Impact of Sanitary and Phytosanitary Agreement on Food Safety and Trade by Developing Countries

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Abstract

There have been concerns that Sanitary and Phytosanitary (SPS) measures can act as a barrier to trade and thus impede the export of agricultural and food products to developed countries. To a large extent, this reflects poor access to compliance resources, including scientific and technical expertise, information and finance. In 1994, developed countries collectively accounted for 72.5% of the total world imports of agricultural products (UNCTAD 1998). This paper explores the impact of the SPS Agreement on food safety and examines some developing food safety issues. The basic rules for food safety as set out by the SPS Agreement are highlighted and the standards by different regulatory and advisory bodies are outlined. Some of the problems and challenges that developing countries experience in meeting SPS standards in food safety are identified.

INTRODUCTION

One of the most important manifestations of economic globalization is the expansion of international trade. During 1987-1997, the world trade nearly doubled and the ratio of trade to GDP (in purchasing power parity dollars increased from 20.6% to 29.6% (World Bank 1999a). The progressive liberalization of trade has provided opportunities for developing countries to become better integrated into the global trading system. However, the ability of developing countries to maintain or expand their world share will depend on their ability to meet the demands of the world trading system such as for quality and safety standards.

The Agreement on the Application of Sanitary and Phytosanitary (SPS Agreement) entered into force with the establishment of the World Trade Organization (WTO) on 1st January 1995. It concerns the application of food safety and animal and plant health regulations. This paper focuses on the impact of the SPS Agreement on food safety and trade in respect to developing countries.

THE TRADE IMPACTS OF SPS MEASURES

The trade impacts can prohibit trade by (1) imposing an import ban or by increasing production and marketing costs; (2) can divert trade from one trading partner to another by laying down regulations and discriminate across potential suppliers; and (3) can reduce overall trade flows by increasing costs or raising barriers for all potential suppliers (Henson and Loader, 2001). In some cases, stricter SPS measures may be applied to both imported and domestic supplies e.g. impose higher costs of compliance on importers than domestic supplies.

PROBLEMS FACED BY DEVELOPING COUNTRIES IN MEETING SPS AGREEMENT

Developing countries will only actualize the potential benefits of the SPS Agreement, it they are willing and are able to participate fully in the institutions and practices.

(1) Some developing countries as a whole have not actively participated in the SPS Agreement. Membership to the international standards organization is encouraged by the SPS Agreement and is crucial if developing countries are to benefit fully such as to ensure that adequate account is taken of their special needs and circumstances;
(2) Another issue is how effective is the institutional capacity at home to implement effective SPS controls. In transparency, some developing countries members have not established specific contact points to facilitate communications e.g. such as a national enquiry point that is responsible for responding to queries from other countries;
(3) Another significant constraint was the insufficient ability to assess the implications of developed country SPS requirements following notification. In many cases the length of time given between the notification of new SPS measures and their application is inadequate for developing countries to respond in an effective and appropriate manner;
(4) It is claimed that there is a reluctance on the part of developed countries to accept SPS measures in developing countries as equivalent, rather they require strict compliance As a consequence, SPS measures may be applied that are difficult to comply with given local circumstances in developing countries. One of the significant problems associated with the operation of the SPS Agreement was that developed countries took insufficient account of the needs of developing countries;
(5) Developing countries are concern about the level and technical assistance given to facilitate the implementation of the SPS Agreement (or compliance with developed country SPS requirements). In particular, technical assistance often fails to address the fundamental day-to-day problems faced by developing countries e.g. scientific and technical expertise;
(6) There is evidence, that much technical assistance given is often reactionary. It is provided once problems with compliance to SPS requirements in

developed country markets have been identified;

(7) Developing countries have been critical of the procedures by which international standards are negotiated and agreed with Codex Alimentarius. However, developing countries have been successful in encouraging Codex Alimentarius to develop standards for products of export such as fresh tropical fruit and vegetable. However, Codex Alimentarius has failed to adequately account for the needs and special circumstances of developing countries. It is claimed, that as a result, the form and/or level of certain international standards is inappropriate and/or unachievable.

