



Woodrow Wilson
International
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China Environment Forum



SOWING THE SEEDS

Opportunities for U.S.-China
Cooperation on Food Safety

By Linden J. Ellis and Jennifer L. Turner



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Cover Photo: A farmer sprays pesticide on a rice field on the outskirts of Yangshuo (Guangxi Zhuang Autonomous Region). Curbing the improper use or overuse of pesticides, as well as the use of illegal pesticides, has become a top priority for Chinese authorities who in 2007 began to strengthen inspections in the country's food industry. The Chinese government is trying to ease concerns by the international community that the country's food and drug exports pose health risks. © Diego Azubelle/epa/Corbis

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Sowing the Seeds

Executive Summary

Although Chinese exports make up less than 1 percent of the total U.S. food supply, China has become the third largest source of food imports into the United States. The value of these imports from China tripled between 2001 and 2007, benefiting Chinese food producers and the international food companies operating in China, as well as U.S. consumers who have a broader selection of food products, particularly fruit and fish.

The global food distribution system has made all countries increasingly dependent on others for food sales and food security, as the current global grain shortage and rising food costs indicate. Food safety demands the active collaboration of the government, food safety technology leaders, the food industry, and consumers both within countries and across borders. Today even small and remote food producers can quickly connect to international markets, making food safety a core challenge for regulatory agencies in every country. Over the past year, a number of highly publicized stories of contaminated food exports from China have put the Chinese food regulatory system and food processing industries under intense scrutiny both domestically and internationally.

China's Challenge

China's capacity to effectively protect food quality is hampered by a weak legal, political, and regulatory infrastructure that has not forced food producers and processors to be accountable. Key weaknesses in China's food safety governance system include: strong local government protectionism of industries; a lack of a product liability law; and weak monitoring capacity of food products, due both to the vast numbers of small-scale food producers and processors and competition among regulating agencies. China also lacks an independent court system, which could better protect consumers and company whistleblowers. Consumer education is also lagging, in part due to few consumer watchdog organizations. Chinese urbanites are now demanding safer food, but answering their demands without addressing the rest of the population may create a dual system of food safety, potentially sparking social unrest.

Domestically, the majority of food safety discrepancies originate from microbial contamination due to poor food handling. Cases of food contamination in exported Chinese food products tend to be linked to unsafe use of chemicals and illegal veterinary drugs in aquaculture. High pesticide use in China has impacted both domestic

and exported fruits and vegetables. Besides the human health impact of unsafe food, China's burgeoning food production system is also taking a toll on the country's soil and water quality, mainly through chemical and organic runoff from crops and concentrated animal farms.

Chinese consumer demands plus an explosion of negative news media attention on food exports have greatly accelerated food safety reforms, new laws, and crack-downs within China. The high volume of food and ingredient exports have made China's food safety shortcomings a global concern. It merits mention that China's food export problems are often exacerbated by weak regulation in importing countries, particularly the United States, where numerous food safety scares were linked to Chinese food imports in 2007.

U.S. Response and the Need for Cooperation

The food safety import scandals in 2007—including a case of melamine-tainted pet food—already have begun to catalyze repairs to the U.S. food safety monitoring system, which has long been under-funded and under-staffed. Currently, the U.S. Food and Drug Administration (FDA) inspects a mere 1 percent of food imports, but only 0.2 percent of the total undergoes laboratory analysis. The recent problems with Chinese products abroad highlight the risks of relying on exporting countries to maintain food safety.

While the initial focus in both China and the United States on strengthening their respective regulatory structures has sown the seeds for broader and deeper cooperation on food safety, it is crucial for both countries to keep up the momentum, which is not an easy task. Notably, China and the United States have greatly increased cooperation since 2007. The FDA has committed to opening offices in China to strengthen on-the-ground coordination regarding food exports. In June 2008 the Fourth Cabinet-level Strategic Economic Dialogue led to a number of new Sino-U.S. agreements on food safety cooperation and emergency preparedness in order to improve consumer confidence in both countries.

Ideally, the United States should follow the model of the EU and the international business community and become directly involved in building the capacity of Chinese food safety regulators and producers—particularly at the local level. U.S. engagement and capacity building with local officials is crucial because China's highly decentralized political structure has meant central government enforcement in food safety is weak.

The Chinese government could make cooperation with the United States easier by recognizing third-party certification of manufacturing processes (e.g., HACCP) rather than individual shipments, which could help ensure safety, as well as faster and less costly delivery of food exported from China. China could also work with U.S. counterparts to isolate “bad actors” and unlicensed processors within China, using a system of auditing and granting pre-approval for qualifying exporters. Other

areas for Sino-U.S. food safety cooperation include: (1) strengthening scientific risk assessment and standard setting; (2) improving monitoring through consolidation of food producers, processors, and laboratories; and (3) building capacity for better agricultural extension. Additionally, U.S. nongovernmental consumer advocate groups have been slow to work in China. Such groups could collaborate with Chinese counterparts to train and build the capacity of food processors and producers, and educate consumers about food safety practices and environmental health impacts of food production in China.

Part One

Linking Chinese and U.S. Food Safety Challenges

By air a Chinese mandarin orange can now reach Pittsburgh in one day. Besides being good news for U.S. orange lovers, this fruit is one of many products illustrating how closely the U.S. and Chinese food markets are linked. Although Chinese exports make up less than 1 percent of the total U.S. food supply, China has become the third largest source of food imports to the United States—notably dominating U.S. fish and fruit markets. The value of these imports from China tripled between 2001 and 2007, benefiting Chinese food producers and the international food companies operating in China, as well as U.S. consumers who have a broader selection of fruit and fish.¹

The global food trade—with China a major player—has made all countries increasingly dependent on others for food sales and food security, as the current global grain shortage and rising food costs indicate. Now even small and remote food producers can quickly connect to international markets, ensuring food safety has become a core challenge for regulatory agencies in every country. Although the speed and scale of the current food distribution system is unparalleled in history, the problem of ensuring safety in imported food through regulation dates back to the 1850s in Europe, when product adulteration was a widespread problem.² At the crest of a recent wave of import concern, China's food regulatory system and food processing industries have come under intense criticism both domestically and internationally. While the main responsibility for solving China's food safety problems rests with the Chinese government and people, food safety is a global concern, one that all countries must diligently address domestically, and an area in which cooperation among nations is vital.³

