
10-10

Meeting Sanitary and Phytosanitary (SPS) Standards: What Can China Do?

By:

Fuzhi Cheng

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Edited by:

Per Pinstруп-Andersen (globalfoodsystem@cornell.edu) and Fuzhi Cheng
Cornell University

In collaboration with:

Søren E. Frandsen, FOI, University of Copenhagen

Arie Kuyvenhoven, Wageningen University

Joachim von Braun, International Food Policy Research Institute

Executive Summary

It is widely recognized that rising sanitary and phytosanitary (SPS) standards have created numerous obstacles to the international exchange of agricultural commodities. The issue is of particular importance for developing countries with abundant agricultural resources as they seek to expand their exports of labor-intensive, high-value-added agricultural products to the more lucrative developed-country markets. Agricultural exporters in developing countries are often required to meet stringent developed-country SPS standards. Not only are these standards much higher than international standards and those prevailing in developing countries, but they are also subject to frequent (usually upward) revisions.

China is a large agricultural producer and exporter. As China's agricultural trade continues to increase, the country has experienced more challenges in meeting the SPS standards set by its trade partners. While some of the SPS standards are legitimate and necessary for protecting human, animal, and plant health, others are considered to be disguised forms of protection. Concern in China has grown that technical regulations such as the SPS standards are increasingly being used to discriminate against some of its exports. The European Union (EU), Japan, and the United States are the three markets in which China has encountered the most SPS barriers.

Because of the difficulty of challenging foreign SPS barriers, it is considered more practical to meet these high foreign standards. To this end, China has enacted many laws and regulations on food and agricultural production. Despite efforts, many problems exist in China's food safety regulatory system. First, domestic food regulations are usually not consistent with or are less restrictive than international standards. Second, there is little coordination among the various government ministries and agencies when they establish agricultural standards and food safety controls. Third, the lack of technical, institutional, and managerial capacity to control and ensure compliance makes the regulations and standards ineffective.

Capacity building in both the public and the private sector will help China move toward better food safety status and create more trade opportunities. The private sector, including the farm sector, has

the main responsibility for producing and selling safe food. Attracting more foreign direct investment (FDI) and establishing Hazard Analysis and Critical Control Point (HACCP) systems and coordinated supply chain management in agriculture should be the main focus. The government, however, sets the framework within which the private sector operates, and the role of the public sector in organizing public services and promoting food safety should be emphasized.

Your assignment is to develop strategies that China can use to enhance its capacity to meet food export quality standards, taking into account the financial, institutional, and technical constraints it is facing.

Background

Food safety risks refer to the potential hazards associated with food that can cause ill health in humans, animals, and plants.¹ In both developing and developed countries, foodborne illnesses and dissemination of pests or invasive species have become an increasingly important public health and environmental issue, imposing a significant burden on communities and their economic systems. In recent years, in response to an increasing number of food safety problems and rising consumer concerns about foodborne hazards, governments all over the world are intensifying their efforts to regulate their food sectors and strengthening their domestic sanitary and phytosanitary (SPS) standards.

Rising SPS standards have created numerous obstacles to the international exchange of agricultural commodities. The issue is of particular importance for developing countries with abundant agricultural resources as they seek to expand their exports of labor-intensive and high-value-added agricultural products to the more lucrative developed-country markets. Agricultural exporters in developing countries are often required to meet stringent developed-country SPS standards by

¹ Hazards include those associated with microbial pathogens, pesticides and veterinary pharmaceuticals, environmental contaminants (for example, heavy metals), naturally occurring toxins (for example, mycotoxins), and the spread of plant pests and animal diseases.

demonstrating that their products do not endanger native species or human health in the importing country. Not only are these standards much higher than international standards as well as those prevailing in developing countries, but they are also subject to frequent (usually upward) revision. Higher SPS standards significantly increase the exporting costs, and failure to meet the standards is usually disastrous for exporters in developing countries.

Policymakers acknowledge that the increasing SPS standards in the developed world are due in part to growing consumer demand for food safety as well as advances in scientific knowledge about food-borne hazards. They also recognize, however, that the disingenuous use of the standards can provide a nontransparent means of impeding trade for protectionist purposes. Such protectionist efforts have become more apparent as traditional trade barriers like tariffs and quantitative restrictions on trade in agricultural and food products continue to decline. The proliferation of SPS-related trade disputes in the 1980s and 1990s led to the creation of a set of new disciplines on the use of SPS measures in the Uruguay Round negotiations—that is, the SPS Agreement in 1995. Since 1995 the role of the SPS Agreement in averting trade-distorting SPS standards has increasingly been recognized.

