

# FOOD SAFETY AROUND THE WORLD

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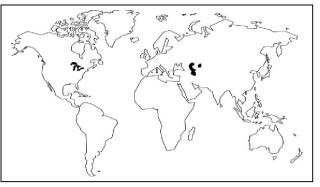
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## **INTRODUCTION**

Foodborne illnesses are prevalent in all parts of the world, and the toll in terms of human life and suffering is enormous. Contaminated food contributes to 1.5 billion cases of diarrhea in children each year, resulting in more than three million premature deaths, according to the World Health Organization (WHO).<sup>1</sup> Those deaths and illnesses are shared by both developed and



developing nations. For example, in the United States, the Centers for Disease Control and Prevention (CDC) estimates that foodborne diseases cause approximately 76 million illnesses annually among the country's 290 million residents, as well as 325,000 hospitalizations, and 5,000 deaths.<sup>2</sup> In South East Asia, approximately one million children under five years of age die each year from diarrheal diseases after consuming contaminated food and water.<sup>3</sup>

Accidental or intentional adulteration of food by toxic substances also can result in serious public health incidents. For example:

- During the winter of 1971-1972, wheat seeds intended for crop planting and treated with methylmercury were accidentally distributed in rural areas of Iraq. An estimated 50,000 people were exposed to the contaminated bread, of which 6,530 were hospitalized and 459 died.<sup>4</sup>
- In Spain in 1981-1982, contaminated rapeseed oil killed more than 2,000 people and caused disabling injuries to another 20,000 many permanently.<sup>5</sup>
- In China, in 2002, more than 200 schoolchildren were sickened and 38 died when rat poison was used to intentionally contaminate bakery products.<sup>6</sup>

#### Human costs

Many countries have not yet established adequate surveillance or reporting mechanisms to identify and track foodborne illness. Therefore, data on foodborne diseases are extremely scarce and improvements are needed to better identify the causes of foodborne diseases.



The symptoms of foodborne illnesses range from mild to life-threatening. While nausea and diarrhea are the most common, kidney and liver failure, brain and neural disorders, and even death can also result. For example, *Listeria monocytogenes* infection, which mainly affects the elderly and pregnant women, has a mortality rate of 20-30 percent.<sup>7</sup> The debilitating long-term complications of foodborne diseases also include reactive arthritis and paralysis.<sup>8,9</sup>

Although everyone is susceptible, infants and young children, pregnant women, the immunocompromised, and the elderly are more likely to experience foodborne illness with severe consequences.<sup>10</sup> In developing countries, foodborne diseases are a primary cause of malnutrition, which then affects the growth and disease resistance of infants and children. Malnourished infants and children are more vulnerable to a range of ailments, such as respiratory infections, which can contribute to further malnutrition and disease. Each year, between 12 million and 13 million children die from the combined effects of malnutrition and infection.<sup>11</sup> Those who survive may suffer from arrested physical and mental development, being deprived of the chance to reach their full potential in society.<sup>12</sup>

#### **Economic costs**

Foodborne diseases create an enormous burden on the economy. Consumer costs include medical, legal, and other expenses, as well as absenteeism at work and school. For many consumers who live at a subsistence level, the loss of income due to foodborne illness can perpetuate the cycle of poverty.<sup>13</sup> Chronic diseases caused by contaminated food, like reactive arthritis or temporary paralysis, can be even more damaging than the initial disease and add dramatically to the medical costs and lost wages.<sup>14</sup>

Costs to national governments stem from increased medical expenses, outbreak investigations, food recalls, and loss of consumer confidence in the products. Foodborne diseases lead to increased demands on already overburdened and poorly funded healthcare systems in developing countries.

The best estimates of the economic costs of foodborne diseases come from developed countries:

- In the United States, a government estimate of seven foodborne pathogens reported a cost of between U.S. \$5.6 billion to \$9.4 billion in lost work and medical expenses.<sup>15</sup>
- In the European Union, the annual costs incurred by the health care system as a consequence of *Salmonella* infections alone are estimated to be around EUR €3 billion.<sup>16</sup>
- In Australia, the cost of an estimated 11,500 daily cases of food poisoning was calculated at AU \$2.6 billion annually.<sup>17</sup>
- In the United Kingdom, care and treatment of people with the new variant of Creutzfeldt-Jakob disease (vCJD) are estimated to cost the health services about £45,000 per case from diagnosis,<sup>18</sup> and a further £220,000 may be paid to each family as part of the government's no-fault compensation scheme.<sup>19</sup>

With the globalization of food trade, countries also suffer economic consequences when unsafe food results in lost exports. For example, the 1991 cholera outbreak in Peru, caused by consumption of water and seafood contaminated by the bacteria *Vibrio cholerae*, resulted in more than \$700 million in lost exports of fish and fish products.<sup>20,21</sup> Because of an outbreak of *Cyclospora* (a protozoan parasite) in Guatemalan raspberries in 1996 and 1997, the number of Guatemalan raspberry growers has shrunk dramatically from 85 in 1996 to three in 2002.<sup>22</sup> Finally, the effect on both Canadian and U.S. beef exports from findings of bovine spongiform encephalopathy (BSE) in their cattle population resulted in losses of \$5 billion for Canada's beef sector<sup>23</sup> and \$2.6 billion in lost exports for the US' beef sector<sup>24</sup> in 2004.

Tourism is also of great economic importance for many countries. Being a haven for "traveler's diarrhea" can damage the reputation of the country as a tourist destination and has huge consequences for its economy.

#### **Political consequences**

Food safety issues can have huge political implications. In Western Europe, BSE has led to more political and structural change than any other food or agricultural issue. In Germany, the emergence of BSE in early 2001 led to the resignation of both the agriculture and health ministers and the restructuring of the agriculture ministry to become more consumer-oriented.<sup>25</sup> In the United Kingdom, responsibilities for food control were transferred from the Ministry of Agriculture, Fisheries, and Food to a new, separate food authority, the Food Standards Agency. Elsewhere in Europe, similar national agencies have been created to ensure adequate regulation of food safety and restore public confidence,<sup>26</sup> and a European Food Safety Authority has been established.

#### Current and new challenges to food safety



Food safety challenges differ by region, due to differences in income level, diets, local conditions, and government infrastructures. In developing countries, the food producer and the consumer often have a close connection. There are fewer processed and packaged foods; most fresh food is traded in traditional markets; and street vendors supply much of the food consumed outside the home. Perishable food is often prepared and consumed immediately, and there is minimal storage of prepared foods.

Food safety concerns in these countries typically include:

- the inappropriate use of agricultural chemicals
- the use of untreated or partially treated wastewater
- the use of sewage or animal manure on crops
- the absence of food inspection, including meat inspection
- a lack of infrastructure, such as adequate refrigeration
- poor hygiene, including a lack of clean water supplies

As a country's economy develops, its participation in the global food economy and its capital investment in the agricultural sector increase.<sup>27</sup> That gives consumers access to both common and exotic foods throughout the year.

Here are some trends, as reported by WHO, <sup>28</sup> prevalent in both developed and developing countries, that can increase food safety challenges:

*Changes in animal husbandry*: Modern intensive animal husbandry practices have been used to maximize production. This has resulted in the emergence and increased prevalence of several human pathogens, like *Salmonella* and *Campylobacter*, in flocks or herds of all the most important production animals (poultry, cattle, pigs). Crowding of animals has led to the increased use of antibiotics on so-called "factory farms" which in turn has been linked to the emergence of new strains of antibiotic-resistant bacteria. Feeding practices also have come under increased scrutiny as a result of BSE.

*Changes in agronomic process*: Agricultural practices have contributed to the increased risks associated with fresh fruit and vegetables, such as the use of manure, chemical fertilizers, untreated sewage, or irrigation water containing pathogens. Outbreaks linked to fruits and vegetables have increased in some regions, especially where improvements in transportation and access to imported fruits and vegetables are giving consumers more fresh produce year round.<sup>29</sup> Examples include a major *E. coli* O157:H7 outbreak in Japan linked to sprouts involving more than 9,000 cases in 1996, and several recent *Cyclospora* outbreaks associated with raspberries in North America and Canada, and lettuce in Germany.<sup>30,31,32</sup>

*Increase in international trade*: International trade allows for the rapid transfer of microorganisms from one country to another. The increased time between processing and consumption of food leads to additional opportunities for contamination and time/temperature abuse, increasing the risk of foodborne illness. Increasing trade also means that new and unfamiliar foodborne hazards can more easily reach consumers who have not developed immunities to those pathogens.

*Changes in food or agricultural technology*: Advances in processing, preservation, packaging, shipping, and storage technologies bring new forms of foods to the market, and sometimes new hazards. For example, the increased use of refrigeration to prolong shelf-life of ready-to-eat foods has contributed to the emergence of *Listeria monocytogenes*.<sup>33</sup> Consumers in many regions have expressed concern regarding the use of technologies like irradiation and genetically-engineered (GE) plants and animals.

*Increase in susceptible populations*: Due to advances in medical treatment, people are living longer, and surviving with chronic medical conditions that used to kill them. By the year 2025, more than one billion of the world's population will be over 60 years of age, two-thirds of whom will live in developing countries. As a result, in some countries, one person in four faces a higher risk of contracting a foodborne disease.<sup>34</sup>

*Increase in travel*: Persons exposed to a foodborne illness in one country can expose others to the infection in a location thousands of miles from the original source.

*Changes in lifestyle and consumer demands*: Many trends impact the frequency and nature of foodborne illnesses. Consumers like to have access to seasonal foods all year. In many developed countries, a larger share of the

food budget is spent on food prepared outside the home. In developing countries, there is a general rise in urban living and street food is an important component of the daily diet. As a result, outbreaks associated with food prepared outside the home are increasing in many regions.

*Bioterrorism*: Following rising incidents of terrorist attacks in many countries in recent years, concerns about intentional adulteration of food by terrorists, criminals, or other antisocial groups have risen and led to the need for new preparedness efforts. The WHO states that "the key to preventing food terrorism is to enhance existing food safety programs. Strengthening national food safety programs requires that national policies and resources to support the infrastructure are in place and that food legislation, food monitoring and surveillance, food inspection, foodborne disease surveillance, and education and training are adequate and up-to-date."<sup>35</sup>

#### **Background on the report**

The rest of this report examines how food safety issues and concerns vary in both developed and developing regions and how governments, international organizations, and consumer organizations have responded. Although in many regions of the world, a large proportion of gastrointestinal disease is caused by contaminated water, this report focuses more on issues of foodborne hazards. In addition, this report is not intended to be a systematic analysis of all regions. Its content reflects the availability of source documents from each region and international resources.

Countries were assigned to each region based on definitions of the World Health Organization (WHO).<sup>36</sup> Each regional report was reviewed by consumer organizations in that region, and their comments and ideas were incorporated.

## **1. WESTERN PACIFIC REGION**

The Western Pacific Region faces a wide array of food safety problems. Some countries in the Western Pacific Region have well-developed food safety programs, but others have no specific written policies.<sup>1</sup> Many countries lack adequate resources to ensure full enforcement of food regulations. Australia and New Zealand are wealthy nations that rely heavily on agricultural exports to fuel their economies, so their programs tend to be better developed. In 2001, the 52<sup>nd</sup> session of the Regional Committee of WHO recognized food safety as a significant public health issue and endorsed a regional strategy.

## 1.1 Foodborne diseases in the Western Pacific Region

The Western Pacific Region has experienced a number of serious outbreaks, including at least one recent instance of intentional contamination of the food supply:

- In 2002, in China, more than 200 schoolchildren were sickened and 38 died from the intentional contamination of bakery products after a competitor put rat poison into the breakfast snacks of a restaurant in Tangshan, a suburb of Nanjing.<sup>2</sup>
- In 2000, food poisoning linked to milk products produced in the Osaka factory of the Snow Brand Company sickened 14,780 persons, making this one of Japan's largest food poisoning outbreaks ever.<sup>3</sup>
- In a 1996 Japanese outbreak, at least 9,578 individuals (mainly schoolchildren) suffered from severe *Escherichia coli* infections linked to white radish sprouts.<sup>4</sup>
- In 1988, a *Hepatitis A* epidemic in China associated with the consumption of clams affected some 292,000 people, killing nine of them.<sup>5</sup>

The Western Pacific Region consists of the following countries:

American Samoa, Australia, Brunei Darussalam. Cambodia. China, Cook Islands, Fiji, French Polynesia, Guam, Hong Kong, Japan, Kiribati, North Korea, South Korea, Republic of Lao PDR, Macao, Malaysia, Mariana Islands, Marshall Islands, Micronesia, Mongolia, Nauru, New Caledonia, New Zealand, Niue, Palau, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Viet Nam, and Wallis and Futuna.

There is considerable evidence to show that foodborne illnesses due to biological hazards are increasing in the Western Pacific Region. Numerous foodborne pathogens are on the rise, including *Campylobacter*, enterohemorrhagic *Escherichia coli*, *Cyclospora*, and *Listeria*.<sup>6</sup> Recent



7



infections have also been linked to new strains of *Vibrio cholerae* (O139) and drug-resistant strains of several enteric pathogens, particularly *Salmonella*. (See Box.<sup>7,8,9</sup>)

#### Illness by the numbers

In Australia alone, among a population of about 19.7 million, there are an estimated 5.4 million cases of foodborne gastroenteritis each year.

In the Philippines and Pacific Island countries, high rates of diarrhea and gastroenteritis are also reported every year, despite these countries having a limited capacity to monitor foodborne illnesses. Between 1996 and 1999, the Pacific Island countries reported more than one case per 100 individuals per year.

In China, foodborne diseases are the most common, followed by chemical foodborne diseases.

Chemical contamination of food also is prevalent. For example, Viet Nam reports a high burden of disease associated with pesticide residues.<sup>10</sup> Many Pacific Island countries report that ciguatera poisoning, a chemical hazard in finfish, is common.<sup>11</sup> Another serious hazard, botulism, is sporadically reported in the Western Pacific Region, most frequently in association with fermented food and sausages.<sup>12</sup>

The lack of food safety education of producers and consumers is often an issue. For example, in Cambodia, in 1996 and 1998, 70 deaths were linked to the drinking of rice wine that had been mixed with pesticides to make it stronger.<sup>13</sup>

Diseases carried by live animals and poultry also present a risk to consumers in the Western Pacific Region. A 1998 outbreak of Nipah virus in Malaysia

killed 105 people. Nipah virus is typically associated with pigs and pork. Recently, a strain of avian influenza ("bird flu") emerged in the Western Pacific Region. This bird flu has caused deaths and illnesses in persons that either have close contact with sick birds or who cared for sick family members. Those outbreaks severely affected both public health and the trade of animal and meat products in those areas.<sup>14</sup>

Moreover, in February 2005, for the first time in the Western Pacific Region, a human case of mad cow disease was confirmed in Japan.<sup>15</sup>

#### 1.2 Food safety concerns in the Western Pacific Region

WHO studies cite many factors that contribute to foodborne illness in the Western Pacific Region. Those include:

• Intensive farming practices, including the use of both slaughter byproducts and animal waste as feed; the misuse of antibiotics, pesticides and growth hormones; and mass slaughtering and processing to meet increased population demands. • Unsafe aquaculture practices, including harvesting fish from polluted water, and illegal uses of poisons and dynamite.



SOUTH KOREA<sup>16</sup>

In South Korea, although food hygiene has been improving, the numbers of foodborne illness outbreaks and cases appear to have increased, triggering growing concern among both the doctors and consumers. (See Table 1.) While food poisoning used to be reported mostly in the summer, it is now reported all year long. Outbreaks in restaurant and school meals have

increased tremendously with the development of the food-service and restaurant industries.

| Year      | 1996  | 1998  | 2000  | 2002  | 2003  |
|-----------|-------|-------|-------|-------|-------|
| Outbreaks | 81    | 119   | 104   | 78    | 135   |
| Cases     | 2,797 | 4,577 | 7,269 | 2,980 | 7,909 |

Table 1. Foodborne illness outbreaks and cases

The major microorganisms causing foodborne illness are changing. (See Table 2.) *Salmonella spp., Staphylococcus aureus*, and *Vibrio parahaemolyticus* have been the three major foodborne bacteria in South Korea for a long time. More recently, a virus (Norovirus) has emerged as an important agent. The failure to identify the causative agents of many outbreaks makes it difficult for the Korea Food and Drug Administration to implement food control or preventative plans efficiently.

Table 2. Major causative agents of foodborne illness outbreaks, 2003

|           | Salmonella | V. parahaemolyticus | S. aureus | Norovirus | Unknown |
|-----------|------------|---------------------|-----------|-----------|---------|
| Outbreaks | 416        | 732                 | 808       | 1,442     | 2,180   |
| Rate      | 5.3%       | 9.3%                | 10.2%     | 18.2%     | 27.6%   |

- Widespread distribution of contaminated foods when problems occur in larger processing operations with extensive distribution systems.
- New packaging and processing technologies that are improperly applied to extend the shelf life of food.

- Failure of some Pacific Island communities to address marine toxin issues associated with the harvesting of particular fish species.
- Rapid urbanization, leading to a lack of waste disposal, safe water, and sanitation facilities.
- Consumer demand for (1) reductions in the use of food additives, including preservatives, and (2) increased access to ready-to-eat and fast food.
- Limited access to education and limited decision-making power at the household level for women, who are often the food handler.
- Increasing international trade in food and feed and large-scale movements of people across national borders as tourists, refugees, and workers.<sup>17</sup>
- Lack of adequate food labeling regulations regarding both locallyproduced and imported food products.

Rapid urbanization and population growth have contributed to significant growth in sales of street-vended food in the Western Pacific Region. Street foods often pose significant food safety problems, owing to:

- The lack of basic infrastructure and services, such as potable water supplies and refrigeration
- Difficulty in controlling the large numbers of street food vending operations because of their diversity, mobility, and temporary nature
- Street vendors lack knowledge of basic food safety measures
- Inadequate public awareness of risks posed by certain street foods

# **1.3 Policies and plans of action in the Western Pacific Region**

Many governments in the Western Pacific Region have no specific written policies on food safety. Consequently, strategies and plans of action are frequently developed from a general health perspective and may address food safety only briefly - if at all. Food safety plans often do not have a clearly articulated goal within the context of government policy. Additionally, different government agencies often claim the same

jurisdiction over matters of food safety. That has resulted in some countries having an excessively complex web of laws and regulations addressing food safety, while other countries lack any laws or standards for their food.<sup>18</sup>

Coordination of inspection activities in the Western Pacific Region is limited, with industry either facing multiple inspections or being free of

comprehensive inspections altogether. There are insufficient numbers of inspectors to implement the national programs effectively. Even when inspectors are present, they are often inadequately trained, and the system of monitoring how inspection affects food safety is limited. In 1999, the New Zealand Food Safety Authority (NZFSA) implemented a performance-based verification program for many processed foods where the frequency and intensity of inspections is based on the food safety risk involved with the product and the performance of the producers.<sup>19</sup>

For export certification, many countries have well-developed programs. However, that sometimes results in higher standards for products being exported than for those same products sold domestically.<sup>20</sup>

The national capacity to conduct laboratory analyses of food also varies across the Western Pacific Region. While some countries are not able to isolate or identify common foodborne pathogens and chemical hazards in food, others have highly developed systems. In Australia, for example, the nature of foodborne disease investigations has changed significantly: more complicated and wide-ranging investigations are becoming normal; outbreaks are more geographically widespread than in the past; smaller outbreaks are being identified; and more outbreaks are identified that involve contaminated products originating from overseas.<sup>21</sup>

Moreover, many governments are decentralizing their laboratory systems, but that can create numerous state, provincial and municipal laboratories, many of which lack adequate technical and financial resources. (See Box.<sup>22,23,24</sup>)

Monitoring programs are undertaken in a minority of the Western Pacific Region's countries and usually cover only a limited

#### Foodborne disease surveillance systems in the Western Pacific Region

In China, a National Food Contamination Monitoring and Foodborne Disease Surveillance System has been established since 2001; there are more than 70 surveillance points among 13 provinces in China, but they cover only about 643 million people.

Fiji recently developed a national collaborative non-Typhi *Salmonella* surveillance and laboratory support program.

Japan has two surveillance systems for foodborne diseases: one is for cases of food poisoning, and the other is for pathogens that cause food poisoning (surveillance of infectious diseases).

In Malaysia, notification of certain priority foodborne diseases is mandatory, and surveillance data is collected mostly through physician-based outbreak investigations. Laboratories, however, are not required to provide any notification. The Department of Veterinary Services (DVS) also conducts a national surveillance program for foodborne pathogens associated with livestock products, including *Salmonella, Escherichia coli O157:H7, Campylobacter, Yersinia* and Vancomycin-resistant *Enterococci* (VRE).

In the Philippines, a laboratory-surveillance project for foodborne pathogens has been started in conjunction with existing surveillance programs. The systems are independent of each other and the data are not yet integrated. The project aims to integrate these programs to create a foodborne disease surveillance system that will include antimicrobial resistance data.

Viet Nam is conducting a study to enhance its capacity to conduct foodborne disease surveillance and determine the burden of such diseases. range of contaminants. Data on pesticides, heavy metals, and mycotoxins are collected most often. Laboratory quality assurance programs are also often non-existent.

For some countries, foodborne illness reporting is required by law, but surveillance systems are not adequately developed. For others, notification of foodborne illnesses is not required.

