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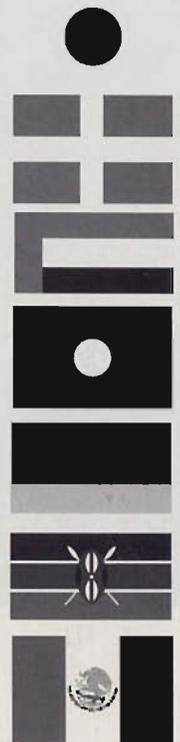
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# Food Safety and International Trade in the Twenty-first Century



**E**xtensive and increasing international agricultural trade (from \$385.4 billion in 1992 to \$463.5 billion in 1997) distributes more diverse foods of varying quality to wider markets. Highly publicized events such as the 1996 *Cyclospora* outbreak traced to imported Guatemalan raspberries have increased concern about the safety of imported foods. The extent of food safety risks from internationally traded food is unclear, but scientists generally agree that the risks are low, though highest for foodborne pathogens, such as *Salmonella*.

Any unsafe imported food can impose health costs on society, but consumers benefit from increased trade through lower prices, year-round supplies, and greater variety and quality. Therefore, countries have incentives to weigh the benefits and costs of different mechanisms which promote the twin goals of food safety and trade benefits. Standards and regulations provide important mechanisms sure to affect food trade and safety in the twenty-first century. Here we hope to clarify many of the complex issues surrounding the adoption of standards and regulations of imported foods.

## Reasons for international differences in food safety measures

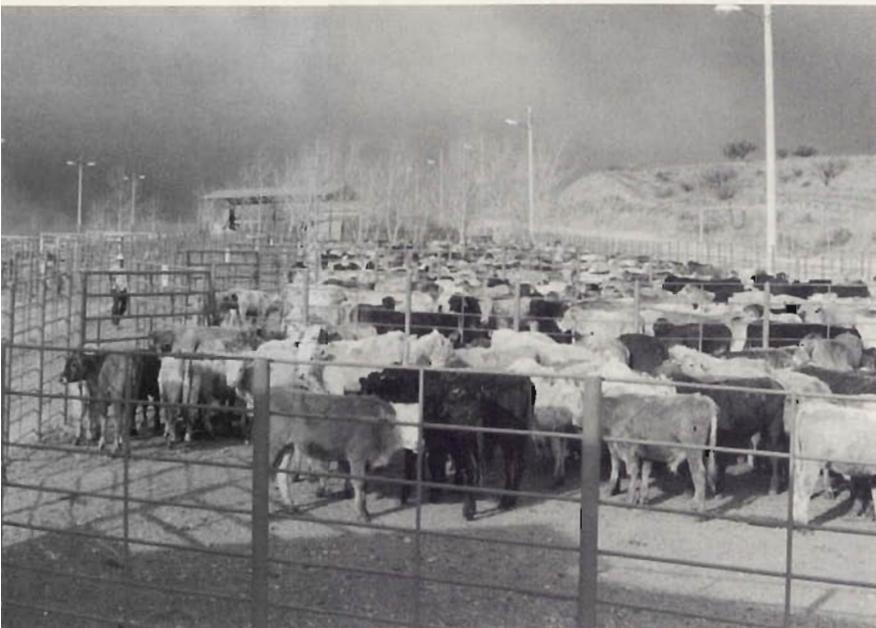
The diverse food safety risks to human health include pesticide and veterinary drug residues, food additives, and foodborne pathogens. The magnitude and the causes of the risks vary among exporting and importing countries. Among exporting countries, risks vary due to international differences

in food production practices (for example, use of veterinary drugs), geographic distribution of pathogens (some pathogens don't survive in colder climates, for example), plant and livestock host factors (herds exhibit varying infection rates), and available technology (such as refrigeration and potable water). Among importing countries, risks vary because of available technology, human host factors (proportion of population with greater susceptibility to these risks), and consumption patterns (for example, routine consumption of raw fish).

Even when risks vary little across countries, assessments of the risks may vary due to differences in access to and use of advances in basic science, detection technology, and mitigation methods. Several committees under the Codex Alimentarius Commission (Codex), such as the Codex Committee on Food Additives and Contaminants, disseminate scientific information on foodborne hazards and risk assessment methodology to narrow information gaps, paving the way for establishing international standards. But continual development of new agricultural inputs and products, together with regular advances in detection and eradication technology, outpace international efforts to establish a consensus on risks and mitigation methods. In the interim, some countries may refuse to allow imports of products (such as genetically modified foods or irradiated meat) that have been approved for sale in others.