WHAT IS SAFE FOOD?

Safe food can be defined as food that is wholesome, that does not exceed an acceptable level of risk associated with pathogenic organisms and physical hazards, and whose supply is the result of the combined activity of government, regulatory agencies, multiple industries, universities, private organizations, and consumers.

Adequate, nutritious, safe food is essential to human survival, but food can also cause or convey risks to health and even life itself. In spite of the recognition and advances in food science and technology and tools to ensure food safety, hundreds of millions of people worldwide suffer from communicable and non-communicable diseases caused by contaminated food. These diseases, also referred to as food-borne diseases, today remain as one of the most widespread health problems and an important cause of reduced activity (WHO, 1984). Food-borne diseases are caused by a wide range of agents, such as bacteria, viruses, helminths and protozoa with varying degrees of severity ranging from mild disposition to chronic or life-threatening illness. For most food-borne diseases only a small proportion of cases comes to the notice of health services, while in the developing countries reported cases probably account for less than 1% of the total (WHO, 1984). Despite these limitations in reporting, available data give evidence of a tremendous public health problem. Moreover, in some industrialized and developing countries, the data indicate an increasing trend (Kaferstein et al. 1999). An effective food safety system is to protect and improve the public health by ensuring that foods meet science-based safety standards through the integrated activities of the public and private sectors.

International food companies need the ability to innovate and produce new products while meeting reasonable standards for food safety around the globe (Park 2002).

THE SANITARY AND PHYTOSANITARY (SPS) MEASURES AGREEMENT

The Agreement on the Application of Sanitary and Phytosanitary Measures sets out the basic rules for food safety and animal and plant health standards. In the application of the SPS measures, there are two issues: (1) How could you ensure that the country's consumers are being supplied with food that is safe to eat "safe" by the standards that are considered appropriate? And (2) at the same

time how to ensure that strict health and safety regulations are not being used as an excuse for protecting domestic producers? The SPS Agreement allows countries to set their own standards. Regulations for standards must be based on science and should be applied only to the extent necessary to protect human, animal or plant life or health and should not arbitrarily or unjustifiably discriminate between countries or similar conditions.

KEY FEATURES OF SPS

All countries maintain measures to ensure that food is safe for consumers, and to prevent the spread of pests or diseases among animals and plants. These sanitary measures and phytosanitary measures can take many from, such as requiring products to come from a disease – free area, inspection of products, specific treatment of processing of products, setting of allowable maximum levels of pesticide residues or permitted use of only certain additives in food. Sanitary (human and animal health) and phytosanitary (plant health) measures apply to domestically produced food as well as to products coming from other countries. SPS measures include all relevant laws, decrees, regulations, requirements and procedures including inter alia, end product criteria, processes and production methods, testing, inspection, certification and approval procedures, quarantine treatments including relevant requirements associated with the trans-port; previous or relevant statistical methods, sampling procedures and methods of risk assessment; and pack-ageing and labeling requirements directly related to food safety. The provisions of the SPS were designed primarily to prevent the misuse trade measures disguised as food safety regulations and to put the imposition of trade measures on a scientific basis.

INTERNATIONAL STANDARDS/HARMONIZATION

The SPS Agreement encourages governments to establish national SPS measures consistent with international standards, guidelines and recommend-ations, a process often referred to as "harmonization". In many cases the harmonization can act to reduce regulatory trade barriers. The WTO itself does not and will not develop such standards. However, most of the WTO's member governments participate in the development of these standards in other international bodies. These standards are developed by leading scientists in the field and governmental experts on health protection and are subject to inter-national scrutiny and review. Member countries are encouraged to use international standards, guidelines and recommendations where they exist. However, members may use measures that result in higher standards if there is scientific justification.

