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The Challenge of Conforming to Sanitary and Phytosanitary Measures for China's Agricultural Exports

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Abstract

China's bilateral trade in food and agricultural products has grown dramatically since the country's entry into the World Trade Organization (WTO). However, the country faces significant problems related to sanitary and phytosanitary (SPS) compliance because of increasing concerns about food safety, stricter SPS requirements in trade, and competitiveness in export markets. China's food and agricultural industry will need to address the SPS issues and make significant changes in production and distribution methods in order to gain wider access to world markets. This study provides a systematic and comprehensive analysis of current Chinese SPS conditions, the food safety regulatory system, production environment, inspection technology, and information systems. In addition, China's progress on resolving SPS problems and ability to adjust to the current SPS measures it faces in world markets are discussed.

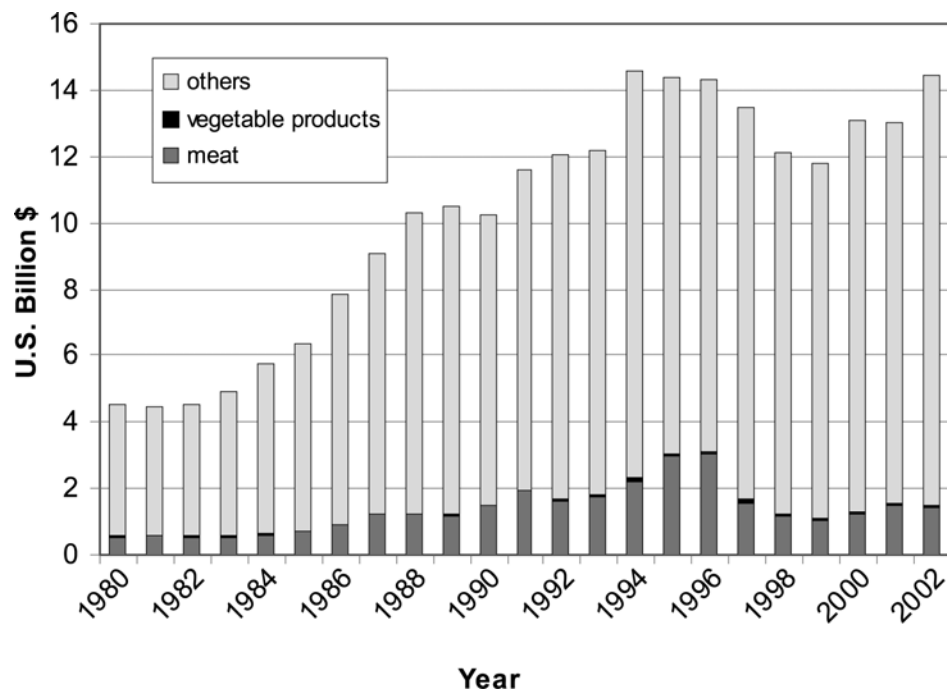
Keywords: agricultural exports, agricultural production, China, sanitary and phytosanitary (SPS).

The Challenge of Conforming to Sanitary and Phytosanitary Measures for China's Agricultural Exports

Introduction

After 15 years of negotiations, China became the 143rd full member of the World Trade Organization (WTO) on December 11, 2001. Since then, with eliminated or lowered tariffs, China's bilateral trade has grown significantly. In 2002, the value of Chinese exports and imports for agricultural products reached \$14.5 billion and \$16.1 billion, respectively, and the total value of trade in agricultural products increased by \$1.2 billion from the previous year (see Figure 1; FAO 2003).

However, several problems have emerged. Chinese farmers and exporters had anticipated a large, positive impact on domestic production with accession to the WTO, especially for labor-intensive agricultural products such as vegetables, fruits, livestock



Source: FAO 2003.