Countries may also choose different policy measures to manage similar risks. Income explains some

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variation, as consumers in wealthier countries may be willing to pay more for higher standards. Also, measures may in part reflect past food safety incidents such as low-probability, high-consequence events (for example, a botulism outbreak) that heighten consumer demand for stricter regulations. And, countries may choose to manage risks differently in response to consumer preferences for other food attributes (such as taste) besides safety (Henson and Traill). For example, many European countries use process standards to minimize the risks of *Listeria* in cheese made from unpasteurized milk, while the United States bans the sale of most of these cheeses.

This complex mosaic of risks and risk mitigation measures creates substantial debate among scientists, disagreement among food safety regulators, and discord among trading partners. The impact of divergent food safety standards on trade is largely

unknown, primarily because we lack systematic information on the measures themselves and we have underdeveloped methods of economic assessment. In one preliminary exploration, however, Roberts and DeRemer surveyed USDA's foreign attachés and representatives from agricultural producer groups. They identified questionable technical trade barriers (trade-restricting regulations that seem primarily aimed at shielding domestic producers from competition) and estimated the impacts on U.S. exports of agricultural products. Respondents identified 303 barriers in 62 countries that threatened, constrained, or blocked an estimated \$5 billion of U.S. exports of agricultural, forestry, and fishery products (7 percent of the total) in 1996. Food safety barriers accounted for about one-fourth of the number of restrictions but accounted for about one-half of the estimated export revenue losses because these barriers often restrict sales of high-value products such as processed foods and meats (table 1). The survey also identified other questionable technical barriers—primarily restrictions justified on the basis of protecting crops and herds.

### Food safety measures in the multilateral trading system

A framework for determining the legitimacy of questionable food safety measures emerged from the 1986–93 Uruguay Round of Multilateral Trade Negotiations in the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement). SPS rules in the original (1947) General Agreement on Tariffs and Trade (GATT) allowed measures “necessary to protect human, animal or plant life and health” but stipulated that measures should not constitute disguised restrictions or create unnecessary trade barriers. Despite these rules, SPS regulations proliferated and began to disrupt trade. Uruguay Round negotiators therefore aimed to create more stringent rules, primarily by requiring that regulatory decisions be based on scientific risk assessments (see sidebar). Negotiators believed that this would encourage countries to adopt measures that balanced desirable benefits and undesirable risks of international trade, while discouraging measures designed simply to protect domestic markets.

Creating multilateral rules that set parameters for food safety measures is a delicate challenge because of the trade-offs between commerce and human health risks. Some fear that the Agreement is intended to promote “downward harmonization” of national standards to facilitate trade. Recognizing these political concerns, negotiators agreed to endorse, rather than oblige, the adoption of international standards. Moreover, the Agreement does not stipulate restrictions on the economic costs that can factor into decisions to mitigate human health

**Table 1. Profile of questionable food safety technical barriers to U.S. agricultural exports, 1996**

Food Safety Attribute	Number of Barriers	Estimated U.S. Export Revenue Losses (%)
Foodborne pathogens	31	12
Food additives	13	45
Veterinary residues	12	8
Residues and pathogens	6	9
Multiple attributes (including genetically modified organisms)	5	24
Naturally occurring toxins	3	< 1
Heavy metals	2	< 1
Pesticide residues	1	< 1
Total food safety barrier	73	100

Source: Roberts and DeRemer.  
Note: Barriers included here are as those that survey respondents judged to be primarily aimed at shielding domestic producers from international competition.

risks. This provides leeway for countries to adopt measures that achieve incremental risk reductions at exorbitant cost. The U.S. Statement of Administrative Action to Congress states that the Agreement “explicitly affirms the rights of each government to choose its levels of protection including a ‘zero risk’ level if it so chooses” (President of the United States). However, the Agreement stopped short of explicitly allowing measures to be based on “consumer concerns” (subjectively assessed risks), as advocated by some countries.