Few governments have training programs for industry personnel aimed at introducing modern food safety concepts based on process control (Hazard Analysis and Critical Control Point systems) principles.<sup>25</sup>

**BSE IN JAPAN** 

Following discovery of the first case of BSE in 2001, the Japanese



government introduced a series of measures to ensure the safety of beef in the market, including the following:

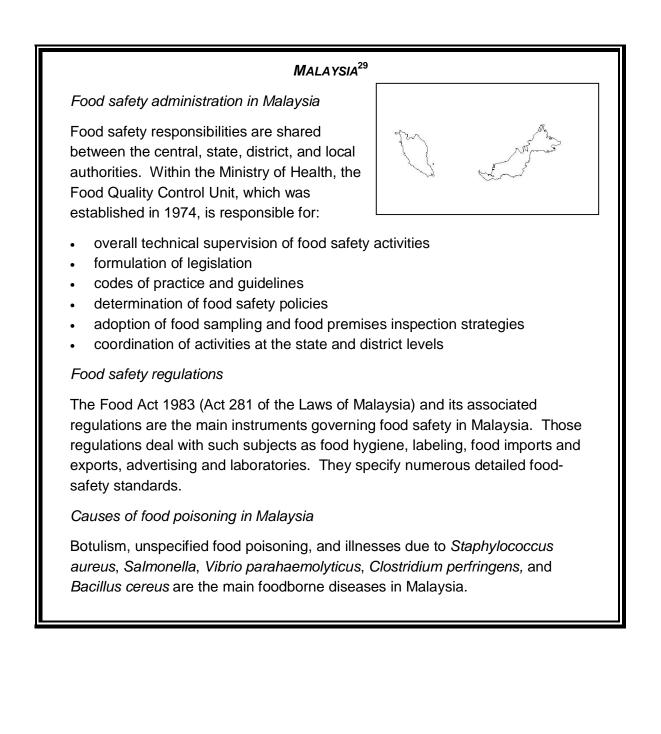
- Immediate suspension of all shipment of any cattle 30 months of age or older throughout the entire nation
- Removal and incineration of the specified risk materials (SRM) from cows at or over 12 months of age
- Removal of the SRM and the implementation of screening tests of all cattle entering the food chain regardless of age

Only a few countries in the Western Pacific Region encourage both industry and consumers to participate in food safety programs or in the development of food standards.<sup>26</sup> And while consumers are targeted for training and education, governments often do not consider consumer organizations to be a source of knowledge or effective agents of change in relation to food safety.

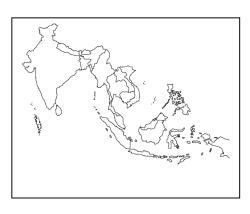
In order to improve food safety communication and coordination at the regional level, the Association of South East Asian Nations (ASEAN)<sup>27</sup> has launched the ASEAN Food Safety Network.<sup>28</sup> Australia and New Zealand have launched Food Standards Australia New Zealand (FSANZ), a bi-national independent statutory authority that develops food standards for composition, labeling, and contaminants, including microbiological limits, that apply to all foods produced or imported for sale in Australia and New Zealand.

# **1.4 Consumer organizations in the Western Pacific Region**

Consumer organizations in the Western Pacific Region have been very active in educating consumers about food safety issues. They are working to develop food safety laws, promote food labeling to allow consumers to make more informed choices, and educate consumers on food-related issues through special consumer projects and reports, magazines, and newsletters. National consumer organizations in the Western Pacific Region also conduct product testing to determine the safety, cleanliness, and quality of many foods. Those tests have exposed products with dangerous levels of dyes, heavy metals, and additives, as well as antibiotic residues in fresh fish and seafood.



## 2. SOUTH EAST ASIAN REGION



Although there have been major nutritional improvements in the South East Asian Region since the 1990s, the same cannot be said for food safety. For a large percentage of the people of the South East Asian Region, gaining access to safe food remains a major obstacle. The rapid population increases in many countries - particularly in the urban areas - also aggravate food safety problems. Given the growing concerns with food safety issues in the South East Asian Region, a regional strategy has been developed to address those concerns.

#### 2.1 Foodborne diseases in the South East Asian Region

The South East Asian Region contains the following countries:

Bangladesh, Bhutan, India, Indonesia, Myanmar, Nepal, North Korea, the Republic of Maldives, Sri Lanka, Thailand, and Timor-Leste. Foodborne diseases are common in most countries of the South East Asian Region.<sup>1</sup> Microbiological contamination of food and water is a major cause of deaths and illnesses due to diarrhea. region-wide, approximately one million children under the age of five die each year from diarrheal diseases after consuming contaminated food and water.<sup>2</sup>

Cholera, which has been controlled in many parts of the world, has been a major health concern in this region for decades - particularly in Bangladesh and India.<sup>3</sup> Cholera

outbreaks generally are linked to contaminated water, but transmission can occur through contaminated foods served by street vendors and restaurants.<sup>4</sup>

#### 2.2 Food safety concerns in the South East Asian Region

Many factors contribute to human health concerns in the South East Asian Region, including inadequate access to clean water, the increased use of pesticides and other chemicals in agriculture and food processing, and the lack of producer and consumer education. The rapid urban population growth in many countries means that many people live in conditions of extreme poverty, filth, overcrowding, and poor sanitation. That has also aggravated food safety problems.

Street food vendors and food service premises are an essential and an increasingly important part of the food supply system in nearly all of these countries. In the absence of strict controls over preparation, storage, distribution, and display practices, those foods have the potential to become a major source of foodborne disease. Many countries, like India and Nepal, lack critical enforcement of health and food safety regulations against street food vendors due to a shortage of health inspectors.

In most countries of the South East Asian Region, laboratories with the capacity to detect common foodborne hazards are rare, and where they do exist, the high cost of testing is an obstacle.

In countries that have a regulatory framework for monitoring food control, enforcement is often weak, owing to inadequate infrastructure and staffing.

#### 2.3 Policies and plans of action in the South East Asian Region

In 1998, countries of the South East Asian Region committed themselves to a 10-point strategy to reduce the burden of foodborne diseases. However, progress toward achieving the strategy's objectives has been inconsistent. While all countries have identified one lead agency to deal with food safety issues - generally within the Ministry of Health - not all of them have developed food safety policies. (See Box.<sup>5,6</sup>)

Food-related disease surveillance activities are also inconsistent. All countries of the South East Asian Region have implemented programs to collect illness and mortality data. With few exceptions, those programs are not specifically targeted to address foodborne diseases and the quality of the information is often poor. Overall, laboratory confirmation of specific diagnoses, such as *Salmonella*, is rare in most areas, reflecting inadequate clinical practices and lack of laboratory access.

Some countries have developed non-official or non-mandatory programs to improve food safety. For example, in Thailand, training programs are used for retailers, restaurants, and

The quality of food inspection programs, including retail inspections, is inconsistent around the region. Some countries, like Bhutan, lack the legal infrastructure to conduct health inspections. Inspection units are often understaffed and lack necessary equipment. In Sri Lanka, studies show that catering establishments - particularly the medium and small type restaurants - often did not conform to the updated hygienic regulations and that regulators lacked the resources to bring them into conformity. As a result, in Sri Lanka, the Food Regulations are being redrafted to ensure that all new establishments obtain registration, which requires them to meet minimum standards before they can open.

other food services to improve food safety and hygiene. Those programs include voluntary inspection and certification of food service businesses.<sup>7</sup>

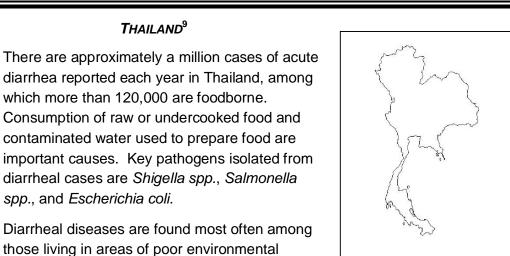
age of health inspectors. uth East Asian Region, laboratories common foodborne hazards are st, the high cost of testing is an



Nevertheless, according to a study from the International Food Policy Research Institute (IFPRI), developed countries continue to reject food products produced by South Asian countries.<sup>8</sup> As a result, the countries of the South East Asian Region, in collaboration with WHO, are focusing on a more holistic farm-to-table approach.

## 2.4 Consumer organizations in the South East Asian Region

Consumer organizations in the South East Asian Region have identified their major projects as developing national food-safety standards, conducting comparative food product tests, advocacy to improve access to safe, nutritious, and affordable food, and adoption of laws to improve the safety of street food.



**THAILAND<sup>9</sup>** 

Consumption of raw or undercooked food and contaminated water used to prepare food are important causes. Key pathogens isolated from diarrheal cases are Shigella spp., Salmonella spp., and Escherichia coli.

Diarrheal diseases are found most often among those living in areas of poor environmental sanitation. The disease incidence in children under five years of age is high.

## **3. EASTERN MEDITERRANEAN REGION**

Food safety is increasingly viewed as an essential public health issue in the Eastern Mediterranean Region. In collaboration with WHO, most countries of that region have undertaken extensive reviews of their food safety systems and some have updated their national legislation. Despite efforts to modernize food safety laws, there is limited information available to fully evaluate the food safety problems and issues

## 3.1 Foodborne diseases in the Eastern Mediterranean Region

Many countries have not established surveillance or reporting mechanisms adequate to identify and track foodborne diseases, so there are no estimates of the rates of human illness linked to foods in the Eastern Mediterranean Region.

According to studies from WHO and FAO, foodborne diseases are generally perceived as mild and selflimiting illnesses, and constitute a fact of daily life in this region. Medications, if used at all, are bought over-the-counter and disease episodes go unreported. Some diseases, like diarrhea and cholera, are

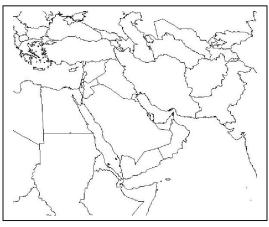
frequently viewed as strictly waterborne -- rather than foodborne -- diseases. Medical attention often is sought too late, when the disease has become extremely debilitating and only drastic treatment might be effective.<sup>1</sup> Improvements are clearly needed in the identification and diagnosis of foodborne illness.

Certain regional or local habits, such as the consumption of raw and cooked salads, and certain specific food preparation techniques, such as the preparation of cheeses from raw milk, enhance the opportunity for microbiological contamination, and thus the spread of foodborne diseases.<sup>2</sup>

There is also a growing trend of eating outside the home and consuming ready-to-eat food, particularly among young people,<sup>3</sup> which has increased the risks of foodborne disease outbreaks.

The Eastern Mediterranean Region contains the following countries:

Afghanistan, Bahrain, Cyprus, Djibouti, Egypt, Islamic Republic of Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Morocco, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates, and Yemen.



Despite the difficulties of obtaining accurate foodborne disease surveillance data in the Eastern Mediterranean Region, it appears that there is a decline of foodborne disease incidence in Gulf countries, including Saudi Arabia and Oman. This was likely due to a number of interventions, such as increased sanitation, milk pasteurization, canning foods, herd vaccination, economic development, use of refrigerators, improved housing, safer water supply, food monitoring, and improved consumer information.<sup>4</sup>

## Impact of food safety standards in the Eastern Mediterranean Region according to WHO

From January to June 2001, 27 percent of food exports from Egypt, Jordan, Lebanon, and Syria to the United States were rejected by the U.S. Food and Drug Administration due to non-compliance with the U.S. safety measures (filth, microbiological contamination, greater than permitted levels of pesticide residues or food additives) and 58 percent were rejected due to labeling problems.

Moreover, product bans have resulted in significant economic losses for the exporting countries of the Eastern Mediterranean Region. In September 1997, Iranian pistachios (the country's third most important foreign exchange earner after oil and carpets) were banned from entering the European Union because of a high content of aflatoxins. Japan imposed a similar ban on Iranian pistachios in October 1998. As a result, Iran lost its 80 percent share of Japan's pistachio market.

Bans on food exports from the Eastern Mediterranean Region have also resulted in considerable difficulties in reentering and regaining market share in once-important developed country markets. For instance, in September 1998, exports of Egyptian potatoes to the European Union were halted because of contamination from brown rot following an European Union decision requiring imports to be derived from certified disease-free areas. Following this decision, the European Union considered all imports diseased unless proven to be disease-free. As a result, Egypt was obliged to submit dossiers to prove the diseasefree status of its potato growing areas. However, the European Commission authorities rejected most dossiers submitted by Egypt due to inadequate documentation (illegible maps and insufficient translation from Arabic) and only five areas of 133 areas were granted pest-free status.

# 3.2 Policies and plans of action in the Eastern Mediterranean Region

In the Eastern Mediterranean Region, for some countries, land suitable for growing food is scarce. Meeting food needs and ensuring food security depend to a large extent on food imports. Therefore, systems to control their safety and quality are vital for public health. Food exports, on the other hand, provide an important means for other countries in the Eastern Mediterranean Region (non-oil economies in particular) to generate foreign exchange. Effective food safety systems, therefore, are also critical to expanding market shares in food and agricultural exports.<sup>5</sup> (See  $Box.^{6}$ )

Animal diseases have been the driving force for food safety reforms in the Eastern Mediterranean Region as it struggles to contain outbreaks of brucellosis, rabies, and animalrelated salmonellosis. Many countries have begun developing programs to ensure the timely exchange of information on disease occurrence, and have established technical cooperation agreements, control strategies, and legislation.<sup>7</sup> However, prevention of zoonoses (infectious diseases transmitted from animals to humans) and interruption of transmission are inevitably challenged by weak or non-existent cooperation between the public health, veterinary, food safety, and animal trade sectors.<sup>8</sup>

Where food control systems do exist in countries of the Eastern Mediterranean Region, most systems are unable to cope with new challenges. Legislation is out-of-date, inflexible or very fragmented; standards are not consistent with international and national needs; and training in proper food handling is minimal.<sup>9</sup> Often, food inspection models are antiquated and inspectors lack knowledge of modern risk-based approaches to food control.<sup>10</sup> Laboratories have limited scientific and technical expertise,



Laboratories have limited scientific and technical expertise, financial resources, and equipment; have difficulty in obtaining necessary reagents and reference materials; and lack internationally recognized accreditation.<sup>11</sup> Governments also have to face resistance to change in their local administrations.<sup>12</sup>

Most countries of the Eastern Mediterranean Region lack reporting systems for foodborne diseases that can effectively communicate with national food control authorities. Even in countries with reporting systems in place, underreporting is common. As a result, the incidence of foodborne diseases is often not used to help define national food safety strategies, and chemical and microbiological contaminants are not given the priority they deserve.<sup>13</sup>

In most countries, food safety is shared among several agencies. In Lebanon, for example, food safety responsibility is shared among six different government agencies. Yet, it has no comprehensive food safety law, and the existing laws are not fully implemented. Extensive use of pesticides, hormones, chemical fertilizers, and antibiotics has led the European Union to ban some exports from that country.<sup>14</sup>

Issues directly related to public health, such as food hygiene and sanitation and foodborne disease surveillance, are usually dealt with by the health authorities at central and local/municipal levels. Matters related to food production, processing, and distribution, including the control of the quality and safety of foods of animal origin, often fall under the authority of the ministries of agriculture. In the Gulf States, because of the relatively limited importance of the agricultural sector in the overall economies of these countries and the concentration of food-related operations in urban areas, the main responsibility over food control lies with the municipal authorities.<sup>15</sup>

Despite these problems, the importance of food safety has attracted increased attention in the Eastern Mediterranean Region, and a regional plan of action to address food safety in the 21<sup>st</sup> century was adopted in 1999.<sup>16</sup> In response to that important resolution, most countries have developed food safety country profiles, and have also planned extensive reviews and improvements of their food safety systems. (See Box.<sup>17</sup>) Some examples include:

Morocco and Tunisia have developed a national strategy for food control and several countries have drafted new food legislation in line with international requirements.<sup>18</sup> Morocco developed a 5-year "Road Map" for the integration of the food control system, calling for the creation of an agency that serves as the central regulatory authority regarding food. In addition, the plan urged the formation of a scientific committee attached to this agency to serve as the country's focal point for food safety risk assessment.<sup>19, 20</sup>

#### Food safety country profiles

According to the recommendations of the Regional Committee for the Eastern Mediterranean of WHO, member states need to identify and evaluate their current food safety infrastructure and problems at the national level to prepare a country profile.

The country profile should:

- identify major food safety problems
- systematically assess factors relevant to food safety at each stage of the food chain
- review health and socioeconomic issues
- identify functions of all sectors involved in food safety
- clearly identify strengths and weaknesses
- establish mechanisms for continuing review

(continued on next page...)

- The Islamic Republic of Iran, Sudan, and the Syrian Arab Republic have reviewed and updated their food standards and regulations.
- Yemen has finalized its food safety country profile.
- Egypt, Jordan, Morocco, and Tunisia have harmonized their food-safety standards with the Codex Alimentarius and are moving towards an approach based on risk management.
- Jordan has established a Food and Drug Administration where all stakeholders in food safety coordinate their efforts.
- The United Arab Emirates has adopted the use of customized software for food inspection to monitor and control the safety of food - whether domestically produced or imported.<sup>21</sup>

Harmonization of food policies, regulations, and standards also has received attention in member countries of the Gulf Cooperation Council (GCC).<sup>22</sup> This coalition has drafted common food export procedures that allow for shared inspection policies and standards, and for food produced in or imported into any of the member countries to enjoy circulation throughout the GCC countries.<sup>23</sup>

Moreover, in the Eastern Mediterranean Region, a manual on the development of food legislation was developed and finalized in collaboration with the Pan American Institute for Food Protection and Zoonoses. The manual will assist authorities in the development of legislation that incorporates the health aspect of food safety and is in accordance with accepted international regulations.<sup>24</sup>

There is also growing acceptance and increasing use of good manufacturing practices (GMP), good agricultural practices (GAP), and Hazard Analysis Critical Control Point (HACCP) throughout the Eastern Mediterranean Region, and efforts have been made to improve the education of farmers and other producers. In Sudan, for example, programs have been developed to promote the application of GAP - especially those in connection with the safe use of insecticides and fertilizers. Tunisia has introduced provisions for the application of HACCP by the fish industry in its food safety legislation.<sup>25</sup>

There also has been an increasing tendency to

### Food safety country profiles (cont.)

Information should be collected in the following areas:

- Government organization: All agencies involved in food safety—responsibilities and functions as well as the existing mechanisms for coordination
- Food production and consumption: Estimates of agricultural production, processing, food consumption, nutrient intakes, and existing food quality and safety programs in the food industry, and surveys of food processing industries present in the country, their type, size, and risk category
- Food imports and exports: Import/export trade statistics by volume and value
- Food legislation: *Reviews of current food legislation, regulations, and standards; implementing legislature and enforcement procedures, systems of coordination among agencies, hygiene, additives, packaging, licensing, inspection, analysis of foods, and any consultation with industry and consumer organizations*
- Epidemiological information: Prevalence and incidence of foodborne diseases, prevalence of micronutrient deficiencies, quality of data collection, coverage estimates, and coordination between agencies
- Human resources and training requirements: Number of staff in each category and agency as well as their qualifications and evaluation of current staff training programs
- Extension and advisory services: *Current* government extension and advisory services to the food sector, non-governmental organization involvement (if any), trade associations, education, and research institutions
- Public education and participation: *Mechanisms* for disseminating of information on food safety and prevention of foodborne diseases, participation of consumer groups, consumer complaint systems, and incorporation of food safety into school curricula

adopt organic production to avoid the excessive and unsafe use of chemicals. The major obstacle of this approach is becoming certified and accredited.<sup>26</sup> Moreover, many industries of the Eastern Mediterranean Region have decided to apply HACCP on a voluntary basis in order to improve food safety domestically as well as increase their share of export markets.<sup>27</sup>

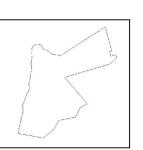
## 3.3 Consumer organizations in the Eastern Mediterranean Region

Consumer organizations in the Eastern Mediterranean Region have identified as principal concerns the quality of manufactured food, pesticides, and food safety education and awareness.

## JORDAN<sup>28</sup>

#### The food safety control system for imported food

Following Jordan's accession to the World Trade Organization (WTO) in April 2000, fundamental restructuring was undertaken in the food safety control system of that country, namely issuing the first Food Act and adopting risk management approach within Jordan's strategic framework.



The traditional food control system imposed a system of 100 percent sample collection and laboratory analysis for all food imports to Jordan regardless of their health hazard, with no systematic product traceability nor recorded history on importers' performance. The system was completely manual, time consuming, and lacked measurable tools to track the official staff evaluation and trader's complaints and violations. Minimal information was collected on handwritten sheets. That prevented data from being stored electronically for further statistical analysis by risk managers and policymakers.

Recognizing that the domestic food market depends heavily on imports, a risk management approach was adopted. Criteria based on the public health risk associated with various foods and other factors were utilized to select food entries for monitoring based on three risk categories.

Following implementation of this approach, Jordan was able to:

- Decrease sampling and test analysis by about 50 percent
- Reduce timeframes required for clearance of imported food consignments
- Direct resources towards enhancing inspection methodologies, proper field cargo examination, portion sampling, and more thorough laboratory tests to assess the safety and quality of imported foods
- Establish the first electronic national database information system in the Eastern Mediterranean Region to build strong data collection tracking record, better analyze trends, and enhance reporting and notification
- Build a model for the Eastern Mediterranean Region that can assist many developing countries in reaching a risk management control approach with better resource allocation

## 4. AFRICAN REGION

The high incidence of diarrheal diseases among newborns and young children are indications of the food hygiene situation in the African Region. Although outbreaks of acute poisoning are frequent in the African Region, individual countries have done little to implement surveillance systems for foodborne diseases. Surveillance is inadequate or nonexistent, which hinders governments' ability to accurately assess the impact of food contamination problems on public health.

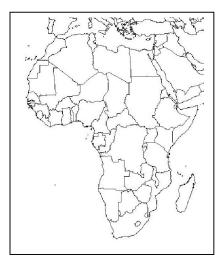
While poverty is the underlying cause of consumption of unsafe food in the African Region, other factors, such as lack of access to clean water, weak government structures, population growth,

the rise of Acquired Immunodeficiency Syndrome (AIDS) and other

communicable diseases, trade pressure, and poor environmental conditions exacerbate the situation. The abundance of national legislation and limited resources to control the quality of imported foodstuffs further compound the challenges faced by the states of the African Region.

# 4.1 Foodborne diseases in the African Region

Even if data regarding foodborne diseases in the African Region are extremely scarce,<sup>1</sup> studies have shown that the



The African Region contains the following countries:

Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Republic of the Congo, Côte d'Ivoire, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Swaziland, United Republic of Tanzania, Togo, Uganda, Zambia, and Zimbabwe.

following pathogens are prevalent: *Campylobacter*, *Salmonella*, *Shigella*, Hepatitis, *Brucella*, *Staphylococcus aureus*, *Bacillus cereus*, *Escherichia coli*, and rotavirus.<sup>2</sup>

Foodborne bacterial infections are particularly common: children in the African Region may experience five episodes of diarrhea per year and 800,000 children die each year from diarrhea and dehydration.<sup>3,4</sup> In Zimbabwe, for example, the proportion of recorded diarrhea episodes among young children that lasted longer than 14 days was reported to be as high as 6.05 percent.<sup>5</sup> In addition, children's exposure to pesticides in the African

Region is suspected of causing immunological and endocrine defects, neurotoxic disorders, and sometimes cancer.<sup>6</sup>

The number of consumers who are highly vulnerable to foodborne illness is growing in this region. In sub-Saharan Africa, where approximately 25 million adults and children live with HIV/AIDS, bacterial infections such as *Salmonella* can cause particularly serious complications, including death.<sup>7</sup> Among the elderly, infections such as enterohemorrhagic *Escherichia coli* can be particularly fatal. Also, with the rise in consumption of foods like refrigerated processed meat products, *Listeria monocytogenes* is an increasing concern for pregnant women in the region. Cholera traditionally associated with water has been shown to be foodborne as well, and is endemic to the African Region.