Codex Alimentarius Commission

The Codex Alimentarius Commission is the major international organisation in the development of international standards, codes of practice, and other guidelines to protect consumer's health and facilitate international food standards, codes of practice, and other guidelines to protect

consumers' health and facilitate international food trade by repression of non-tariff trade barriers. The Food and Agriculture Organization and the World Health Organization jointly recommend that the Codex Alimentarius Commission, the international food standards organization, incorporate the use of risk analysis The Sanitary and Phytosanitary Measures Agreement of the Uruguay Round of GATT requires WTO members to base their sanitary and phytosanitary measures on Codex standards. Codex comprises representatives of the governments of 184 countries, 46 intergovernmental organizations, and 134 international non-governmental organization (NGOs) (Ebert 2002).

EQUIVALENCE

Members are required to accept the SPS measures of other members where they can be demonstrated to be equivalent; they offer the same level of protection. This protects the countries from unjustified trade restrictions even where the products under qualitatively different SPS requirements. Members are instructed to take account the special needs of developed countries and in particular the least – developed countries in the development of SPS measures. Members are encouraged to provide technical assistance to other Members in particular developing countries, the purpose of allowing such countries to meet the SPS protection required in their export markets.

ASSESSMENT OF RISK

The application of Sanitary and Phytosanitary Measures promote the use of risk analysis. Members are required to provide scientific evidence when applying SPS measures that differ from international standards. The evidence should be based on a risk assessment, taking into account, when possible and appropriate risk assessment methodologies developed in the international standard organizations. Members are obliged to avoid arbitrary or unjustifiable distinctions in the levels of protection it considers to be appropriate if the distinction would act to distort trade.

TRANSPARENCY

The Agreement establishes procedures for enhanced transparency in the setting of SPS standards amongst Members. Members are obliged to publish and notify the SPS Secretariat of all proposed and implemented SPS measures.

CONSULTATION AND DISPUTE SETTLEMENT

The WTO Agreement established detailed and structural procedures for the settlement of disputes between members regarding the legitimacy of the SPS measures that distort trade. Governments are required to notify other countries of any new or changed sanitary and phytosanitary requirements which affect trade, and to set up offices (called "Enquiry Points") to respond to requests for more information or existing measures.

Food Safety Issues – An Increasing Concern

A number of factors will drive the emergence of new food safety concerns, including changes in the characteristics of the consuming public, changes in the foods manufactured and sold, changes in the hazards themselves, changes in the ability of public health officials to identify illnesses as food-borne and to trace illnesses to their food source (Arthur 2002).

There are trends which contribute to the possible increase in food-borne disease: changes in diet, the increasing use of commercial food services, new or re-emerging infectious food-borne agents and the growing number of people at high risk for severe or fatal food-borne diseases. New consumer concerns about genetically modified organisms, recent outbreaks such as BSE and toxic substances such as dioxin.

Diet

Cultural changes affect what we eat, but also where we eat and how the food is prepared, as we have time-pressured lifestyles. Saving time and effort in shopping and preparing for will be important. With less time spent in the kitchen and greater availability of ready-to-eat dishes and convenience items, critical food safety techniques such as washing hands and utensils, handling of foods, and storing foods at optimal and optimal temperatures would be of concern.

Bioterrorism

The events of September 11th, 2001, focused the world's attention on terrorism and the threat of future terrorist acts. From the experience in the food industry, the threat of tampering with food using harmless materials can be effective as a real attack. Product tampering (real or hoaxes) and vandalism have proven to be particularly "productive" in terms of perpetrator notoriety and economic damage to target. For consumers, there is a threat of bioterrorism and hence there will need to have renewed food inspection system. Developments in food safety issues mean that new consumer concerns about genetically modified organisms; recent disease outbreaks such as bovine spongiform encephalopathy (BSE); and toxic substances such as dioxin. How to regulate genetically engineered food products? These are currently being examined by CODEX