In principle, the SPS Agreement and the associated World Trade Organization (WTO) dispute settlement mechanism can ensure that SPS standards are not abused or misused for protectionist aims. But in practice developing countries are usually placed at a disadvantage when it comes to making use of these procedures. They are especially hampered by the lack of resources for meeting these standards and constrained by their limited institutional and political power for challenging unfair treatment (Hoekman and Mavroidis 2000; Busch and Reinhardt 2003).² As a result, issues related to the impact of SPS standards on developing-country

² An article in the SPS Agreement specifically promotes the provision of technical assistance to developing countries (Article 9). A related provision is the special and differential treatment, which stipulates that in applying SPS measures, the special needs of developing countries should be accounted for and a phase-in period for compliance with the SPS Agreement may be granted (Article 10). According to the literature, whether these provisions actually benefit developing countries is arguable (see Hoekman et al. 2004).

agricultural trade, as well as the role of the SPS Agreement in addressing SPS-related trade disputes, remain at the forefront of the ongoing global trade policy debate.

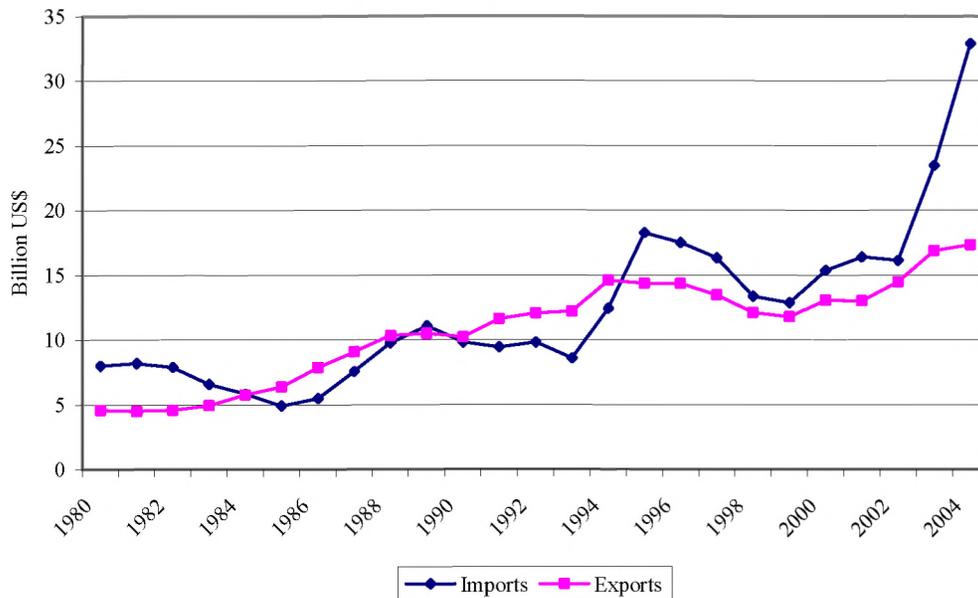
There is a voluminous literature on the legal and institutional aspects of SPS issues. Few attempts have been made, however, to examine the problems faced by governments and exporting firms in developing countries in meeting these challenges. This information gap makes it difficult for developing countries to address their own supply-side problems. It also makes it difficult to conduct the current policy dialogue between developing and developed countries on this important issue in an informed and cooperative manner.

The purpose of this case study is to fill this knowledge gap. Drawing on the experience of China, the largest developing-country exporter of several agricultural commodities, this study aims to contribute to the understanding of the impact of international food safety regulations on agricultural trade, particularly on high-value-added products; to identify the policy, institutional, and technical problems faced by producers and exporters in meeting these requirements; and to identify appropriate policy responses to address these problems.

China's Agricultural Trade Patterns

Broad economic reforms initiated in 1978 brought rapid economic growth to China, and the country witnessed major changes in policies, which gradually shifted from central planning to more reliance on market mechanisms. During this period, China's agricultural sector has grown strongly. China alone accounts for one-fifth of world agricultural production. It became the 143rd member of the WTO on December 11, 2001, and the value of its agricultural trade continues to increase. In 2004 the total value of Chinese agricultural trade reached US\$50.2 billion (imports plus exports), an increase of US\$20.8 billion from 2001 (Figure 1). Agricultural exports and imports were US\$17.3 billion and US\$32.9 billion, respectively, in 2004, resulting in a record high agricultural trade deficit of US\$15.6 billion. The rise of the agricultural trade deficit in recent years is due primarily to the dramatic increase in domestic demand for grain, cotton, and sugar.

Figure 1: Chinese Agricultural Imports and Exports, 1980–2004



Source: National Bureau of Statistics, *China statistical yearbook*, various years.

Adjustments in China's trade policy, including tariff reduction policies, have significantly changed China's agricultural export and import structure. Agricultural trade has moved in a direction that is more consistent with China's comparative advantage (Hayes and Fuller 1999). For example, the proportion of grain exports fell to 20 percent of total agricultural exports in the 1990s, from more than 40 percent in the 1980s (Huang and Rozelle 2002). Horticultural, animal, and aquatic products accounted for more than 80 percent of agricultural exports in the late 1990s. By re-grouping trade data according to factor intensity in production, Huang and Rozelle conclude that China's net exports of land-intensive bulk commodities, such as grains, oilseeds, and sugar crops, have fallen, while exports of high-value and more labor-intensive commodities have risen. Similar trade patterns were observed in an earlier study by Carter and Li (1999).