FIGURE 1. Chinese agricultural product exports

and poultry products, and seafood, but these expectations proved unrealistic. In fact, these products have been hardest hit by the need to meet significant sanitary and phytosanitary (SPS) standards, and this has prevented substantial growth in these agricultural exports.

According to a recent investigation by China's Ministry of Commerce, about 90 percent of China's exporters of foodstuffs, domestic produce, and animal by-products were affected by foreign technical trade barriers and suffered losses totaling U.S.\$9 billion in 2002 (*China Daily* 2003). These large losses have received attention from the Chinese government, food industry, and farmers, and have encouraged efforts to address SPS problems in order to gain wider access to world markets.

The objective of this paper is to analyze in a systematic and comprehensive manner the current Chinese SPS conditions in agricultural production and to consider China's ability to adjust to the current SPS measures it faces in the world market.

Sanitary and Phytosanitary Issues for Chinese Agricultural Products

China's recent experiences with SPS barriers have been mainly with the European Union, Japan, and the United States. These three countries accounted for 41, 30, and 24 percent, respectively, of the trade losses attributable to SPS measures in 2002 (Zhu 2003). And, because failure to pass SPS inspections often leads to closer inspection of future exports, China's agricultural products have confronted much stricter inspection in these markets following several of the SPS-related problems. For example, in November 2001, 300 metric tons (mt) of shrimp shipped from Zhoushan in the Zhejiang province to the European Union were discovered to contain 0.2 parts per billion of chloramphenicol. As a result, the European Union suspended imports of Chinese products of animal origin intended for human consumption or for use in animal feeds. Affected products included rabbit meat, poultry meat, and crustaceans such as shrimp and prawns. Later, other countries, including Hungary, Russia, and Japan, implemented stricter inspections of poultry meat from China. As a consequence, exports of poultry meat from China decreased by about 33 percent in 2002 compared with the previous year.

Other recent examples include a ban on imports of honey by the European Union; Japan's ban on imports of frozen spinach from China; and a reduction of tea exports to the European Union and Japan following stricter pesticide inspections. In February 2002, the European Union banned imports of honey from China after finding chloramphenicol

at levels higher than 0.1 part per billion. Following the E.U. ban, the United States and Japan increased controls and tests of honey from China. China's honey exports decreased from more than 100,000 mt in 2001 to 76,000 mt in 2002. The European Union has not yet lifted its ban, and China's exports of honey continued to fall in 2003.

In July 2002, Japan blocked imports of frozen spinach from China after finding pesticides called chlorpyrifos. Prior to this ban, imports from China accounted for 99 percent of Japan's annual imports of 40,000 to 50,000 mt of spinach. Japan's restriction on Chinese exports of frozen spinach lasted for about eight months (until February 2003). In May 2003, after detecting higher-than-permitted pesticide residue, Japan again advised importers not to import Chinese frozen spinach.

In 2002, China's tea exports to the European Union and Japan decreased by more than 30 and 15 percent, respectively, following the implementation of stricter inspection standards. The European Union increased its inspection categories for pesticide residuals from 6 to 62. Japan adopted new inspection methods and increased its inspection categories to 77.

In addition to the loss of exports, failure to pass SPS inspections also leads to additional losses associated with returned goods. When goods are returned, exporters not only incur the loss of value in the goods but also pay extra transportation costs.

Currently, Chinese exports of seafood, vegetables and fruits, tea, honey, poultry meats, and red meats are creating the most frequently encountered SPS problems.¹ From August 2002 to July 2003, the U.S. Food and Drug Administration (U.S. FDA) refused 1,285 shipments of Chinese foodstuffs from entry into the United States. Agricultural and aquatic products accounted for 630 of these shipments, or nearly half of all refusals. Table 1 lists the product and number of agricultural and aquatic products refused by the U.S. FDA and the reasons for refusal.

Although China's export mix varies from country to country, Table 1 clearly shows some common SPS problems with Chinese agricultural products. Except for some problems related to labeling and packaging, most refusals result from violations of SPS measures. Excessive pesticide residues, low food hygiene, unsafe additives, contamination, and misuse of veterinary drugs have been major issues.