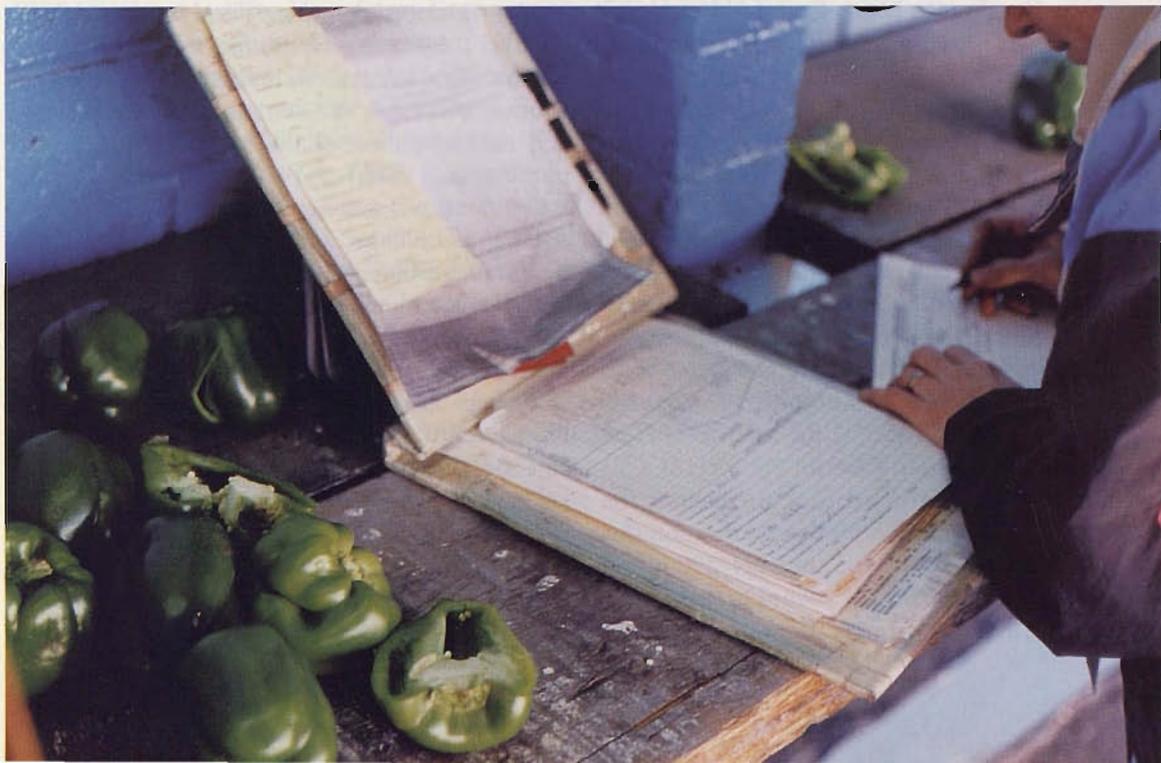
Controversy over multilateral rules for food safety measures is compounded by the fact that most measures apply equally to domestic and foreign producers (are “facially neutral”), raising questions about the degree of protectionism that these measures could actually provide. In reply, exporters point to several instances in which their interests are harmed by facially neutral measures that are tailored for domestic production systems. Facially neutral measures can disadvantage foreign producers if in fact the foodborne risks are lower in the products of the exporting country than in the importing country. For example, exporters of ranged cattle have objected to cost-increasing process measures in importing countries where the norm is intensive feed-lot production.

The SPS Agreement has averted and defused a number of trade problems over the past four years. However, the outcome of the only food safety dispute to advance to the World Trade Organization (WTO) Appellate Body—the U.S./Canadian complaint about the European Union’s (EU’s) ban on the use of growth hormones in domestic and imported beef—will likely dominate judgment about the Agreement’s effectiveness for some time. The

appellate judges ruled that although the ban was not discriminatory or a disguised restriction on trade, there did not appear to be a “rational relationship” between the ban and the evaluated health risks, and therefore the ban was not *based on* a risk assessment. This decision suggests that the WTO will rule against measures based on popular misconceptions of risks as well as more overtly discriminatory measures. The EU did not fulfill its obligation to bring its measure into conformity with the Agreement by May 1999, stating that it was still waiting for the results of additional risk assessments. The U.S., Canada, and the EU could not reach agreement on resolution of the *Hormones* dispute based on product labeling, nor could the parties agree on a compensation deal that would leave the EU ban in place but offer compensating trade concessions on other products. The WTO General Council has therefore authorized retaliation by the complainants against \$128.1 million of European products.