Biological Contamination

Biological Contamination - New or Re-emerging Infectious Food-borne Agent

Biological contaminants, i.e. bacteria, viruses and parasites constitute the major cause of food-borne diseases. In developing countries, they are responsible for a wide range of diseases (e.g. cholera, C*ampy-lobacter, Escherichia coli,* gastroenteritis, *Salmonellosis, shigellosis*, typhoid and paratyphoid fevers, *brucellosis, amoebiasis, poliomyelitis*). Diarrheal diseases, especially infant diarrhea are the dominant problem and indeed one of the massive proportions.

In recent years industrialized countries have experienced a succession of major epidemics. The estimated annual incidence of food-borne diseases in the United States of America ranges from 6.5 to 80 million cases (Bennett, 1987; Archer and Kvenberg,

1985; Todd, 1989). Emerging and re-emerging infections have been identified as new and recurring, or drug resistant infections threatens to increase (NRC 1993) and the size of the increase risk is unknown. Some examples of newly recognised agents are: *Escherichia coli* 0157:H7, other pathogenic *E. coli*, *Cyclospora*, and *Cryptosporidium*. There have been recent increases in antimicrobial resistance of pathogens, such as *Salmonella typhimurium* DT104 and *Campylobacter jejuni* in humans, which have been attributed to the use of antimicrobial agents in food animals (NRC, 1998).

The risk of food-borne disease is related to several factors, including the presence and dose of pathogen or toxin in food, the virulence of the pathogen or toxin in food, the mechanisms of transmission, and the susceptibility of a host. Many factors influence susceptibility to infection and the severity of disease, including age, the immunosuppressive agents, and disease states that increased immuno-suppression. The increasing number of people with immunosuppressive diseases, such as human immunodeficiency virus, also contributes to the public health importance of food safety.

Many reasons are given for the increasing incidence of food-borne diseases, among which are the following (Jones, 1998; Institute of Medicine, 1998):

1. Better methods of detection and identification together with better epidemiological capacity have contributed to a rise in reported cases;
2. The emergence of new food-borne pathogens such as *Escherichia coli* 0157:H7 and the re-emergence of previously identified pathogens such as Salmonella have resulted in new microbiological hazards, Contamination of red meat with *Salmonella* and *Escherichia coli* 0157: H7 remains important, but the risk posed by chicken for *Campylobacter* and *Salmonella* has grown substantially;
3. Advances in science and technology that allow the development of genetically modified foods and the construction of modified macro-nutrients require new ways of evaluating the safety of substances added to the food supply, and this need will increase;
4. Lifestyle factors may be responsible for a rise in actual incidence. People are eating more, traveling more, and choosing exotic foods more frequently than in the past;
5. As people get further away from learning about correct food handling, they have greater likelihood of handling food incorrectly;
6. Current food trends - with increased food being purchased and fast-food outlets and in prepared and refrigerated forms - result in food being handled by more people, treated and distributed in stages, and held before being sold, all factors that increase the chance of food becoming contaminated or being held at improper temperatures;
7. Heightened consumer interest in raw and minimally processed fruits and vegetables, partly in response to dietary recommendations, has created a year – round demand for fresh produce, which can be met only through increased

imports. This increased produce volume requires additional attention to possible contamination as well as imported fruits and vegetables. Many new products are designed to meet the consumer's demand for fresh products with no additives e.g. they may be pasteurized and stored under controlled atmospheres and sold in the refrigerator;