TABLE 1. U.S. Food and Drug Administration refusals of Chinese agricultural foodstuff shipments

Product Type	Number of Refusals	Reason Cited
Seafood	34	Salmonella
	19	Veterinary drugs
	35	Filthy
	34	Other ^a
Fruits/Vegetables	27	Pesticides
	13	Other
Honey	5	Chloramphenicol
	1	Veterinary drugs
Additives/Color	2	Unsafe additives
Crushed pepper	15	Pesticides
	3	Filthy
	1	Salmonella
	2	Other
	50	Filthy
Dried mushroom/Fungus	8	Other
	115	Filthy
Other foodstuffs	115	Unsafe
	146	Other

Source: U.S. FDA 2003.

Note: Some products were refused for more than one reason and only the reason listed first is shown here.

^a This includes unsafe additives/color, poisonous contents, listeria, filthy conditions, chloramphenicol, improper information or labeling.

Current Sanitary and Phytosanitary Conditions in Chinese Agricultural Production

SPS problems have existed in agricultural production in China for a long time but have only received world-wide attention since China's accession to the WTO. Although reasons for bans on or returns of agricultural products exported from China do not exclude protectionism by importing countries, the major reasons lie within China itself. The causes of China's SPS problems can be attributed to many factors, most of which are common to developing countries.

China's Regulatory and Oversight Systems

Because the Chinese government is still working to perfect its SPS regulatory and oversight systems, the regulation and supervision of food product quality do not yet provide the necessary guidelines for agricultural and food production. Current regulations in China are insufficient to meet the present requirements of international trade.

Some industries and commodities have no technical standards, and there is no sound food safety law to support and upgrade inspections. In comparison, with respect to restrictions on pesticide residues, Codex has set up over 2,500 maximum residue levels, the European Union has over 22,000, the United States has over 8,600, and Japan has over 9,000, while China has only 484 (Zhang 2003), and fewer than 20 percent of these conform to Codex levels.

During more than 50 years of regulation, China has enacted many regulations on food and agricultural production. However, many of the regulations are outdated and repetitive and are not consistent with or are less restrictive than international standards. Moreover, the establishment of agricultural standards involves 10 government ministries, with little coordination from the central government down to the county level. As a result, each level of government has developed its own standards. This dispersed structure neither facilitates coordination nor supports effective implementation of food safety regulations. In addition, the lack of technical, institutional, and managerial capacity to control and ensure compliance makes the regulations and standards less effective.

The Production Environment

The lack of effective regulation of quality standards and a supervision system to control agricultural production and processing, coupled with noncompliance with regulations, has resulted in Chinese producers often misusing or abusing chemical fertilizers, pesticides, and antibiotics. Antiquated production techniques and technology also have an impact. More than occasionally some very hazardous chemicals can be found in agricultural products. In addition, pollution and a low-quality input supply make the condition worse.

In 2001, average pesticide use was 14 kilograms per hectare, or two times the average 7 kilograms per hectare used in developed countries (Wan 2002). Farmers' lack of knowledge about how and when to utilize chemicals appropriately and the low quality of agricultural inputs supplied by manufacturers and marketing companies worsen the situation. According to inspection reports of produce sampled by the General Administration of Quality Supervision, Inspection, and Quarantine of China in the third quarter of 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.

Increasing industrial pollution in China is also damaging the water and soil environment, which directly affects agricultural production. According to samples drawn from 220 million kilograms of crop production grown on 300,000 hectares of land in 2000, 10 percent of crop production contained excessive levels of heavy metals (Wan 2002).