The Impact of SPS Barriers

Before 2001, Chinese farmers and exporters had generally anticipated that China's WTO accession would have a large, positive impact on agricultural

production and exports, especially for labor-intensive agricultural products. These expectations have largely not been borne out during the post-WTO years. With a few exceptions, most agricultural products in which China maintains a comparative advantage have not performed strongly in export markets. In fact, many of them have suffered significant losses. The products hardest hit are usually those subject to stringent foreign SPS standards.

As China's agricultural trade continues to increase, the country has experienced more challenges in meeting the SPS standards set by its trade partners. Concern has grown that technical regulations such as the SPS standards are being used to discriminate against some of its exports. But neither the scope of this problem nor the economic consequences have been fully identified. Some reports suggest that such barriers pose a very high cost in terms of lost export sales. For example, one Ministry of Commerce report concludes that almost 90 percent of Chinese agricultural exports faced overseas technical barriers that resulted in US\$9 billion of lost export sales (Zhu 2003). According to an

official government newspaper, about US\$7.4 billion of exports from China were lost annually owing to increasing technical barriers (*People's Daily* 2002).

Despite these estimates of large aggregate effects of technical barriers, China has pursued only a few cases of technical barrier disputes through the informal or formal dispute settlement processes established by the WTO. Through 2004, China had raised nine informal challenges within the

WTO SPS Committee to regulations affecting its exports: three concerning the EU (over maximum residue limits and regulations on aflatoxins and ocratoxin A in foods for infants and young children), three concerning Japan (over the amendment of a food sanitation law and standards for food additives), one concerning the Philippines (over fruit regulations), and two concerning the United States (over rules on materials derived from cattle and restrictions on potted plants) (Box 1).

Box 1: SPS Concerns Raised By China

Food Safety

- European Communities—Notification G/SPS/N/EEC/236 and 237 on maximum residue levels for pesticides on food
- European Communities—Notification G/SPS/N/EEC/223/Add.1 on EC regulation on aflatoxins and Ocratoxin A in foods for infants and young children
- European Communities—Notification G/SPS/N/EEC/196 and Add.1 on maximum residue levels in pesticides
- Japan—amendment of the food sanitation law
- Japan—Notification G/SPS/N/JPN/104 on the revision of standards and specifications for food and additives
- Japan—Notification G/SPS/N/121 on standards and specifications for food additives (boscalid)

Animal Health and Zoonoses

- United States—Notification G/SPS/N/USA/933 and G/SPS/N/USA/934 on U.S. rule on materials derived from cattle and record keeping requirements

Plant Health Concerns

- United States—Restrictions on imports of Chinese potted plants in growing medium
- Philippines—Notification on Chinese fruit

Source: WTO 2005.

In addition to the informal notifications China has made to the WTO (none of which has advanced to the formal dispute settlement process), disputes in other venues concern pesticide residue limits and inspection requirements viewed as excessive for Chinese vegetable exports to Japan, restrictions on poultry meat and eels by Japan, EU restrictions on products of animal origin, poultry products, peanuts, shrimp, tea, and honey, and restrictions by the United States on longans, lychees, apples, and pears (Cheng 2005).

Import Refusals

China's recent experiences with SPS barriers have been mainly with the EU, Japan, and the United States.³ Table 1 presents a summary of import refusals for Chinese food and agricultural products during 2004 and 2005. Overall, the total number of import refusals by these three major markets remained stable between 2004 and 2005. There was an increase in refusals by the United States (3.7 percent) and the EU (20.5 percent), but the numbers were nearly offset by the decrease by Japan (-20.1 percent). Among the three markets, the United States had by far the most import refusals, followed by Japan and the EU. When, however, the number of refusals is compared with the respective export value of agricultural products, a slightly different result is obtained. Although the United States still maintains the highest refusal rate, this rate is lower for Japan than for the EU because the value of agricultural exports to Japan is more than double that to the EU. In recent years Japan has been China's largest agricultural trading partner, importing approximately US\$8 billion from China in 2005.

China's agricultural and food exports suffering from foreign SPS barriers cover a wide range of products, including processed food products, agricultural products, pharmaceutical products, livestock products, fishery products, and forestry products.⁴ Table 2 shows the number of refusals for each category of products in the EU, Japan, and the United States in 2005. It can be seen that

import refusals are concentrated in three product categories: processed food, agricultural products, and pharmaceutical products. Together they account for 90.3 percent of all import refusals in the three regions in 2005. Import refusals in pharmaceutical products are significant for the United States, totaling 312 cases in 2005, but not for the EU and Japan—only 3 cases were reported in Japan. For these two countries/regions, exports of livestock products seem to be more problematic than pharmaceutical products. For all three regions, import refusals occur less frequently in fishery and forestry products.

Two considerations are important in interpreting these refusal data. First, the products reported as "refusals" may subsequently gain access to the export market. For example, under the current U.S. Food and Drug Administration (FDA) detention system, a product placed on automatic detention may resume normal entry when the shipper or importer proves that the product meets FDA standards. "Refusal" is thus not a final rejection, since there is the possibility that some products could later be released with proper documentation and re-examination. No data on such releases are obtainable, however. If the product is finally refused, the importer is required to either re-export or destroy the article.

