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TECHNICAL DOCUMENT

Food Safety

EXECUTIVE SUMMARY

In the Region of the Americas, 77 million people fall ill every year from contaminated food, causing more than 14,000 deaths; 29% of these illnesses are in children under five. Besides, serious outbreaks of foodborne disease have been documented throughout the Region in the past years, illustrating both the public health and social significance of these diseases. Almost 10% of the potential events with public health importance reported to WHO Event Management System since 2002 are foodborne. Foodborne diseases are fundamentally linked with trends in trade, consumer demand, economic and environmental policies. National food safety authorities have responsibility to ensure the safety from infection and contamination of the food produced, consumed and commercialized. PAHO recognizes this situation and has identified food safety as a priority. Improving food safety is part of PAHO strategic objectives as per its 2014-2019 Strategic Plan, and it is working with Member States for ensuring nutritious and safe food supply.

BACKGROUND AND CONTEXT

Food safety is a global priority and an important public health issue since foodborne disease (FBD) infections and intoxications are a major cause of suffering and death throughout the world. Foodborne diseases can be defined as those conditions that are commonly transmitted through ingested food and comprise a broad group of illnesses caused by enteric pathogens, parasites, chemical contaminants and bio-toxins. These diseases reduce societal productivity, impose substantial stress on the health care system, and reduce economic output as a result of loss in confidence in tourism, food production and access to domestic and export markets.

Food can be the vehicle of a large number of hazards. More than 200 known biological agents and many chemical agents can be transmitted by food, including serious emerging diseases such as Bovine Spongiform Encephalopathy and Haemolytic Uremic Syndrome. The incidence of foodborne diseases varies greatly between

countries, and low-income countries bear the greater burden of the problem. However, episodes of foodborne illness continue to constitute a challenge to public health even in industrialized countries, despite advances in food hygiene, food protection and food control. In the Region of the Americas, 77 million people fall ill every year from contaminated food, causing more than 14,000 deaths; 29% of these illnesses are in children under five. The most common foodborne disease in the Region of the Americas is diarrheal disease (95 percent of those who fall ill), being the pathogens involved, Norovirus, *Campylobacter*, *Escherichia coli* and non-typhoidal *Salmonella*. Other pathogens such as toxoplasmosis and the pork tapeworm (*Taenia solium*), are shown to be a public health concern in the Region of the Americas, as well. Finally, the chemical aflatoxin also contributes to the burden of foodborne disease in the Region. In a recent burden of illness study in the Caribbean, incidence rates of acute gastrointestinal illness associated with contaminated food were reported to vary from 0.65 cases/person/year to 1.4 cases/person/year, with estimated total costs associated between US\$700,000 per year to US\$19 million. In the USA, the Centers for Disease Control and Prevention (CDC) estimates that each year approximately 1 in 6 Americans (or 48 million people) gets sick, 128,000 are hospitalized and 3,000 die of foodborne diseases with a total cost of US\$77.7 billion.

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Food safety is fundamentally linked with trends in trade, consumer demand, economic and environmental policy. Globalization is providing for a continuous increase in international travel and commerce. Food grown in one country can now be transported and consumed on the other side of the world. This rapid movement of persons and products across the globe will continue to cause an increased risk of disease transmission. Consumers not only reshape product and food chain processes through changing preferences, but also influence country and global agriculture and food policies.

The above-described situation is contributing to a new global scenario in which both known and new foodborne diseases can rapidly emerge and spread. A single source of contamination may become widespread, with global consequences. Greater life expectancy and increasing numbers of immune-compromised people create a larger vulnerable population for whom unsafe food poses a serious threat. Other key challenges include the emergence of antimicrobial resistance through antibiotic use in food production. Examples include *Escherichia coli* and *Salmonella* spp resistant to 3rd and 4th generation cephalosporin and fluoroquinolones *Campylobacter* spp resistant to macrolides and fluoroquinolones as well as *Staphylococcus aureus* resistant to all beta-lactam-type drugs (i.e. Methicillin-resistant *Staphylococcus aureus*, MRSA). More recently, the detection of a plasmid-mediated colistin resistance mechanism, related to *mcr-1* (Mobile Colistin Resistance) gene, isolated from animals and humans, has impacted the world because colistin is a reserve antibiotic to treat infections caused by bacteria resistant to carbapenems. However, is used in veterinary medicine in farm animals to prevent infection and promote growth.