In animal production, there are persistent violations of regulations on drug additives and quality standards. In 2002, China's Ministry of Agriculture conducted sample inspections in the nation on production, marketing, and utilization of feed and feed additives. In the first six months of 2002, 14 percent of samples drawn from farms and manufacturing/marketing enterprises were substandard and nearly 2 percent of feed drawn from farms contained prohibited drugs. In the second half of 2002, 10 percent of the samples were substandard and about 5 percent of feed drawn from farms contained prohibited drugs. Besides prohibited drug additives, lead, aflatoxin B1, and *Salmonella* were the most common adulterants or types of contamination found. The rate of substandard labeling ranged from 20 percent to 40 percent.

Scale of Production

The small scale of fresh produce and livestock operations in China and the fact that they are relatively scattered across producing areas contribute to the abuse of agricultural chemicals and noncompliance with regulations. For example, 92 percent of swine producers have an annual production with only one to five pigs (Ke 2002). Controlling the use of chemicals and veterinary drugs in such a vast country—with more than 900 million farmers and countless household farming operations—is extremely difficult.

Poor machinery and low management levels in household operations also contribute to SPS problems. Small-scale farmers have little or no motivation to comply with SPS regulations if they do not face penalties for noncompliance or if they face increased production risks. Even when large-scale, standardized production might develop, compliance with SPS standards can lead to significant increases in production costs and, in the short term, the potential loss of revenue can be a significant barrier to change.

Fragmented food chains make it difficult to achieve traceable product flows and meet requirements for quality assurance. From planting/raising, management, harvest,

transportation, storage, processing, and, eventually, the delivery of finished products to market, SPS problems can occur at each step or level of the process, and each problem potentially will affect the quality of the final product.

Inspection Technology and Equipment

Current inspection and testing technologies and instruments often do not provide the necessary measures for detecting possible SPS problems. In some cases, antiquated inspection methods and instruments are not able to detect the maximum residue levels set by developed countries for imported agricultural product, especially when more and more tolerances are set at very low doses (i.e., parts per million [mg/kg], parts per billion [ug/kg], and parts per trillion [mug/kg]). Out-of-date testing technology and equipment can result in questionable assurance results and reduced inspection speeds. Lack of up-to-date inspection equipment limits the ability to conform to internationally accepted assessment procedures. Currently, quality inspection organizations are not able to meet the demand for services in terms of quality or scale of operation, especially for evaluating pesticides and veterinary drug residue.

Information Transfer

China's inefficient information systems and isolated markets mean that market information and other technical requirements are not communicated in an efficient manner. The lack of effective information channels across levels of government, industries, and regions means that even if some firms or industries confront SPS problems in export markets, other firms or industries likely would not be informed on a timely basis. In addition, most farmers do not have access to information about SPS standards, let alone to the resources required to comply with these standards such as appropriate technologies and scientific and technical expertise. Most producers have only a limited awareness of SPS measures in general and lack an understanding of their importance.

China's Progress on Resolving Sanitary and Phytosanitary Problems

Today, with increasing interaction with world markets, China's government and traders have recognized SPS problems and are taking actions to improve the production and marketing environment. Under China's recently established National Agricultural

Standards Development Plan for 2003-2005, the government has focused on reducing residue levels and increasing inspection methods for chemicals, veterinary drugs, and feed additives. The government has also made an effort to construct agricultural product quality inspection centers and has increased efforts to educate producers on requirements for production methods in international markets. The Ministry of Agriculture approved more than 90 non-public hazard agri-food products demonstration bases, established 23 national agri-food products standardized demonstration areas, and created five no-listed-disease areas (*People's Daily* 2002).