8. As technology has advanced, a smaller number of food facilities provide food to larger numbers of consumers, increasing the extent of harm that can arise from a single accident;
9. Consolidation of many food processing operations into larger ones could contribute to an increase in food-borne diseases g one massive outbreak;
10. The concentration of animals into larger production units and of animal slaughter into fewer and larger plants increases the possibility of cross-contamination among meat carcasses;
11. The remarkable success of modern medicine in extending the lifespan and increasing the quality of life for many people has placed new demands on the food system and on those responsible for guarding its safety. Increasing numbers of people have immune systems that are compromised because of age, illness or medical treatment. These people are highly susceptible to illness and death from microbial pathogens, and might be more sensitive to new food ingredients and recently identified natural components of the diet;
12. Microorganisms are developing resistance to antibiotic, which may contribute to increased incidence and decreased treat ability of food-borne disease;
13. Increasing consumption of fortified foods and dietary supplements including herbals, has raised new questions about the safety of "natural" substances not normally in the diet, or normally part of the diet but as much lower concentrations, and about the health effects of consuming high concentrations of nutrients ordinarily considered safe.

Managing microbiological food safety is a complex task, with roles for the food industry, regulatory and allied professionals, and consumers. It is critically important that regulatory policies and food safety policies must be flexible to incorporate scientific knowledge in a product- and process-specific manner.

Chemicals and Toxicants in Food

The trade impact of SPS measures have been acknowledged in a developed country context such as the dispute between the European Union and the United States over hormone use in meat production. The Joint FAO/WHO Expert Committee on Food Additives (JECFA) evaluates food additives, contaminants, and veterinary drug residues and the Joint FAO/WHO Meeting on Pesticide Residues (JMPR) evaluates pesticide residues. Recommendations are made on the Acceptable Daily Intake (ADI), on Maximum Residue Levels (MRLs) in the case of pesticides and animal drugs, and

Maximum Levels (MLs) in the case of food additives. In the case of contaminants, JECFA may establish Provisional Tolerable Weekly Intakes (PTWI) to protect consumers against health hazards usually associated with these chemicals. There are concerns by developing countries about certain recent decisions for examples standards or maximum residue levels (MRLs) for growth hormones in beef (Zarilli 1999).

The Joint FAO/WHO Codex Alimentarius Commission and its member countries have established safe levels for chemicals and toxicants in food by the adoption of food standards, guidelines, and other recommendations based on the recommendations of JECFA. Since its exception in 1962, Codex has adopted 237 food standards, 3274 MRLs for various pesticide/ commodity combinations, and 41 Codes of practice. The World Trade Organization refers to Codex standards, guidelines, and recommendations in the arbitration of trade disputes involving health and safety requirements, if these are used as the basis for non-tariff barriers in the international food trade. Moreover, the Global Environment Monitoring Programme and the Food Contamination Monitoring and Assessment Programme (GEMS/Food) of WHO provides information on the levels of contaminants in food and on time trends of contamination, enabling preventative and control measures. Data from GEMS/Food and from surveys made in the industrialized countries suggest that the food supply in developed countries is largely safe from the chemical viewpoint because of the extensive food-safety infrastructure (i.e. legislation, enforcement mechanisms, surveillance, and monitoring systems) and the general level of responsibility of the food industry (Kaferstein *et al.*, 1999).

Veterinary Drug Residues

Veterinary pharmaceuticals have been a key element in increasing animal productivity. Vaccines and therapeutic drugs are essential in the production of confined animals, which are under more stress and are more at risk for communicable diseases. Antibacterial drugs are also given to animals in less than normal therapeutic doses to promote weight gain and to improve feed efficiency. The use of antibiotics has given rise to potential problems with anti-biotic resistant organisms.

Made available by modern biotechnology are the species-specific purified protein pharmaceuticals most notably bovine somatotropin (BST). In general, under conditions of good agricultural and veterinary practice, veterinary drug residue levels will all be below the approved maximum residue levels as recommended by JECFA and Codex. JECFA has evaluated the safety of BST and concluded that under good agricultural and veterinary conditions, minute residues of the anabolic drugs do not present any risk to the consumer. However, constant monitoring is necessary to ensure that permitted limits are not exceeded.

