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FOOD SAFETY: FROM FARM TO PLATE

Context and importance of the problem

Sufficient access to safe and nutritionally adequate food is an essential human right and the foundation to build a world without hunger and poverty. The diseases associated with unsafe food and drinking water are causing death of 2.2 million people a year globally, most of whom are children. These diseases not only cause stomach discomfort, but some of them cause permanent damage of the liver and kidney functions, neurological damage, cancer, premature birth or stillborn child, sepsis, and even death. Chemical contamination of food with pesticides, metals, polychlorinated biphenyls and polycyclic aromatic hydrocarbons can lead to non-communicable diseases, primarily cancer, and problems of the reproductive health and the endocrine system.

In the past decade serious epidemics were recorded with contaminated food on different continents, some which of international magnitude, thus once again confirming the seriousness of food safety as public health concern.

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Table. 1 - Morbidity rate of intestinal infection per 100,000 population in the Republic of Macedonia for the period 2009-2014

Diseases related to microbialagents	2009	2010	2011	2012	2013	2014
Enterocolitis	616,2	586,2	716,9	625,6	582	512,3
Bacterial alimentary infections and intoxications	65,9	59,9	69,4	46,3	45,5	44
Salmonellosis	7,8	9	13,7	11,9	12,7	9,9
Infections with E.coli	0	0	0	4,9	3,9	7,8
Shigellosis	3	1,2	0,8	1,1	0,4	1,1
Listeriosis	0	0	0	0	0	0,5
Campylobacteriosis	0	0	0	0,1	0,1	0,1

The established national system for surveillance and notification of infectious diseases in the Republic of Macedonia shows that microbial infections caused by contaminated food have variable trend, bacterial alimentary infections and intoxications had decreasing trend, salmonellosis was increasing, and intestinal infections caused by E.coli had increasing trend due to the recently introduced legal obligation to report (Table 1).

In the Republic of Macedonia, in 2014 the first epidemic of listeriosis caused by contaminated food was reported, with recorded high mortality rate (50%). On the other hand, brucellosis was decreasing from 14.1 in 2009 to 1.9 in 2014, due to the multi-sectoral efforts to reduce the incidence of this zoonosis.

These diseases not only burden the health care system, but also cause serious economic effects on the individual and family, have negative effects on agriculture, business, tourism, the overall economy and international trade of a country or region. Thus, the policy makers at local, national and international level need scientifically-based objective assessments of the hazards of unsafe food, so to be able to inform and mobilize resources for the timely prevention and thereof to promote the public health.

New **threats to food safety** are constantly emerging, as a result of changes in food production, distribution and consumption, intensive agriculture and the globalization of food trade. Permanent changes in dietary habits - mass catering, fast food, consuming outside the home and environmental changes followed by the emergence of new, dangerous bacteria and toxins are challenges for food safety and have widespread effects on health. One source of contamination can become widespread, with global consequences, with a longer duration and an increased number of affected

immunocompromised persons and other vulnerable groups. Antimicrobial resistance of pathogens, the identification and evaluation of newly discovered pathogens and chemicals in the food chain, evaluation of the impact of new technologies in food production, including genetic engineering and nanotechnology are also new challenges for science research.

The policy on Food safety of the Republic of Macedonia has three main objectives:

1. Food safety and human health protection;
2. Consumer protection and enforcement of EU standards
3. An integrated approach to the control of food and feed safety, coordination within the system based on the principle “from farm to plate” and applying an effective methodology for risk assessment in the whole system.

The institutional setup and allotment of responsibilities of this complex activity is still very disintegrated. This is evident through the involvement of various institutions from different sectors, such as: Food and Veterinary Agency, Administration for Plant Protection, the State Inspectorate for Agriculture, Laboratories for food safety testing in agriculture, veterinary and health sectors. Recorded incidents of unsafe food in the Republic of Macedonia such as the occurrence of residues of pesticides in agricultural products, an outbreak of listeriosis in 2014, the presence of aflatoxin M1 in milk in the region and so forth are indicative of the necessity for improved coordination between the various bodies participating in the control of complex food chain.

Food safety data, based on laboratory tests conducted at the Institute of Public Health and the Centres of Public Health have shown that microbiological hazards are the leading cause of unsafe food. In 2014, out of 30942 tested samples of food products 1.7% were microbiologically unsafe, non-compliance for presence of additives in 0.8% of the tested samples. But it should be noted that this database does not include tests carried out in other laboratories outside the health system.