China's Challenge

China's capacity to effectively protect food quality is hampered by a weak legal, political, and regulatory infrastructure that has not forced food producers and processors to be accountable. Key weaknesses in China's food safety governance system include: strong local government protectionism of industries; a lack of a product liability law; and weak monitoring capacity of food products, due both to the vast numbers of small-scale food producers and processors and competition among regulating agencies. China also lacks an independent court system, which could better protect consumers and company whistleblowers. Consumer education is also

Box 1

Olympic-Scale Food Safety Efforts

The 2008 Beijing Olympics, intended to proclaim China's arrival on the international scene, have been an opportunity for China to publicly address issues that concern the international community, including food safety. Beijing spent tens of billions of dollars to prepare the city for the Olympics—including the construction of the Olympic Village, expansion of the public transport system, cleaning up the city's air and water, and the creation of extensive new monitoring measures for the food served at Olympic venues and major tourist destinations.⁴ With regard to food safety, athletes and visitors have expressed concerns about the quality of food in China, as evidenced by announcements by the U.S. Olympic Team in February 2008 that it would bring its own produce and cook its own meals during the Games. The declaration was prompted by a random sampling of Beijing grocery chicken that tested positive for hormones, which the team was concerned might cause U.S. athletes to fail drug tests.⁵

It is, however, very unlikely anyone attending the Games came into contact with ordinary grocery food. Beginning with the establishment of the Beijing Olympics Experts Committee for Food Safety in 2005, the central and relevant municipal governments (mainly Beijing, Qingdao, and Shanghai) instituted multiple checks to address food safety challenges rampant in the country. In fact, even Team USA's decision to bring its own food goes against the Beijing municipality's safety protocol forbidding uncertified food from entering the Olympic Village. The decision forced the U.S. athletes to cook and eat their imported food at a local university instead. The government created elite supply chain monitoring systems for food served at Olympic venues. For example, a food tracking system and database are now in place in Beijing that cover fruits, vegetables, animal products, and packaged foods, which allowed for regular testing and mass recalls, if necessary.⁶ GPS is being used to track food labeled for the Olympics through the supply chain.⁷ Shanghai also has set up a food safety tracking system based on a network of 79 contamination field inspection facilities and 20 mobile inspection units throughout the city, with particular focus on the safety of pork products.⁸ All food producers and processors that provided food for the Olympic venues must meet international standards and use the quality safety (QS) label. Such food was inspected regularly at Olympic venues, as well as hotels, restaurants, and major scenic sites.

In addition to being subjected to a better monitoring and inspection system,

mors began to circulate that China was raising pig for the Olympics, which were kept in an undisclosed biologically secure location, fed only organic feed with no hormones.⁹ While the Olympic pig story remains unconfirmed, the city did set up separate supply chains and tracking of food for the Olympic Village, a development that prompted concern from Chinese citizens that their own food is so unsafe as to warrant extra measures for the Olympics. The situation emphasizes the possible development of a two-tier system for food safety, one for the international community and one for domestic use. The Olympics gave the government a taste of its citizens' reaction to such a system.

Overall, the food safety system set up at the Olympic Games provides a model for broader application in the country, as it addresses many key challenges facing food production, processing, and preparation in China. Some long-term benefits of the Olympic food safety measures in Beijing are:

- Standardization of cooking techniques in restaurants and canteens;
- Increased capacity in the QS labeling system, required for all Olympic contractors;
- Enhanced cold chain capacity, which was required for all Olympic produce; and,
- Exposure to new techniques and technology, for example nontoxic disinfectants like acidic electrolyzed oxidizing water are required for all Olympic contractors. This cleaner notably breaks down into water.



Source: <http://commons.wikimedia.org/wiki/Image:CountdownBeijing2008-4.jpg>

lagging, in part due to few consumer watchdog organizations. Now, with the development of the Chinese middle class truly underway, China's urbanites are demanding safer food. But answering the demands of urbanites without addressing the rest of the population may create a dual system of food safety, potentially sparking social unrest.

Since 2004, when babies in Anhui Province died from consuming fake baby formula, concern within China over food safety has been growing. Although the Chinese government reported in 2007 that nationally 85.1 percent¹⁰ of the Chinese population was satisfied with the quality of their food, incidences of food poisoning and bans on China's exported food are on the rise, indicating that domestic food problems continue to be a serious challenge.¹¹

Most food safety discrepancies within China originate from microbial contamination due to poor handling (e.g., time-temperature processes and unsanitary conditions in cafeterias and food processing facilities). Hepatitis A outbreaks, which frequently appear in the news, are often blamed on infected food and beverage preparers and poor sanitation at canteens and processors. Cases of food contamination in exported products tend to be linked to unsafe use of chemicals and illegal veterinary drugs in aquaculture. High use of pesticides in China has impacted both domestic and exported fruits and vegetables, which are among the largest growth areas for Chinese food exports. Besides the human health impact of unsafe food, China's food production system is also taking a toll on the country's soil and water quality, mainly through chemical and organic runoff from crops and concentrated animal farms, which produce some 40 times more nitrogen pollution and 3.4 times the solid waste of industrial factories.¹²

Chinese consumer demands plus an explosion of negative news media attention on food exports have greatly accelerated food safety reforms in China. Food safety problems—ranging from food bans by the European Union (EU) and Japan to the U.S. Olympic team declaring it would import its food for the Olympics—are bringing global attention to these deficiencies and catalyzing new laws, crackdown, and pilot projects within China. (See Box 1). The high volume of food and ingredient exports have made China's food safety shortcomings a global concern. It merits mention that China's food safety problems are often exacerbated by regulatory failure in importing countries, particularly the United States, where numerous food safety scares were linked to Chinese food imports in 2007.

U.S. Response and the Need for Cooperation

Both China and the United States have faced negative press globally regarding food safety—with the United States under fire for genetically modified organisms (GMOs) and over application of veterinary medicine. The Chinese food safety scandals in 2007 have already begun to catalyze repairs to the U.S. food safety monitoring system, which has long been under-funded and under-staffed. A central shortcoming



At a dumpling shop in Shanghai, no one wears hairnets or latex gloves, yet Shanghai's government has been one of the most progressive in controlling food safety with a new food safety tracking system in place, a fish-product branding scheme pilot, and a "face label" project where displayed smiling face stickers indicate a facility whose production processes are certified safe.