A second important consideration regarding the import refusal data is that they are count data and do not reflect the dollar value of Chinese food and agricultural products refused entry to the foreign markets. The value of refused products relative to the value of imports is the most direct measure of the challenges encountered at border inspection. Unfortunately, this measure cannot be calculated owing to the lack of value data for refused shipments. A rough measure of relative refusal rates can be made by comparing the number of refusals to the value of agricultural and food products imported in a certain year, as discussed earlier.

³ In 2005 SPS-related import refusals of China's agricultural and food products totaled 1,985, of which 1,634, or 82.3 percent, originate from the EU, Japan, and the United States.

⁴ In this section, "food and agricultural products" also cover pharmaceutical products.

Table 1: Import Refusals by the EU, Japan, and the United States, 2004 and 2005

| Importing country | Number of refusals | | | Total agricultural exports (billion US\$) | | |
|-------------------|--------------------|-------|------------|---|------|------------|
| | 2004 | 2005 | Change (%) | 2004 | 2005 | Change (%) |
| United States | 1,138 | 1,180 | 3.7 | 2.3 | 2.8 | 22.5 |
| EU | 146 | 176 | 20.5 | 2.6 | 3.5 | 33.5 |
| Japan | 348 | 278 | -20.1 | 7.4 | 7.9 | 7.2 |
| Total | 1,632 | 1,634 | 0.1 | 12.3 | 14.2 | 15.6 |

Source: GAQSIQ 2006.

Table 2: Import Refusals by Product Category in 2005

| Product category | United States | EU | Japan | Total |
|-------------------------|---------------|-----|-------|-------|
| Processed food products | 448 | 49 | 195 | 692 |
| Agricultural products | 328 | 96 | 44 | 468 |
| Pharmaceutical products | 312 | 0 | 3 | 315 |
| Livestock products | 18 | 20 | 22 | 60 |
| Fishery products | 15 | 1 | 12 | 28 |
| Forestry products | 2 | 3 | 0 | 5 |
| Others | 57 | 7 | 2 | 66 |
| Total | 1,180 | 176 | 278 | 1,634 |

Source: GAQSIQ 2006.

Stakeholders

In China, exports of agricultural and food products, especially those in which China has a comparative advantage, offer opportunities to producers, processors, and traders. These exports are particularly important for poor families with abundant labor and limited land, since producing labor-intensive export-oriented commodities allows for far higher production value, income, and employment per hectare than land-intensive commodities such as grain crops and soybeans.

Fruit and vegetable production can be used as an example (World Bank 2005): in 2000 the number of days of labor input per *mu* (0.067 hectare) was 12 for maize, 10 for wheat, and 15 for rice but

increased to 44 for apples, 81 for tomatoes, and 74 for cucumbers. Net value added in renminbi (RMB) per *mu* was 185 for maize, 115 for wheat, 279 for rice, 985 for apples, 1,717 for tomatoes, and 1,172 for cucumbers. Exports of higher-quality fruits and vegetable for demanding foreign buyers may require additional labor input and generate more value added both on the farm and during processing and packing at the postharvest stage.

Foreign SPS barriers have a direct impact on the welfare of smallholder farmers producing high-value-added, labor-intensive agricultural commodities. The magnitude of such impacts is, however, hard to measure at the micro level. Available data

at more aggregate levels indicate that these barriers can lead to substantial losses in terms of lost export sales. Three broad categories of products—fruits and vegetables, products of animal origin, and honey and tea—have been affected the most. Correspondingly, major domestic stakeholders are farmers and exporters of these products and foreign stakeholders are the EU, Japan, and the United States.⁵

Fruits and Vegetables

China's fruit and vegetable sector has become one of the fastest-growing sectors of agricultural production in the past decade. Fruit and vegetable production reached 145 million metric tons and 540 million metric tons, respectively, in 2003. Although this volume of output is large, only a small portion (less than 1 percent) is exported. Japan is the dominant export destination for China's vegetables and fruits. Vegetable exports to Japan accounted for 25 percent of the volume and 40 percent of the value of total vegetable and fruit exports, and fruit exports to Japan accounted for 11 percent of the volume and 22 percent of the value. Besides Japan, other major markets for Chinese fruit and vegetable exports are the EU, Hong Kong, Malaysia, South Korea, and the United States.

China's continued role as a major supplier of fruits and vegetables to Japan depends on how Chinese food producers and processors respond to the increased demand for food safety by Japanese consumers. A case in point is China's spinach exports to Japan. Before 2002, 99 percent of Japan's annual spinach imports came from China. In July 2002, owing to an excess of residues of agricultural chemicals detected in imported Chinese vegetables, Japan's Ministry of Health, Labor, and Welfare (MHLW) reinforced safety inspections of Chinese vegetables at the border and promulgated an import ban on frozen spinach from China. This

prohibition lasted about eight months till February 2003. But in May 2003 Japan again prohibited importers from purchasing Chinese frozen spinach after detecting higher than permitted levels of pesticide residue. Export of spinach did not resume until July 2004, when the MHLW lifted the ban and allowed frozen spinach to be imported from 27 authorized Chinese companies.