Foreign Direct Investment and “Dragon-Head” Enterprises

In order to develop the infrastructure required to support better food safety control, China needs to find a way to increase investment in agriculture. With relatively scarce capital internally, the government has encouraged foreign direct investment (FDI) in agriculture. Such investment can introduce capital, advanced technology, and management and marketing skills to improve product quality, increase exports, and assist in the transition from traditional to modern agricultural operations. Agricultural production and food processing sectors each account for only about 2 percent of total FDI (see Table 2), and food processing, grain and feed processing, and aquatic product processing had more

TABLE 2. Foreign direct investment in agriculture and food processing in China, 2001-2002

FDI	No. of Projects		Values of Contract (billion U.S.\$)		Percentage of Total (%)	
	2001	2002	2001	2002	2001	2002
Agriculture	887	975	1.76	1.69	2.5	2.0
Farming	536	571	0.96	0.79		
Forestry	24	26	0.04	0.03		
Animal husbandry	115	133	0.35	0.45		
Fisheries	126	157	0.25	0.27		
Food processing	927	1,154	1.44	1.77	2.1	2.1
Grain and feed	134	122	0.28	0.24		
Vegetable oil	24	28	0.10	0.13		
Slaughter, meat, and eggs	67	86	0.15	0.11		
Aquatic product	213	256	0.23	0.23		

Source: China, Ministry of Commerce 2003.

FDI than did the other components. Except for a few inland provinces, FDI in general has been concentrated in the southeast coastal areas. The United States, Japan, and South Korea are the most important investing countries.

Chinese agriculture is becoming increasingly industrialized, and the government has supported the development of leading, large-scale enterprises, or “dragon-head” enterprises. According to the secretary of the Chinese department of agriculture, by the end of 2002, 372 key dragon-head enterprises had formed at the national level, and nearly 1,900 formed at the province level. Approximately 30 percent of all farmer households produce product sold to these industrial enterprises. The national and provincial level key dragon-head enterprises are mainstays of the move toward a more industrialized agricultural system.

Additional FDI and key dragon-head enterprises hold some hope for small-scale farmers with low management skills and poor production techniques. Moves to organize the small-scale farmers to operate as single large-scale entities would allow them not only to gain economies of scale but also to more easily standardize production and comply with SPS measures at lower costs. Improved organization and investment to facilitate the larger-scale production and processing may allow small-scale producers to remain competitive in the stricter food safety environment required in international markets.

Hazard Analysis and Critical Control Point Systems and Good Practices

Following the lead (and requirements) of the United States and other countries, China has turned to implementing Hazard Analysis and Critical Control Point (HACCP) systems as another potentially useful approach to reducing SPS problems in China. The aquatic product industry was the first to adopt HACCP systems in China. In 2002, China's General Administration of Quality Supervision, Inspection, and Quarantine introduced regulations requiring export-oriented enterprises producing six kinds of food (canned food, aquatic products [excluding fresh, frozen, air-cured, pickled/salted products], meat and meat products, frozen vegetables, fruit/vegetable juice, and frozen convenience food containing meat or aquatic products) to pass a HACCP system examination for hygiene certification before producing, processing, or storing exported food. Use of HACCP systems is expected to improve greatly the sanitary situation of those exported foods.

However, since producers of most exported products and production services at various stages of the supply chain are not required to adopt HACCP, the responsibility for improving SPS conditions “at source” will come through self- or market-oriented discipline. Producer efforts toward good practices can be motivated primarily through incentives to earn more revenues by way of foreign exchange in export markets. Thus, in addition to supporting technical advances and developing internal regulations, the government is challenged to raise awareness of SPS standards and the importance of SPS requirements for export performance on the part of producers, transport operators, processors, traders, quality inspectors, and government officials through public education.

Production of Organic Foods

In an effort to solve environmental problems and improve food quality in China, the Chinese government has encouraged the development of “green food”: foods that are pollution-free, nutritious, high-grade, and certified to meet certain standards. The Chinese green-food regulatory system includes six quality-control standards, which are categorized as environmental quality, production and processing procedures, product quality, packaging, storage and transportation, and other related standards. Chinese green food is classified into two grades, AA-grade green and A-grade green. Both grades require food to be produced in an environment that meets prescribed criteria and in accordance with specific operating procedures, including tests of quality controls and packaging checks. The only difference between the two grades is that to meet AA grade, no harmful synthetic chemicals are allowed to be used in production, while limited quantities of prescribed synthetic chemicals are allowed in A-grade green-food production. In addition, no genetically modified technology is allowed in AA-grade green-food production.