Photo Credit: Drew Thompson, The Nixon Center

is that U.S. regulators lack a mandate to prevent food safety violations. Strikingly, the food safety system used today in the United States is based upon legislation that has not changed significantly since 1938 and is centered on the principle of detecting problems through sparse inspections at the port of entry. Under this system, the U.S. Food and Drug Administration (FDA) inspects a mere 1 percent of food imports, but only 0.2 percent of the total undergoes laboratory analysis. The recent problems with Chinese products abroad highlight the risks of relying on exporting countries to maintain food safety. (See Appendix A for a brief overview of the development of food safety systems in the United States, Japan, and the EU).

Food safety demands the active collaboration of the government, food safety technology leaders, the food industry, and consumers both within countries and across borders. International collaboration on food safety generally prioritizes food security and international trade, but often overlooks the equally important pursuits of: (1) promoting food production systems that protect the environment, and (2) empowering citizens and civil society groups to be involved in monitoring the regulation of food.

Food safety offers an important opportunity for the United States and China to collaborate for the benefit of both countries. While the initial focus in both China and the United States on strengthening their respective regulatory structures has sown the seeds for broader and deeper cooperation on food safety, it is crucial for both countries to keep the momentum going, which is not an easy task. Ideally, the United States should follow the model of the EU and the international business community and become directly involved in building the capacity of Chinese food safety regulators and producers—particularly at the local level. U.S. engagement and capacity building with local officials is crucial because China's highly decentralized political structure has meant central government enforcement in food safety is weak.

The Chinese government could make cooperation with the United States easier by recognizing third-party certification of manufacturing processes (e.g., HACCP)

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rather than individual shipments, which could help ensure safety, as well as faster and less costly delivery of food exported from China. China could also work with U.S. counterparts to isolate “bad actors” and unlicensed processors within China, which could be strengthened by a system of auditing and granting pre-approval for qualifying exporters. Other areas for Sino-U.S. food safety cooperation include: (1) strengthening scientific risk assessment and standard setting; (2) improving monitoring through consolidation of food producers, processors, and laboratories; and (3) helping build up the capacity for better agricultural extension.

Many international businesses already have begun working on these issues in China by educating their supply chains and producers. Encouraging civil society groups to enter into consumer food safety activities—an issue included as a general provision in China’s new draft food safety law—could help promote stronger watchdogs of local industry. The nascent Chinese consumer protection groups could benefit from the experience of U.S. nongovernmental organization (NGO) community. Some of these U.S. groups could potentially carry out training and capacity building of food producers and processors in China, as well as work with local partners to help educate consumers about safe food and food handling, and environmental health impacts of food production in China.

International assistance to China to strengthen its food safety regulation could have a positive spillover effect into the pharmaceutical sector, which is regulated by many of the same Chinese and U.S. agencies that monitor food, for many drug products are derived from agricultural products. One recent scandal linked a contaminated blood thinner exported from China to 81 deaths in the United States—a claim that has yet to be scientifically proven. (See Box 2). At a broader level, building more Sino-U.S. partnerships around food safety not only promotes stronger food security globally, but could also help offset tensions in other parts of Sino-U.S. relations.

Box 2

Traceability Traversed—Pigs, Producers and the Heparin Case

Although not consumed as food, U.S. regulators blamed contaminated Chinese heparin for causing 81 deaths in March 2008 in the United States, driving home the lack of secure traceability of China's manufactured products derived from agriculture. Most distressing about the case is that the contaminated product reached 11 countries, but only in the United States was it connected with possible fatalities. Moreover, both private companies and the U.S. Food and Drug Administration (FDA) were slow to recall the drug for fear of a shortage, even when it was becoming clear that the supply was contaminated. Heparin is a blood thinner derived from pig intestines that is used in surgeries and dialysis. The contaminant (not yet scientifically proven to have caused fatalities) found in the blood thinner from Chinese suppliers of Baxter International and other companies appears to have been intentionally added as a cheap substitute or extender to the heparin, rather than an accident caused by poor conditions at the supplier.

Nevertheless, the effort to identify where the contaminant entered the supply chain exposed the pressures and incentives to produce counterfeit products in China, and the weaknesses of the U.S. and Chinese regulatory systems with respect to imported products. This crisis is one of many over the past year that pushed the U.S. FDA to increase its staff and request new offices in China. The heparin case is very relevant to the food safety challenge as it involves the same regulatory bodies. In fact, in addition to heparin itself, the contaminant—over-sulfated chondroitin sulfate—is also derived from animal parts. It is made from cartilage and is normally used to treat joint pain.¹³

Top-down

Baxter International sells blood thinner to patients of kidney dialysis and cardiac surgery in the United States. Since 2004, Baxter audits and buys the blood thinner from Changzhou Scientific Protein Laboratories (SPL), which is owned primarily by the U.S. company Scientific Protein Laboratories. However, Changzhou SPL was never audited by any government. The Chinese government never audited it because it falls in a regulatory loophole producing chemical ingredients, not food or drugs, and the U.S. government apparently audited the wrong factory by accident. Changzhou SPL buys the raw material for the blood thinner, heparin, from two reputable wholesalers, which in turn purchase their heparin from 10 to 12 secondary



Pigs are jostled in a three story transport truck heading into Beijing. Along the ride, stress increases the bacteria in the animal's intestines and thus increases the potential for bacterial contamination of the meat at slaughter. However, transporting the live animals is notably safer to the consumer than transporting meat the same distance without proper cold storage.