Pesticide Residues

An accidental contamination of food with pesticides e.g. organochlorines as well as occupational and intentional exposure to pesticides may cause serious health effects following excessive exposure. In the Caribbean, in a number of situations, foods have been found to contain high levels of

pesticide residues as when crops are harvested too soon after applications of pesticides, or when excessive amounts of pesticides have been applied. The reported effects may range from acute fatal poisoning to sensitization, impaired immune function, neuro-behavioural disorders, and cancer (Kaferstein et al., 1999) and could further be aggravated by poor nutrition and dehydration, which lower the toxicity threshold of pesticides (WHO, 1990). Use of Good Agricultural Practices (GAP) is extremely important when these substances are employed.

In the developing countries, poor infrastructure has not permitted an accurate assessment of the problem of chemicals in food. Poor knowledge of the handling and application of pesticides among agricultural workers could result in a large number of acute poisonings.

Food Additives

Food additives comprise a large and varied group of chemicals that are added intentionally to food to ensure keeping quality (thus preventing losses) and safety, nutritional quality, other qualities (taste, appearance etc.) and certain properties required from processing and/or storage. The Codex recommendations and food additives as evaluated by JECFA have resulted in an approved list of additives.

Naturally Occurring Toxicants

Naturally occurring toxicants probably present risks second only to those imposed by microorganisms such as seafood toxins and food-borne toxins. Mycotoxins, the toxic metabolites of certain microscopic fungi (moulds), may cause serious adverse effects in humans as well as in animals. Animal studies have shown that besides acute intoxication, mycotoxins are capable of causing carcinogenic, mutagenic, and teratogenic effects (European Commission, 1994). Aflatoxins are found mainly in oilseeds (e.g. peanuts), maize, tree nuts and some fruits as figs. Post-harvest handling and environ-mental play an important role in the growth of molds, hence compliance with good agricultural / manufacturing practice is of utmost importance. Other mycotoxins of concern are ochratoxin *A, patulin*, and *fumonisin* B1. The Joint FAO/WHO Expert Committee on Food Additives (JECFA) has established very low provisional tolerable intakes for *ochratoxin* A and *patulin* (FAO/WHO, 1990, 1991, 1996).

Environmental Chemicals

Unintentional additives can include environmental or industrial contaminants as well as some substances used in food production but not intended to be part of the food. A number of chemical substances may occur in the food supply as a result of environmental contamination. Their effects on health may be extremely serious. Serious consequences have been reported when foods contaminated with heavy metals such as lead, cadmium, or mercury have been ingested over extended periods of time. Lead affects the nervous and renal systems. When lead pipes or lead-lined water storage tanks are used, the lead exposure from drinking water is appreciable. Methylmercury is the most toxic form of mercury has been shown to have serious effects on the nervous system, which in severe cases may

be irreversible. Fish are the major dietary source of mercury, and the levels of mercury may be influenced by industrial pollution of the environment. Other environmental chemicals of interest are polychlorinated biphenyls (PCBs) used in various applications. PCBs may have carcinogenic effects. Levels of PCBs found in adipose tissue of women in the United States of America have been associated with developmental and behavioural deficits in their infants (Jacobson et al. 1990).

Industrial Chemicals

The migration of food production substances into the final product is generally very low, but must be regulated to ensure food safety. The use of sanitizers used to keep food production surfaces safe, packaging materials used to keep food safe and fresh, pesticides used on crops and drugs used in animals to mitigate damage, disease, microbial toxin production, and general food losses.

NEW FOOD COMPONENTS

There is a growing interest in the relationship between diet and health has led to an increased demand for foods or food constituents that are not only nutritive value but also hold promise for prevention or even treatment of disease. These products have been referred to as dietary supplements, functional foods, pharma-foods or nutra-ceuticals or herbal products. Some supplements and herbal products on the market may pose a risk of adverse health effects because they are not required to meet specify safety standards before being sold.