Although the ban on spinach has been lifted, it was a major disruption in trade from China to Japan, not only for spinach, but also for vegetables and fruits in general. Many Japanese and Chinese companies incurred heavy financial losses on stocks of product and on current contracts. The ban resulted in increased commercial risks for importers and food retailers. Moreover, it had a lasting negative impact on Japanese consumers' confidence in the safety and quality of Chinese fruits and vegetables and negatively affected their buying attitudes. Consequently, prices of imported Chinese fruit and vegetable products in the Japanese market declined, and Japan's share in total Chinese exports dropped.

The problems with frozen spinach are not the only ones for Chinese fruit and vegetable exports to Japan. Problems occur occasionally with other products, including fresh cabbage, fresh peas, fresh celery, and peanuts. Most cases of noncompliance with food safety in the Japanese fruit and vegetable market are related to pesticide residues. Phytosanitary constraints, however, are also important. Currently, Japan's Plant Protection Law stipulates 16 types of plant pests and diseases in foreign countries that are major quarantine concerns, and 5 types are relevant for trade with China: oriental fruit fly (*Bactrocera dorsalis* species complex); melon fly (*Dacus cucurbitae*); codling moth (*Cydia pomonella*); sweet potato weevil; and rice stem nematode.

Products of Animal Origin

China is also a significant player in world trade of meat and fishery products. Major export markets for these products include the EU, Hong Kong, Japan, South Korea, Russia, and some countries in the Middle East (such as Saudi Arabia). In November 2001, 300 metric tons of shrimp shipped from China to the EU were discovered to contain 0.2 parts per billion (ppb) of chloramphenicol. As a result, the EU suspended imports of Chinese products of animal origin intended for

⁵ Within these countries, producers and consumers are both stakeholders who may have potentially different interests. When the SPS barriers are implemented to protect domestic producers, consumers lose as result of trade limitation and price increase. When the SPS barriers are based on science and serve legitimate purposes, however, consumers may gain from enhanced food safety (even though the price they pay still increases). In either case, producers in importing countries are beneficiaries of the SPS barriers.

human consumption or for use in animal feeds. Affected products included rabbit meat, poultry meat, and crustaceans such as shrimp and prawns. Exports of aquatic products to the EU slumped more than 40 percent from 193,000 metric tons in 2001 to 110,000 metric tons in 2002. Meat exports to the EU dropped to 5,000 metric tons in 2002—only 36 percent of the 2001 level. Following the EU ban, other countries, including Hungary, Japan, Russia, and the United Arab Emirates, implemented stricter inspections of meat and fishery products from China.

In April 2004 the European Commission issued Commission Decision 2004/432/EC listing the names of countries approved by the Commission with regard to the submission of monitoring plans and the categories of products approved. China is on the list of countries with approved products covering only pigs and sheep. Since then the EU has approved two modifications to the list of countries and products. In the list revised in May 2005, China's residue-monitoring plans for pig and sheep products, poultry, fishery products, rabbit meat, and honey were approved.

On the basis of Commission Decision 2005/573/EC published in July 2005, the EU completely lifted the import ban on fishery products (except aquaculture fishery products and shrimp), gelatin, and pet food from China. For some other products, including aquaculture fishery products, shrimp (including peeled shrimp and crayfish), casings, rabbit meat, honey, and royal jelly, China must meet not only the general regulations for EU imports from third countries, but also new regulations specifically for China. In other words, the EU member states can authorize imports of products only if they are accompanied by a declaration from the relevant Chinese authorities stating that before being dispatched, each consignment has been subjected to a chemical test to ensure that the products do not present a danger to human health.

Honey and Tea

Honey and tea are two traditional Chinese staple export products. Since 2002, however, exports of honey and tea from China to the EU, Japan, and the United States have been drastically reduced owing to the new food safety standards in these markets. In February 2002 the EU banned imports

of honey from China after finding chloramphenicol (CAP) at levels higher than 0.1 part per billion (ppb). Following the EU ban, Japan and the United States increased their controls and tests of honey from China. For example, in May 2002 the U.S. FDA lowered the maximum level of chloramphenicol residue in Chinese honey to 0.3 ppb and claimed that the standard may be increased to 0.1 ppb. Following the adjustment, China's honey exports to the United States dropped from 15,000 metric tons in 2001 to less than 8,000 metric tons in 2002. Honey exports to Japan also decreased in 2002, though to a lesser extent.

Other countries have also banned or set higher standards for China's honey exports. For example, Saudi Arabia, which had imported about 200 metric tons of honey from China annually, imposed a complete ban in 2002. On June 2, 2002, Mexico ordered 356 metric tons of contaminated Chinese honey to be sent back or destroyed. Canada began stricter inspection for antibiotics in Chinese honey starting February 20, 2002, and required testing for the residue of phenol and 19 kinds of sulphanilamide (SN). Exports of honey to Canada decreased from almost 5,000 metric tons in 2001 to a little more than 1,000 metric tons in 2002.