Photo Credit: Linden J. Ellis, Woodrow Wilson Center

suppliers who are subject to SPL audits. Those secondary suppliers are faced with a bulky and price sensitive supply chain above them, and an increasingly costly raw material below. Thus, the suppliers outsource some or all of their own work to cheaper production facilities—a common practice in other industries, according to Alexandra Harney, author of *The China Price*. According to *The New York Times*, as many as 70 percent of China's manufacturers are small factories, which are difficult to regulate for often the regulators and customers are not aware they exist. Wholesalers, who do know of their existence, believe it is not their responsibility to audit them, but that of the government.¹⁴

The Pinch

This fragmented and ill-regulated supply chain for heparin has been going on for several years without reported dangerous impacts until the 2008 contamination case, which was linked indirectly to a 2007 outbreak of highly pathogenic blue-ear pig syndrome, or Porcine Reproductive and Respiratory Syndrome (PRRS). PRRS reduced pig stock in China dramatically, particularly in genetically homogenous industrial farms—often sourced for heparin because they are considered safer than family-scale farms. This disease and other factors led to an 80 percent rise in pig prices between 2006 and 2007, which was not reflected in the price of heparin. In fact, Baxter posted higher yields in 2007 and delivered financial increases to stockholders and board members. As suppliers were asked to provide heparin at the same or reduced prices under increasing domestic price pressures due to the pig shortage, they also forced producers to compete for business and turn to the smaller and lower-quality producers, which were cheaper.¹⁵

This story of complex, price-sensitive supply chains is by no means unique to heparin, and in fact is true of most manufactured products in China, in-

cluding processed foods and additives. However, this tragic and well-publicized contamination case illuminates many of the problems, and improvements, in food regulation in China. Exactly a year after melamine-contaminated pet food and DEG in toothpaste reached the U.S. public, the heparin case highlighted advancements in cooperation and transparency on the part of the China's State Food and Drug Administration (SFDA) (discussed below). However, in order for China to supply safe products for export, more emphasis must be put on quality rather than price, and prices will surely increase now as both U.S. and Chinese food and drug regulators are becoming stricter. For example, the U.S. FDA is now requiring every batch of heparin entering the United States be tested for over-sulfated chondroitin sulfate at an additional cost of 1.7 cents a dose.¹⁶

Missed Opportunity to Build Trust, Capacity, and Cooperation

In the heparin case, U.S. FDA staff commented repeatedly that cooperation on the part of China's SFDA had increased the ease and speed of the investigation as compared with similar contamination cases in 2007. Part of this cooperation was a direct result of an accord signed by the SFDA and the FDA that allowed FDA inspectors to quickly reach relevant Chinese factories and formalized communication between both countries' investigators. SFDA and FDA promptly investigated the production of Changzhou SPL and two Chinese experts (from Peking Union Medical College and National Institute for the Control of Pharmaceutical and Biological Products) were sent to a conference in Washington, D.C. in April 2008 to gather information on the U.S. cases. Despite this notable improvement in communication, misunderstandings in the case abound. For example, the Chinese requested the FDA share the medical records of the patients who received the drug, but this information was denied due to U.S. medical privacy laws. Members of the Chinese delegation also visited the Baxter plant in Cherry Hill, N.J., where the finished drug is made, but complained they were denied samples of the medicine and details on how specific batches of the medicine were produced in the fall of 2007—although SPL representatives claim they have responded positively to all requests by the visitors. The Chinese side felt rebuked, which led to reporting in China that the United States is withholding information valuable for the Chinese SFDA investigation.

The continued misunderstandings and conflicting reports from the two countries over the heparin investigation point to a broad lack of understanding that both sides have of each other's laws, processes, and institutions. Clearly there is a great need to further normalize bilateral communications between SFDA and FDA—such as through training workshops and working-level personnel exchange—so there can be standardized means of communicating and jointly investigating food and drug problems. Better communication will accelerate the response to such emergencies and potentially prevent future ones.

Part Two

The Scope and Drivers of China's Food Safety Challenges

Domestic Threats to Food Safety

Food security has long been a priority of Chinese leaders—both ancient and modern. Over the past 28 years, China's economic reforms have catalyzed a boom in agricultural production, with Chinese citizens now enjoying more choices in fruits, vegetables, meat and processed food. Over the past decade, however, the Chinese news media has reported growing incidents of food contamination, reflecting how the quality of food is perhaps becoming a greater concern to consumers and government officials than the quantity.

Although one study finds that awareness of food-borne illness remains quite low, in 2008, the *China Daily* reported that 86 percent of rural Chinese consider food safety a major concern while shopping.¹⁷ With deaths from food poisoning in China rising 31 percent between 2006 and 2007 and 42 percent between 2005 and 2006, such concerns appear valid.¹⁸ The Hebei CDC has estimated approximately 300 million incidences of food-borne illness (including poisonings, microbial, chemical, and allergens) occur in China annually.¹⁹ Official records indicate fewer than 300 incidences of deaths from food poisoning each year, with each incident involving varying numbers of victims. This number is likely too low—an estimated 5,000 die of food-borne disease in the United States annually—due to misdiagnosis and underreporting. Other estimates of food-related poisonings have ranged as high as 200,000, which underscore the challenge of statistics in China.²⁰ The Asian Development Bank estimates that food-related disease in China costs the country \$14 billion annually in lost lives and healthcare costs.²¹

Within China, threats to food safety come in many forms, such as pesticides, fungicides, illegal veterinary medicine, animal to human disease, and contamination during processing and transport. Most of these threats originate in the small-scale farms and food processing plants that are difficult to manage and monitor effectively. Animal farms often feed what is necessary—including industrial compounds and manure—to their animals in order to reap the highest profit with little knowledge of postproduction consequences. For example, in 2007, the OECD reported that in rural areas where there is no latrine "...human excrement, food waste and waste from other animals is often disposed of in the pigsty, where it will be consumed by the pigs."²²

In June 2007, *chinadialogue* reported that 80 percent of chickens that die of disease end up in the human food chain in China, either directly through vendors and food processors, or through pigs that are fed the diseased birds.²³ According to

anecdotal evidence from Sichuan, one of the provinces with the highest pig densities, farmers often simply medicate sick pigs to make them look better and then sell them immediately to slaughter. Such corner-cutting practices are all too common because the government provides little insurance or compensation to farmers who lose stock or market share from culling diseased animals. In comparison, for a premium, the U.S. government offers extensive insurance from loss or declining value of crops and livestock.