NEW FOOD TECHNOLOGIES

Modification of plants or animals via genetic engineering can improve yields and increase resistance to pests. The new technology might offer improvements in food safety through increased resistance to molds that produce mycotoxins or through lower levels of allergenic proteins, fatty acids or other undesirable components of food. There are concerns over the safety of products from genetically engineered plants and animals. Food irradiation is not a new technology that decreases the risk of pathogens and extends shelf life. However, there were concerns which prompted the requirements that certain irradiated foods be labeled.

TRANSGENIC FOODS

The advent of transgenic food agricultural products and agro-inputs may severely test the application of SPS measures and its agreement on Technical Barriers to Trade. There is a confrontation in respect to trade between the European Union and the United States over how consumer resistance to transgenic food products could be accommodated within SPS (Kerr 1999). There is a strong reaction by consumers to the absence of information relating to food safety. Incomplete information allows the media to emphasize the potential hazards of food products and sometimes to misuse poor quality information to influence the fears of consumers. Activist consumer groups often just push policy makers into implementing domestic policies which satisfy

the risk inverse preferences of consumers regarding food safety. An example of strong trade policy was the banning of beef imports from Britain by members of the European Union (and other countries) in the wake of bovine spongiform encephalopathy (BSE) – Mad Cow Disease of the crisis of 1996 (UK Meat and Livestock Commission, 1996). The ban on the importation of beef grown using hormones has become a major irritant in trade relations between the United States and the European Union (Peterson et. al. 1988).

Producers of new genetically modified foods have an obligation to ensure that foods offer to consumers are safe and in compliance with applicable legal requirements e.g. Federal Food, Drug and Cosmetic Act. These requirements include: (1) demonstration that genetically modified foods do not contain substantially increased levels of previously known toxic substances, new hazardous or different levels of nutrients than traditional counterparts and (2) addressing whether known or potentially new allergens have been transferred to the modified product (IFT, 2002)

There are two aspects to the best available scientific information criteria based on appropriate science and risk assessment:

- Could the transgenic gene be considered as an additive or a contaminant? However, contaminants are not usually considered to be added purposely. Some transgenic products may be toxic or disease causing but not all of them.
- There are three obligations of the SPS which can be applied to transgenic products: (1) Exporters can challenge the regulations of importers on the basis of their scientific justification; (2) Each country determine its own level of acceptable risk thus allowing it to respond to the social and cultural concerns of its citizens regarding the appropriate level (Stanton 1995). A country may object to the assessment of risk if they perceive that is being used as a trade barrier; and (3) SPS allows countries to put in place domestic regulations and trade barriers on the basis when insufficient evidence does not exist for definitive assessment.

PHYSICAL HAZARDS

Rocks, stones, metal, wood, glass, and other physical objects can become part of raw ingredients. Further contamination can occur in the transport, processing, or distribution of foods because of equipment failure, accident, or negligence. Foreign physical materials in foods can cause serious harm to consumers. Protective devices that remove or prevent physical hazards include metal detectors, magnets, sieves, scalpers, and screens.

Who is Responsible for Safe Foods?

Governments have a responsibility to ensure that a safe, nutritious food supply is continuously available at economic prices to enable the public to choose healthy and enjoyable diets. Food safety in many countries is regulated by a wide range of regulatory and advisory bodies such as the World Health Organization (WHO) and the Food and Agriculture and Organization (FAO), the food industry and the government. The food industry is very

interested in ensuring that the food it sells, is safe which affect food producers, processors, distributors, retailers, and ultimately the consumers. In doing so, its members are protecting their own self-interest as well that of consumers. The reputation of a company as one that sells safe food is crucial for consumer confidence.