### Multilateral coordination mechanisms and private systems approaches

Many countries have shown an increased interest in food safety issues, as seen by the United Kingdom’s efforts to create a single food safety agency, the series of new U.S. food safety initiatives, and regulatory reorganization efforts by Canada, New Zealand, and Australia. In response to cross-border spillovers, arbitrage pressures, and other trade-related tensions, countries are adopting multilateral coordination mechanisms such as mutual recognition, coordination, and harmonization (Sykes). Mutual recognition means a country explicitly accepts the standards, certification procedures, and regulations of other countries (for ex-



## Principal Provisions of the Uruguay Round SPS Agreement

### The SPS Agreement

- requires measures to be based on a scientific risk assessment;
- states that measures must not discriminate between countries when risks are similar or identical;
- recognizes each country's right to establish its own level of protection but disallows "arbitrary and unjustifiable" variation in the levels of protection provided by different measures in one country if this variation results in trade discrimination;
- endorses the adoption of international standards;
- requires authorities in importing countries to recognize that measures, although different, may be functionally equivalent; and
- allows countries to adopt measures on a temporary basis while evaluating unfamiliar risks.

The Agreement also established mechanisms to help countries police the measures of their trading partners. The Agreement

- requires notification of proposed measures that might affect trade;
- created an SPS Committee to develop guidelines and facilitate informal consultations; and
- recognizes the authority of World Trade Organization (WTO) trade dispute panels to rule whether a measure complies with the SPS Agreement. Decisions by trade dispute panels may be appealed to the WTO Appellate Body.

ample, U.S. inspection of meat is accepted for their imports). Coordination takes convergence one step further by jointly designing adjustments to each country's policies (using, for example, WHO control procedures for communicable diseases). Harmonization entails even higher levels of convergence such as regional or world standards or agreements. However, greater coordination may add costs. For example, if a group of countries agrees to only trade foods that meet a particularly high standard, then imports not meeting these standards will not be available to consumers, reducing consumer choice.

As with food safety regulations, private system approaches to reduce food safety risks are becoming more widespread and stringent and are evolving under the influence of the SPS agreement (Caswell and Henson). Private system approaches include self-regulation, vertical integration (to ensure quality/safety of inputs, for example), Hazard Analysis and Critical Control Point (HACCP) systems, and third party certification such as the International Organization for Standardization (for example, the ISO 9000 series or "EN 29000" in Europe). HACCP essentially identifies, monitors, and controls hazards at critical control points in

food production and processing. Although still used in its original form as a voluntarily adopted private management tool by particular firms, some government regulations also use HACCP as performance or process standards (Caswell and Hooker). These private-sector approaches do not necessarily enhance food safety; effective implementation is key. For example, Gill advocates microbial testing for truly effective HACCP systems. Statistical Process Control (SPC), another internationally recognized innovation, also shows promise for reducing food safety risks (Bisaillon et al.). SPC uses standardized sampling procedures to reject or accept lots to reach a desired level of quality or safety.

These private-sector approaches are often intertwined with each other (ISO standards often use HACCP and SPC principles, for example) and with multilateral coordination mechanisms (such as Codex HACCP standards). Countries and firms within countries may use private system approaches differently, and this difference influences the marketing of food safety internationally. In general, the greater the coordination of multilateral mechanisms and private approaches among firms and nations, the more they will be able to provide verifiable and valuable information to trading partners and facilitate trade.

### Food safety and trade issues in the twenty-first century

The twenty-first century will bring increased globalization of the food supply, the continuing emergence of new foodborne pathogens, growing understanding of food safety risks to human health and associated trade impacts, and increasing demand for higher levels of food safety, particularly among developed countries. Food safety and international trade issues have so far been handled with relatively few contentious disputes, considering the enormous volume of internationally traded food and the complexity of the issues. Countries vary tremendously in terms of risk exposure levels, regulatory measures, and access to and use of relevant science, technology, and mitigation methods. International differences in public perceptions, attitudes, and acceptance of food safety risks, such as in the hormone case, will continue to complicate international standard setting.

Perhaps in some instances, trade friction could be reduced if each country based food safety measures on a cost-benefit analysis (CBA). These analyses could provide convenient normative reference points that might help countries establish a more formal, systematic, and uniform basis for understanding trade-offs, possibly leading to the adoption of fewer or less-severe trade-restrictive mea-

asures. On the other hand, CBA relies on interpretation and its use may change the focus of discussions but not diminish trade friction.

Multilateral coordination mechanisms on food safety issues will become increasingly important determinants of trade patterns. Trade analysts and policy makers should be able to help determine the most effective future mechanisms for fostering the international exchange of safe food. Public educational campaigns (like safe meat handling information) may also continue to play a larger role, particularly in developed countries. Meanwhile, as a result of market incentives, product liability actions, and regulation, private system approaches will likely become even more widespread and intertwined with each other and with multilateral coordination mechanisms. ■

### ■ For more information

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