Industrial waste and pollution in general is a significant threat to food safety in China, with effluent from factories being directly deposited in waterways used to irrigate crops and raise fish. In April 2007, the Ministry of Land Resources said that 30.4 million acres (more than 10 percent of the country's arable land) was contaminated by pollution.²⁴ Industrial waste in waterways also forces fish farmers to heavily medicate their animals so they can survive. According to the Director of Aquaculture at the Chinese Fisheries Bureau, water quality is the number one concern for Chinese aquaculture and the impacts upon people eating fish raised in sewage and DDT contaminated water are also potentially great.²⁵

Pesticides

For centuries Chinese farmers have been intensely cultivating their small plots, leaving much of China's scarce arable land depleted and rural areas poor. Since the 1980s, when the Chinese government encouraged widespread use of pesticides to increase farm output, China has become the world's greatest consumer, producer, and exporter of chemical pesticides.²⁶ Official statistics show that China produces about 300 types of pesticides and an additional 800 types of pesticide mixtures. In 2005, China produced 1,039,000 tons of pesticides and exported 428,000 tons.²⁷ However, regulating and gathering statistics regarding pesticides in China is confounded because many products were marketed under several—or as many as 700—different names. As of July 2008, this practice is illegal. *Xinhua* reported that the current pesticide system is so complicated that “even agricultural experts hardly [are] able to identify the actual product.”²⁸ Another complication is that an estimated 20 to 40 percent of all pesticides in China could be counterfeited, encouraging over application to protect crops. Although China banned the use of the 5 most toxic pesticides in January 2007, they are still manufactured and may find their way into the domestic market and the environment.²⁹

Due to low levels of farmer education and fears of low-potency counterfeit pesticides, the annual pesticide use in China is about 1.2 million tons on approximately 300 million hectares of farmlands and forests; twice what is needed according to the Chinese central government.³⁰ Seven percent of China's arable land is degraded due to the use of chemical pesticides and fertilizers. Recent reports highlighting the seriousness of pesticide residue problems include:

- **February 2008:** China recalled pesticide-tainted China-processed mackerel from Denmark sold to Japan.³¹

- **January 2008:** At least 10 people fell ill in Japan from eating Chinese-produced pork dumplings tainted with banned methamidophos pesticides. Although multiple investigations found no evidence of contamination at the Chinese factory, the toxin was again found in dumplings in Japan in April 2008.³² This failure to identify the source of contamination raises serious questions regarding the traceability of ingredients.
- **In 2006,** China Watch reported that vegetables in southern China had a very high level of nitrate (about 70 percent higher than the national standard).³³

Chinese government figures in 2003 showed that pesticides poison between 53,300 to 123,000 people each year, although statistics are often confounded by underreporting and high rates of suicide from pesticides.³⁴ Consumers are at risk of pesticide poisoning when they consume unwashed produce, but farmers face greater risks because many are not willing, or able, to invest in protective clothing and equipment for safe pesticide use, which has greatly increased their risk of pesticide poisoning. A study published in 2000 indicated that 300 to 500 Chinese farmers die each year due to improper use of pesticides, although this estimate is likely low, as over 100 farmers died due to pesticides in Yunnan alone over the same time period.³⁵ Many Chinese farmers suffer liver, kidney, nerve and blood problems due to pesticide poisoning, as well as eye problems, headaches, skin effects and respiratory irritations. Despite the recorded public health problems linked to pesticides, Chinese government statistics show that in the first half of 2007, 93.6 percent of vegetables passed national pesticide requirements.³⁶ It is difficult to know how such statistics are collected or to attest to their accuracy, but it seems likely that they underestimate the problem of pesticide residues.

Fungicides, Heavy Metals, and Dangerous Veterinary Medicine

All animals require carefully manipulated diets to survive, let alone grow, under high-density conditions, particularly since confined animals cannot select their own food based on their nutritional requirements. These human-made diets can include harmful additives such as antimicrobial drugs; fungicides (for fish); potentially dangerous fillers (such as the coal-based melamine found in pet foods in 2007); and cosmetic components (such as carcinogenic Sudan Red, an industrial dye to make egg yolks darker; and arsenic or mercury to make meat redder). Malachite green—banned in 2002, but still used by some Chinese fishers to control aquatic parasites and infections—has been reported to cause liver tumors in humans when consumed over time. Moreover, antibiotics from seafood may be associated with increased antibacterial resistance. When farmers and feed producers cut corners to reduce costs, these kinds of potentially harmful substances can enter the food chain.³⁷

Aquaculture is the chief contributor to fungicides and illegal veterinary medicine in the human food chain in China, which is the world's top producer of farmed seafood. In 2004, China produced 91 billion pounds of seafood—70 percent of the global output—but as various countries banned China's seafood, production de-

creased to 72 billion pounds in 2007.³⁸ Fungicides, such as the industrial dye malachite green, although illegal, are often poured directly into fishponds and tanks primarily to protect eggs from fungus. Other dangerous veterinary medicines include antibiotics and heavy metals, such as copper, zinc, selenium, cobalt, arsenic, iron and manganese. One 2005 study in Beijing found that all 29 pig farms in the study tested positive for arsenic.³⁹ (See Box 3 for more examples).

According to the Ministry of Land Resources, in 2007, 13 million tons of grain are contaminated by heavy metals from industries in China annually.⁴⁰ Animals and fish can absorb heavy metals—which will persist in their meat—from contaminated grain and water. Mercury from China's prolific coal-fired power plants lands in water and is consumed by humans through fish, a major source of protein in China. Mercury exposure can cause miscarriages, harm brain development, as well as damage the endocrine system, kidneys, and other organs. Statistics on mercury in Chinese fish are scarce, but Chinese coal is believed to be responsible for mercury contamination in fish as far away as the western United States, pointing to a strong possibility of mercury contaminated fish within China.⁴¹

Other heavy metal pollutants that can be absorbed into food include lead, cadmium and other carcinogens. Lead can cause many neurological disorders in children, but when ingested as an adult it can also cause neurological diseases and anemia. Long periods of exposure to cadmium can cause kidney damage. Contaminants that can enter food during food processing from industrial pollutants or poor food handling, such as aflatoxins, dioxins and dioxin-like polychlorinated biphenyls (PCBs), are all highly toxic and carcinogenic.⁴²

Another worrisome issue is food additives such as melamine, an industrial compound thought to have caused the deaths of perhaps 1,400 pets in the United States in 2007. There is no scientific proof that melamine scrap, a coal-based compound used to artificially enhance the detectable protein content in animal feed, is dangerous to humans; however, in the United States the government ordered cautionary swine culls of animals that had eaten melamine-tainted feed. In China, this industrial compound was commonly added to animal feed, including fish and swine, with no known consequences until it was banned in 2007.⁴³

Disease and Beyond-the-Farm Concerns

According to Mr. Wu Yongning of the Chinese Centers for Disease Control and Prevention (CDC) who spoke at the Woodrow Wilson Center in December 2007,⁴⁴ the greatest food safety threat in China remains microbial contamination, which became acutely evident in the spring of 2008 when 119 children fell ill from drinking contaminated milk.⁴⁵ Microbial contamination occurs as a direct result of poor hygiene and production practices, often at end users or in cafeteria/catered settings. Unlike some of the other food safety threats, microbial contamination is most closely connected to a lack of basic understanding of food safety practices, such as cutting raw meat and vegetables on different surfaces.