Many parts of the current food safety assurance system are in the early stages of transition to Hazard Analysis Critical Control Point (HACCP) programs. It is widely accepted by the scientific community that the use of HACCP systems in food production, processing, distribution, and preparation is the best known approach to enhancing the safety of foods. If HACCP programs are fully implemented increase the effectiveness of the system. HACCP programs use a systematic approach to identify micro-biological, chemical and physical hazards in the food supply, and establish critical control points that eliminate or control such as hazards (NRC, 1985). The control must effectively address the identified hazard and the effectiveness of the control point must be validated. This approach appears to be much more effective in ensuring the safety of foods than traditional visual inspection practices. The HACCP system institutes methods to control food safety hazards, whereas traditional inspection and testing procedures are not designed to detect and control contaminants that are sporadically distributed throughout foods and are not visible.

An Effective Food System

The current system for food system in developing countries is complex and multi-layered activity that depend on multiple players such as the government, universities, the news media and of course the public itself, both the handlers of food and as consumers. These varied roles which each segment plays in food safety must be integrated with the changing system of the food supply from production to final consumption.

An effective food system is to protect and improve the public health by ensuring that foods meet science-based safety standards through the integrated activities of the public and private sectors.

The attributes of a food safety system should be based on the following components: (1) It should be science - based as required by SPS Agreement, with a strong emphasis on risk analysis; (2) the national food laws should be clear, rational, comprehensive, be compatible with international standards e.g. Codex and scientifically based on risk; (3) An ideal system would be preventive and anticipatory in nature, and thus designed with integrated national surveillance and monitoring along with education and research required to support these activities. Research should have both applied and basic components and be targeted at the needs of producers, processors, consumers and regulatory decision-makers and other scientists; (4) there should be a unified mission to have the implementation of science-based policy in all regulatory activities related to food safety. This would allow for effective and consistent regulation and enforcement; (5) Control of resources is also critical to order to encourage movement toward science-based food safety provisions and to ensure that

research and education are targeted toward efforts that will produce the greatest benefit for a given cost of improving food safety; (6) It must be organized to be responsive and work with true partnership with the state, local, industry and consumers in the food safety system; and (7) An effective food safety system must be supported by funding adequate to carry out its major functions and mission in the promotion the public's health and safety.

PROTECTION OR PROTECTIONISM?

Sanitary and Phytosanitary measures by their very nature may result in restrictions in trade. All Governments accept the fact that some trade restrictions may be necessary to ensure food safety. However, governments are sometimes pressured to go beyond what is needed for health protection and to use sanitary and phytosanitary restrictions from economic completion. Such pressure, is likely to increase as other trade barriers are reduced as a result of the Uruguay Round Agreements. The Agreement on Sanitary and Phytosanitary (SPS) builds on previous GATT rules to restrict the use of unjustified sanitary and phytosanitary measures for the purpose of trade protection. The basic aim of the SPS Agreement is to maintain the sovereign rights are not misused for protectionist purposes and do not result in unnecessary barriers to international trade.

A sanitary or phytosanitary restriction that is not required for valid health reasons can be very effective protectionist device and, because of its technical complexity, a particularly deceptive and difficult barrier to challenge.

PROBLEMS/CONCERNS

Concerns have been expressed that developing countries lack the resources to participate effectively in the institution of the WTO and thus may be unable to exploit the opportunities provided by the SPS Agreement. SPS measures are considered to be an important impediment to agricultural and food exports to developed countries. This reflects the poor access to scientific and technical expertise, information and finance. An effective and efficient food safety system must be based on science. To achieve a food safety system based on science, current laws and food safety regulations must be revised. To implement a science-based system, reorganization of government food safety efforts is required. Of concern to developing countries is the extent to which developed countries take account of the needs of developing countries. Developing countries would need to be more aware of the needs and special circumstances of developing countries, but does not imply that developed countries should be expected to adopt lower requirements in terms of protection to human, plant and animal health. There will need to be institutional structures and procedures that best enable agricultural producers and food processors to comply with the SPS requirements that they face in developed country markets. Key issues include the nature of decision-making processes within international standards or organizations and the ability of developing countries to represent themselves.

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