Establishment of strong links between public health - the health sector and other sectors - agriculture and animal health is necessary for high level of food safety and human health protection. The public health sector should take a key role in building a community of diverse partners and stakeholders who share similar goals and responsibilities. In this partnership the science, the research, the agriculture, the industry and the regulatory bodies should be included.

Recommendations for new policy and implementation

The European policy for health and well-being Health 2020 calls for effective communication, information exchange and common action, both national and international, including public health, veterinary and agricultural sectors. This will be a long way toward ensuring a safer food on our plates.

Dr. Zsuzsanna Jakab, director of the WHO Regional Office for Europe on the occasion of World Health Day, 2015.

European framework policy for health and wellbeing Health 2020 focuses on effective integrated strategies and interventions in response to major health challenges in the region and supports the continuing efforts to combat communicable diseases. Thereby a special accent is placed on building capacity for information exchange and common activities of monitoring and controlling diseases by public health, veterinary, agricultural institutions in charge of food safety in order to better control infectious diseases transmitted by animals to humans, including emerging infectious diseases, antibiotic-resistant organisms and food-borne infections. Food safety should be integrated into all policies and interventions that improve the nutrition and the access to food.

Scientifically based decisions about measures throughout the chain of food production from ‘farm to plate’. National standards for food safety and policy decisions should be based on transparent, objective and independent assessments of risks of unsafe food.

- **Scientifically based decisions** about measures throughout the chain of food production from field to dining table. National standards for food safety and policy decisions should be based on transparent, objective and independent assessments of risks from unsafe food.
- Establishment and functioning of the **National Council for Food and Feed Safety** which should provide scientific and technical support to policies that have a direct or indirect impact on food and feed safety, health and animal welfare. This Council should meet regularly, provide independent opinions and recommendations, promptly recognize hazards in food and the risk, and thereby increase consumer confidence.
- Preparation and adoption of a single document - **Strategy for food and feed safety** that will enable an integrated approach and monitoring of food “from field to table”, or “from farm to plate” as per the motto of World Health Day 2015. This type of document has so far not been prepared and adopted in the Republic of Macedonia.

- **Inclusion of measures and activities on food safety in the other policies.** Some measures and actions for improving food safety are included measures in the Action plan for public health and Action plan for health and the environment, but they are not adopted yet. But food safety should be included in the policies for trade, agriculture, economic development, tourism and transport.
- Adoption of the law on phytopharmaceuticals and creating conditions for its effective and full implementation. The application of this law should allow sustainable use of phytopharmaceuticals by reducing the risks and impacts of their use on human health, animals and the environment. It deals with the rules for the authorization of phytopharmaceutical in trade form and placing them on the market, their use, the implementation and the collection of statistical data on marketed and used phytopharmaceuticals, their residues in food and feed.
- **Strengthening the intersector collaboration and information sharing** by creating a single database for food safety and diseases associated with unsafe food. Creation of a single database for food and feed safety, which would gather all the data from laboratory testing of food nationwide, that can be used to assess the biological, chemical or physical food risks.
- Establishing the **relationship between the trend of food safety and the trend of communicable and non-communicable diseases** by strengthening the public health facilities, or by strengthening the human and material resources. For the execution of this activity a major role and significance of the implementation is envisaged for the National Food Consumption Study, the first of its kind in Macedonia, conducted by the Institute of Public Health, with the support of the World Health Organization and the Ministry of Health of the Republic of Macedonia.
- **Improving the system for reporting and recording** of communicable diseases, and non-communicable diseases associated with unsafe food, again with strengthening the human and material resources.

Executive summary

The World Health Day 2015 was dedicated to food safety, a topic of great importance for all the people on the planet and a multitude of stakeholders, including the government, civil society, private sector and inter-governmental organizations. The food can be contaminated at any stage of the food chain. Cooperation between the health sector, agriculture, food production, food transport, catering is necessary in order to obtain safe food in the complex food chain (Health 2020). Sufficient access to safe and nutritionally adequate food is an essential human right. The diseases associated with unsafe food and drinking water caused death of 2.2 million people a year globally, of which most are children. In the past decade serious outbreaks with contaminated food were recorded on different continents, some of them of international character, confirming how important food safety is from public health aspect. These diseases not only burden the health care system, but also cause serious economic effects on the individual and family, have negative effects on agriculture, business, tourism, the overall economy and international trade of a country or a region. That is why the policy makers at local, national and international level have a need of scientifically-based objective assessments of the hazards of unsafe food, so to be able to inform and mobilize resources for the timely prevention and thereof to promote the public health.

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