China's food distribution and monitoring infrastructure is still developing and

Box 3

Illegal Veterinary Practices Reach the Chinese Consumer

- **September 2007:**
330 people in Shanghai sickened by pork laced with clenbuterol—a steroid that promotes weight gain in animals.⁴⁶
- **November 2006:**
11 out of 15 samples of Mandarin fish from China tested positive for malachite green in Hong Kong.⁴⁷
- **November 2006:**
Carcinogens (chloramphenicol, malachite green and furazolidone) were found in 100 percent of tested turbot in Shanghai. Turbot sales were subsequently suspended in Shanghai, Beijing and Shenzhen. Turbot is a high value species of flatfish with low disease resistance that requires considerable veterinary input, particularly when water quality is compromised.⁴⁸
- **November 2006:**
More than 10,000 kg of duck eggs contaminated by the carcinogenic Sudan Red industrial dye were in supermarkets in Beijing before being pulled from the shelves.⁴⁹ Sudan Red also has reached Chinese consumers repeatedly in the last few years through other products such as chili.

does not uniformly meet international standards. Fred Gale at the U.S. Department of Agriculture Economic Research Service noted that in China “[t]here is little attention to risks of microbial contamination of fresh fruit and vegetables and cold chain facilities are underdeveloped.”⁵⁰ David Barboza of *The New York Times* stated that China has only 30,000 refrigerated trucks nationally for transporting food, while the United States has 280,000.⁵¹ However, it is important to note that food culture also impacts the demand for cold chain, for China consumes more fresh products (such as fish) and fewer frozen products than the United States. Further, most food produced in China travels shorter distances than in the United States, requiring less cold chain. Nevertheless, China will need to develop cold chain capacity and improve food handling education as food is beginning to be transported further distances.

As demand for cold chain is a relatively recent development, China lacks cold chain companies or specialists, which is a significant constraint for small-scale farmers and producers who cannot afford a fleet of refrigerated units of their own. Large and international companies operating in China solve this problem for their own products by vertically integrating production and managing the infrastructure for the entire supply chain, including providing their own temperature controlled trucks and storage facilities.

Animal to human disease is a less common, yet serious threat to food safety within China as well as globally. The 2003 Severe Acute Respiratory Syndrome (SARS) epidemic is the poster child for this issue in China, for the crisis exposed many of the weak points in the country’s public health system. Avian influenza is another example of a pathogenic disease that can spread from food animals to humans. Besides being a threat to poultry handlers, avian influenza can enter the food chain through a variety of sources. According to the Institute for Agriculture and Trade Policy, the virus can stay alive in cool water for almost a month and survive indefinitely in frozen poultry, as well as be transmitted from meat cooked at less than 162 degrees Fahrenheit or from contamination between cooked and uncooked meat.⁵² The increasing concentration of the meat industry—with 4 percent of Chinese broiler chicken farms producing 84 percent of chicken output in 2003—may increase the potential for epidemic and even pandemic disease outbreaks in China. The FAO announced in September 2007, that “excessive concentrations of animals” is a contributor, if not catalyst, for pandemic disease around the world.⁵³

In the summer of 2005, China’s largest pork-producing province, Sichuan, experienced an unprecedented human outbreak of the pig pathogen *Streptococcus suis*, or meningitis. The 215 cases, with 40 deaths confirmed, totaled more than all previous human cases worldwide, and were primarily people infected by eating sickened pigs or by working closely with the animals. The Ministry of Commerce stated that the outbreak “was found to have direct links with the foul environment for raising pigs.”⁵⁴ Human consumption of animal waste in contaminated food or water can lead to fatal bacterial infections and diseases, such as *Escherichia coli* and *Salmonella*. According to the Hebei CDC, *Salmonella* alone accounts for 97 percent of China’s 300 million cases of food-borne illnesses.⁵⁵

Risk Assessment and the Connection between Science and Policy

Since the 2007 Chinese food safety scares, one could say that the political pendulum has swung all the way to the other side—from letting many products slip through the system without testing, to letting none pass through. With the high potential punishment for exporting or importing hazardous food, laboratories and local governments have little incentive to approve products, particularly for export. Chinese laboratories now follow standards precisely and the authority to judge the actual risk to health is unclear. For example, if a substance is on a watch list and is detected by a laboratory, the testers will fail the product even if there is no scientific reason to believe it is a hazardous level of contamination. With this now overcautious policy approach increasing, the risk to food companies—particularly small exporters—rises dramatically and chases potentially good food from the market. Analytical methods employed should be sufficiently specific and robust to engender confidence in their results from both the regulators and the producers. High prices for government testing and labeling also encourage companies to operate outside the legal structure, and in some cases international firms may ponder moving operations to other countries.⁵⁶

A Global Effect

China is the largest exporter of food products in the world, with the United States as a major market. According to WTO statistics, China's total food exports reached \$53.3 billion in 2005 (although Chinese government statistics show only \$27 billion for 2006), which is about 7 times the \$7.5 billion it exported in 1980.⁵⁷ According to the General Administration on Supervision, Inspection and Quarantine's (AQSIQ's) Import and Export Food Safety Bureau Director General Wang Daning, 12,700 food processors have licenses to export.⁵⁸ A growing percentage of China's exports are made up of food ingredients or preservatives (e.g., wheat gluten, lactic acid, and ascorbic acid), much of which is imported to the U.S. market. In 2002 alone, 82,000 shipments of food products and ingredients were exported from China to the United States, rising to 199,000 shipments in 2006. Officials at the FDA estimate such food shipments from China reached 300,000 in 2007.⁵⁹

Although China's weak regulation of food quality has been an ongoing problem domestically, the magnitude of the country's food safety crisis did not become a contentious issue among China's trading partners until after the melamine-tainted pet food reached the United States in 2007. Since then, despite the fact that importing countries accept 99 percent of exports from China, world news has spotlighted China's food, with reports such as *The New York Times* article that noted 55 companies publicly blacklisted for supplying tainted products overseas were able to evade inspection and ship again.⁶⁰

Food Ban Blues

22 Although in theory food bans should be based predominantly on sound assessments

of risk, misinformation and misperceptions can lead governments and/or consumers to reject imported food products—most notably illustrated in the clash over U.S. beef imports to Korea that erupted in the summer of 2008. Korean consumers, who perceived U.S. beef as unsafe, took to the streets to protest their government's removal of the long-standing ban.

