terrorist organizations and small groups. It is very effective and at the same time weakly detectable in the initial stage of attack [12, 13].

5. CONCLUSIONS

The phenomenon of bioterrorism was already known in antiquity, when arrows were poisoned with strong biological toxins, or tossing enemies with dangerous animals such as snakes and bees. It is known from historical sources that Alexander of Macedon left behind the bodies of soldiers who died of infectious diseases during the retreat from the battlefield. A similar case referred to the Tatars, who in 1346 raided the bodies of the deceased plague using the catapults of the besieged Kaffa fortress. On the other hand, the Spaniards in 1495 in Naples infused wine with the blood of leprosy patients. During World War II there are times of the greatest development of biological weapons, in which Japan, the USA, England and the USSR were involved. During the war with China, the Japanese conducted research in Manchuria on the use of anthrax, puffer rods, spider stems cholera, typhoid bacilli and botulinum toxin55. The USA, Canada and the United Kingdom, in case of using biological weapons by Japanese and Germans, also had prepared anthrax spore bombs. It was not until 1972, at the request of the United Nations Security Council, that 152 countries signed the Convention on Biological Weapons, which prohibited research, production, storage and use of biological weapons. However, the provisions of the Convention have not always been respected. UN experts report that more than a dozen countries are constantly and systematically developing technologies related to the production of biological weapons, and more than 20 countries have such weapons and have means to carry them. There have also been incidents, as in the United States, where from October until December 1998 a series of reports on the threat of bioterrorist attacks in a paper form was reported. The content of the letters contained information on the contamination of the contents of the envelope with anthrax stems.

Terrorism is nowadays one of the most dangerous dangers threatening the society. Terrorists are increasingly improving their methods of operation, the area of their operations is still growing, and the scale of security threats can be measured on an international or even global scale. After the tragedy that occurred on September 11, 2001, the extent of the threat was realized and real deliberate fear of intentional contamination and poisoning of food began. The necessity to implement measures aimed at protecting food from the consequences of terrorist attacks has arisen. In the United States, in 2002, food inspection institutions prepared the first legal acts and guidelines for defending food against intentional contamination.

Also, appropriate activities on the international arena were started and in 2006 the initiative of APEC Food Defense Initiative 59 was launched, which aimed at combating acts of bioterrorism. Another example is the Australian Group, in which 41 countries and the European Commission cooperate. The Group conducts activities aimed at limiting the risk of the spread of biological and chemical weapons. Joint checklists containing a list of goods and technologies that threaten their use for the production of biological or chemical weapons are used for this purpose, hence they undergo a detailed export control.

References

[1] Bouwmeester, Hans, et al. Review of health safety aspects of nanotechnologies in food production. *Regulatory toxicology and pharmacology* 53.1 (2009) 52-62

[2] Wandel, Margareta, and Annechen Bugge. Environmental concern in consumer evaluation of food quality. *Food quality and preference* 8.1 (1997) 19-26

[3] Oliver, Stephen P., Bhushan M. Jayarao, and Raul A. Almeida. Foodborne pathogens in milk and the dairy farm environment: food safety and public health implications. *Foodbourne Pathogens & Disease* 2.2 (2005) 115-129

[4] Griffith, Christopher J., Barbara Mullan, and Patricia E. Price. Food safety: implications for food, medical and behavioural scientists. *British Food Journal* 97.8 (1995) 23-28

[5] Burlingame, Barbara, and Maya Pineiro. The essential balance: Risks and benefits in food safety and quality. *Journal of Food Composition and Analysis* 20.3-4 (2007) 139-146

[6] Smallwood, David M., and James R. Blaylock. Consumer demand for food and food safety: models and applications. *Economics of food safety*. Springer, Dordrecht, 1991. 3-27

[7] Luning, P. A., et al. Comprehensive analysis and differentiated assessment of food safety control systems: a diagnostic instrument. *Trends in Food Science & Technology* 19.10 (2008) 522-534

[8] DeRosier, Joseph, et al. Using health care failure mode and effect analysis™: the VA National Center for Patient Safety's prospective risk analysis system. *The Joint Commission journal on quality improvement* 28.5 (2002) 248-267

[9] Jevšnik, Mojca, Silvestra Hoyer, and Peter Raspor. Food safety knowledge and practices among pregnant and non-pregnant women in Slovenia. *Food control* 19.5 (2008) 526-534

[10] Pinquart, Martin, and Silvia Sörensen. Differences between caregivers and noncaregivers in psychological health and physical health: a meta-analysis. *Psychology and aging* 18.2 (2003) 250

[11] Torrance, George W. Measurement of health state utilities for economic appraisal: a review. *Journal of health economics* 5.1 (1986) 1-30

[12] Beehr, Terry A., and John E. Newman. Job stress, employee health, and organizational effectiveness: A facet analysis, model, and literature review 1. *Personnel psychology* 31.4 (1978) 665-699

[13] Dennis, Cindy-Lee. Peer support within a health care context: a concept analysis." *International journal of nursing studies* 40.3 (2003) 321-332

[14] Bradley, Elizabeth H., Leslie A. Curry, and Kelly J. Devers. Qualitative data analysis for health services research: developing taxonomy, themes, and theory. *Health services research* 42.4 (2007) 1758-1772

[15] Getzen, Thomas E. Health care is an individual necessity and a national luxury: applying multilevel decision models to the analysis of health care expenditures. *Journal of health economics* 19.2 (2000) 259-270

[16] Ziguras, Stephen J., and Geoffrey W. Stuart. A meta-analysis of the effectiveness of mental health case management over 20 years. *Psychiatric services* 51.11 (2000) 1410-1421