## 4.2 Food safety concerns in the African Region

#### 4.2.1 Poverty

While a number of related problems keep foodborne diseases at high levels within the African Region, the root cause is poverty, which disproportionately affects women and children. Poverty exacerbates food safety problems in many ways and contributes to:

- unsanitary conditions in rapidly growing urban centers
- lack of access to clean water
- unhygienic transportation and storage of foods
- low education levels among consumers and food-handlers, leading to reduced information on food safety

Moreover, national governments lack the financial resources to:

- enhance foodborne disease surveillance and monitoring capacities
- implement food safety regulations through an efficient inspection system
- invest in modern facilities and utilities
- develop food safety education programs
- conduct disaster planning and relief

As a result, WHO has developed an integrated approach to combine food safety concepts with poverty reduction activities at the national level.

## 4.2.2 Street foods

Street vendors are an important source of affordable food. But street foods often do not meet proper hygiene standards, in large part because of weak regulatory systems, inadequate food safety laws, lack of financial resources to invest in safer equipment, and lack of education for food-handlers.

Street food is frequently cooked well in advance of consumption and is subject to contamination from exposure to dust and flies. In addition, food preparers may be sick with tuberculosis, typhoid, and other illnesses that can contaminate food.

Numerous programs have been developed by FAO and WHO to improve the quality and safety of street foods in African countries. For example, in South Africa, a project provides vendors and handlers with health education and training in acceptable food preparation and handling practices.<sup>8</sup> Guinea Bissau has funded a project to identify practical actions to improve the quality and safety of street foods, to protect consumers, and to reorganize the street food sector.<sup>9</sup>

## 4.2.3 Mycotoxins<sup>10</sup>

Naturally occurring fungal toxins – mycotoxins – pose profound challenges to food safety. Aflatoxins are mycotoxins of public health importance within the African Region.

Mycotoxins contaminate various agricultural commodities either before harvest or under post-harvest conditions. Generally, tropical conditions such as high temperatures and moisture, monsoons, unseasonal rains during harvest, and flash floods lead to fungal growth and production of mycotoxins. Poor harvesting practices, improper storage, and less than optimal conditions during transport and marketing can also contribute to fungal growth and increase the risk of mycotoxin production.

The chronic incidence of aflatoxin in diets is evident from the presence of aflatoxin M1 in human breast milk in Ghana, Nigeria, Sierra Leone, and Sudan and in umbilical cord blood samples in Ghana, Kenya, Nigeria, and Sierra Leone.

Together with the hepatitis B virus, aflatoxins contribute to the high incidence of primary liver cancer in tropical Africa. Recent studies carried out in West African countries, such as Benin, Gambia, and Togo, indicate chronic exposure of population groups and fetuses to dietary aflatoxins. Moreover, children exposed to aflatoxins may experience stunted growth or be chronically underweight and thus be more susceptible to infectious diseases in childhood and later life.

## 4.2.4 Food safety emergencies<sup>11</sup>

The high frequency and magnitude of humanitarian emergencies in the African Region in recent decades have had huge effects on food safety.



In the wake of natural disasters such as floods, droughts, and earthquakes, or intense civil war or border conflicts, food supplies are often destroyed or seriously contaminated, which has grave consequences for the health of survivors.

In refugee camps, because of unsanitary conditions, environmental contaminants, and improper food handling, outbreaks of foodborne diseases are common. In 1994, a major outbreak of cholera

devastated Rwandese refugee camps near Goma, Zaire (Democratic Republic of the Congo), where an estimated 70,000 cases of diarrheal disease (mostly cholera) occurred with a high fatality rate. During 1992, in the Lisungwi camp in Malawi that housed 60,000 refugees from Mozambique, 772 cases of abdominal cramps and bloody diarrhea were documented.<sup>12</sup>

## 4.2.5 Economic impact of foodborne diseases

Foodborne diseases have many adverse economic consequences within the African Region. For example, the 1998 outbreak of cholera in Tanzania cost US \$36 million. In Nigeria, the Food and Drug Administration destroyed aflatoxin-contaminated food worth more than US \$200,000.<sup>13</sup>

WHO has documented numerous food safety and quality problems that have affected food exports and imports in African countries. Those include:<sup>14</sup>

- spoilage
- substandard/fake products
- failure to provide production dates
- improper or deceitful labeling of food imports
- poor product quality and packaging of food exports
- expired food
- exceeding levels for preservatives/additives
- lack of harmonization of food safety regulations
- fraud

African nations often lack adequate inspection and laboratory capabilities, and their exports may be barred owing to non-compliance with microbiological and other standards.

Those problems often have resulted in the importation of substandard food items as well as trade rejections of food exports. Losses from export rejection not only rob countries of critical revenue but also of credibility as reliable trading partners. In 1997, for example, a ban was imposed on Ugandan fish exports to the European Union (EU) because the country's fish processors and exporters failed to meet the new EU Hygiene and Processing quality standards. Uganda lost US \$36.9 million in reduced returns during the ban, which ended in July of 1999. The fishing community also lost a total income of about US \$720,000 per month.<sup>15</sup>

## 4.3 Policies and plans of action in the African Region<sup>16</sup>

Many of the countries of the African Region lack adequate food access so having effective food control systems is given a lower priority. Often, minimal attention is given to promoting, administering, and enforcing food legislation.

## 4.3.1 Food Law Regulations and Administration of Food Safety Controls

In the African Region, basic food laws may not be incorporated into legislation, or they may be outdated, fragmented, or simply inadequate.

Often, the legal structure can be confusing for the enforcement agents, producers, and distributors. There are many ministries or departments involved in food safety activities, causing overlap, duplication of efforts, and gaps in enforcement. Sometimes, it is impossible to determine which department represents the countries on food control policy. But progress is being made in that area. In 2004, for example, a unified food safety agency was created in Madagascar, the "Unité de Contrôle de Qualité des Denrées Alimentaires."<sup>17</sup>

Food regulation systems in Africa are often based on laws adopted during colonial times. Those systems were introduced on an ad hoc basis to deal with problems of particular interest to the colonial administrators and have not been updated in many countries.

Most African countries have made some attempts to revise outdated food laws. For instance, in Mauritius, a new Food Act was passed in June 1998 (to replace the former act of 1940) and became operational in January 2000. But the act was criticized by the food industry for not meeting international norms.  $^{18}\,$ 

#### 4.3.2 Surveillance, Laboratory and Food Inspection Services

In the African Region, improper coordination between surveillance, food laboratories, and food inspection services commonly leads to disorganized sampling. Furthermore, the emphasis is on sampling for enforcement purposes and often there is no systematic monitoring for food contaminants. Inadequate recordkeeping can create a vicious cycle that results in the absence of information on which to base local decision-making, regulations, and food standards.

Moreover, few countries have surveillance systems sensitive enough to identify common agents of foodborne diseases. Therefore, surveillance data are patchy and unreliable.<sup>19</sup>

In collaboration with the Pasteur Institute in France, WHO has been organizing courses on foodborne disease surveillance and microbiological monitoring of foods for the Francophone countries in the African Region. Training courses for the Anglophone and Portuguese-speaking countries are yet to begin.

Food safety control laboratories generally do not function well due, in part, to a lack of financial resources for the development and maintenance of equipment and manpower. Moreover, most of the public health laboratories in the African Region lack the capacity to test for chemical contaminants and naturally-occurring toxins.<sup>20</sup>

Food inspectors must have a comprehensive knowledge of food safety and related subjects, but that appears not to be the case in most of the African Region. For example, most countries of the region lack specific mechanisms for the collection and dissemination of information on food exports rejected by foreign buyers. Lack of skilled inspectors (Comoros and Mauritania had only two food inspectors in 2002) and coordination among the relevant organizations are also problems affecting oversight of exported and imported foods.<sup>21</sup>

#### 4.3.3 Education and training

Food safety education for industry and consumers is limited in most countries of the African Region.

Additionally, there is an overall shortage of trained personnel to support laboratory services and most countries of the African Region are not adequately equipped for capacity building at the local level.

## 4.3.4 Funding

Financial support for food safety programs is often meager, because many African governments believe they have more pressing priorities.

Due to the lack of resources at the local and national levels, actions are being taken at the regional level with the help of international organizations. For example, the Common Market for Eastern and Southern Africa (COMESA) in collaboration with FAO has developed programs to improve food safety and quality control systems and facilitate policy harmonization.<sup>22</sup>

## 4.4 Consumer organizations in the African Region

Some consumer organizations in the African Region, such as those in Senegal, Nigeria, Cameroon, and Benin, are heavily involved in food safety programs, and often perform functions carried out by government organizations in other regions. Some groups run programs to ensure food control and inspection of markets and shops; conduct chemical, bacteriological, and physical analysis of food products; provide supervision to ensure that contaminated foods are withdrawn from the market; and ensure that the government or industry provides consumer notification. In other areas, the emphasis is on programs targeting the quality of street foods and consumer training and awareness.

One organization in Benin is developing what is described as a "Consumers House" to monitor foods imported into the country and give the consumer information about the quality of imported food products.

## **5. EUROPEAN REGION**



Over the past 10 years, food policy in the European Region has been reshaped in response to a series of problems, beginning with the bovine spongiform encephalopathy (BSE) crisis in Britain, and followed quickly by dioxin contamination of animal feed, resulting in the contamination of numerous meat products in northern Europe. Within the European Union (EU), comprising 25 European nations, these problems led to an integrated approach to food safety and to a set of food safety regulations designed to harmonize existing national requirements. Because food safety laws in the EU were developed recently, they are often innovative in their approach.

#### 5.1 Foodborne diseases in the European Region

Although it is difficult to estimate the total burden of foodborne illnesses, WHO finds that foodborne diseases are on the rise in the European Region:<sup>1,2</sup>

The European Region contains the following countries: Albania, Andorra, Armenia, Austria\*, Azerbaijan, Belarus, Belgium\*, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus\*, Czech Republic\*, Denmark\*, Estonia\*, Finland\*, France\*, Georgia, Germany\* Greece\*, Hungary\*, Iceland, Ireland\*, Italy\*, Kazakhstan, Kyrgyzstan, Latvia\*, Lithuania\*, Luxembourg\*, Malta\*, Monaco, Netherlands\*, Norway, Poland\*, Portugal\*, Republic of Moldova, Romania, Russian Federation, San Marino, Serbia and Montenegro, Slovakia\*, Slovenia\*, Spain\*, Sweden\*, Switzerland, Tajikistan, The former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine, United Kingdom of Great Britain and Northern Ireland\*, and Uzbekistan.

Note: European Union members are designated with an "\*".

- i) Since 1985, illnesses from *Campylobacter jejuni* have increased steadily. In several countries, this observed rise could be attributed to an improvement in diagnosis rather than increasing incidence. Most reported cases of campylobacteriosis occur sporadically, as single cases, or small family outbreaks.
- ii) Although the incidence of salmonellosis is decreasing in several countries, WHO data

show that *Salmonella* is still the most frequently reported cause of foodborne outbreaks.<sup>3</sup> It is responsible for about 75 percent of the

outbreaks, of which one-third are caused by *Salmonella* Enteritidis, a hazard frequently linked to contaminated eggs.<sup>4</sup>

- iii) The parasitic disease trichinellosis is increasingly reported in the Balkan region<sup>5</sup> among the non-Muslim population, owing in part to the consumption of pork products processed at home without adherence to mandatory veterinary controls.
- iv) Since the mid-1990s, reports of serious zoonoses such as brucellosis (Malta fever) have been on the rise in the central Asian republics, particularly Kyrgyzstan and Tajikistan. Brucellosis in those countries is transmitted mainly through the consumption of unpasteurized goat and sheep milk. The increase is attributed to the socioeconomic and political changes that have led to the deterioration of control programs for livestock, coupled with limited awareness of the disease.
- v) Botulism occurs frequently in Eastern Europe, due in large part to traditional ways of preserving foods at home. The highest incidence of botulism is reported in the Caucasus (Armenia, Azerbaijan, and Georgia). Traditional methods of canning are widespread in those countries, primarily because of the high cost of fresh vegetables and the limited availability of canned food.
- vi) Harmful levels of pesticides and other chemicals are found in some foods, such as fish. Long-term ingestion of those chemicals can cause cancer and damage to the respiratory, nervous, reproductive, immune, and endocrine systems. In Central and Eastern Europe, food contamination arises largely from industrial contamination from mining and smelting activities, the energy sector, the agricultural industry, or dispersal of hazardous and municipal waste. Such effects are readily observable, for example, in the Aral and Caspian Sea regions.
- vii) Accidental or intentional adulteration of food by toxic substances has resulted in serious public health incidents. For example, in Spain in 1981-1982, rapeseed oil denaturated with aniline killed more than 2,000 people and disabled another 20,000, many permanently. In that case, the party responsible for the contamination was never identified despite intensive investigations.
- viii) Few countries report cases of *Listeria monocytogenes*, and higher incidences are reported by countries – like France – with mandatory reporting. Also, few countries provide information on numbers of

*Escherichia coli* O157:H7 infections or hemolytic-uremic syndrome (HUS) cases. Considering the large differences in the reporting systems among countries, it is still difficult to perform an analysis of trends for Listeriosis or for *Escherichia coli* infections and HUS cases.

### 5.2 Food safety concerns in the European Region

### 5.2.1 BSE

In 1986, the first cases of bovine spongiform encephalopathy (BSE), or "mad cow disease," were reported in cattle in the United Kingdom. Between November 1986 and November 2002, about 180,000 cases of BSE were confirmed in the United Kingdom.



In March 1996, a new human disease called variant Creutzfeldt-Jakob Disease (vCJD) was first described. It is strongly linked to exposure to the BSE agent from infected cattle that have entered the human food supply. So far, approximately 150 human deaths have been linked to vCJD in the United Kingdom,<sup>6</sup> and several other deaths have occurred in other European countries, including France and the Netherlands.<sup>7</sup>

In response to BSE, the European Commission (EC) has introduced a comprehensive set of European Union-wide measures,<sup>8</sup> covering:

- controls on animal feed including a ban on the feeding of mammalian meat and bone meal (MBM) to cattle, sheep and goats,<sup>9</sup> and a total EU-wide suspension of the use of processed animal protein in feeds for any animals raised for food production
- mandatory veterinary inspection of all cattle presented for slaughter
- stringent processing standards for the treatment of ruminant animal waste
- surveillance measures for the detection, control, and eradication of BSE involving active monitoring by veterinarians and passive monitoring through tests
- the culling of animals with a high probability of having received potentially infected feed
- required removal of specified risk materials (SRMs), such as the spinal cord, brain, eyes, tonsils, and parts of the intestines from cattle, sheep, and goats before introduction to human and animal food chains
- targeted testing for BSE, with a focus on high risk animal categories<sup>10</sup>

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The surveillance system requires compulsory examination of all animals showing signs suggestive of BSE. In addition, rapid post-mortem testing for BSE is required on:

- all bovine animals over 24 months of age slaughtered as emergencies or showing signs of any kind of illness at the ante-mortem inspection in the slaughterhouse
- all bovine animals over 30 months of age subject to normal slaughter for human consumption<sup>11</sup>
- all bovine fallen stock over 24 months of age, that have died or been killed on the farm or in transport, but not slaughtered for human consumption<sup>12</sup>

Since the discovery of the first known case of BSE in a goat in January 2005, a testing scheme has been adopted to determine whether that case represents an isolated incident or whether further measures are needed.<sup>13</sup>

## 5.2.2 Genetically engineered (GE) foods

Genetically engineered foods have been highly controversial in the European Region. Consumer organizations have expressed concerns based on a variety of food safety, environmental, and economic issues, including:

- i) the capability of GE plants and animals to introduce engineered genes into wild populations
- ii) the impact of pesticidal traits on insects that are not pests
- iii) the reduction in the spectrum of other plants and the loss of biodiversity
- iv) the potential for allergic reactions and other adverse effects on human health
- v) the intellectual property rights of the industry and the rights of farmers to own their crops
- vi) the chain of accountability in case of disaster
- vii) the labeling and traceability of GE organisms

The public concerns about GE food in general have led to an almost total rejection of GE products in the EU. They have also resulted in a five-year de

facto moratorium on approval of GE products, which ended in May 2004. In addition, they have led to extensive legislation<sup>14</sup> that:

- implements detailed mandatory approval procedures for the deliberate release of a GE organism into the environment and/or for use of a GE organism in food or feed
- requires business operators to transmit information about products that contain or are produced from GE organisms
- gives consumers comprehensive information and requires labeling of all food and feed containing a GE organism<sup>15</sup>

#### 5.2.3 Antibiotic resistance

In recent years, as the use of antibiotics in food production has grown, microbes found on many food animals have become increasingly resistant to antibiotic drugs. Such common strains as *Salmonella* and *Campylobacter* with resistance characteristics can spread from animals through food and cause infections in humans.<sup>16</sup> Human illnesses can become much harder to treat, as some common antibiotics are rendered useless.

In the EU during the late nineties, approximately one-third of all antibiotics produced were used on food-producing animals and poultry.<sup>17</sup> Large quantities were used on healthy animals, either as a prophylaxis or for growth promotion. This practice exposed a large number of animals to sub-therapeutic concentrations of antibiotics, irrespective of the animals' actual health status.

With growing evidence of bacterial resistance to antibiotics, the EU adopted legislation banning the use of some antibiotics as animal feed additives and growth promoters. In December 1998, four products (virginiamycin, spiramycin, tylosin phosphate, and bacitracin-zinc) were banned. More recently, a new EC regulation was adopted that phases out approval of four antibiotic feed additives that are still on the EU market as of January 2006.<sup>18</sup>

#### 5.2.4 Irradiation

The European Commission heavily regulates irradiated foods and food ingredients.<sup>19</sup> The general and technical aspects of the treatment process, labeling of irradiated foods, and conditions for authorizing food irradiation are all prescribed in a European Union-wide directive.<sup>20</sup>

Although a small number of foods have already been approved for irradiation, in 2002, the European Parliament rejected a proposed extension of the list of irradiated foods in the EU. That extension was strongly opposed by several European consumer organizations.

#### 5.2.5 Growth hormones in meat

Since 1988, the EU has prohibited the use of hormones for growth promotion in farm animals.<sup>21</sup> That prohibition applies to both Member States and importers alike.<sup>22</sup> It has drastically reduced the circumstances under which growth-promoting hormones may be administered for other purposes to food-producing animals.<sup>23</sup>

#### 5.2.6 Contaminants in food

The contamination of food by environmental chemical hazards is a major public health concern in the European Region. Dioxins and polychlorinated biphenyls (PCBs) are toxic chemicals that belong to a group known as

persistent organic pollutants (POPs). Once in the environment, those chemicals tend to bio-accumulate in the food chain. In 2001, contaminated animal feed led to a major food scare, as elevated levels of dioxins and PCBs were found in many meat products in Belgium and other parts of Europe.

Other chemicals, such as mercury, tend to bio-accumulate in large ocean-dwelling fish. That has caused several European countries to recommend that vulnerable groups, including pregnant women, limit

## Pilot project on rapid environment and health risk assessment (REHRA)

In January 2000, a cyanide spill in the Danube River highlighted the need for better systems for regional authorities to manage health and environmental risks from industrial sources.

The REHRA project, a joint effort of WHO/Europe and the Italian Ministry for the Environment, developed a system that enabled national authorities and regional bodies to quickly rank environmental and health risks from a wide variety of active and inactive industrial sources, and to plan appropriate measures. The particular value of that project lies in its consideration of risks to human health as well as the environment.

their intake of certain fish known to contain high levels of mercury.

Nuclear contaminants, known as radionuclides, also pose an important environmental problem in the European Region, although their emission is largely the result of a major industrial accident. In 1986, the Chernobyl nuclear power plant accident raised great concerns about the health risks. The impact was greatest for people living in the vicinity of the accident and in areas of the European Region where nuclear fallout was deposited. In others, concerns focused on contaminated foods from those areas as the main source of exposure. Food contaminated by radionuclides with extended half-lives, such as cesium 137, continues to be a source of exposure for people living in Ukraine.

#### 5.3 Food safety oversight in the European Region

#### 5.3.1 Inside the EU

The member states of the EU have developed an integrated approach to food safety intended to assure a high level of protection for human life and health. The EU uses farm-to-table measures and monitoring to implement improvements in food safety, animal health and welfare, and plant health. The EU has also given consumers a legal right to safe food and to accurate and honest information, and strives to harmonize existing national requirements to ensure the free movement of food and feed throughout the EU.

In 2002, the European Parliament and the Council adopted a regulation establishing the general principles and requirements of Food Law.<sup>24</sup> The aim is to provide a coherent approach in the development of food legislation and to establish common definitions, principles, and obligations covering all stages of food and feed production and distribution. The Food Law articulates the need for proper scientific advice with emphasis on the fundamental principles of excellence, transparency, and independence. To facilitate the implementation by farmers, businesses, and national authorities of the major requirements of the Food Law, a guidance document has been issued.<sup>25</sup>

The inclusion of feed in the scope of that legislation was particularly important because feed contamination has been at the root of many major food scares of the past decade. It makes food safety the clear responsibility of food and feed businesses.

The Food Law is supplemented by: (i) targeted legislation on such food safety issues as pesticide use, food supplements, colorings, and antibiotics and hormones in food production; (ii) rules on hygiene; and (iii) stringent procedures on release, marketing, labeling and traceability of crops and foodstuffs containing genetically engineered (GE) organisms.

Within the EU, the EC enforces the Food Law in three ways, by:

• verifying that EU legislation has been properly incorporated into member state law

- auditing reports from member states and other countries on compliance with the rules
- carrying out on-site inspections in the EU and in other countries that trade with the EU

## 5.3.2 Strengthening food safety systems in Eastern and Central Europe

In expanding its membership, the EU declared that it would not compromise food safety by admitting countries with lower food safety standards or with programs that pose additional risks for consumers. Therefore, most European countries that seek EU membership must harmonize their food safety regulations with the requirements of the EU.