As the Korean case demonstrates, once a country's safety has come into question, distrust can be challenging to overcome—a situation China is now facing. Moreover, a single ban can lead countries to respond with retaliatory bans. Ongoing tit-for-tat bans between the United States and China (see endnote 82) are doing little to help promote cooperation and communication.

In 2006, the European Union's Rapid Alert System for Food and Feed (RASFF) reported 260 food safety problems linked to Chinese products.⁶¹ The FDA's rejection rate of Chinese food imports—due mainly to contamination or veterinary drug residues—is much higher than those from other trading partners.⁶² In the United States in 2006, the FDA repeatedly found carcinogenic antimicrobial agents in Chinese seafood imports, including nitrofurans, malachite green, gentian violet, and fluoroquinolones, which may cause antibiotic resistance in human populations. Unsafe residues were found on 25 percent of tested shipments imported to the United States; one-fifth of the rejections of seafood were due to illegal veterinary medicine.⁶³ In January 2008, at least 10 were sickened in Japan from pesticide-laced frozen dumplings imported from China—the same contaminant was also identified two months later. While Japan is the number one importer of Chinese food products, it also has one of the most stringent import food safety systems in the world. (See Appendix A).

Although also potentially influenced by trade protectionism, continuing safety problems with China's food exports appear to have catalyzed stricter inspection standards in many countries. For example, Japan dramatically raised the technical standards for the import of food products from China in 2002, increasing the number of inspection criteria for Chinese vegetables, rice, juice, and chicken products. In 2002, the EU completely blocked imports of many Chinese animal products, which involved 94 Chinese enterprises and led to a loss of \$623 million for Chinese exporters.⁶⁴ For example, EU food regulators banned Chinese shrimp and crayfish when they tested positive for chloramphenicol, a potent antibiotic and a source of aplastic anemia.⁶⁵ According to official statistics, these bans in 2002 decreased Chinese poultry, livestock, and honey exports by 32.9, 4.1, and 16.7 percent, respectively.⁶⁶ EU bans on animal products were eased in 2004 after China made significant improvements to its veterinary standards for food destined for the EU, but instances of bans on fish have emerged over the past two years.⁶⁷

In the United States, risk-based inspections targeted Chinese aquaculture leading to a dramatic rise in reports of contaminated shipments. Other instances of recent bans include: in October 2006, Taiwan banned imports of hairy or mitten crabs from the mainland due to traces of carcinogens; in April 2007 Wal-Mart removed Chinese catfish from U.S. stores due to antibiotic contamination; and in June 2007 Russia's federal agricultural products inspection agency banned fish from China.⁶⁸

While international concerns about China's food exports are now high, domestically the problem of food safety may be even more serious, representing a growing threat to the health of Chinese consumers.

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Genetically Modified Organisms

Recently, genetically modified organisms (GMOs) in Chinese food products have raised safety concerns internationally, particularly within the EU. In April 2008, the EU confirmed that Chinese GM rice continues to infiltrate European food systems, even after repeated warnings, eventually requiring every batch of rice imported from China to be tested. The offending strain, Bt63, is an experimental strain of pest resistant rice that the EU has not approved for human consumption. In 2005, Greenpeace discovered that the experimental rice had been sold to farmers in China, prompting the Chinese government to destroy crops and punish seed companies, but the contaminated strain continues to turn up around the world.⁶⁹ Pest resistant GMOs are very attractive to many Chinese farmers, for on small-scale farms with small profit margins any loss to pests is potentially impoverishing. Moreover, the unsafe methods of applying pesticides often immediately affect the health of farmers, whereas any affect from GMOs may take years to appear. However, there are concerns that GMOs spread quickly, affecting the genetic code of non-GMO and native species such as rice, a staple crop in China, and their consumption may cause allergies or worse due to the pest resistant properties of the crop. GMOs represent a promising area of Sino-U.S. research (into both development and regulation) because both countries are expanding GMO crops.

Decentralized, Fragmented, and Opaque Structures

Although China is rapidly adding new infrastructure to address food safety problems, most of the challenges to guaranteeing the quality of food are based in the financial, educational and geographic gap between the east and the west, the city

and the countryside. For example, the task of regulating food safety falls mainly on local governments, which lack financial resources to implement central government legislation. Local officials fear closing food processors or farms, which provide much-needed revenue for the people and government in areas where other options may not exist.

Another core obstacle to safer food in China is the prohibitive cost. For example, traceable foods—such as certified organic or “green” products—can cost as much as 500 times wet market foods.⁷⁰ With 20 percent of the world’s population, GDP per capita is still less than a quarter that of the United States.⁷¹ GDP is also distributed unevenly across the nation with most of the wealth concentrated on the urban east coast, leaving some inland farmers and food handlers quite impoverished.

The Danger of Thin Profit Margins

There are several significant challenges facing the Chinese government as it tries to ensure food safety for the country’s exports and domestic markets. The first challenge is the structure of China’s food system with 70 percent of food processors having less than 10 employees and most farms being 2 acres or less, which makes monitoring and securing food difficult.⁷² These small processors and producers cannot afford safety equipment, are often not educated in safe food handling, and have no brand name to protect. Rapid economic growth has enabled a massive expansion in highways and cell phone usage, which now connect the small farms with faraway markets, further confounding traceability of food products and additives.

In July 2007, the AQSIQ admitted that half of all food producers have improper licenses and 164,000 had no license at all.⁷³ Nonetheless, AQSIQ maintained that 70 percent of food from such small-scale producers met national standards, compared with about 90 percent for large-scale producers.⁷⁴ The actions of these small-scale producers are practically invisible to regulators as they have no brand and interact in a primarily cash-based system.