By the end of 2000, there were 964 enterprises and 1,831 kinds of food products carrying green-food labels. In 2001, China exported U.S.\$300 million of green foods, which accounted for about 2 percent of total agricultural product exports from China, and China is aiming to raise its total output of green food to 45 million metric tons (mmt) by 2005 (*Asia Times* 2002). Although superior to other domestic standards, most Chinese green-food standards are not identical to internationally recognized standards for organic products.

Furthermore, A-grade green food, which accounts for most green-food production, cannot meet the requirement for organic food because of the use of limited synthetic chemicals.

Organic food production is getting more and more attention because of increasingly strong demand from the world market. China currently has two organic food authentication institutions: the Organic Food Development Center (OFDC) of the State Environment Protection Administration, established in 1994; and the China Organic Food Certification Center (COFCC), established in 2003. Labels used by the two organization are shown in Figure 2. By the end of 2002, OFDC had authenticated about 200 producers and 28,000 hectares in production as organic. COFCC had authenticated over 50 producers (of mainly primary agricultural produce) and 4,000 hectares of production as organic.



FIGURE 2. Labels for organic food accredited by the Organic Food Development Center and the China Organic Food Certification Center

Establishing a complete and reliable system of SPS standards, regulations, oversight, testing, and enforcement that comply with international standards will be a long process for China. Many of these changes require relatively large investment in production and processing facilities. However, before the transformation to larger-scale production processes is complete, producers will want to export their products to the world. Many Chinese producers choose organic food production to take advantage of relatively higher product market prices and a production technology that may favor smaller producers and those with relatively low labor costs.

World trade in organic foods totaled U.S.\$21 billion in 2002 and the market continues to grow rapidly. China's organic food production potential is great. Besides the advantages of low labor cost, a large land base, and diverse topography and climate in China, some regions, such as the western region, have little pollution and vast "virgin" soil, making them ideal for future organic product development. However, the western

regions, which are underdeveloped and scarce of capital, need supportive policies and investment from the government and from dragon-head enterprises to provide necessary logistical services and control of soil erosion in order to give local advantages a competitive edge. With low labor costs and the potential development of organic production in those parts of western China with clean environments, China has the potential to gain a large share in world organic markets.

Market Opportunities for China in Response to Current Sanitary and Phytosanitary Measures

Although SPS condition levels as a whole in China are low, the coastal and open provinces and regions have reached SPS conditions consistent with international ones as a result of their relatively open markets and exports to developed countries. These markets are now mostly controlled by the “invisible hand” of international market forces, and producers can quickly adjust production to market signals. However, large regional differences limit prospects in international markets, and it will take a long time to make the necessary adjustments to improve the overall SPS conditions in China. During the transition, the potential for exports of China’s agricultural production will vary.

Fishery Products. Fishery exports are likely to increase to catch up to strong demand, although some food safety related problems will continue to affect trade. The aquatic product industry was the first to adopt HACCP systems and most firms have adopted HACCP and FDI projects in food processing. Given the new regulation on the adoption of HACCP, SPS conditions are likely to be much improved. Despite some detentions and product returns, aquatic product exports totaled more than 2 mmt in 2002 and were valued at U.S.\$4.69 billion, or more than 25 percent of China’s total farm product exports (*Beijing Time* 2003).

Pork. China’s pork exports are only slightly affected by the imposition of stricter SPS standards for trade because most of China’s pork exports go to developing countries. Several highly contagious diseases, including foot-and-mouth disease (FMD), preclude export to the United States and European Union. Low prices are the key for China’s growing exports to developing countries’ markets. Because of the presence of FMD, it will be difficult for China to open new markets in developed countries, where SPS issues

are of greater concern than prices. Also, problems with feed input supplies, production techniques, production processes, small-scale enterprises, and nonconformity to world standards are factors in meat production that will not be resolved in the short term.