Joining the EU requires countries in Central and Eastern Europe to take a number of steps to improve their food safety systems, including:

- adopting a new food law and improving coordination among the different national competent authorities and institutions responsible for food controls
- harmonizing all health legislation in accordance with EU regulations
- updating approaches and methods to improve food safety and moving from mandatory compliance with so-called "Ghost Standards" from the former Soviet Union toward risk-based control systems<sup>26</sup>
- improving access to laboratories and the quality of laboratory equipment
- increasing laboratory-based surveillance of foodborne diseases and epidemiologic investigation of outbreaks, as well as chemical and microbiological food contamination monitoring

Educating workers from the farms to the laboratories of the importance of food safety is another important element. Initially, only managers in Central and Eastern European countries received extra training and many workers questioned the necessity of the extra tasks. Training of staff to operate the new and sophisticated equipment is an additional problem, especially as the newer systems are often computerized.<sup>27</sup>

Training in modern food safety systems is often not available at many universities of post-communist countries, leaving a shortage of specialists who are able to work as quality managers. Moreover, many well-educated young specialists are leaving for work in Western countries, making it more difficult to find qualified specialists.<sup>28</sup>

The lack of financial resources allocated by national governments and the costs of the process are other obstacles to the modernizing of food safety systems in Central and Eastern European countries. The financial help provided by the EU,<sup>29</sup> FAO, and WHO<sup>30</sup> has therefore been essential to building food safety action plans in those countries.

## 5.3.3 Food Safety Agencies in Europe

In 2002, the European Food Safety Authority  $(EFSA)^{31}$  was created. It has since expanded its scientific and communications activities and is currently developing its institutional, stakeholder, and international relations. It aims to provide the EC with independent scientific advice on all matters with a direct or indirect effect on food safety. It is a separate legal entity, independent of the EC, and other EU institutions.

EFSA's portfolio covers all stages of food production and supply, from primary production to the safety of animal feed to the delivery of food to consumers. It collects information and analyzes new scientific developments in order to identify and assess potential risks to the food chain. It carries out scientific assessments on matters that may have a direct or indirect effect on the safety of the food supply, including those relating to animal health and welfare, and plant health.

EFSA also gives scientific advice on non-food and feed GE organisms, as well as on nutrition, in relation to EU legislation. It can communicate directly with the public on any issue within its purview.

There has been a debate regarding the powers vested in EFSA. Some consumer organizations have criticized EFSA as toothless because the agency lacks the powers to regulate food production and handling or to enforce EU legislation regarding food safety. Others have argued that this separation between risk assessment and risk management ensures that the agency operates as an unbiased scientific advising body, free of political influence.

Along with the creation of EFSA, many European countries have established unified food safety agencies.<sup>32</sup> The creation of these unified agencies has improved communication between all levels of government from local to international. It has also improved the scientific and technical level of food control.<sup>33</sup>



## 5.4. Policies and plans of action in the European Region

## 5.4.1 Risk Assessment and Risk Management

EU regulations state that risk assessments shall be based on available scientific evidence and undertaken in an independent, objective, and transparent manner.<sup>34</sup> They also formally establish the precautionary principle as an option open to risk managers when decisions have to be made to protect public health but scientific information concerning the risk is inconclusive or incomplete.<sup>35</sup>

The precautionary principle is relevant in circumstances where risk managers have found reasonable grounds for concern that an unacceptable level of risk to health exists but the supporting evidence is insufficient for a comprehensive and accurate risk assessment.

When scientific evidence is scarce, risk managers may use the precautionary principle and take appropriate action to protect the public until more information on the nature of the risk becomes available. Such measures are provisional and have to comply with the normal principles of non-discrimination and proportionality.

## 5.4.2 Responsibility for food safety

The primary responsibility for ensuring both food safety and compliance with food law in the EU rests with food and feed businesses. For example, a food and feed business operator is required by law to inform authorities immediately if there is reason to believe that food it has placed on the market may be injurious to human health. Operators must inform authorities of actions taken to prevent risks to consumers and shall not prevent or discourage any person from cooperating with the relevant authorities.<sup>36</sup> Following the recent contamination of spices, like chili powder and curry, with Sudan dyes (industrial dyes normally used for coloring plastics and other synthetic materials) that have a carcinogenic effect, the European Commission published a leaflet for food businesses, reminding them of their responsibilities under European law for ensuring the safety and traceability of their products.<sup>37</sup>



#### 5.4.3 Traceability and labeling

The EU defines "traceability" as the ability to trace and follow food, feed, and ingredients through all stages of production, processing and distribution. General provisions for traceability (applicable since January 2005) cover all food and feed, all food and feed business operators, at all stages of production, processing, and distribution, although tougher standards may apply to specific sectors such as beef, fish, and GE organisms.<sup>38</sup>

In most circumstances, the requirement for traceability is limited to ensuring that businesses are able to identify the immediate supplier of the product in question and the immediate subsequent recipient, although retailers are exempted.

The EU legislation on labeling, presentation, and advertising of foodstuffs to the final consumer,<sup>39</sup> based upon the principle of functional labeling, aims to ensure that the consumer gets essential information regarding the product composition, the manufacturer, and methods of storage and preparation. Producers and manufacturers are free to give additional information, provided that it is accurate and does not mislead the consumer.

#### 5.4.4 Recall

Whenever a business operator has reason to believe that food or feed is not in compliance with food safety requirements, it must withdraw the food from the market and inform the relevant authorities. If the product has already reached the consumer, the operator must inform the public of the withdrawal and must recall products already supplied to consumers.<sup>40</sup>

#### 5.4.5 Food inspections

Food inspections extend from the farm to the market level. Animal health certificates must accompany all imported live animals. Upon arrival in the EU, the animals and the accompanying certificates must be verified and checked by EU official veterinarians at a designated Border Inspection Post (BIP).<sup>41</sup> Products of animal origin from a non-EU country are allowed into the EU only if they come from an establishment specifically approved to export to the EU.<sup>42</sup>

A new regulation will take effect on January 1, 2006 that clearly defines the Member States' responsibility to ensure that business operators apply EU

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legislation correctly and establishes the role of the Commission's Food and Veterinary Office (FVO) as "auditor" of the Member States' performance.

That regulation includes both performance criteria to evaluate the Member States programs and a harmonized approach to the design of new control systems.<sup>43</sup> It also:

- Sets forth a framework to support developing countries in meeting EU import requirements and enables the Commission to fund activities that enhance food and feed safety
- Establishes a risk-based system for regulating food imports, based on the nature and frequency of hazards associated with the products. Consequently, import inspections can be more stringent for products with a higher risk profile<sup>44</sup>

Food sampling and analysis to determine that food meets the residue limits are conducted as part of the EU's auditing program.<sup>45</sup> EU Member States must have official controls covering all stages of food production, processing, and

distribution.<sup>46</sup> To aid these governments, the EFSA identifies emerging risks that have a direct or indirect impact on food and feed safety, and helps to standardize government controls throughout the region.<sup>47,48</sup> (See Box.<sup>49,50</sup>)

## 5.4.6 Food control laboratories

To coordinate detection and monitoring of biological hazards and chemical residues efficiently in the EU, the Commission created a network of National Reference Laboratories (NRL) coordinated by Community Reference Laboratories (CRL).<sup>51</sup> The CRLs have scientific and technical expertise in the areas of animal health, public health, and animal production and breeding. They are responsible

## Improving surveillance activities in Europe

The WHO has initiated a surveillance program for control of foodborne infections and intoxications in Europe. This program is based on surveillance activities at the national level and participation is voluntary.

Its objectives are to:

- Identify the causes and epidemiology of foodborne diseases in Europe
- Disseminate relevant information on surveillance
- Collaborate with national authorities to identify methods of reinforcing their surveillance systems

for establishing EU-wide standards for testing, routine procedures, and reliable testing methods, and they assist NRLs, in particular, by giving technical advice, providing training courses, and conducting comparative tests.

Certain areas, such as the South Caucasus region, lack independent food control laboratories, which makes the monitoring of food hazards less reliable.<sup>52</sup>

#### Alert systems

The Rapid Alert System for Food and Feed (RASFF) provides the EU's food safety officials with an effective tool for the exchange of information on measures taken to ensure food safety.

Alert notifications must be sent to the EC when the food or feed presenting the risk is on the market and when immediate action is necessary. Alerts are issued when a Member State has detected the problem and has initiated relevant measures, such as withdrawal or recall. The notification aims to give government officials information to verify whether the product involved is on their markets, so that they can take the necessary measures. The EC publishes a weekly overview of alert and information notifications.

EFSA may supplement the notification with scientific or technical information that will facilitate rapid and appropriate risk management action by the Member States.

The Commission must inform a non-EU country in the following circumstances:

- 1. if a product subject to an alert notification has been exported to that country
- when a product originating from that country has been the subject of a notification, so that it can take corrective measures and avoid repetition of the problem

## 5.4.7 Food contaminant monitoring and maximum residue limits

In Europe, WHO has developed the European Program on Monitoring and Assessment of Potentially Hazardous Substances (GEMS/Food-EURO), which promotes the monitoring of food contaminants in all countries in the European Region, especially in the new countries of the Balkans and of the former Soviet Union.

At the EU level, the basic elements of legislation on contaminants in food are:<sup>53</sup>

- Food containing a contaminant in an amount unacceptable from the public health viewpoint, and in particular at an unacceptable toxicological level, is barred from the market. (See Box.<sup>54</sup>)
- Contaminant levels shall be kept as low as reasonably achievable following good practices.
- Maximum residue levels (MRLs) must be set for certain contaminants in order to protect public health.<sup>55</sup>

Moreover, the EC proposed a new regulation to harmonize the MRLs of pesticides permitted in products of plant and animal origin. According to those new rules regarding pesticides, the EFSA will be responsible for risk assessment, whereas the Commission will provide risk management by setting the MRLs, taking EFSA's opinions into consideration.<sup>56</sup>

## 5.4.8 Food and feed hygiene

At the EU level, a radical revision of food safety hygiene rules is underway.<sup>57</sup> The new regulations will harmonize and simplify detailed and complex hygiene requirements previously contained in a number of Council Directives covering the hygiene of foodstuffs and the production and placing on the market of products of animal origin. These regulations will cover all food and all operators throughout the food chain and provide more effective instruments to manage food safety and any future food crises.

The revised rules are based on the following key measures:

- implementation of a "farm-to-table" approach
- introduction of a Hazard Analysis and Critical Control Point (HACCP) system for all food processors to assure that adequate safety procedures are identified, implemented, maintained, and reviewed<sup>58</sup>
- registration or approval of certain food establishments
- development of guides for good hygiene practices (GHPs) and for the application of HACCP principles by food processors
- establishment of a special provision to ensure flexible regulations covering food produced in remote areas, such as high mountains or remote islands, and traditional production and methods

The new hygiene law will be applicable in January 2006. Feed hygiene is also covered in an equally comprehensive new regulation.<sup>59</sup>

To assist non-EU countries in adopting these new standards and in organizing official controls on products exported to the EU, the EU has developed various programs, including technical assistance, joint projects, guidelines, and training. The EU also plans to create a training center where official food and feed inspectors from the European Member States and from other countries will be trained.<sup>60</sup>

## 5.4.9 Animal health and food safety

Animal health is an important factor in food safety because some diseases, like brucellosis, salmonellosis and listeriosis, can be transmitted to humans through contaminated food. Each year, the EC publishes a report on sources of zoonotic agents in food, animals, and feed, and the trends in cases of human illnesses in the EU.<sup>61</sup>

In 2003, to reduce the incidence of foodborne diseases, the EC legislation regarding zoonotic agents was revised to prioritize *Salmonella*.<sup>62</sup> Following the "farm-to-table" approach, the EC has introduced other tools to control foodborne pathogens along the food chain, such as microbiological criteria for specific foodstuffs.

#### SWEDEN

After a *Salmonella* outbreak in 1953, which resulted in 90 deaths, strict regulations were enacted designating

any food containing *Salmonella* unfit for human consumption.

The Swedish Salmonella Control Program, approved by the EC, aims to ensure that animal products intended for human consumption are free from Salmonella by only sending Salmonella-free animals to slaughter. This policy requires regular monitoring at all levels of the production chain. If Salmonella is detected, traceback is used to identify and destroy Salmonella-infected flocks.

Since implementation in 1961, the percent of *Salmonella*-positive poultry flocks has steadily decreased from 2.7% (1970) to 0.1% (1995). Using this strict government policy, Sweden has achieved an almost complete eradication of *Salmonella* from its meat, poultry and eggs.

The EC has approved a number of programs in Member States to control or eradicate *Salmonella* in certain animal populations, brucellosis in large and small ruminants, and tuberculosis in cattle.<sup>63</sup> (See Box.<sup>64,65</sup>)

## 5.5 Consumer organizations in the European Region

Consumer organizations in the European Region are involved in many types of food safety projects, such as food testing, developing consumer education materials, participating in the development of food legislation, and maintaining a comprehensive online resource for consumers. In addition to food hazards, groups in the European Region focus on the use of food additives, growth hormones, antibiotics, pesticides, and GE organisms.

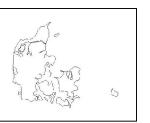
Consumer organizations are playing an increasingly crucial role in the process of policymaking on a national and regional level. Improvements in consumer participation are sought through increased transparency of decision making, providing a framework for discussions between scientific experts and consumers, and ensuring accurate and honest information for consumers in the marketplace.

## DENMARK<sup>66</sup>

The Danish food safety system is considered one of the most progressive in the world.

A single, unified food safety agency

The Danish Zoonosis Centre, established in 1994,



is the centralized coordinating body which links all the major food safety stakeholders from along the farm-to-table continuum. These stakeholders include the government agencies and institutions involved in monitoring and control of foodborne infections, the industry, and consumer groups. The Centre is also responsible for communication to the general public and to the media.

Denmark's highly integrated food safety system facilitates communication, coordination of control activities, and collaboration for data exchange and outbreak investigations. It utilizes a central database to monitor foodborne illness trends and conduct comprehensive analysis.

## Linking human foodborne illnesses to animal food sources

This integrated surveillance system links public health data with data from animals and retail food, enabling Denmark to routinely attribute both foodborne outbreaks and sporadic foodborne illnesses to specific food and animal sources. This is made possible by the extensive and routine microbial sub-typing of isolated pathogens from humans, animals, and retail foods.

### 6. CENTRAL AND SOUTH AMERICAN REGION



The Central and South American Region embraces some of the greatest biodiversity on the planet. The region's different climates set the stage for a wide range of food safety problems, resulting from the prevalence of certain pathogens, cultural practices that promote their growth and spread, the globalization of trade, and increased travel and tourism.<sup>1</sup>

## 6.1 Foodborne diseases in the Central and South American Region

Diarrhea caused by contaminated food and water is a major challenge for health authorities in many countries and communities of the Central and South American Region that lack basic sanitary services.<sup>2</sup> In addition, outbreaks of foodborne disease affect tourism, a major revenue source. Published reports from the Caribbean countries indicate that 11 to 20

percent of tourists interviewed report becoming ill from food.<sup>3</sup>

Between 1993 and 2002, 21 Latin American and Caribbean countries reported 10,400 outbreaks of food- and waterborne illness, according to information gathered by the Pan American Health Organization (PAHO) and the WHO.

The Central and South American Region contains the following countries:

Argentina, Bahamas, Turks and Caicos Islands, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, CPC Barbados, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Suriname, Trinidad and Tobago, Uruguay, and Venezuela. Those outbreaks caused nearly 400,000 illnesses and 500 deaths. The most frequent bacterial agents involved were *Salmonella spp.* (20 percent of the reported outbreaks),<sup>4</sup> *Staphylococcus aureus*, and *Clostridium perfringens*.<sup>5</sup>

Another pathogen, *Escherichia coli* O157:H7, has increased dramatically in the Central and South American Region. Argentina has one of the highest incidences of HUS -- a serious complication of *E. coli* infection -- especially in the pediatric age group.<sup>6</sup>

Food items most commonly associated with the

reported outbreaks were: fish/seafood (22 percent), water (20 percent) and red meats (14 percent).<sup>7</sup>

## 6.2 Food safety concerns in the Central and South American Region

## 6.2.1 Pathogens in food

Geographic and cultural factors contribute to the large number of foodborne illnesses in the Central and South American Region. In the Caribbean, for example, food contamination may be caused by marine biotoxins.<sup>8</sup> In the Amazon jungle, the food safety concerns are often related to waterborne parasites and high levels of arsenic and mercury in local water and fish.<sup>9</sup> Among the Andean countries (Bolivia, Colombia, Ecuador, Peru, and Venezuela), however, outbreaks are attributed to handling practices and population issues that are also prevalent in North America and Europe, such as:

- the growth of vulnerable population groups
- lack of personal hygiene throughout the food chain
- excessive storage time of food
- inadequate refrigeration temperatures
- cross contamination of food
- improper handling by food service workers<sup>10</sup>

## 6.2.2 BSE issues

No cases of BSE have been reported in the Central and South American Region. That is not surprising, as many beef producers rely on grass feeding or exclusively plant-based diets rather than diets supplemented with animal-derived proteins. In Brazil, for example, large pasture areas contribute to the inexpensive feeding of animals.<sup>11</sup>

Despite the absence of cases, efforts to evaluate and strengthen the BSE prevention systems, especially the feed quality control systems, were initiated in Argentina, Brazil, Chile, Colombia, Paraguay, Peru, and Uruguay in 2002.<sup>12</sup>

## 6.2.3 Mycotoxins

In Brazil, companies and consumers alike have become increasingly concerned about the dangers of mycotoxins.<sup>13</sup> As a result, there is an ongoing effort by both the public and private sectors to control mycotoxins in foods consumed by humans and animals.

Because mycotoxin contamination can destroy the market for a specific product, incentives exist for industry-wide improvement. In Bolivia and Peru,

mycotoxins are an important consideration for certain export products. However, consumers in Peru and other countries in the Central and South American Region are largely unaware of this problem.<sup>14</sup>

## 6.2.4 Reducing pesticide use

To reduce pesticide residues in food, many countries of the Central and South American Region are instituting pre-inspection programs that include both farm level Integrated Pest Management (IPM) and post-harvest monitoring programs.<sup>15</sup> Those programs help ensure that food that reaches consumers does not carry excessive pesticide residues. However, such programs are very difficult to implement for the thousands of small farmers involved.



#### **PERU**<sup>16</sup>

A national survey of Peruvian consumers found that approximately one-fourth of the population reported illnesses, but nearly half of those consumers did not seek medical attention owing to the lack of doctors or affordable healthcare.<sup>17</sup> Furthermore, in Peru, the medical establishment does not consider diarrhea as serious as other medical conditions.

There has been an increase in acute diarrheal disease in children under the age of five.<sup>18</sup> The Peruvian Office for General Epidemiology states that the main causes of diarrheal disease are pathogenic strains of *Escherichia coli*, *Campylobacter*, *Salmonella spp.*, and *Shigella*.<sup>19</sup> Twenty percent of hospitalizations at the Children's Institute of Health in Lima were the result of digestive system diseases, other infectious and parasitic diseases, and dysentery and gastroenteritis.<sup>20</sup>

More periodic surveys, along with better reporting of foodborne diseases from physicians, would greatly improve surveillance of foodborne illness at the local level.

## 6.2.5 The Barter Network

The economic crisis in Argentina led to the emergence and expansion of a barter network, an informal production and marketing system. Approximately five to seven million people are involved in trading goods under that system, and food is one of the items most often traded. A high percentage of those foods are home-made and sold in open air markets or other locations where it is difficult to prevent contamination.<sup>21</sup> As economic conditions improve, activity on the barter network is decreasing.

In Brazil, an informal work market employing 30 million people has developed in much the same way as that in Argentina. Food items usually are produced domestically and then sold in open-air markets, making the adoption of prevention measures difficult.

# 6.3 Policies and plans of action in the Central and South American Region

International organizations have recognized foodborne diseases as a significant public health issue in the Central and South American Region, giving rise to a number of innovative programs to promote networking and collaboration among countries in Central and South America, such as:

- The Regional Foodborne Disease Surveillance Network, known by its Spanish acronym SIRVETA
- INFAL, a network integrating laboratories from the Americas, which has developed an information system for its member laboratories, and distributes reference manuals, promotes participation on proficiency tests, organizes training programs, and fosters exchange of experiences between laboratories<sup>22</sup>
- PULSENET for Latin-America, which aims to strengthen the surveillance of foodborne diseases in the region, by the use of biological molecular techniques<sup>23</sup>
- WHO-GLOBAL SALM SURV, a network to strengthen surveillance and response system capabilities, contributing to the global effort of containment of antimicrobial resistance of foodborne pathogens such as *Salmonella*, *Campylobacter* and *Escherichia coli* O157:H7<sup>24</sup>
- Epi-ETA, a network of foodborne disease epidemiologists, whose purpose is to enhance communication and collaboration among individuals involved in foodborne diseases through an epidemiologic network that provides information and scientific knowledge, an electronic communication forum, and a platform for training in foodborne disease epidemiology<sup>25</sup>
- Legalim, a computerized system of food legislation

Moreover, in 2001, the Pan American Commission for Food Safety (COPAIA) was established to provide expertise for national food safety programs and to promote collaboration within the Americas.

## 6.3.1 Epidemiological surveillance



The SIRVETA represents one of the best regional surveillance systems worldwide. Even so, the foodborne disease reporting rates are still too low to have an accurate measure of disease across the Central and South American Region.<sup>26</sup>

Epidemiological surveillance would be improved if physicians and other public health officials were trained and then linked to laboratories to ensure that illnesses were being fully reported.<sup>27</sup>

Countries in the Central and South American Region could also ensure that comprehensive information is passed on to SIRVETA.

#### 6.3.2 Legislation

In 2002, as part of the effort to harmonize and develop food legislation in the Central and South American Region, a computerized system of food legislation (Legalim) was established. This database is designed to analyze the countries' laws to harmonize food safety regulations.

#### 6.3.3 Consumer Education

The Central and South American Region has developed an integrated system for educating consumers about food safety. In 2002, the Pan American Sanitary Bureau (PASB) developed a consumer Internet site to provide food safety information in English, Portuguese, and Spanish. However, most consumers in the Central and South American Region do not have access to the Internet and even many public and local government workers only have limited access to it.

#### 6.4 Consumer organizations in the Central and South American Region

Consumer organizations in the Central and South American Region address a variety of issues, including sustainable food production and consumption, comparative tests of food, strengthening food safety systems, food labeling policies of national governments, agricultural biotechnology issues, and consumer food safety education.