A similar situation occurred for China's tea exports. The EU and Japan, the two largest importers of China's tea, have increased the standards for testing pesticide residues in tea in recent years. From 1999 to 2002, the number of pesticide residues tested for by the EU increased from 7 to 191. The criteria in terms of maximum residue limits (MRLs) are also becoming much stricter. For example, the MRL for fenvalerate in EU went from 10 ppm in the 1990s to 0.01 ppm in 2002. After the withdrawal of authorizations for plant protection products containing endosulfan, the EU reduced the MRL for endosulfan in tea from 30 ppm to 0.01 ppm, making the new standard 3,000 times stricter than the original one and much stricter than the prevailing international standard (30 ppm, according to the Codex Alimentarius).

Japan has also strengthened its inspection of tea imports, especially those from China. With the amendment of its food hygiene law on November 8, 2002, Japan had MRLs for 108 pesticide residues for China's tea exports. With the introduction in Japan of the Positive List System of Agricultural

Chemical Residues in Foods on May 29, 2006, 448 pesticides are on the list for screening and 276 residue limits are listed for tea. Following the implementation of stricter inspection standards, China's tea exports to the EU and Japan decreased by more than 30 percent and 20 percent, respectively, in 2002 compared with 2001.

Policy Issues

Problems with the Regulatory System

The most salient feature of China's food safety regulatory system is the fragmentation of regulatory authority among different government agencies. Currently the Ministry of Health (MOH), the Ministry of Agriculture (MOA), the General Administration of Quality Supervision, Inspection, and Quarantine (GAQSIQ), the State Administration for Industry and Commerce (SAIC), the Ministry of Commerce (MOC), and the State Food and Drug Administration (SFDA) are actively involved in regulating food safety. This fragmentation of the food safety regulatory system presents a challenge for regulatory implementation. In some cases there may be excessive enforcement; in others, shirking of responsibility and shifting of blame (Tam and Yang 2005).

China has enacted many laws and regulations on food and agricultural production, and many of them are outdated, repetitive, and inconsistent with or less restrictive than international standards. For example, with respect to restrictions on pesticide residues, the Codex Alimentarius has set up more than 2,500 maximum residue levels, the EU has more than 22,000, Japan has more than 10,000, and the United States has more than 8,600, whereas China has only 484, and fewer than 20 percent of these conform to Codex levels (Dong and Jensen 2004). Moreover, the establishment of agricultural standards and food safety controls in China involves multiple government ministries and agencies, with little coordination from the central government down to the county level. As a result, each level of government has developed its own standards creating a dispersed regulatory structure that neither facilitates coordination nor supports effective implementation of food safety regulations.

The lack of effective regulation of quality standards and a supervision system to control agricultural production and processing has led to substantial

noncompliance with regulations. Problems with farmers misusing or abusing chemical fertilizers, pesticides, and antibiotics are particularly acute. According to inspection reports of produce sampled by the GAQSIQ in 2001, 86 of 181 vegetable samples contained excessive pesticide residues. Among them, three prohibited hazardous pesticides—rogor, carbofuran, and isocarbophos—were found in 25, 18, and 16 samples, respectively (Dong and Jensen 2004). Noncompliance also occurs at the processing and marketing stage. Some "questionable" food-processing procedures currently reported in China include sleeve-fish preserved in formalin, bamboo shoots kept fresh with industrial sulfur, cuttlefish dyed with ink, and moldy oranges covered with a coating of paraffin. In 2005 the GAQSIQ tested 2,000 processed food samples and found one-fifth of them below state-imposed quality standards (*China Daily* 2005a).

Lack of Knowledge

A lack of basic knowledge on food safety contributes to China's current SPS situation. Apart from moral reasons, farmers and food industry workers who are not aware of the importance of food safety may not discipline themselves to meet the standards. Consumers may not demand or are unwilling to pay more for safety features incorporated in food because they do not know the importance of safe food for human health. Agricultural producers and processors who are not aware of the changes in food safety requirements taking place in domestic and foreign markets may make the wrong decisions for improving their business.

In recent years, following a series of food scandals, there has been an increase in food safety awareness among China's urban residents. But for most Chinese small-scale farmers, food safety education and technical training is still lacking. Some farmers are not able to follow instructions for pesticide use, whereas others do not have enough knowledge or expertise to identify the risks of pests or diseases. In both cases, farmers tend to misuse or overuse pesticides. Farmers often do not know when their products are safe to be harvested after the pesticides are used, and there is no testing available at the farm level, especially for small farmers.

Small Production Scale

The small scale of agricultural and food production in China, as well as the fact that producers are relatively scattered across producing areas, contributes to the abuse of agricultural chemicals and other hazardous materials. In 2004 the GAQSIQ surveyed producers (including farmers and processors) of rice, wheat flour, cooking oil, soy sauce, and vinegar products. Of these, 79 percent were family businesses with fewer than 10 workers each. Nearly 16 percent of them were producing without a license, and quality control and safety inspections were nonexistent in 64 percent of them (*China Daily* 2005a).