The World Declaration on Nutrition (1992) states that “access to nutritionally adequate and safe food is a basic individual right.” This was reaffirmed by the Rome Declaration in 2014 at the Second International Conference on Nutrition, which stated that “improvements in diet and nutrition require relevant legislative frameworks for food safety and quality, including the proper use of agrochemicals, by promoting participation in the activities of the Codex Alimentarius Commission for the development of international standards for food safety and quality”. On the other hand, PAHO published in 2015 a report demonstrating that industrially processed food products, sugary drinks and fast foods are displacing more nutritious traditional diets, with alarming health results, i.e. obesity rates. The report examines sales of products including carbonated soft drinks, sweet and salty snacks, breakfast cereals and bars, candy, ice cream, sports and energy drinks, fruit and vegetable juices, bottled

teas and coffee drinks, spreads, sauces and ready-to-eat meals. From 2000 to 2013, per capita sales of these products increased 26.7% in the 13 Latin American countries.

Food safety systems are responsible for guaranteeing safe and nutritious food and ensuring the existence of a solid base for national and international food trade. Given the responsibilities of food safety systems, their basis is official, mandatory in nature, and their application does not discriminate against any type of food, or systems for their production, processing, or sale. In accordance with international trends, the strategic focus of food safety system is on: a) prevention, b) “farm-to-table”, c) scientific evidence, supported by risk analyses, and d) transparency. Currently, the food safety systems in the Americas demonstrate an imbalance between technological capacity, regulatory mechanisms and institutional sustainability. This has led to fragmentation of food safety systems and the difficulty of developing their strategic focus as mentioned above. The great challenge for meeting this approach is the difficulty of adequate inter-sectoral articulation with shared responsibility among all stakeholders along the agro food chain.

Recognizing the importance of food safety and FBD as an important cause of illness and deaths worldwide, the World Health Organization (WHO) adopted Resolution WHA53.15 (2002) and Resolution WHA 63.3 (2010), establishing food safety and the prevention and control of FBD as a WHO priority. Similarly, the Pan American Health Organization (PAHO) has identified food safety as a priority and its improvement is stated as one of its strategic objectives in its 2014-2019 Strategic Plan. The WHO Director-General, on a recent note published by The Lancet, stated that “It is high time for a sustainable response to the core problems, which are fragmentation of food safety authorities, unstable budgets, and a dearth of convincing evidence on the effect of foodborne diseases”.

WHAT IS REQUIRED?

Interventions on the Social and Economic determinants of foodborne diseases

The social and economic determinants³ are the factors leading to differential exposure and increased vulnerability to foodborne diseases. The structural determinants in food safety are: poverty, education, ethnicity, gender, demographic factors, living and working conditions and trade. The latter determinants will influence the modes of food production, food handling and food consumption. Ethnicity and gender are two important cut cross themes in PAHO’s technical cooperation. Ethnicity is closely associated with a disadvantaged position in society, thus ethnicity is often structurally linked to inequity within local national contexts leading to conditions prejudicial to food security and safety. Another important consideration is the fact that some aspects of foodborne diseases involve transmission via foods that are more commonly consumed by ethnic populations, as a consequence of their traditional eating habits, such as brucellosis and consumption of raw milk, cheese, or other derivate. Gender, beyond biological conditions (pregnancy), translates into practices and behaviors that affect food safety. Last but not least female literacy rates and education make significant contributions to food availability and food safety.

Improve the modes of Food Consumption and Food Handling

- Contemporary lifestyle and consumer preferences may adversely affect exposure to foodborne hazards, with many consumers appearing more interested in saving time and money and in convenience, than in proper food handling and understanding of the basic principles of food preparation. (i.e. cross contamination, and/or other WHO 5 keys for safer food).

- Education does not always translate into improved food handling, and a substantial number of educated consumers frequently implement unsafe food handling practices (e.g.. food not properly cooked).
- There is increased consumer demand for foods that are fresh and organic. As a consequence, today's marketplace has more perishable products, which leads to an increased risk of food handling errors. There are more than 139 countries and 25 million hectares dedicated to organic production worldwide. Latin-America represents 24% of these countries.
- Low income populations incur higher food safety risks due to higher environmental exposure to pathogens. These marginalized populations do not always benefit from an effective food safety regulatory system or access to quality health care.
- A substantial proportion of foodborne diseases are attributable to improper food handling practices in the consumer's home. This is mainly due to ineffective hygiene practices, lack of safe water and sanitation, and inadequate environmental conditions, which often act synergistically.
- Poverty or extreme conditions (e.g. emergencies), lack of potable water, poor sanitation, absence of facilities for adequate storage and absence of fuel for cooking (wood, gas, electricity) hamper safe preparation of food and increase the risk of exposure to foodborne hazards.