### **B**RAZIL<sup>28</sup>

#### Foodborne diseases

Diarrhea continues to be one of the most serious problems in Brazil. There are specific areas in Brazil, especially those removed from large metropolitan centers or those located on the periphery of cities, where basic sanitation (sewage and plumbing systems) is still insufficient and sometimes nonexistent.



#### Consumer education

In Brazil, consumer education is a cross-disciplinary subject involving the social sciences, like history and geography (economic and social), as well as physics, biology, and mathematics. Numerous civic entities deal with the subject of consumer defense, among which consumer organizations play an important role. For example, the non-profit Brazilian consumer organization PRO TESTE has a strong presence in consumer education; its journal enhances consumers' knowledge of the quality of food products and services.

#### Legislation

In 1990, Brazil adopted the code for consumers' defense (CDC),<sup>29</sup> which is considered one of the most modern and efficient laws in this field. The CDC is used systematically and effectively by both consumers and non-governmental organizations working for consumers' rights. That legislation permits public civil actions by organizations working for consumers' defense. These actions can determine responsibility for damages to consumers and the environment.

Moreover, the Brazilian government is developing more efficient forms of organization for the management of its actions in the public health sector. In 1999, the National Health Surveillance Agency, ANVISA, was created to protect and promote public health and ensure the safety of products and services. Risk analysis procedures in health surveillance activities have been one of the milestones in the management of the Agency. Thanks to those new procedures, the Agency has been able to deregulate a significant number of food groups, assessed as being of low risk for human consumption, and concentrate its efforts on higher-risk products. The Agency also is trying to encourage the participation of food producers, consumers, and professional associations in public open consultations.<sup>30</sup>

## BRAZIL (CONT.)

Nevertheless, related legislation such as rules and regulations designed for government bodies involved in "sanitary vigilance and normalization" have not always integrated the most desirable levels of security for consumers.

## Mycotoxins

Mycotoxins, including aflatoxins and ocratoxins, are still a significant concern for Brazilian consumers. A test of 14 brands of desserts containing roasted peanuts showed that 12 brands were barely acceptable in terms of toxin levels and the other two brands were completely unacceptable.

Brazil does not set limits for each aflatoxin (B1, B2, G1, and G2) and the maximum accepted levels for each of those are quite high, especially in comparison to the limits set in the European Union. Consumer organizations in Brazil are demanding revisions of those standards.

## Reducing pesticide use

Brazil requires that the purchase and use of pesticides be documented, and requires that the type, quantities and applications of pesticides be provided to government agencies before products can be obtained and their use authorized. Despite these legal requirements, it is not unusual to find pesticide residues in agricultural products. Organic food is available, theoretically free of pesticides, but it is too expensive for the average consumer.<sup>31</sup>

## 7. NORTH AMERICAN REGION

Although the North American Region is considered to have one of the most advanced food safety programs, the region faces significant challenges. Numerous factors affect food safety, including new technologies, more sophisticated distribution systems, increased concentration in production and manufacturing systems, the rise of monoculture in crop and livestock production, and increased access to

imported foods. New foodborne pathogens and the increased susceptibility of certain segments of the population to foodborne infections pose additional challenges. Improving food safety in the North American Region will require

its three countries to establish greater links, in part, through an integrated surveillance program.

## 7.1 Foodborne diseases in the North American Region

Public health departments and agencies in the three

North American countries have estimated the prevalence of foodborne diseases. In Mexico, for example, there were 6.8 million reported cases of foodborne illnesses among its 100 million inhabitants in 1999.<sup>1</sup> Mortality from diarrheal diseases in children under five years of age was estimated to be 25 per 100,000, and many of those deaths were linked to contaminated food and water.<sup>2</sup>

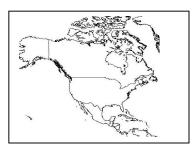
Canada, with a population of 32 million, has approximately 10,000 reported cases of foodborne diseases each year and an estimated two million actual cases.<sup>3</sup>

In the United States, the Centers for Disease Control and Prevention (U.S. CDC) estimates that foodborne diseases cause approximately 76 million illnesses annually among the country's 294 million residents, as well as 325,000 hospitalizations and 5,000 deaths per year. Known pathogens account for about 18 percent of the illnesses and 36 percent of the deaths, while unknown agents account for the rest. Three pathogens in particular, *Salmonella, Listeria*, and *Toxoplasma*, are estimated to cause 1,500 deaths each year.<sup>4</sup>

Since 1996, the U.S. CDC has been tracking well-known foodborne diseases through its FoodNet program and has reported a decline in major bacterial foodborne illnesses including *Yersinia, Campylobacter, Escherichia coli* 

Region will require The North American Region contains the following countries:

Canada, Mexico, and the United States of America.



O157:H7, and *Salmonella*.<sup>5</sup> While the FoodNet data has many strengths, one weakness is that illnesses cannot be attributed to specific food categories.

Foodborne illness outbreaks in the United States are primarily investigated by state and local health departments. However, the states are not required by law to report foodborne illness outbreaks to the U.S. CDC, which means that many - and perhaps most - outbreaks never enter the reporting system maintained by the U.S. CDC. (See Box.<sup>6</sup>)

#### **Outbreak Alert!**

The Center for Science in the Public Interest (CSPI) maintains a unique listing of foodborne illness outbreaks, categorized by food. CSPI's database, *Outbreak Alert!*, is compiled from various sources, including the U.S. CDC, state health departments, and scientific journal articles. The database contains only those outbreaks with known or suspected etiology and an identified food source. *Outbreak Alert!* highlights the food vehicles most often linked to outbreaks, and provides an important source of information on food-pathogen combinations. According to *Outbreak Alert!*, the most common foods linked to foodborne illness outbreaks are seafood, produce, poultry, beef, and eggs.

U.S. economists have estimated that foodborne illnesses cost billions of dollars each year in medical costs and lost productivity. In 2000, the costs associated with five major pathogens<sup>7</sup> amounted to at least \$7 billion annually.<sup>8</sup> In 2003, the annual cost of salmonellosis alone was \$3 billion.<sup>9</sup>

## 7.2 Food safety concerns in the North American Region

#### 7.2.1 Foodborne illness

Despite having many programs and resources devoted to fighting foodborne disease in this region, the incidence of foodborne illnesses in North America is still quite high. In the United States, for example, one in four

consumers gets ill from food annually, according to the U.S. CDC estimates.<sup>10</sup> Outbreak data demonstrate that food once considered low-risk, such as fruits and vegetables, cause a surprising number of outbreaks. Imported produce has been implicated in a number of large outbreaks and has introduced unique pathogens. For example, *Cyclospora* on Guatemalan raspberries shipped widely throughout the United States and Canada caused thousands of illnesses in the 1990s.<sup>11</sup>

Recent improvements, such as the introduction of Hazard Analysis and Critical Control Point (HACCP) systems in seafood, meat and poultry plants and greatly expanded food testing programs, have reduced the disease burden from some products. Intensified surveillance reported a reduced incidence of foodborne disease in most areas of the U.S.<sup>12</sup> Systems for highly sensitive pathogen subtyping have been adopted in the U.S. and Canada, and Mexico is

partnering with Central and South American countries to establish such a system.  $^{\rm 13}$ 

## 7.2.2 Antibiotic resistance

Farmers frequently use antibiotics at low non-therapeutic levels to compensate for crowded conditions on factory farms and promote faster growth among their food animals. That use increases the likelihood that bacteria will become resistant to antibiotics and lead to harder-to-treat human infections. To address that public health risk, WHO recommends that medically important antibiotics should not be used for non-therapeutic purposes. However, antibiotics continue to be widely used for those purposes in the North American Region.

In the United States, over half of all antibiotics produced domestically are used in livestock production. Much of that use is routine and includes prolonged "non-therapeutic" dosing of animals. The U.S. Food and Drug Administration (U.S. FDA) estimates that 5,000 people per year have had illnesses prolonged due to the use of a medically important antibiotic (fluoroquinolone) in flocks of poultry.<sup>14</sup>

In Mexico, antibiotic resistance is of great concern due to the absence of strict regulation over the distribution of many types of antibiotics.<sup>15</sup> As a consequence:

- fruit growers spray their crops with antibiotics to fight diseases<sup>16</sup>
- the use of antibiotics in poultry has quadrupled in the late  $1990s^{17}$

In Canada, antibiotics are prescribed and used therapeutically for the treatment of diseases in animals, as well as non-therapeutically. As part of the approval process for veterinary drugs used in food animals, Health Canada has set Maximum Residue Limits (MRLs) – the level of drug residues in the tissue or food product that poses no adverse health effects. A similar approval system is used in the United States. However, those limits do not lessen the threat of antibiotic resistance, which is the consequence of use on the farms.

In recent years, each country of the North American Region has established a national system to monitor trends in antibiotic resistance. Canada has developed a surveillance program called CIPARS. One of its key objectives is to monitor trends in the development of antimicrobial resistance (AMR) in the food chain.<sup>18</sup>

In the United States, the U.S. CDC established the National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS) in 1996, and in 2001 a Task Force of 11 government agencies issued a Public Health Action Plan to Combat Antimicrobial Resistance.<sup>19</sup>

Mexico is working with the U.S. FDA's Center for Veterinary Medicine (CVM), using NARMS as a template, to develop a cooperative project known as *ResistVet*. This program will monitor trends in antimicrobial resistance in human infections, bacterial populations in animals, and bacterial pathogens in retail foods at four sites in Mexico. To further support antimicrobial resistance monitoring in Mexico, the U.S. FDA collaborated with WHO to conduct a training course in 2001 on the surveillance of *Salmonella* and antimicrobial resistance in foodborne pathogens.<sup>20</sup>

#### 7.2.3 Contaminants in food

Animals and fish in particular are vulnerable to contamination by toxic industrial and agricultural pollutants, such as pesticides, mercury, polychlorinated biphenyls (PCBs), dioxins, flame retardants, and other



lipophilic chemicals. Those pollutants can accumulate in fish that are then consumed by people.

In the United States, scientists at the U.S. Environmental Protection Agency (U.S. EPA) have estimated that as many as 630,000 children are born each year having been exposed to unsafe levels of mercury in the womb. Many adverse birth outcomes have been linked to prenatal exposure to excessive amounts of mercury. Even small amounts are predicted to cause delayed motor development, delayed speech, and other adverse effects among exposed children.<sup>21</sup> As a result, in March 2004, the U.S. government issued a warning for women who are or might become pregnant, nursing mothers, and young children: (i)

not to eat shark, swordfish, king mackerel, or tilefish because they contain high levels of mercury; (ii) eat no more than two average meals a week of a variety of fish and shellfish that are lower in mercury and; (iii) check local advisories about the safety of fish caught by family and friends in local lakes, rivers, and coastal areas.<sup>22</sup>

In the 1970s, the commercial marketing of PCBs as insulation in electrical transformers was banned by the U.S. EPA because of concerns over their extreme persistence in the environment. It categorized PCBs as a probable

human carcinogen and warned that those poisons also compromise the immune system and can cause low birth weight and learning disabilities in children. PCBs are fat-soluble, accumulating in the marine food chain and reaching high levels in predator fish. More than 90 percent of Americans' exposure results from diet, mostly from fish. Children also can be exposed through breast milk. Human fetuses also are exposed in the womb, as PCBs are able to cross the placenta and concentrate in the fatty tissue of the brain.

According to the U.S. EPA, PCBs remain in human fat cells for 25 to 75 years. High levels of PCBs have been documented in the sediments of the Hudson River, the Great Lakes, and other bodies of water in this region.<sup>23</sup>

#### 7.2.4 Bioterrorism

According to the WHO, "food is...vulnerable to intentional contamination by debilitating or lethal agents. The diversity of sources of foods, including the global market, makes prevention difficult, if not impossible."<sup>24</sup> Sporadic threats of tampering and several incidents of intentional contamination of food products already have occurred in the North American Region. For example, in 2003, an employee deliberately contaminated 200 pounds of ground beef at a grocery store in Michigan with a nicotine-based pesticide, resulting in almost 100 illnesses.<sup>25</sup>

Since the terrorist attacks of September 11, 2001, which served as a wake-up call in the region, bioterrorism has become an issue of great concern in North America.

In Canada, the "Centre for Emergency Preparedness and Response" (CEPR) was created in July 2000 to serve as the country's single coordinating point for public health security. Regarding food safety, the Centre for Emergency Preparedness and Response is supported by the Canadian Food Inspection Agency (CFIA), which is specifically responsible for preparing emergency plans<sup>26</sup> and developing effective response capabilities for food safety emergencies.<sup>27</sup> The Canadian government also is establishing a nationwide network of local, provincial, and federal laboratories that will be able to quickly test foods and identify unknown agents. Moreover, in 2002, Canada promulgated a new statute, the *Public Safety Act*, which provides new power to various Ministers, including the Minister of Health, to issue an emergency interim order (for example, to prohibit the sale of a food) if the Minister believes that immediate action is required to deal with a significant risk - direct or indirect - to human life, health, and safety.<sup>28</sup>

Canada has also worked with WHO to develop and implement the Global Public Health Intelligence Network, a database that uses the Internet to provide preliminary intelligence on global public health issues, such as disease outbreaks, infectious diseases, contaminated food and water, and bioterrorism.<sup>29</sup>

In 2002, the United States Congress approved the Public Health Security and Bioterrorism Preparedness and Response Act (Bioterrorism Act). The Act gives the U.S. FDA several important new tools to protect the food supply, including provisions for the registration of food facilities, prior notice of imports, recordkeeping to trace foods, and administrative detention of suspect foods.

Nevertheless, the primary U.S. food safety agencies, U.S. FDA and the U.S. Department of Agriculture (USDA), lack essential powers such as mandatory recall authority which would assist in removing tainted products if terrorists attacked the food supply. In addition, the U.S. FDA lacks authority to certify that countries exporting food to the United States have systems in place to deter intentional contamination.

#### 7.2.5 BSE

Several cases of BSE have been found in the North American Region. However, the incidence of BSE has been minimal and the risk of contracting the human form of "mad cow disease," called variant Creutzfeldt-Jakob Disease (vCJD), is virtually nil.

The first case of BSE in an indigenous cow was detected in May 2003. Until then, cattle crossed borders freely in the region. Canada implemented measures to enhance food safety controls regarding BSE, working closely with provincial and territorial authorities, the cattle industry, and U.S. representatives to ensure their implementation, and where appropriate, harmonization with U.S. measures.<sup>30</sup> Specifically, Canada has excluded bovine specified risk materials (SRM) from human food, and enhanced animal identification and BSE surveillance. Also, it is working to extend the ban on SRM to all animal feed.<sup>31</sup> Nevertheless, in January 2005, two other cases of mad cow disease were confirmed in Canada,<sup>32</sup> presumably due to infected feed consumed by cattle prior to the tightened regulations.

No cases of BSE have been detected in Mexico, but the government has nevertheless agreed to enhance efforts to increase harmonization of BSE regulations within the North American Region.<sup>33</sup>

In December 2003 in the United States, the USDA announced the first diagnosis of BSE in an adult Holstein cow from Washington State. An ear-tag identification number indicated that the BSE-infected cow was imported into the United States from Canada in August 2001. The first case of BSE in the United States led USDA and the U.S. FDA to announce a number of policy changes, including expanded surveillance for BSE<sup>34</sup> and additional safeguards for human and animal food.<sup>35</sup> Despite government assurances, however, enforcement of those new rules is largely dependent on government testing, and an animal identification system is lacking.

Early in 2004, the agriculture ministers of Canada, Mexico, and the United States agreed to enhance ongoing efforts to resume the North American trade in beef.<sup>36</sup> Some limited trading in beef products continues in the North American Region, but the findings of BSE in Canada have dramatically curtailed trading in beef products among those three nations, as well as with many other countries.

In addition to the animal health concerns, two human illnesses were also reported in this region. In April 2002, a case of vCJD (the human form of BSE) was reported in Canada, in a patient who was a resident of the United Kingdom in the late 1980s during the early years of the BSE outbreak. Only one case of the variant Creutzfeldt-Jakob Disease (vCJD) has been discovered so far in the United States. The case was a Florida woman who probably became infected while growing up in England during the height of the mad cow epidemic there.

#### 7.2.6 Genetically engineered (GE) foods

Genetic engineering (GE) allows specific genes isolated from any organism (such as a bacterium) to be incorporated into the genetic material of a different organism (such as a corn plant). That differs from traditional plant and animal breeding in which the genes of only closely-related organisms (such as a corn plant and its wild relatives) can be exchanged. Thus, GE plants and animals can carry unique traits that could not have occurred by natural reproduction.

While highly controversial, that unique technique for manipulating hereditary traits can provide significant benefits. Genetic engineering has the potential to decrease adverse environmental effects of conventional agriculture, increase yields for farmers, improve the nutritional quality and taste of crops, and contribute to sustainable agriculture. Concerns about GE crops in the North American Region include the introduction of an allergen; the transfer of the

engineered gene to wild species; the emergence of pests resistant to pesticides; and the potential for adverse effects on small farmers or developing nations.

In Canada, the Novel Foods Regulation requires companies to notify the Health Products and Food Branch (HPFB) prior to marketing or advertising a GE food. Pre-market notification permits Health Canada to conduct a thorough safety assessment of all biotechnology-derived foods to demonstrate that they are safe and nutritious before they are marketed.

In Mexico, the "Comisión Intersecretarial de Bioseguridad y Organismos Genéticamente Modificados" (CIBIOGEM) coordinates the Mexican government's policies on the production, import, propagation, and consumption of GE products and byproducts. Specific legislation about GE foods also has been approved to protect Mexican consumers.

Moreover, unlike the United States and Canada, Mexico has ratified the Cartagena Protocol on Biosafety<sup>37</sup> which seeks to address the potential risks that may be posed by "living modified organisms" (LMOs)<sup>38</sup> resulting from modern biotechnology on biological diversity.

Although Mexico imposed a ban on planting GE corn in 1998, scientists detected GE corn growing in Oaxaca province in 2001. The researchers' report suggests that the GE corn got into fields when farmers planted corn imported from the United States intended for consumption.<sup>39</sup>



In the United States, in 2003, approximately 40 percent of all field corn (mostly used for animal feed), 80 percent of all soybeans (also used primarily for animal feed), and 73 percent of all cotton grown was genetically engineered. U.S. farmers also grew small amounts of GE papayas, summer squash, and insect-resistant sweet corn.<sup>40</sup>

Three government agencies share oversight of GE plants: the U.S. FDA, the USDA, and the U.S. EPA.

Although the U.S. FDA is responsible for ensuring that plant-based foods are safe to eat, it lacks the legal authority to approve GE crops before they are commercialized. The U.S. FDA regulates GE crops through a voluntary notification process rather than a mandatory pre-market approval process.

USDA regulates GE plants to ensure they do not pose any risk to plant health. Unlike the U.S. FDA, USDA has established a mandatory notification and permitting process that developers must comply with before planting any GE crop on open fields. However, developers can petition USDA to deregulate the GE plant, allowing crops to be grown commercially without any regulatory requirements. Over 9,000 field trials have gone through the USDA's regulatory procedures and over 75 crops have been deregulated.

The U.S. EPA is responsible for the safety of pesticides, including GE plants, such as *Bacillus thuringiensis* (Bt) corn or Bt cotton, that have been engineered to produce a natural toxin that acts as a pesticide. In its regulatory process, the U.S. EPA determines the benefits and risks from the crop and imposes any conditions it believes will minimize or eliminate any potential harmful effects on the environment. The U.S. EPA's formal approval process also assesses the safety to humans and animals if they consume the pesticide and establishes a safe tolerance level below which the pesticide is considered harmless.

In approving Bt crops for commercial use, the U.S. EPA has imposed planting restrictions to inhibit the development of resistance to the crop by pests and ensure long-term benefits from those crops. Nevertheless, a 2003 report by CSPI found that approximately 20 percent of Midwest corn farmers did not comply with government planting restrictions for Bt corn.<sup>41</sup> Therefore, to better protect the environment, the U.S. EPA and USDA should pursue rigorous post-approval oversight of GE crops.

Concerns also have arisen over the use of engineering food crops as factories to produce pharmaceuticals or industrial chemicals. Such activities appear to be experimental but commercialization is being considered.

Genetically engineered animals, for which commercial approval is also being sought, raise new safety and ethical questions. The U.S. government does not have an adequate program in place to monitor and control these animals.

#### 7.2.7 Irradiation

Food irradiation is a process in which food is treated with a controlled amount of ionizing radiation to kill or control bacteria, parasites, insects, and fungi. Irradiation is also used to reduce spoilage and slow down ripening and sprouting of produce.<sup>42</sup>

There has been controversy in the North American Region over the risks and benefits of irradiation. In certain situations, irradiation may be useful to reduce the risk of microbial foodborne illness. Some consumer groups believe that irradiation may cause other problems. Among their concerns are inadequate testing and approval processes, dangers to workers and the environment, toxic byproducts, and the potential for cellular or genetic damage.<sup>43</sup> Scientific and medical groups, industry, and government contend that irradiation is safe and a useful way to reduce the risk posed by harmful bacteria in the food supply.



Canada established a list of foods that may be irradiated, the maximum doses allowed, and other appropriate requirements. All irradiated foods must be labeled. In addition to a written description, such as "irradiated," a distinctive logo - the "radura" - must be on the package to identify the product. Owing to the division between standard setting and enforcement that is relatively unique to Canada, Health Canada is responsible for establishing those regulations. It is, however, the responsibility of the Canadian Food Inspection Agency (CFIA) to enforce them.

Mexico has some irradiation facilities and has given clearance to irradiate more than 60 categories of food.

A variety of foods have been approved for irradiation in the United States, for several different purposes. For meats, separate approval is required both from the U.S. FDA and USDA.<sup>44</sup> The radura logo also is required on food packaging if the product has been irradiated, though not for minor ingredients such as spices or when the irradiated food is part of a multi-ingredient food. According to polls, U.S. consumers strongly support labeling of irradiated foods.

#### 7.2.8 Consumer Education

To reduce the risk of foodborne illness, consumer education is considered a critical element of food safety.

In the United States, numerous programs and campaigns are designed to improve consumer education about food safety.<sup>45</sup> One of the main educational tools is the "*Fight*BAC!<sup>TM"</sup> campaign, which is supported by a partnership among the food industry, government, and consumer organizations.<sup>46</sup> Moreover, electronic information networks have been launched by the U.S. FDA to provide up-to-date information regarding food safety.<sup>47</sup>

In Canada, a partnership led by the food industry and federal and provincial government agencies, with participation from health, environmental, and consumer organizations, resulted in the formation of the Canadian Partnership

for Consumer Food Safety Education. In 1998, it launched a "*Fight*BAC!<sup>TM"</sup> campaign based on the U.S. program.<sup>48</sup> (See Box.<sup>49</sup>)

In Mexico, the National Service for Agriculture and Food Hygiene, Safety and

Quality has established a General Office for Consumers' Communication to inform the general public - especially users of the office's services - about relevant legislation and regulations in force.