Food safety control in a country with a farm population of more than 600 million and countless household farming operations is a difficult, if not impossible, task given China's current financial and institutional capacity. The fragmented food supply chain, from planting, raising, harvesting, transportation, storage, processing, and, eventually, to the delivery of finished products to markets, makes it even more difficult to achieve traceable product flow and meet requirements for quality assurance. In addition, small-scale farmers themselves have little or no motivation to comply with SPS regulations since compliance leads to higher production costs while noncompliance does not incur any penalties.

Environmental Problems

Increasing industrial pollution in China is also causing SPS problems. Polluted water and soil directly affect agricultural production. This pollution could be the reason that some testing results show noncompliance with lead (Pb) limits. For example, samples drawn from 220 million kilograms of crop production grown on 300,000 hectares of land in 2000 show that 10 percent of crop production contained excessive levels of heavy metals (Dong and Jensen 2004). According to a recent estimate by the State Environmental Protection Administration (SEPA), 12 million tons of grain nationwide are polluted with heavy metals that have found their way into soil each year. Direct economic losses exceed 20 billion yuan (about US\$2.5 billion) (Xinhua News Agency 2006).

Policy Options

The Public Sector

Organization and coordination. Since China has a multiagency system for food safety control, there is much overlap in the functioning of various agencies and a lack of coordination between them (Tam and Yang 2005). There are also conflicts between governments at various administrative levels as a result of their potentially different policy goals. To improve the current institutional framework for China's food safety, the government should strengthen organization and coordination so that responsibilities for monitoring and controlling food safety are clearly specified and distributed among different ministries and agencies at different levels. For example, the Ministry of Agriculture should be responsible for enforcing food safety regulations during agricultural production and promoting good agricultural practices (GAPs); the General Administration of Quality Supervision, Inspection and Quarantine should coordinate and monitor activities in domestic food markets and for imports and exports; the Ministry of Health should be responsible for food safety at the consumption stage, and the State Food and Drug Administration should coordinate the relevant bureaucracies to draft laws and administrative regulations concerning food safety.

Food safety promotion and information sharing. Improving people's awareness about food safety is an important strategy for the government. Over the past few years, food safety awareness in China has increased, mostly owing to food scandals and mainly among urban consumers.⁶ To date, no mass media campaigns related to food safety have taken place in China, and information dissemination on food safety is limited in scale and usually disorganized. It is very important that the government can play a central role in promoting food safety

⁶ A national survey recently revealed that food safety has become the primary concern for China's urban residents. The survey covered 1,058 people from China's 10 major provinces and municipalities between June 16 and 26, 2005. According to the survey, public awareness of food safety issues increased after several serious food scandals, including the use of the cancer-causing Sudan I red dye by Kentucky Fried Chicken (KFC) and a subsidiary of U.S.-based Heinz, the addition of excessive iodine to infant formula by Nestlé, and the reprocessing of out-of-date milk by Bright Dairy (*China Daily* 2005b).

through activities such as general education about hygiene in the workplace and on the farm, education for farmers about the safe use of pesticides, integrated pest management (IPM), and GAPs, and news paper, TV or web-based information sharing about food safety for the general public. Promotion of food safety in agri-food business should be accompanied by the establishment of alert systems and databases about possible health hazards. This can help industry improve product quality and prevent and control food safety hazards. In the trade arena, a food safety notification and inquiry system maintained by the government (such as the GAQSIQ's WTO TBT/SPS enquiry point) can better assist importers and exporters in obtaining up-to-date information on domestic and foreign regulatory changes.

Food safety monitoring. Monitoring is critical for creating food safety related data, setting relevant policies and targets, and prioritizing measures for supervision and enforcement. To enhance food safety monitoring and testing capacity, the Chinese authorities have established many laboratories at different levels of government. While good infrastructure building is important, a narrow emphasis on investment is not enough. The critical issue now in China is how to use these available resources efficiently and effectively. So far a lack of qualified technicians and relevant expertise presents a bigger constraint than a lack of advanced testing equipment and facilities. Therefore, China needs to invest more on personnel training on new analysis technology, methods, and operation of monitoring and testing devices.

Good food safety monitoring also requires an efficient data gathering system. Without such a system, consistent and reliable data will be unavailable and evidence-based interventions will be impossible. A monitoring and surveillance system employing sentinel sites and regional and national laboratory networks as well as food safety agencies at different administrative levels would serve the purpose. Since many entities are involved in this system, it is important to ensure that the whole system is transparent, its functionings are science-based, the subsystems are comparable, and, hence, the monitoring results are credible. Currently, China does not have an efficient monitoring system, which has led to a paucity of scientific data related to food safety. By reevaluating the existing system in the areas such as the sampling frames, testing methods,

data analyses, lab capacities, and management and personnel skills and by better integrating the efforts of different departments and central and local labs, the government can develop an improved monitoring network that benefit both domestic and export markets.