Improve the modes of Food Production

- Foodborne diseases can be caused by unsafe food contaminated during agricultural and animal health and production practices. For example, pathogens on raw vegetables or fruits may result from irrigation or washing with polluted or inadequately treated wastewater. Sick or infected animals may transmit diseases through their products.
- Mycotoxins in grains, such as maize and groundnuts can be attributed to improper post-harvest practices (storage, conservation) and may cause impaired child growth.
- In developing countries, the close association between the rural population and animals facilitates the spread of food borne zoonotic infections.
- There is growing evidence that resistant microorganisms are emerging in the food chain. To prevent antimicrobial resistance, the prudent use of antimicrobials in agriculture, particularly in animal health and production, and aquaculture, is recommended. Food safety should serve as a platform to bring stakeholders together to raise awareness and to establish policies and programs to prevent the problem.

Consider the interaction with trade and tourism

Food safety and tourism security have been linked for many decades. While safe food cannot assure a tourist destination's success, food borne illnesses can help to determine its failure. Tourism depends on a safe and reliable food supply. While food safety measures are not trade measures per se, food safety regulations and standards can impede trade and significantly affect the ability of developing countries to access markets, particularly in industrialized countries. The national food safety competent authorities should be aware that increasing national food safety standards will increase their competitiveness in the international food market.

Consider the interaction with food security, malnutrition and comorbidity

Different vulnerabilities to foodborne diseases depend primarily on biological and physiological conditions that alter the host defences and suppress the function of the immune system. As an example, under nutrition is one of the leading causes of increased host vulnerability to foodborne infections. In children, under nutrition is associated with both the incidence and duration of diarrhea.

Cancer and AIDS patients undergoing intensive chemotherapy with immunosuppressive drugs are subject to opportunistic infections, including foodborne illnesses due to immunosuppression.

CONCLUSIONS

- Data on the burden caused by foodborne illnesses emphasize the global threats posed by unsafe foods, and the need for coordinated, cross-border action across the entire food supply chain. Food safety standards and practices should be applied along the entire food chain, from food production, transport, processing, distribution, retail sale, storage, handling, cooking, and serving. Inadequate practices at any stage of the food chain cause exposure to food hazards, which disproportionately affect the most disadvantaged groups.
- Unsafe food can contain harmful bacteria, viruses, parasites or chemical substances, and cause more than 200 diseases, ranging from diarrhea to cancer. Efforts to prevent such emergencies can be strengthened, however, through development of robust food safety systems that drive collective government and public action to safeguard against chemical or microbial contamination of food.
- At the consumer end of the food supply chain, the public plays important roles in promoting food safety, from practicing food hygiene and learning how to take care when cooking specific foods that may be hazardous, as well as reading labels when buying and preparing food.
- Food must be nutritious and safe. National authorities have responsibility to ensure safety from infection and contamination of food we produce, consume and trade.
- There is a strong link with the sustainable development goals, in particular SDG 3 and the targets related with child and maternal health as well with HIV/AIDS. Furthermore, food safety also relates with SDG 1: End poverty; SDG 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture, and SDG 12: Ensure sustainable consumption and production.

DELIVERY MECHANISMS

1. **Laws, regulations and implementation of food safety policy:** The fundamental food law sets the objective framework for food control to supply food that is fit for human consumption. Consistent with the international framework, the law specifies the areas of application covering the entire food chain, the powers of agents, responsibilities and rights of stakeholders along the entire food chain, and defines offenses and penalties.
2. **Competent authority:** The Competent Authorities have the regulatory texts required for the implementation of their control missions across the entire food chain. The texts include clearly defined roles and responsibilities with delegated authority for taking action, including compliance and enforcement authority, such as preventing contaminated food from reaching consumers.
3. **Monitoring and surveillance programs:** Food hazard monitoring and FBD surveillance are integrated into a cycle of risk analysis and their implementation can be shared among several institutions. Risk reduction

programs, including certification, are implemented and managed using the data from integrated surveillance. Knowledgeable staff is essential to perform advanced scientific analysis and evaluation of programs. Communication and integration between the Competent Authorities should be effective throughout the chain and cover all identified risks.

4. **Education:** In food safety, it is essential to promote community participation. The society should be aware of the challenges of foodborne diseases and incorporate in their daily habits desirable behaviours which contribute to prevention. Therefore, the competent authorities should work in social communication and education based on the structuring of models, both for campaigns and for educational materials. On the other hand, risk communication needs strengthening, since there is frequently a lack of a definition of the responsibilities and communication strategies targeted at all the partners of the food chain. There are often no official sources for consumers to know and evaluate risks, the way to handle them, and their implications on public health. When risk communication strategies are not well established, the tasks of control systems become more complex because informing and educating on how to prevent foodborne risks is not being done, nor in the understanding of the solutions, on how and why it is important to manage risk.
5. **Inspection Services.** As for risk management, this is usually the component for which countries are best suited. There is a good level of knowledge, some skills developed in the training of staff, but it hasn't been possible to take the definitive step to base inspections on risk and oriented to audit. Most inspection services continue to follow traditional inspection schemes, probably due to the absence of a definition for risk-based policies.

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