## 7.3 Policies and plans of action in the North American Region

The Canadian food safety system operates in a multi-jurisdictional setting, involving federal, provincial, territorial, and municipal authorities.<sup>50</sup>

Health Canada is responsible for establishing and administering regulatory standards under the Food

### Food safety mistakes caught on tape

University research suggests that consumer education programs have had only limited effectiveness.

A 2000 FDA-funded study conducted by Utah State University, researchers placed video cameras in the kitchens of 100 families and observed them preparing salad ingredients and following one of three recipes. Among those families who tended to be confident in their food safety habits, cooks were "caught on tape" undercooking meals and making other food handling mistakes during preparation: improper refrigerator storage of raw meat and seafood, and improper or nonexistent hand-washing, countertop cleansing, and fruit and vegetable washing. Such research shows that the effect of limited consumer education on the overall burden of foodborne illness may be negligible.

and Drugs Act - the core federal legislation regulating the safety and nutritional quality of food sold in Canada. The Canadian Food Inspection Agency (CFIA), operating under the auspices of the Minister of Agriculture and Agro-food, is responsible for conducting inspections and enforcement of federal food safety law. The Pest Management Regulatory Agency (PMRA), within the Department of Health, has a mandate to protect human health, safety, and the environment by minimizing risks associated with pesticides, while enabling access to pest management tools - namely, pest control products and pest management strategies.

However, some laws governing food safety are also set and enforced by provincial/territorial and municipal authorities. Those authorities also carry out some enforcement duties in respect of federal laws pursuant to agreements with the federal agencies.

Because of the shared jurisdiction in Canada regarding food safety,<sup>51</sup> protocols have been developed to clarify the roles of all participants, as for example the "Foodborne Illness Outbreak Response Protocol" and the "Canadian Code of Practice - General Principles of Food Hygiene."

Moreover, to foster the collaboration of the non-governmental stakeholders in the Canadian food safety system, partnerships have been established with the public, private, and academic sectors, such as the "Canadian Supply Chain Food Safety Coalition" and the "Royal Society Expert Scientific Panel on the Future of Food Biotechnology."<sup>52</sup>



Mexico has only recently developed an integrated food safety program, and legislation is currently being revised to improve food safety in the country. Since 2001, the National Service of Agro-food Safety and Quality (SENASICA) controls the agrofood sector and the Federal Commission for the Protection Against Sanitary Risks (COFEPRIS) unifies and harmonizes the policies of the Mexican government regarding health and food safety. These new measures should, for example, improve oversight of farms and help them reduce microbiological, chemical, and physical risks.

In 2002, a National Forum on Food Safety was held in Mexico with the participation of consumers, industry, farmers, and state governments to discuss strategies for ensuring food safety. Participants agreed that food safety should be a priority for the federal government and that it was necessary to have an agency exclusively devoted to food safety. They also agreed on the need for comprehensive national laws and regulations to oversee food production from the farm to the table. The government subsequently established the National System for Food Safety.<sup>53</sup>

In the United States, food is regulated by 12 different federal agencies and 35 different statutes.<sup>54</sup> That highly fragmented system divides regulatory responsibility based on food products. The primary agencies that inspect and regulate food are USDA, which oversees meat, poultry, and processed egg products, and the U.S. FDA, which is responsible for all other foods.

Although U.S. FDA-regulated foods are linked to two-thirds of the outbreaks with known causes, the U.S. FDA's budget is just 31 percent of the total federal budget for food safety inspections.<sup>55</sup> The U.S. FDA, hampered by limited funding, inspects less than two percent of the estimated five million shipments of imported food each year.<sup>56</sup> Although meat-processing plants are inspected by USDA daily, plants processing seafood, eggs, produce, or processed foods containing less than two percent meat are inspected by the U.S. FDA about once every five years.<sup>57</sup>

When foodborne illness outbreaks do occur, neither USDA nor the U.S. FDA has the power to order recalls of contaminated food. They must ask food companies to voluntarily remove foods from the market. That lack of authority can delay recalls and increase the number of illnesses linked to outbreaks. Recent lawsuits brought by meat processors have curbed USDA's ability to close down plants producing contaminated meat.

## 7.4 Consumer organizations in the North American Region

Consumer organizations in the North American Region work on food labeling, reducing foodborne illness, obesity, alcohol policy, and antibiotic resistance. They also conduct product evaluations that are published in their magazines and the general media. Several consumer organizations are relatively large and well-funded. Two such organizations are almost completely funded though the sale of magazines evaluating food and other consumer products. Government funding of consumer organizations is less common than in other regions, though some organizations have obtained specific project grants from the government. Smaller groups are funded by foundations.

#### Recommendations for reform of U.S. food laws

The primary food safety laws in the United States were passed in 1906. Many organizations have put forth ideas for modernizing U.S. food law, including the National Academy of Sciences, the U.S. Government Accountability Office, and the Center for Science in the Public Interest (CSPI). These groups recommend that the U.S. Congress and Executive branch should unify all of the federal food safety activities.

Current legislation proposes the formation of a single, independent agency – the Food Safety Administration (FSA). That agency would be responsible for setting food safety and labeling standards, approving new food technologies, conducting food safety inspections, and enforcing the relevant laws. The new statute would build on the strengths of the existing laws, while modernizing the mandates and authorities of the new FSA. The unification of the food safety system would be accomplished over a period of several years, with full participation by many stakeholders, including the food and agriculture industries, scientists, public health experts, and consumer organizations.

### **CONCLUSION**

Foodborne illnesses represent a major and daily health threat in all countries, from the most to the least developed. Recent trends in global food production, processing, distribution, and preparation are creating a growing demand by consumers for effective, coordinated, and proactive national food safety systems. Those programs are essential to protect consumer health and protect national economies from trade disruptions.

Food safety programs should:

- cover the entire food chain from production to consumption
- take into account both naturally occurring, and deliberate threats of contamination
- consider national, regional, and international specificities and requirements
- involve consumers and be transparent

Governments play critical roles in protecting the food supply. However, many countries are poorly equipped to respond to existing and emerging food safety problems. They lack technical and financial resources, effective institutional frameworks, trained personnel, and sufficient information about the hazards and risks involved. To improve food safety, governments should:

- have up-to-date food legislation and regulations that address global concerns, as well as specific national and regional needs
- have inspection and food surveillance programs to inform and enforce legislation and regulations
- increase health surveillance to ensure the availability of reliable data on which to base risk-management decisions
- provide for regulatory oversight that extends from farm to table
- promote systems of preventative controls within the food industry, such as the Hazard Analysis and Critical Control Point System (HACCP)
- undertake intensive efforts to educate the food industry, food-handlers, and consumers

Placing food safety on the political agenda as a priority in public health is the first step torward reducing foodborne illness. In that regard, it is critical to develop the support and coordination of all concerned partners: national

agencies, international organizations, health and education sectors, industries, farmers, and consumer groups.

By sharing their national experiences and knowledge, consumer groups can participate vigorously in policy debates and reduce the serious adverse effects of foodborne diseases worldwide.

## **ENDNOTES**

#### INTRODUCTION

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<sup>11</sup> Food Safety – An Essential Public Health Issue for the New Millenium, at p. 6.

<sup>12</sup> Food Safety – An Essential Public Health Issue for the New Millenium, at p. 2.

<sup>13</sup> WHO Global Strategy for Food, at p. 6.

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### **CHAPTER 1: WESTERN PACIFIC REGION**

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<sup>2</sup> World Health Organization, Office for the South East Asia Region, "Health situation in the South East Asia Region 1994-1997", pp. 213-214.

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-The "Clean Food Good Taste" program: This program started in the year 1999 and includes inspection of food services and street vendors all over the country on the basis of hygienic and sanitary standards. Since the program started, more than 30,000 food services, which is almost 30 percent of the food service businesses in the country, have been certified and awarded the "Clean Food Good Taste" mark.

-The certification of fresh markets program: This program entails the inspection of fresh markets for sanitary standards and analysis for the contamination of 6 chemical hazards including pesticide residues. The inspection involves the sampling of food collecting from fresh markets. Any fresh market that passes inspection will be certified and awarded the label of fresh market certification. Fresh markets may then use the label for advertisements. More than 700 fresh markets have applied to join this program thus far.

Government of Thailand "Application of Farm-to-Table Official and Non-Official Food Safety Control in Thailand: Case Study on Fresh Produce", Second FAO/WHO Global Forum of Food Safety Regulators, Bangkok, Thailand, 12-14 October 2004, CRD 26.

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# CHAPTER 3: EASTERN MEDITERRANEAN REGION

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<sup>3</sup> "The work of WHO in the Eastern Mediterranean Region: Annual report of the Regional Director, 1 January–31 December 2003/WHO Regional Office for the Eastern Mediterranean", ISBN 92-9021-368-0, [hereafter "*Annual Report 2003*"], Section 4.3. Available at <http://www.emro.who.int/rd/AnnualReports/2003/pdf/RD2003b.pdf>.

<sup>4</sup> Impact of current food safety systems on human health, at pp.6,7.

<sup>5</sup> Food and Agriculture Organization, Discussion paper for the Technical Consultation on Food Safety and International Trade in the Near East (Cairo, December 2003) in preparation for the 27 th FAO Regional Conference for the Near East (Doha, Qatar, March 2004) "Food safety and international trade in the Near East Region", [hereafter "*Food safety and international trade*"], p.2. Available at <ftp://ftp.fao.org/es/esn/food/nerc\_report.pdf>.

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<sup>10</sup> WHO/FAO "National food safety systems in the Near East - A situation analysis", FAO/WHO Regional Meeting on Food Safety for the Near East, Amman, Jordan, 5-6 March 2005, NEM 05/2 [hereafter "*National food safety systems in the Near East*"], p. 4.

<sup>11</sup> National food safety systems in the Near East, p. 5.

<sup>12</sup> Government of Maroc "Renforcement du système national de contrôle de la sécurité sanitaire des aliments", Second FAO/WHO Global forum of food safety regulators, Bangkok, Thailand, 12-14 October 2004, CRD 4.

<sup>13</sup> National food safety systems in the Near East, p. 5.

<sup>14</sup> Contribution of Abed Berro from "Consumers Lebanon."

<sup>15</sup> National food safety systems in the Near East, p. 2.

<sup>16</sup> *Technical Paper*, Section 5.1 "Regional plan of action to address food safety in the 21<sup>st</sup> in the WHO Eastern Mediterranean Region."

<sup>17</sup> Technical Paper, Section 5.2 "Recommendations".

<sup>18</sup> Egypt, Jordan, Lebanon, Morocco, Oman, Pakistan, Sudan and United Arab Emirates.

<sup>19</sup> National food safety systems in the Near East, p. 2.

<sup>20</sup> TCP/MOR/0168 (A): Appui à la création de l'Agence de la qualité et de la répression des fraudes.

<sup>21</sup> Annual Report 2003, Section 4.3.

<sup>22</sup> Members are: The United Arab Emirates, Bahrain, Saudi Arabia, Oman, Qatar and Kuwait.

<sup>23</sup> Annual Report 2003, Section 4.3.

<sup>24</sup> Annual Report 2003, Section 4.3.

<sup>25</sup> National food safety systems in the Near East, p. 5.

<sup>26</sup> Government of Sudan "Farm -to-Fork Food Safety Approach: The Role of Ministry of Agriculture and Forestry in Production of Fresh Agricultural Products for Consumption", Second FAO/WHO Global Forum of Food Safety Regulators, Bangkok, Thailand, 12-14 October 2004, CRD 69.

<sup>27</sup> In Oman, Tunisia, UAE and Yemen, quality management regulations based on HACCP have been adopted for fish and fish products to regain access to importing markets (ex. EU market). In addition, Tunisia has introduced provisions for the application of HACCP by the fish industry in its food safety legislation. Some countries, such as Lebanon, Morocco, Oman, and UAE have or are developing legislation and guidelines on GMP and the HACCP system. The Islamic Republic of Iran has introduced legislation requiring HACCP certification for food exports and has strengthened its national capacity to monitor and control residues (pesticides, animal drugs and chemical residues) in foodstuffs with FAO assistance. *Food safety and international trade*, p.2.

<sup>28</sup> Hashemite Kingdom of Jordan "Strengthening Official Food Safety Control Services: Risk Management Approach - Imported Food Control - A Success Story", Second FAO/WHO Global Forum of Food Safety Regulators, Bangkok, Thailand, 12-14 October 2004, CRD 2.

### **CHAPTER 4: AFRICAN REGION**

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<sup>2</sup> WHO Regional Office for Africa "Developing and Maintaining Food Safety Control Systems for Africa Current Status and Prospects For Change", Second FAO/WHO Global Forum of Food Safety Regulators, Bangkok, Thailand, 12-14 October 2004, CRD 32 [hereafter "Developing and Maintaining Food Safety Control Systems for Africa"].

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<sup>9</sup> *Codex*, p.9.

<sup>10</sup> World Health Organization, Regional Office for Africa, Division of Healthy Environments and Sustainable Development, Food Safety Unit "Mycotoxins", Fact Sheet 5.

<sup>11</sup> World Health Organization, Regional Office for Africa, Division of Healthy Environments and Sustainable Development, Food Safety Unit "Food safety in emergencies", Fact Sheet 4.

<sup>12</sup> The major factor contributing to illness was consumption of cooked food bought at the market.

<sup>13</sup> Developing and Maintaining Food Safety Control Systems for Africa.

<sup>14</sup> Available at: <http://www.afro.who.int/des/fos/country\_profiles/index.html>.

<sup>15</sup> Developing and Maintaining Food Safety Control Systems for Africa.

<sup>16</sup> Developing and Maintaining Food Safety Control Systems for Africa.

<sup>17</sup> Government of Madagascar "Renforcement des services officiels de contrôle des aliments- Mise en place d'un système national de contrôle de qualité des denrées alimentaires à Madagascar", Second FAO/WHO Global Forum of Food Safety Regulators, Bangkok, Thailand, 12-14 October 2004, CRD 7.

<sup>18</sup> Report of FAO/WHO Workshop, "Food control systems – practical approaches in the southern African region," workshop held in collaboration with ILSI, 1 September 2003, Pretoria, South Africa, at p. 4.

<sup>19</sup> A regional strategy for foodborne disease surveillance is currently in preparation by WHO/FAO. *Developing and Maintaining Food Safety Control Systems for Africa.* 

<sup>20</sup> Developing and Maintaining Food Safety Control Systems for Africa.

<sup>21</sup> Developing and Maintaining Food Safety Control Systems for Africa.

<sup>22</sup> The Regional Agricultural Trade Promotion and Food Security Program developed by COMESA has been conceived in the context of FAO supported Regional Food Security Programme (RPFS). More information available at: <a href="http://www.fao.org/tc/tca/pdf/comesa.pdf">http://www.fao.org/tc/tca/pdf/comesa.pdf</a>.

# CHAPTER 5: EUROPEAN REGION

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<sup>2</sup> WHO "Statistical Information on Food-borne Disease In Europe - Microbiological and Chemical Hazards", FAO/WHO Pan-European Conference on Food Safety and Quality, Budapest, Hungary, 25 – 28 February 2002, PEC 01/04.

<sup>3</sup> World Health Organization, Regional Office for Europe, "Food and Health in Europe: a new basis for action", Part 2, pp. 94-95, ISBN 92 890 1363X.

<sup>4</sup> Most of these outbreaks are due to the consumption of foods of animal origin, particularly insufficiently cooked eggs or foods containing raw eggs, such as mayonnaise, ice creams or cream-filled pastries. WHO "Several Foodborne Diseases are Increasing in Europe. 'Five keys to safer food' for winter holidays", Press release EURO/16/03, Copenhagen, Rome, Berlin, 16 December 2003.

<sup>5</sup> The countries included in the Balkan region are: Slovenia, Croatia, Bosnia and Herzegovina, the Former Yugoslav Republic of Macedonia, Serbia and Montenegro (formerly the Federal Republic of Yugoslavia), Albania, Greece, Romania, Bulgaria, and European Turkey.

<sup>6</sup> CJD surveillance unit, Edinburgh. More information is available at <a href="http://www.cjd.ed.ac.uk/figures.htm">http://www.cjd.ed.ac.uk/figures.htm</a>>.

<sup>7</sup> International Society for Infectious Diseases, "CJD (New Var.) Update 2005 (05)," *ProMED-mail* Archive Number 20050505.1243, Published May 5, 2005.

<sup>8</sup> In particular, on 22 May 2001, the European Parliament and Council adopted Regulation (EC) 999/2001 laying down rules for the prevention, control and eradication of certain transmissible spongiform encephalopathies, which is known as the "TSE Regulation". This Regulation is applicable as of 1 July 2001. *Official Journal of the European Union L 147*, *31/05/2001 P. 0001 – 0040*.

<sup>9</sup> This was introduced in light of scientific consensus that the spread of BSE in cattle was caused by the consumption of feed contaminated by ruminant protein in the form of meat and bone meat (MBM). The European Commission, "Questions and Answers on BSE," 8 January 2002, Memo/03/3 [hereafter Q&A on BSE].

 $^{10}Q$  & on BSE.

<sup>11</sup> Sweden is allowed to test only a random sample.

<sup>12</sup> In the UK, where the vast majority of bovine animals over 30 months of age are destroyed under the Over Thirty Months Scheme (OTMS), BSE testing must be carried out on the following animals slaughtered under that scheme: all bovine animals subject to casualty slaughter, all animals over 42 months of age born after 1 August 1996 and subject to normal slaughter and a random sample of bovine animals born before 1 August 1996 and subject to normal slaughter.

<sup>13</sup> More information available at

<http://www.europa.eu.int/comm/food/food/biosafety/bse/goats\_index\_en.htm>.

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- § Directive 2001/18/EC on the deliberate release into the environment of genetically engineered organisms is a 'horizontal' Directive, which regulates experimental releases and the placing on the market of genetically engineered organisms. *Official Journal of the European Communities L 106*,17 April 2001, pp. 0001-0039.
- § Regulation (EC) No1829/2003 on genetically engineered food and feed regulates the placing on the market of food and feed products containing or consisting of genetically engineered organisms and

also provides for the labelling of such products to the final consumer. Official Journal of the European Communities L 268, 18 October 2003, pp. 0001-0023.

- § Regulation (EC) No 1830/2003 on traceability and labelling of genetically engineered organisms (GMO) and the traceability of food and feed products from GMOs introduces a harmonised EU system to trace and label GMOs and to trace food and feed products produced from GMOs. Official Journal of the European Communities L 268, 18 October 2003, pp. 0024-0028.
- § Commission Regulation (EC) No 641/2004 on the detailed rules for the implementation of Regulation 1829/2003. Official Journal of the European Communities L 102, 07 April 2004, pp. 0014-0025.
- Directive 90/219/EEC, as amended by Directive 98/81/EC, on the contained use of genetically ş engineered micro-organisms (GEMs), regulates research and industrial work activities involving GEMs under conditions of containment. This includes work activities in laboratories. Official Journal of the European Communities L 117, 08 May 1990, pp. 0001-0014.

<sup>15</sup> European Commission "Questions and Answers on the regulation of GMOs in the EU", Brussels, 15 April 2004, Memo/04/85. Available at:

<http://www.europa.eu.int/comm/food/food/biotechnology/gmfood/gmo faq en.pdf>.

<sup>16</sup> World Health Organization, "Antimicrobial resistance", Fact sheet N°194, January 2002.

<sup>17</sup> According to a study of the European Federation of Animal Health (FEDESA), in 1999, farm animals consumed 4,700 tons (35 percent) of all the antibiotics administered in the European Union, and humans consumed 8,500 tons (65 percent). Of the antibiotics that were given to animals, 3,900 tons (or 29 percent of the total usage) were administered to help sick animals recover from disease, and 786 tons (or 6 percent of the total usage) were given to farm animals in their feed as growth promoters. The survey estimates that the amount of antibiotics used as growth promoters fell by 50 percent from the levels used in 1997, when animals consumed around 1,600 tons as feed additives. More information is available at:

<http://europa.eu.int/rapid/start/cgi/guesten.ksh?p\_action.gettxt=gt&doc=IP/02/466|0|RAPID&lg=EN>.

<sup>18</sup> Regulation (EC) No 1831/2003 of the European Parliament and of the Council of 22 September 2003 on additives for use in animal nutrition. Official Journal of the European Communities L 268, 18 October 2003, pp. 0029-0043.

<sup>19</sup> The European Commission, "Report from the Commission on food irradiation for the period September 2000 to December 2001", 09 October 2002, (COM (2002) 549)(2002/C 255/02).

<sup>20</sup> Directive 1999/2/EC of the European Parliament and of the Council of 22 February 1999 on the approximation of the laws of the Member States concerning foods and food ingredients treated with ionising radiation. Official Journal of the European Communities L 066, 13 March 1999, pp. 0016-0023.

<sup>21</sup> Examples for these kind of growth promoters are oestradiol 17ß, testosterone, progesterone, zeranol, trenbolone acetate, and melengestrol acetate (MGA).

<sup>22</sup> The legal instrument in force is Directive 96/22/EC (Official Journal of the European Communities L 125, 23/05/1996 P. 0003 – 0009) as amended by Directive 2003/74/EC (Official Journal of the European Communities L 262. 14/10/2003 P. 0017 - 0021).

<sup>23</sup> Only three uses remain permissible on a transitional basis and under strict veterinary control: treatment of foetus maceration/ mummification, pyometra in cattle (for animal welfare reasons), and oestrus induction in cattle, horses, sheep and goats. The latter use has to be phased out by September 2006. Products to be used for these remaining permissible purposes have to comply with the general marketing authorization requirements for veterinary medicinal products established in Directive (2001/82/EC). By October 2005 the Commission will present a report on the availability of alternative veterinary medicinal products to those containing oestradiol 17ß or its ester-like derivatives for the treatment of foetus maceration/mummification in cattle and for the treatment of pyometra in cattle.

<sup>24</sup> Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. *Official Journal of the European Communities L* 031, 01 February 2002, pp. 0001-0024.