The Private Sector

Foreign direct investment and "dragon-head" enterprises. To develop the infrastructure required to support better food safety control, China needs to find a way to increase investment in agriculture. Given limited domestic funding resources, the government should continue to attract foreign investments, and in particular, foreign direct investments (FDI). It is believed that the FDI, as compared to other types of investments, can not only introduce stable capital inflows but also bring advanced technology and management and marketing skills that are essential for improving product quality, increasing exports, and assisting in the transition from traditional to modern agricultural operations. In addition to encouraging FDI, the government needs to support the development of large-scale rural firms, or "dragon-head" enterprises, because they play an important role in the industrialization of the agricultural system and the linkage between farmers and markets.⁷

Both the FDI and dragon-head enterprises can help millions of small-scale farmers who have low management skills and poor production techniques to comply with stricter food safety requirements and remain competitive in the international markets.⁸ Through contracts or other arrangements, small-scale farmers are linked to larger-scale production and processing which allow them to gain economies of scale, acquire modern production and management skills and adapt to more standardized production procedures. This means farmers can now meet

⁷ Enterprises are registered and attached to administrative levels based on figures including turnover, profits, market share, taxes paid, and growth rates. Dragon-head enterprises are specific to agriculture, as they must have contact with or lead along a large number of farmers and contribute to agro-industrialization and vertical integration. Dragon-head enterprises are commonly eligible for preferential tax treatment, preferential access to loans, and invitations to join official meetings and delegations.

⁸ There are concerns about whether FDI and dragon-head enterprises can actually benefit small farmers. Some argue that farmers get little assistance in terms of inputs, technology, and marketing (Huang et al. 2006).

food safety standards more easily and with lower costs. Currently the involvement of FDI and dragon-head enterprises is disproportionately concentrated in China's coastal region while the share of agriculture in total FDI is relatively low (about 5 percent). Additional policies are needed to direct more FDI to the agricultural sector and to nurture more dragon-head enterprises in the inland regions.

HACCP, GAP, and GMP. Agro-food businesses in China should consider implementing standardized food safety control procedures as another potentially useful approach to reducing SPS problems. The Hazard Analysis and Critical Control Point (HACCP) system is one of those international recognized procedures.⁹ The HACCP system requires identification of critical control points and development of procedures for monitoring controls and addressing any failures in control. Often, firms are given some flexibility in determining control points and critical limits, so implementation of HACCP is adaptable to many different contexts. The imposition of regulations mandating the HACCP system reflects a growing recognition that it is important to prevent and control food safety hazards before they reach the consumer.

Given the fact that not all food producers and processors are required to adopt HACCP, the responsibility for improving SPS conditions will also come through self- or market-oriented disciplines such as good agricultural practices (GAPs) and good manufacturing practices (GMPs). GAPs and GMPs principles provide food growers and manufacturers with guidelines to reduce the potential contamination of their products. Guidelines cover growing, harvesting, sorting, packing, and storage operations. National-level guidelines on GAPs and GMPs enhance the consistency and scientific basis of food safety programs developed by public and private institutions. Producers' adoption of good practices such as GAPs and GMPs can be promoted by the government or motivated by the promise of earning more returns by selling products of higher quality and safety.

⁹ China first adopted the HACCP system in the production of aquatic products and later introduced it to other foods including canned food, meat and meat products, frozen vegetables, fruit/vegetable juice, and frozen convenience food containing meat or aquatic products. The use of the HACCP system is primarily export oriented, although in recent years there is an increasing demand for this certification for domestically consumed products.

Supply chain management. Experience has shown that coordinated and integrated supply chains are crucial for participation in modern food markets since they provide an efficient and effective tool for food quality and safety control. But to date in China, coordinated supply chains handle a relatively small percentage of food.¹⁰ In cases where coordinated supply chains are established, they are mostly within the export sector, which have received valuable support from foreign partners. To create an overall environment of enhanced food safety, it is important for the whole agriculture sector to adopt modern supply chain management and strengthen the participation of small-scale farmers.

Although private enterprises and their partners have primary responsibility for setting up and managing coordinated supply chains and safety management programs, proper government support is also important. To avoid creating unnecessary market distortions, the government's supporting role should focus on a good investment climate for coordinated supply chains, especially legal and regulatory issues, infrastructure, a skilled labor force, and relevant business services. Privately maintained supply chain schemes from the world's leading food importers as well as other well-established supply chain with independent accreditation and certification, such as under the British Retail Consortium (BRC) or Euro-Retailer Produce GAP (EUREPGAP), can help domestic firms meet high food safety standards with limited public sector intervention. It is therefore important for the government to enhance the formation and functioning of these types of coordinated supply chains.

Assignment

Your assignment is to develop strategies that China can use to enhance its capacity to meet food export quality standards, taking into account the

¹⁰ Although upstream segments of the supply chain have evolved dramatically in China in the past 20 years, agricultural marketing is still dominated by the sales of farmers to small wholesalers and small traders. There is little penetration of the new retailing institutions because of high transaction costs between modern retailers and small farmers, and buyers play little role in providing technology, inputs, technical advice, or credit (Huang et al. 2006).

financial, institutional, and technical constraints it is facing.

Additional Readings

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