Tea. China's share of the world tea market is likely to decrease slightly, in part because of stricter standards and inspections by the European Union and Japan. China's tea production is scattered and small in scale (of the 2.6 million acres planted, 70 percent is operated by scattered households [*International Financial News* 2002]), which means that tea production and processing are unlikely to improve over the short term. There is no recognizable brand that represents good quality. In addition, China faces increased competition from Vietnam and Indonesia in export markets.

Fruits and Vegetables. China's fruit and vegetable sector has become one of the fastest-growing sectors in agricultural production in the last decade. Fruit production increased from 30 mmt in 1990 to 70 mmt in 2002, and vegetable production increased from 128 mmt in 1991 to 368 mmt in 2002. Although this volume of output is large, only a small portion (less than 2 percent) is exported. Because Asia has been the dominant destination for China's vegetable and fruit exports (accounting for 68 percent of China's exports in 1998-2000 [USDA-ERS 2002]) and because Japan is a big player in China's export market (accounting for over 50 percent of China's fresh vegetable, processed vegetable, and fruit exports), any uncertainty in China's future vegetable exports will come mainly from Japan.

China's continued role as a leading supplier of vegetables to Japan will depend on how Chinese food producers and processors respond to the increased demands placed by stricter SPS requirements. Because vegetables exported by China are mainly from a few export-oriented provinces (e.g., Shandong and Guangdong), producers can quickly adjust production to market changes. For example, in Shandong province, which accounts for about 20 percent of China's vegetable exports, the provincial government enforced a set of criteria on pesticide residues, which stipulates that vegetable export businesses set up strong monitoring systems and only purchase vegetables from registered production bases. Suppliers are required to provide certificates to prove they have not used banned pesticides (Xinhua News Agency 2003). Because of China's proximity to Japan, the similarity of their dietary habits, and China's broad product offering and low prices,

China is likely to remain Japan's leading vegetable supplier, even with some friction over chemical residue issues. In addition, increasing foreign investment has bolstered Chinese exports to Japan, especially investment from Japanese trading companies that provides the seeds, spores, production/packing techniques, and connections to Japanese markets.

Because over 70 percent of China's fresh fruit exports go to other Asian countries, exports to those countries may be affected to a lesser extent by concerns over SPS problems. However, the near-term prospects for expanding export markets for fruits from China are limited because of high domestic demand, which will absorb the supply of high-quality produce.

Future Prospects for Sanitary and Phytosanitary Measures as Nontariff Trade Barriers

Although the WTO SPS Agreement requires members to ensure that SPS measures are based on sufficient scientific evidence, there are some well-founded concerns that countries may abuse SPS measures by using them as trade barriers. In 1996, for example, the USDA Foreign Agricultural Service found that 62 countries reported having questionable technical barriers on U.S. agricultural exports (Roberts, Josling, and Orden 1999). The study also found that developing countries are subject to more SPS disciplinary actions than are developed countries.

As China works to respond to the SPS regulations of other countries, concerns have arisen that some countries will use SPS barriers to keep out lower-cost Chinese products. Because of very low production and labor costs, some products exported from China are very competitive in world markets. Consequently, importing countries may look to restrict imports from China by setting relatively high standards or strict inspections in order to protect domestic markets. As China faces more SPS conflicts, the government will participate in bilateral negotiations to resist unfair trade restrictions and discrimination and is likely to utilize the WTO to coordinate and resolve trade disputes. As a member of the WTO, China can participate in the negotiation and establishment of international regulations and standards to obtain a more equal position for its agricultural exports.

Endnote

1. U.S. technical standards preclude imports of beef, pork, and poultry meat into the United States in an effort to prevent the import of highly contagious animal diseases that are endemic in China, including foot-and-mouth disease.

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