<sup>25</sup> "Guidance on the implementation of Articles 11, 12, 16, 17, 18, 19 and 20 of Regulation (EC) No 178/2002 on General Food Law – Conclusions of the Standing Committee on the food chain and animal health", December 20, 2004. Available at

<http://europa.eu.int/comm/food/foodlaw/guidance/guidance\_rev\_7\_en.pdf>.

<sup>26</sup> M.C. Tirado, WHO Regional Office for Europe "Food safety strategies in Europe: Promoting a new approach to for food control in the region", Second FAO/WHO Global forum of food safety regulators, Bangkok, Thailand, 12-14 October 2004, CRD 84 [hereafter "*Food safety strategies in Europe*"].

<sup>27</sup> Lithuania "Constraints in CEEC countries to Achieving International Laboratory Accreditation", FAO/WHO Pan-European Conference on Food Safety and Quality, Budapest, Hungary, 25 – 28 February 2002, CRD 08 [hereafter "*Constraints in CEEC countries to Achieving International Laboratory Accreditation*"].

<sup>28</sup> Constraints in CEEC countries to Achieving International Laboratory Accreditation.

<sup>29</sup> More information available at <http://europa.eu.int/comm/enlargement/pas/phare/intro.htm>.

<sup>30</sup> Food safety strategies in Europe.

<sup>31</sup> The EFSA was formally established by the Regulation (EC) No 178/2002 (Articles 22 to 49).

<sup>32</sup> The "Österreichische Agentur für Gesundheit und Ernährungssicherheit GmbH" in Austria, the "Štátna veterinárna a potravinová správa" in Slovakia, the "Agence française de sécurité sanitaire des aliments" in France, the "Agencia Española de Seguridad Alimentaria"in Spain, the "Agência para a Qualidade e Segurança Alimentar" in Portugal, the "Bundesamt für Verbraucherschutz und Lebensmittelsicherheit (BVL)" in Germany, the "EΦET" in Greece, the "Elintarvikevirasto" in Finland, the "Fødevaredirektoratet" in Denmark, the "FAVV/AFSCA" in Belgium, the "Food Safety Authority of Ireland" in the Republic of Ireland, the "Státní zemìdìlské a potravináøské inspekce" in the Czech Republic, the "Valstybineë maisto ir veterinarijos tarnyba" in Lithuania, the "Veterinaar-ja Toiduamet" in The Netherlands, the Food Standards Agency in the United Kingdom, the "National Sanitary Veterinary and Food Safety Authority (ANSVSA)" in Romania. Available at <http://www.food.gov.uk/aboutus/agencyineurope/eufsanations>.

<sup>33</sup> Germany "Official Food Control and Legal Foundations in Germany", Second FAO/WHO Global forum of food safety regulators, Bangkok, Thailand, 12-14 October 2004, CRD 41.

<sup>34</sup> Regulation EC/178/2002 - Article 6.

<sup>35</sup> Regulation EC/178/2002 - Article 7.

<sup>36</sup> Regulation EC/178/2002 - Articles 19, 20 and 21.

<sup>37</sup> European Commission "Commission extends Sudan dye measures and reminds food operators of their responsibilities", Press Release, Brussels, 4 April 2005, IP/05/385. Available at: <a href="http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/05/385&format=HTML&aged=0&language=EN&guiLanguage=fr">http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/05/385&format=HTML&aged=0&language=EN&guiLanguage=fr</a>.

<sup>38</sup> In particular, Regulation EC/178/2002 - Article 18.

<sup>39</sup> Council Directive 2000/13/EC. Official Journal of the European Communities L 109, 06/05/2000 P. 0029 – 0042.

It has been amended by Commission Directive 2001/101/EC of 26 November 2001 regulating the definition of meat for labelling purpose, where meat is used as an ingredient in foodstuffs (*Official Journal of the European Communities L 310*, 28/11/2001 P. 0019 – 002) and by Directive 2003/89/EC of 10 November 2003, as regard indication of the ingredients present in foodstuffs (*Official Journal of the European Communities L 308*, 25/11/2003 P. 0015 – 0018).

<sup>40</sup> Regulation EC/178/2002 - Articles 19, 20.

<sup>41</sup> In general, these certificates must be signed by an official veterinarian of the competent authority of the exporting third country guaranteeing that the conditions for import into the EU have been met. Source: European Commission, DG Health and Consumer Protection, Animal Health and Welfare Internet Site "Trade and Imports of Live Animals – Introduction". Available at <a href="http://europa.eu.int/comm/food/animal/liveanimals/index\_en.htm">http://europa.eu.int/comm/food/animal/liveanimals/index\_en.htm</a>>.

<sup>42</sup> European Commission, Health and Consumer Protection Directorate General "General guidance for third country authorities on the procedures to be followed when importing live animals and animal products into the European Union", 1 October 2003. Available at <a href="http://europa.eu.int/comm/food/international/trade/guide\_thirdcountries\_en.pdf">http://europa.eu.int/comm/food/international/trade/guide\_thirdcountries\_en.pdf</a>>.

<sup>43</sup> Regulation (EC) No 882/2004 of the European Parliament and of the Council of 29 April 2004 on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules, *Official Journal of the European Union L 191, 28/05/2004 P. 0001 - 0052*.

<sup>44</sup> European Commission "Byrne welcomes completion of extensive review of food and feed controls and hygiene rules", Press Release, Brussels, 26 April 2004, IP/04/544. Available at <a href="http://europa.eu.int/rapid/pressReleasesAction.do">http://europa.eu.int/rapid/pressReleasesAction.do</a>?reference=IP/04/544&format=HTML&aged=0&langua ge=EN&guiLanguage=en>.

<sup>45</sup> For Aflatoxin levels: Commission Directive 1998/53/EC amended by Commission Directive 2002/27/EC; for levels of heavy metal and 3-MCPD: Commission Directive 2001/22/EC; for Dioxin levels: Commission Directive 2002/69/EC; for Ochratoxin A levels: Commission Directive 2002/26/EC; for Patulin levels: Commission Directive 2003/78/EC. More information available at <a href="http://europa.eu.int/comm/food/food/chemicalsafety/contaminants/sampling\_en.htm">http://europa.eu.int/comm/food/food/chemicalsafety/contaminants/sampling\_en.htm</a>>.

<sup>46</sup> Regulation EC/178/2002 - Article 17.

<sup>47</sup> Regulation EC/178/2002 - Article 22.

<sup>48</sup> Regulation EC/178/2002 - Article 34.

<sup>49</sup> Information and data reported: number of ill persons, causative agent, type of food, place where food was consumed, place where food was acquired, place where food was contaminated, factors contributing to outbreak. National sources of data include: statutory notifications (cases reporting); reporting of investigated outbreaks; laboratory reports; special surveys. Source: WHO/Regional Office for Europe "WHO surveillance program for control of foodborne infections and intoxications in Europe"; 8<sup>th</sup> report 1999-2000, Introduction. Available at <a href="http://www.bfr.bund.de/internet/8threport/8threp\_fr.htm">http://www.bfr.bund.de/internet/8threport/8threp\_fr.htm</a>>.

<sup>50</sup> The program for surveillance of foodborne diseases in Europe was launched by WHO/Europe in 1980, with the participation of 8 countries. The number of participating countries has steadily increased, reaching

51 in 2000. Under the responsibility of WHO/Europe, the program is managed by the Federal Institute for Risk Assessment (BfR), a FAO/WHO Collaborating Centre for Training and Research in Food Hygiene and Zoonoses. More information available at

<http://www.euro.who.int/eprise/main/WHO/Progs/FOS/Surveillance/20020903 3>.

<sup>51</sup> The CRLs have been designated in different Community Decisions, Directives and Regulations. Within the framework of Council Decision N° 90/424/EEC on expenditure in the veterinary field of 26 June 1990, these laboratories may receive a Community financial aid for fulfilling tasks and functions specified in legislation. Source: European Commission Internet site "Community Reference Laboratories in the field of Veterinary Public Health (Biological Risks)". More information available at <http://europa.eu.int/comm/food/fs/sfp/crl risk en.html>.

<sup>52</sup> Contribution of the Independent Consumers Union of Azerbaijan.

<sup>53</sup> Council Regulation 315/93/EEC of 8 February 1993. Official Journal of the European Communities L 037, 13 February 1993, pp. 0001-0003.

<sup>54</sup> RASFF is a system which has been in place since 1979 but which has been revised by the Regulation EC/178/2002 - Articles 50, 51 and 52. More information available at <http://europa.eu.int/comm/food/food/rapidalert/index en.htm>.

<sup>55</sup> Maximum levels are set for certain contaminants in foodstuffs in Commission Regulation 466/2001 of 8 March 2001 and in the subsequent amendments as follows: nitrate in lettuce and spinach (Commission Regulation 563/2002), aflatoxins in nuts, dried fruit, cereals, spices and milk (Commission Regulation 257/2002 and Commission Regulation 472/2002), the heavy metals lead, cadmium and mercury in a range of foods (Commission Regulation 221/2002), 3-monochloropropane diol (3-MCPD) in soy sauce and hydrolysed vegetable protein, Dioxins in a range of foods (Council Regulation 2375/2001), Ochratoxin A cereals and cereal products and dried vine fruit (Commission Regulation 472/2002), Patulin in apple juice and apple juice ingredients in other beverages (Commission Regulation 1425/2003). More information available at <http://europa.eu.int/comm/food/food/chemicalsafety/contaminants/legisl en.htm>.

 $^{56}$  The proposed Regulation is scheduled to go to the European Parliament for a second reading with a view to allow it to enter into force in 2005. It should replaces and simplify the four existing basic Council Directives on pesticide residues, namely Directives 76/895/EEC, 86/362/EEC, 86/363/EEC and 90/642/EEC. Source: European Commission "Pesticides: consumer protection to be boosted via harmonisation of maximum residue levels", Press Release, Brussels, March 14 2003, IP/03/383. Available at

<http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/03/383&format=HTML&aged=0&langua ge=EN&guiLanguage=en>.

<sup>57</sup> Regulation (EC) 852/2004 on the hygiene of foodstuffs, 29 April 2004. Official Journal of the European Union L 139. 30/04/2004 P. 0001 - 0054.

Regulation (EC) 853/2004 laying down specific hygiene rules for food of animal origin, 29 April 2004. *Official Journal of the European Union L 226*, 25/06/2004 P. 0022 – 0082.

Regulation (EC) 854/2004 laying down specific rules for the organisation of official controls on products of animal origin intended for human consumption, 29 April 2004. Official Journal of the European Union L 139, 30/04/2004 P. 0206 - 0319.

Directive 2004/41/EC repealing certain Directives concerning food hygiene and health conditions for the production and placing on the market of certain products of animal origin intended for human consumption and amending Council Directives 89/662/EEC and 92/118/EEC and Council Decision 95/408/EC, 21 April 2004. Official Journal of the European Union L 157, 30/04/2004 P. 0033 – 0044.

Regulation (EC) No 882/2004 on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules. *Official Journal of the European Union L 165*,  $30/04/2004 P.\ 0001 - 0141$ .

<sup>58</sup> HACCP systems are already mandatory in certain sectors like in meat plants for example (Commission Decision 2001/471/EC. *Official Journal of the European Communities L 165*, 21/06/2001 P. 0048 – 0053).

<sup>59</sup> On 26 of April 2004, the Council adopted the Regulation of the European Parliament and of the Council laying down requirements for feed hygiene: "Regulation of the European Parliament and of the Council laying down requirement for feed hygiene". The proposal will replace Council Directives 95/69/EC and 98/51/EC laying down the conditions and arrangements for approving and registering certain establishments and intermediaries operating in the animal feed sector. The new regulation introduces the following main elements:

- § compulsory registration of all feed business operators by the competent authority;
- § approval system for feed businesses that deal with higher-risk substances;
- § mandatory hygiene requirements for all feed manufactures;
- § mandatory good hygiene practice at all levels of agriculture production and use of feed;
- § Hazard Analysis Critical Control Point (HACCP) principles for the feed business operators other than at the level of primary production;
- § compulsory requirements for feed production at farm level;
- § a EU framework for guides to good practice in feed production.

Moreover, it endorses the principle that feed business operators must provide a financial guarantee in order to cover the risks related to their businesses.

Source: European Commission, DG Health and Consumer Protection Internet Site "Animal Nutrition –Feed Hygiene". Available at <a href="http://europa.eu.int/comm/food/food/animalnutrition/feedhygiene/index\_en.htm">http://europa.eu.int/comm/food/food/animalnutrition/feedhygiene/index\_en.htm</a>

<sup>60</sup> European Community "European Union Training Centre on Food Safety", Second FAO/WHO Global forum of food safety regulators, Bangkok, Thailand, 12-14 October 2004, CRD 30.

<sup>61</sup> The report is compiled in accordance with Article 5 of Council Directive N° 92/117/EEC and it is based on annual reports submitted by the Member States and Norway. The report contains a valuable overview of the prevalence of zoonoses in the Community. Source: European Commission, DG Health and Consumer Protection, Food and Feed Safety Internet site "Salmonella and Food-borne Diseases-Introduction". Available at <a href="http://europa.eu.int/comm/food/food/biosafety/salmonella/index\_en.htm">http://europa.eu.int/comm/food/food/biosafety/salmonella/index\_en.htm</a>>.

<sup>62</sup> Adopted on 29th September 2003:

- Regulation (EC) 2160/2003 of the European Parliament and of the Council of 17 November 2003 on the control of salmonella and other specified food-borne zoonotic agents, *Official Journal of the European Union L 325*, 12/12/2003 P. 0001 - 001, and

- Directive 2003/99/EC of the European Parliament and of the Council of 17 November 2003 on the monitoring of zoonoses and zoonotic agents, amending Council Decision 90/424/EEC and repealing Council Directive 92/117/EEC, *Official Journal of the European Union L 325*, *12/12/2003 P. 0031 - 004*.

<sup>63</sup> Within those approved programs, the eradication of some *Salmonella* serotypes (*Salmonella* enteritidis and *Salmonella* Typhimurium) from fowl breeding flocks (Gallus gallus) has been co-financed by the European Community.

<sup>64</sup> Lindblad, Johan, "Animal Health and Food Safety in Swedish Chicken Production," in "The Swedish Model of Animal Production," (Ministry of Agriculture, Food and Fisheries, Sweden, Stockholm 3-4 September 1998), p.26.

<sup>65</sup> Ministry of Agriculture, Food and Fisheries (Sweden), *Country report on the Swedish experience relating to the control of Salmonella in the national herd, with specific focus on the salmonella policy related to poultry production, and the results regarding Salmonella prevalence and human salmonellosis incidence*, FAO/WHO Global Forum of Food Safety Regulators, Marrakech, Morocco, 28-30 January 2002.

<sup>66</sup> Lo Fo Wong DMA, Andersen JK, Nørrung B, Wegener HC, *Food contamination monitoring and foodborne disease surveillance at national level*, Second FAO/WHO Global Forum for Food Safety Regulators, Bangkok, Thailand, 12-14 October 2004.

### CHAPTER 6: CENTRAL AND SOUTH AMERICAN REGION

<sup>1</sup> World Health Organization, Pan American Health Association, 13th Inter American meeting, at the ministerial level, on health and agriculture "Proposed Plan of Action of the Pan American Institute for Food Protection and Zoonoses (INPPAZ), 2004-2005", RIMSA 13/5, 17 March 2003, p. 1 [hereafter "*Proposed Plan of Action of INPPAZ*"].

<sup>2</sup> Pan American Health Association "Annual Report of the Director 2003", at p. 72.

<sup>3</sup> Proposed Plan of Action of INPPAZ, p. 3.

<sup>4</sup> INPPAZ "International cooperation on food contamination monitoring and foodborne disease surveillance. A case study in the AMRO Region", Second FAO/WHO Global forum of food safety regulators, Bangkok, Thailand, 12-14 October 2004, CRD 66 [hereafter "*International cooperation on food contamination monitoring and foodborne disease surveillance in the AMRO region*"].

<sup>5</sup> Data from 21 countries - SIRVETA, Outbreak Data for Latin America and the Caribbean, PAHO- From years 1993 – 2002.

<sup>6</sup> International cooperation on food contamination monitoring and foodborne disease surveillance in the AMRO region.

<sup>7</sup>International cooperation on food contamination monitoring and foodborne disease surveillance in the AMRO region.

<sup>8</sup> During the mid-1990s, the available epidemiology data showed that *Ciguatera* (a form of human poisoning caused by the consumption of marine fish that has accumulated naturally occurring toxins) was one of the main causes of disease from fish products in Cuba. Between 1993 and 1998, 1086 outbreaks of *Ciguatera* were recorded in Cuba, representing 3116 individual cases. Mortality attributed to *Ciguatera* during this period reached 6 percent of all recorded deaths resulting from food hazards. *Ciguatera* peaked in 1996 with 279 recorded outbreaks. Source: Based on data from the Cuban Ministry of Public Health and Ministry of Fishery Industries (FAO/MIP Workshop on Quantitative Risk Assessment in the Fishery Industry, Havana, March 2000). Available at <a href="http://www.fao.org/docrep/003/x8002e/x8002e05.htm">http://www.fao.org/docrep/003/x8002e/x8002e05.htm</a>>.

<sup>9</sup> World Health Organization "Water for Health –Taking Charge", 2001, p. 18-19. Available at <a href="http://www.who.int/water\_sanitation\_health/en/wwdreport.pdf">http://www.who.int/water\_sanitation\_health/en/wwdreport.pdf</a> >.

10

Which of the following circumstances have been influential in the appearance of outbreaks of foodborne illness in the Andean countries?

|  | Bolivia | Colombia | Peru | Venezuela |
|--|---------|----------|------|-----------|
| Population growth                      | Ι       | Ι        | Ι    | Р         |
| Growth of vulnerable population groups | V       | V        | Ι    | V         |

| Increased urban living                          | Ι                         | Р             | Р  | Р   |  |  |  |
|---|---------------------------|---------------|----|-----|--|--|--|
| Increased tourism                               | Р                         | V             | Р  | Р   |  |  |  |
| Intense international trade                     | I*                        | Р             | Р  | Р   |  |  |  |
| Use of new production techniques                | Ι                         | Ι             | Р  | V   |  |  |  |
| Need for long distance transportation of food   | Р                         | V             | Р  | Р   |  |  |  |
| Preference for processed foods                  | V                         | Ι             | Р  | Ι   |  |  |  |
| Increased food consumption in institutionalized | V                         | V             | Р  | Р   |  |  |  |
| cafeterias                                      |                           |               |    |     |  |  |  |
| Lack of food safety training for food handlers  | V                         | V             | V  | V   |  |  |  |
| Consumption of food on the street               | V                         | V             | Ι  | Ι   |  |  |  |
| Personal hygiene throughout the food chain      | V                         | **            | V  | *** |  |  |  |
| Minimal attention to hygiene in home kitchens   | V                         | **            | V  | *** |  |  |  |
| Excessive retention times (between preparation  | V                         | V             | Ι  | V   |  |  |  |
| and consumption)                                |                           |               |    |     |  |  |  |
| Inadequate refrigeration temperatures           | V                         | V             | V  | V   |  |  |  |
| Insufficient cooking times                      | Ι                         | V             | Ι  | Ι   |  |  |  |
| Cross contamination                             | V                         | V             | V  | V   |  |  |  |
| Presence of sick food handlers                  | V                         | V             | Ι  | V   |  |  |  |
| Use of raw materials from uncertain sources     | Ι                         | V             | V  | Ι   |  |  |  |
| * Contraband                                    | $\mathbf{V} = \mathbf{V}$ | ery influenti | al |     |  |  |  |
| ** Lack of potable water                        | $I = I_{I}$               | nfluential    |    |     |  |  |  |
| *** Others P = Poorly influential               |                           |               |    |     |  |  |  |

Source: FAO "Strengthening the management of the National Codex Alimentarius Committees in Andean Countries. Report from the Subregional Workshop for trainers on Good Manufacturing Practices and the HACCP system for food control", Bogota, Colombia September, 2003, Project TCP/RLA 2904.

<sup>11</sup> Brazilian beef is popularly known as "green beef" to indicate the fact that cattle feed in open pastures or in confined conditions but always with vegetable products.

<sup>12</sup> Technical Cooperation Program (TCP) from the Food and Agriculture Organization "Evaluación y Reforzamiento del Sistema de prevención de la Encefalopatia Espongiforme Bovina y el Sistema de Control de calidad de Piensos", TCP/RAL/0017. Available at <a href="http://www.rlc.fao.org/prior/segalim/animal/eeb/tcp0177/">http://www.rlc.fao.org/prior/segalim/animal/eeb/tcp0177/</a>.

<sup>13</sup> Elisabete Salay "Food Safety in Food Security and Food Trade – Case Study Reducing mycotoxins in Brazilian crops", Brief 15, International Food Policy Research Institute, Focus 10, September 2003.

<sup>14</sup> Contribution of Mariso Caipo from Asociación Peruana de Consumidores y Usuarios (ASPEC).

<sup>15</sup> George W. Norton, Guillermo E. Sanchez, Dionne Clarke Harris, Halimatou Koné Traoré "Food Safety in Food Security and Food Trade – Case Study Reducing pesticide residues on horticultural crops", Brief 10, International Food Policy Research Institute, Focus 10, September 2003.

<sup>16</sup> Contribution of Mariso Caipo from Asociación Peruana de Consumidores y Usuarios (ASPEC).

| Total      | Ill        | Consultation | No consultation |
|------------|------------|--------------|-----------------|
| 25,655,031 | 6,448,382  | 3,603,471    | 2,884,911       |
|            | Healthy    | Consultation | No consultation |
|            | 19,176,649 | 526,205      | 18,650,444      |

<sup>17</sup> Total population and population that consulted a doctor in Peru in the year 2000:

Source: Instituto Cuanto: "Encuesta Nacional sobre Medicion de Niveles de Vida (ENNIV) 2000". From Webb, R. and Fernandez Baca, G. 2003. Anuario Estadisitco: Peru en Numeros 2003. Instituto Cuanto Lima, Peru. p. 346.

| <sup>10</sup> Registered | cases of acute of | liarrheal disease | in children your | nger than 5 years | s of age. 1997 – | 2002. Peru: |
|--------------------------|-------------------|-------------------|------------------|-------------------|------------------|-------------|
|                          | 1007              | 1008              | 1000             | 2000              | 2001             | 2002        |

|             | 1997             | 1990    | 1999    | 2000    | 2001    | 2002    |
|-------------|------------------|---------|---------|---------|---------|---------|
| Total       | 607,871          | 606,544 | 515,424 | 553,854 | 538,245 | 665,624 |
| Source Paru | vian Ministry of | Health  |         |         |         |         |

Source: Peruvian Ministry of Health.

Webb, R. and Fernandez Baca, G. 2003. Anuario Estadisitco: Peru en Numeros 2003. Instituto Cuanto Lima, Peru. p. 351.

<sup>19</sup>Source: Instituto Cuanto: "Encuesta Nacional sobre Medicion de Niveles de Vida (ENNIV) 2000". fromWebb, R. and Fernandez Baca, G. 2003. Anuario Estadisitco: Peru en Numeros 2003. Instituto Cuanto Lima, Peru. p. 346.

<sup>20</sup> Main causes for hospitalization at the Institute de Salud del Niño (Children's Health Institute) 1992 – 2001. Lima, Peru:

|                               | 1992                                    | 1993 | 1994 | 1995 | 1996 | 1997 | 1998   | 1999   | 2000   | 2001   |
|-------------------------------|---|------|------|------|------|------|--------|--------|--------|--------|
| Total n                       | Total number hospitalized               |      |      |      |      |      |        |        |        |        |
|                               | 6748                                    | 6627 | 6207 | 7042 | 7408 | 7504 | 11,160 | 11,543 | 12,093 | 11,619 |
| Disease                       | Diseases of the digestive system        |      |      |      |      |      |        |        |        |        |
|                               | 851                                     | 754  | 820  | 839  | 816  | 886  | 911    | 941    | 900    | 823    |
| Other i                       | Other infectious and parasitic diseases |      |      |      |      |      |        |        |        |        |
|                               | 869                                     | 634  | 547  | 743  | 749  | 693  | 467    | 388    | 342    | 257    |
| DYSENTERY AND GASTROENTERITIS |   |      |      |      |      |      |        |        |        |        |
|                               | -                                       | -    | -    | -    | -    | 519  | 525    | 577    | 677    | 727    |

Source: Instituto de Salud del Niño – Oficina de Estadistica e Informatica.

From Webb, R. and Fernandez Baca, G. 2003. Anuario Estadisitco: Peru en Numeros 2003. Instituto Cuanto Lima, Peru. p. 274.

# <sup>21</sup> Proposed Plan of Action of INPPAZ, p. 9.

<sup>22</sup> As of October 2004, INFAL was integrated by 54 laboratories from 28 countries. It was established in December 1997. *International cooperation on food contamination monitoring and foodborne disease surveillance in the AMRO region*. More information available at <a href="http://www.panalimentos.org/rilaa/ingles/index.asp">http://www.panalimentos.org/rilaa/ingles/index.asp</a>>.

<sup>23</sup> It was established by PAHO/WHO, in alliance with the U.S. Centers for Disease Control and Prevention - CDC and the National Institute of Infectious Diseases of Argentina. *International cooperation on food contamination monitoring and foodborne disease surveillance in the AMRO region*.

<sup>24</sup> More information available at <http://www.panalimentos.org/salmsurv>.

<sup>25</sup> Epi-ETA is an initiative of the WHO Collaborating Center for Foodborne Disease Surveillance at the Centers for Disease Control and Prevention (Foodborne and Diarrheal Diseases Branch and the Food Safety Office) in the USA and the Pan American Health Organization (PAHO) specialized center, INPPAZ (Pan American Institute for Food Safety) in Argentina. More information available at <a href="http://www.epi-eta.org/">http://www.epi-eta.org/</a>>.

<sup>26</sup> SIRVETA has a web-based database where users enter queries about Foodborne diseases. PAHO Member Countries have agreed to report, at least once a month, the information related to cases/outbreaks, with information of patients in terms of place, time and person, the implicated food and the etiological agent. *International cooperation on food contamination on food contamination monitoring and foodborne disease surveillance in the AMRO region*. More information available at: < http://www.panalimentos.org/sirveta/e/index.htm>.

<sup>27</sup> Proposed Plan of Action of INPPAZ, p. 7.

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<sup>28</sup> Contribution of the Brazilian consumer organization, PRO TESTE.

<sup>29</sup> Law no. 8078 as of September 11, 1990.

<sup>30</sup> Government of Brazil "Assembling Effective Food Safety Systems - The Official Strengthening of Food Safety Control Services", Second FAO/WHO Global forum of food safety regulators, Bangkok, Thailand, 12-14 October 2004, CRD 9.

<sup>31</sup> PRO TESTE, a Brazilian consumer organization, is currently conducting comparative tests in organic vegetables in order to verify such claims in large urban centers.

## CHAPTER 7: NORTH AMERICAN REGION

<sup>1</sup> Jose Luis Flores Luna, Ministry of Health, Amada Vélez Méndez, Ministry of Agriculture, Livestock, Rural Development, Fishery and Food of Mexico, "Communication and participation – The experience of Mexico", FAO/WHO Global Forum of Food Safety Regulators, Morocco, January 2002, GF 01/6 [hereafter "*FAO/WHO Global Forum*"]; Population Resource Center, "Executive Summary: A Demographic Profile of Mexico" <a href="http://www.prcdc.org/summaries/mexico/mexico.html">http://www.prcdc.org/summaries/mexico/mexico.html</a>.

<sup>2</sup> Pan American Health Organization, "Core Health Data Selected Indicators. Data Updated to 2002; and the Health Situation Analysis and Trends Summary." Available at <a href="http://www.paho.org/English/DD/AIS/cp\_484.htm">http://www.paho.org/English/DD/AIS/cp\_484.htm</a>>.

<sup>3</sup> Health Canada, "Health Canada Policy - Food Program - Food Safety Assessment Program", January 2nd, 2002. Available at <a href="http://www.hc-sc.gc.ca/food-aliment/fsa-esa/e\_policy.html">http://www.hc-sc.gc.ca/food-aliment/fsa-esa/e\_policy.html</a>.

<sup>4</sup> Mead PS, Slutsker L, Dietz V, et al., Centers for Disease Control and Prevention, "Food-Related Illness and Death in The United States," Emerging Infectious Diseases, 1999, Vol.5, No.5, pp. 607-25.

<sup>5</sup> Centers for Disease Control and Prevention "Preliminary FoodNet Data on the Incidence of Infection with Pathogens Transmitted Commonly Through Food - Selected Sites, United States, 2003," Morbidity and Mortality Weekly Report, April 30, 2004/53(16);338-343.

<sup>6</sup> Center for Science in the Public Interest, "Outbreak Alert! Closing the Gaps in Our Federal Food-Safety Net," March 2004. Available at <a href="http://cspinet.org/new/pdf/outbreakalert2004.pdf">http://cspinet.org/new/pdf/outbreakalert2004.pdf</a>>.

- CSPI tracked a total of 3,500 outbreaks, representing 115,700 individual cases of foodborne illness that occurred between 1990-2003. The top five single-food vehicles of outbreaks were:
  - Seafood and seafood dishes, with 720 outbreaks and 8,044 cases of illness.
  - Produce and produce dishes, with 428 outbreaks and 23,857 cases.
  - Poultry and poultry dishes, with 355 outbreaks and 11,898 cases of illness.
  - Beef and beef dishes, with 338 outbreaks and 10,795 cases of food poisoning.
  - Eggs and Egg dishes, with 306 outbreaks and 10,449 cases.
- Multi-ingredient foods (such as salads, pizza, and sandwiches) where the contaminated ingredient was not identified were linked to a total of 591 outbreaks and 17,728 cases of food poisoning.
- Foods regulated by the Food and Drug Administration (FDA) were the vehicles in two-thirds of the outbreaks in CSPI's database, while foods (meat, poultry) regulated by the U.S. Department of Agriculture (USDA) were the vehicles in one-fourth of the outbreaks.

<sup>7</sup> Campylobacter (all serotypes), Salmonella (nontyphoidal), Escherichia coli O157, Escherichia coli non-O157 STEC, and Listeria monocytogenes.

<sup>8</sup> Data from the Economic Research Service of the United States Department of Agriculture (ERS), "Economics of Foodborne Disease: Feature." Available at <http://www.ers.usda.gov/briefing/FoodborneDisease/features.htm>.

<sup>9</sup> ERS Data, "Foodborne Illness Cost Calculator: Salmonella."

Available at <http://www.ers.usda.gov/Data/FoodBorneIllness/salm\_Intro.asp?pathogen=Salmonella>. This estimate is for all cases of salmonellosis, not just foodborne cases. The estimate includes medical costs due to illness, the cost (value) of time lost from work due to nonfatal illness, and the cost (value) of premature death. It excludes a number of other potential costs, such as those associated with chronic complications, disutility for nonfatal illness, pain and suffering, travel, childcare, etc.

<sup>10</sup> Mead PS, Slutsker L, Dietz V, McCaig LF, Bresee JS, Shapiro C, Griffin PM, and Tauxe RV. Food-related illness and death in the United States. *Emerg Infect Dis* 1999 Volume 5, Number 5.

<sup>11</sup> Bern C, Hernandez B, Lopez MB, Arrowood MJ, Alvarez de Mejia M, De Merida AM, Hightower AW, Venczel L, Herwaldt BL, Klein RE "Epidemiologic studies of *Cyclospora cayetanensis* in Guatemala." Emerging Infectious Diseases 1999; 5:766-74.

 $^{12}$  CDC. Preliminary FoodNet data on the incidence of infection with pathogens transmitted commonly through food – 10 sites, United States, 2004. *MMWR* 2005; 54(14): 352-356.

<sup>13</sup> FAO/WHO, "International cooperation on food contamination and foodborne disease surveillance," Second FAO/WHO Global Forum of Food Safety Regulators, Bangkok, Thailand, October 12-14, 2004.

<sup>14</sup> Center for Science in the Public Interest, Antibiotic Resistance Project, "Human-use antibiotics are used to treat animal disease". Available at <a href="http://www.cspinet.org/ar/ar\_animaldisease.html">http://www.cspinet.org/ar/ar\_animaldisease.html</a>>.

<sup>15</sup> GAO Report, "Antibiotic resistance: federal agencies need to better focus efforts to address risk to humans from antibiotic use in animals." April 2004. GAO-04-490.

<sup>16</sup> Sarah Sims, Leicester Royal Infirmary drug information pharmacist, "Underground Resistance," Dot Pharmacy. Available at <a href="http://www.dotpharmacy.co.uk/upanti.html">http://www.dotpharmacy.co.uk/upanti.html</a>>.

<sup>17</sup> Kirk E. Smith and others, "Quinolone-Resistant *Campylobacter jejuni* Infections in Minnesota, 1992-1998," New England Journal of Medicine Vol. 340, No. 20 (May 20, 1999), p. 1525-1532.

<sup>18</sup> Health Canada, "The Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS) – Frequently Asked Questions." Available at <a href="http://www.hc-sc.gc.ca/vetdrugs-medsvet/cipars\_faq\_e.html">http://www.hc-sc.gc.ca/vetdrugs-medsvet/cipars\_faq\_e.html</a>.

<sup>19</sup> Centers for Disease Control and Prevention, "FAQ: Antibiotic Resistance and Foodborne Illness," December 29, 2003.

<sup>20</sup> FDA, "NARMS Brochure - National Antimicrobial Resistance Monitoring System - Enteric Bacteria", May 2003.

<sup>21</sup> Food and Nutrition Board, Institute of Medicine, "Seafood Safety: Committee on Evaluation of the Safety of Fishery Products," Ahmed FE (ed.), National Academy Press: Washington, DC, 1991, p. 117.

<sup>22</sup> USDA and EPA "What you need to know about Mercury in Fish and Shellfish," March 2004, EPA-823-R-04-005. Available at < http://www.cfsan.fda.gov/~dms/admehg3.html>.

<sup>23</sup> W. Reed Moran, Stephen A. Shoop, M.D. "Robert F. Kennedy, Jr. votes against PCBs", USA Today, 09/24/2001. Available at <a href="http://www.usatoday.com/news/health/spotlight/2001-09-24-kennedy-pcbs.htm">http://www.usatoday.com/news/health/spotlight/2001-09-24-kennedy-pcbs.htm</a>>.

<sup>24</sup> World Health Organization, Food Safety Department, "Food Safety Issues: Terrorist Threats to Good, Guidance for Establishing and Strengthening Prevention and Response Systems," (2002), at p. 5.

<sup>25</sup> Centers for Disease Control and Prevention, "Nicotine poisoning after ingestion of contaminated ground beef – Michigan, 2003," *MMWR* 2003; 52(18): 413-16.

<sup>26</sup>Emergencies plans such as the CFIA Emergency Book and the Functional Food Safety Emergency Plan.

<sup>27</sup> Government of Canada "Prevention and Response to Intentional Contamination", Second FAO/WHO Global forum of food safety regulators, Bangkok, Thailand, 12-14 October 2004, CRD 47.

<sup>28</sup> Government of Canada "Canadian Approach to a More Responsive Food Safety Control System", Second FAO/WHO Global forum of food safety regulators, Bangkok, Thailand, 12-14 October 2004, CRD 44.

<sup>29</sup> Health Canada, "Bioterrorism and Emergency Preparedness", June 2003. Available at <a href="http://www.hc-sc.gc.ca/english/protection/bioterrorism.htm">http://www.hc-sc.gc.ca/english/protection/bioterrorism.htm</a>>.

<sup>30</sup> Canadian Food Inspection Agency, "Enhancements to BSE Surveillance and Animal Tracking," January 9, 2004. Available at

<a href="http://www.inspection.gc.ca/english/anima/heasan/disemala/bseesb/bseesbsurvfse.shtml">http://www.inspection.gc.ca/english/anima/heasan/disemala/bseesb/bseesbsurvfse.shtml</a>>.

<sup>31</sup> Canadian Food Inspection Agency, "Canada to enhance BSE feed controls", July 9, 2004. Available at <a href="http://www.inspection.gc.ca/english/corpaffr/newcom/2004/20040709e.shtml">http://www.inspection.gc.ca/english/corpaffr/newcom/2004/20040709e.shtml</a>>.

<sup>32</sup> More information available at

http://www.inspection.gc.ca/english/anima/heasan/disemala/bseesb/bseesbindexe.shtml.

<sup>33</sup> United States Department of Agriculture, "Joint Statement by the United States, Canada and Mexico," News Release No. 0022.04, January 16, 2004. Available at <a href="http://www.usda.gov/Newsroom/0022.04.html">http://www.usda.gov/Newsroom/0022.04.html</a>> [hereafter *Joint Statement*].

<sup>34</sup> United States Department of Agriculture, "Veneman Announces Expanded BSE Surveillance Program," News Release No. 0105.04, March 15, 2004. Available at <a href="http://www.usda.gov/Newsroom/0105.04.html">http://www.usda.gov/Newsroom/0105.04.html</a>>.

<sup>35</sup> United States Department of Health and Human Services, "Expanded "Mad Cow" Safeguards Announced To Strengthen Existing Firewalls Against BSE Transmission," Jan. 26, 2004. Available at <a href="http://www.hhs.gov/news/press/2004pres/20040126.html">http://www.http://wwww.http://www.http://www.http://wwww

<sup>36</sup> Joint Statement.

<sup>37</sup> The Cartagena Protocol on Biosafety was adopted on January 29, 2000 by the Convention on Biological Diversity. More information on the Protocol available at <a href="http://www.biodiv.org/biosafety/background.asp">http://www.biodiv.org/biosafety/background.asp</a>>.

<sup>38</sup> A Living Modified Organism (LMO) is defined in the Cartagena Protocol on Biosafety as any living organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology. In everyday usage LMOs are usually considered to be the same as GEOs (Genetically Engineered Organisms).

<sup>39</sup> Elisabeth Malkin, "Research Panel Warns Mexico of Threat from Modified Corn," The New York Times, March 12, 2004.

<sup>40</sup> Center for Science in the Public Interest, Biotechnology Project "Frequently-Asked Questions". Available at <a href="http://www.cspinet.org/biotech/faq.html">http://www.cspinet.org/biotech/faq.html</a>.

<sup>41</sup> Gregory Jaffe, "Planting Trouble: Are Farmers Squandering Bt Corn Technology? An analysis of USDA Data showing significant non compliance with EPA's refuge requirements," Center for Science in the Public Interest, 2003.

<sup>42</sup> U.S. Centers for Disease Control and Prevention (CDC), Frequently Asked Questions About Food Irradiation, <a href="http://www.cdc.gov/ncidod/dbmd/diseaseinfo/foodirradiation.htm">http://www.food Administration (FDA), Food Irradiation: A Safe Measure, <a href="http://www.fda.gov/opacom/catalog/irradbro.htm">http://www.fda.gov/opacom/catalog/irradbro.htm</a>).

<sup>43</sup> Center for Food Safety, Facts and Issues, CFS Publications, CFS Winter 2002 Food Safety Review, "Irradiation Revisited: As FDA Considers Expanded Use, New Health Concerns Arise," <a href="http://www.centerforfoodsafety.org">http://www.centerforfoodsafety.org</a> ; Center for Food Safety, facts and Issues, CFS Publications, CFS Winter 2002 Food Safety Review, "Irradiation Revisited: As FDA Considers Expanded Use, New Health Concerns Arise," <a href="http://www.centerforfoodsafety.org/">http://www.centerforfoodsafety.org</a> ; Center for Food Safety Review, "Irradiation Revisited: As FDA Considers Expanded Use, New Health Concerns Arise," <a href="http://www.centerforfoodsafety.org/">http://www.centerforfoodsafety.org/</a> >.

<sup>44</sup> Centers for Disease Control and Prevention, "Frequently Asked Questions about Food Irradiation: Which Foods Have Been Approved for Irradiation in The United States?," September 29, 1999. Available at <a href="http://www.cdc.gov/ncidod/dbmd/diseaseinfo/foodirradiation.htm#foodapproved">http://www.cdc.gov/ncidod/dbmd/diseaseinfo/foodirradiation.htm#foodapproved</a>>.

<sup>45</sup> These programs include:

- i) the "National Food Safety Education Month" taking place in September whose goals are to reinforce food safety education and training among restaurant and foodservice workers and to educate the public to handle and prepare food properly at home;
- ii) the USDA/FDA "Foodborne Illness Education Information Center" which provides information about foodborne illness prevention to educators, trainers, and organizations developing education and training materials for food workers and consumers;
- iii) the "Food Safety Training and Education Alliance for Retail, Food Service, Vending, Institutions, and Regulators (FSTEA)" which coordinate efforts of government, industry, and academia in order to change behaviours at the retail level and to remove barriers to communication by facilitating information exchange, strengthening communications networks and alliances, and coordinating/supporting collaborative projects;
- iv) the "Primer", developed by FDA, in collaboration with the American Medical Association (AMA), the CDC, and the USDA, and which is intended to provide physicians with current guidelines for the diagnosis, treatment, reporting, and prevention of foodborne illness; it also provides physicians with information for patients on prevention of foodborne illness;
- v) the "Lose a Million (Bacteria)" game, developed by the FDA and the "National Science Teachers Association (NSTA)" which is a fun, interactive game based on the popular TV game show, "Who wants to be a Millionaire."; the game begins with a million bacteria and the object of the game is to lose bacteria;
- vi) the "Science and Our Food Supply" program, developed by the FDA, the NSTA and the "Center for Food Safety and Applied Nutrition (CFSAN)" which is a public education program developed to teach middle and high school students about food safety and food science careers;
- vii) the "Senior and Food Safety" campaign developed by FDA and USDA, which informs senior citizens about foodborne illness and contain information on eating in and outside the home and

address, among other topics, why some people are at greater risk for foodborne illness and how to recognize it.

<sup>46</sup> More information on the *Fight*BAC!<sup>TM</sup> campaign available at <http://www.fightbac.org>.

<sup>47</sup> For example:

-"EdNet", the National Food Safety Educator's Network, which is an electronic network for food safety educators intended as a one-way direct mail food safety education update from the FDA, USDA, and CDC; and

- "Foodsafe" which is an interactive electronic discussion group intended as a communication tool to link professionals interested in food safety issues.

<sup>48</sup> Health Canada, "The Canadian Partnership for Consumer Food Safety Education." More information available at <a href="http://www.hc-sc.gc.ca/food-aliment/mh-dm/mhe-dme/e\_fightbac.html">http://www.hc-sc.gc.ca/food-aliment/mh-dm/mhe-dme/e\_fightbac.html</a>.

<sup>49</sup> Associated Press, "Food safety mistakes caught on tape," June 19, 2000.

<sup>50</sup> Government of Canada, "Canada's Regulatory Framework and Food Safety Program," country paper proposed by Canada, FAO/WHO Global Forum of Food Safety Regulators, Marrakesh, Morocco, January 2002, GF/CRD Canada-1.

<sup>51</sup> Pan American Health Organization, "Summary of information from the Core Health Data System updated in the year 2002, and the General Health Situation and Trends CANADA." Available at <a href="http://www.paho.org/English/DD/AIS/cp\_124.htm">http://www.paho.org/English/DD/AIS/cp\_124.htm</a>.

<sup>52</sup> Government of Canada "Defining the Responsibilities and Tasks of Different Stakeholders within the Framework of a National Strategy for Food Control", Second FAO/WHO Global forum of food safety regulators, Bangkok, Thailand, 12-14 October 2004, CRD 43.

### <sup>53</sup> FAO/WHO Global Forum.

<sup>54</sup> National Research Council, Institute of Medicine, "Ensuring Safe Food: From Production to Consumption", National Academy Press, Washington, D.C. 1998, p. 9.

<sup>55</sup> General Accounting Office, "*Food Safety: Overview of Federal and State Expenditures*" 2-3 (2001) [hereafter *GAO Food Safety Expenditures*], available at <<u>http://www.gao.gov/new.items/d01177.pdf</u>>; U.S. Department of Agriculture, Office of Budget Program and Analysis, USDA FY 2003 Budget Summary, available at <<u>http://www.usda.gov/agency/obpa/Budget-Summary/2003/2003budsum.htm</u>>; Food and Drug Administration, FY2003 Budget Program Narratives, available at <<u>http://www.fda.gov/oc/oms/ofm/budget/2003/Narratives.pdf</u>>.

<sup>56</sup> This estimate is based on the new resources the FDA received in the FY2002 bioterrorism supplemental appropriations. "*Hearing on FY 2003 Food and Drug Administration Appropriations Before the Subcommittee on Agriculture, Rural Development, FDA and Related Agencies of the House Committee on* Appropriations" (written responses of Lester M. Crawford, Deputy Commissioner).

<sup>57</sup> GAO Food Safety Expenditures, at p. 12, 16.

Last accessed date of the webpages mentioned in the Endnotes: May 13, 2005.