Besides being difficult to regulate, small-scale farmers and producers are also hard to educate on safe and hygienic practices. One revealing example of this problem is while many Chinese farmers are attracted to organic foods because of high profit margins, they often lack an understanding of the time and costs demanded to make such production sustainable. Thus, farmers have a strong incentive to cut corners.⁷⁵ Paper-thin profit margins combined with a local and international demand for cheap prices also pressure food processors to evade costly quality control laws. A big regulatory challenge is thus the ubiquitous “shadow factories” that Alexandra Harney detailed in her 2008 book *The China Price: The True Cost of Chinese Competitive Advantage*. Harney explained that in order to meet internationally demanded prices and labor standards, factory owners often will operate two factories—one that follows all the requirements and another much more productive one that follows none of them and supplies the first factory.⁷⁶ These ostensibly invisible factories may explain the 2008 Japanese pesticide-laced dumpling case, in which repeated bilateral investigations uncovered no evidence of contamination,

yet methamidophos appeared again in the same product from the same company, Tianyang Food Company, months later.

Government Structure and Local Corruption

The current strategy of China's government to ensure food safety has been a top-down, end-product approach, which so far has met with limited success in a food sector where traceability to the source of the contamination is limited at best. Central government food safety mandates and regulations have prompted many companies to purchase required technology, which many never use as the risk and cost of being penalized is less than the cost of staffing, maintaining and running advanced safety equipment. Due to the transparency issues noted above, the top-down approach also has failed to keep unlicensed or blacklisted producers from sending their products to market. The largely decentralized structure of the government further fuels enforcement problems, as the local government is often unwilling or unable to enforce mandates and policies from the central government. The fact the Chinese political system still prioritizes GDP growth over all other issues for professional advancement exacerbates the weak enforcement.

Enforcement of many food safety and other laws is hindered at the local level due to the widespread indebtedness in China's rural governments, dating back to the 1990s with stagnant and shrinking tax bases, bloated payrolls, and failed government-owned industries. With the recent removal (by central government order) of the agricultural tax, many rural governments cannot make payroll legitimately, which encourages bribery and ignoring violations of the law.

The lack of transparency and corruption at the local level has led processors and farmers to distrust local oversight or regulation. For example, confidence in the authority of local regulators is often undermined due to ubiquitous demands for bribes when purchasing licenses.⁷⁷ Lastly, well-intentioned local governments often subsidize the prices of pesticides and other harmful chemicals in order to encourage and aid farmers in their jurisdictions. The same local regulators, most notably animal husbandry bureaus (*xumuju*), may also receive payments from the companies who make the products they are recommending to farmers. Although standards for pesticide and veterinary medicine use exist, some local governments may not even know about them, let alone know how to enforce them.

In addition to enforcement "slippage" in China's highly decentralized political system, the other central political obstacle to regulating food safety is the overlap in responsibility and turf wars within the regulatory structure. According to An Daochang of the Ministry of Science and Technology, there are 13 governing bodies that play a role in ensuring food safety in China. In May 2007, *Reuters* gave the example of pesticides where "...the Ministry of Agriculture monitors field use, the state planner and the Commerce Ministry grant production licenses, the Ministry of Health is responsible for setting maximum residue levels, and the State Environmental Protection Administration monitors environmental impacts."⁷⁸ Poor enforcement often occurs due to poor coordination and communication among these agencies.

Limited Civil Society Involvement

There are few individuals and nongovernmental organizations (NGOs) working on issues of safer food in China. Thus, the Chinese NGO Pesticide Eco-Alternatives Center (PEAC) in Yunnan is particularly noteworthy, for it is the only Chinese civil society group working on pesticide problems. Since 2002, PEAC has been using participatory approaches with consumers and farmers to protect human and ecological health from farm chemicals by lowering the use of harmful pesticides and promoting alternative forms of pest control.⁷⁹

There are some individual consumer safety advocates in China focused on product and food safety in China. Most well-known is Wang Hai, who has been active in anti-fraud and consumer protection advocacy for more than a decade. Besides running a consumer hotline, he most recently has shifted to the Internet to promote his consumer awareness raising work on a blog.⁸⁰ It is not clear whether such individuals are yet making a significant impact, for none of them have headed up influential class action cases on food or product safety or created an NGO akin to Ralph Nader's Public Citizen.

In 1984, China's State Council created the China Consumer's Association (CAA), a state-run public interest group that helps consumers to receive compensation from companies that sell them low quality, unsafe, or fake products. According to CAA's website, in 2007, 5.6 million people were given assistance of some sort from the association, receiving reimbursements from companies (usually a double refund) of about 840 million Yuan. There are over 3,000 CAA offices throughout China and they are generally funded locally, sometimes by industrial bureaus. The most publicized aspect of CAA's work has been complaints surrounding household products, computers, and personal electronics, but in 2006 and 2007 they received 42,106 and 36,815 complaints on food products, respectively, which was nearly 40 percent of total reported complaints.⁸¹ It is difficult to decipher from the CAA's website the exact nature of these food product complaints or whether they were resolved, nevertheless such a channel educates consumers of their rights to complain and potentially raises expectations for better accountability from the food industry.

Citizens are notably getting more information on food safety, as well as help in publicizing the problems they experience, through some activist news journalists. Most notable are writers from *Southern Weekend (Nanfang Zhoumo)* who have been reporting food safety incidents fairly regularly. Such stories of scamming businesses and innocent victims are popular and easy to write, but are also indirect ways of criticizing local government or implying weaknesses in the central policy without naming names.

Despite the CAA, growing news reporting, and a handful of individual advocates, Chinese consumers still lack sufficient independent "watchdogs" to ensure the safety and affordability of food. Also missing in the nongovernmental sector are any manufacturer associations to encourage best practices and address their collective interests in ensuring food safety either domestically or internationally. The government has further reduced incentives of manufacturers to self-regulate by sometimes restricting news media coverage of food contamination stories that might cause panic, hurt the economy, or decrease faith in government regulation.

Part Three

Actions from Within and Without

If any good news has come out of the repeated food safety scandals and scares in China, it is that all relevant players are taking the problem seriously. Strikingly, China's regulatory shortcomings have highlighted problems within the U.S. food monitoring structure. Despite continued tit-for-tat food bans and political finger-pointing between China and the United States since early 2007, more discussions have emerged between the two countries to address the problems, with the Strategic Economic Dialogue talks being the most promising.⁸² Nevertheless, much more could be done.

In many ways the international business community and the EU have been models of proactive assistance to China by establishing long-term capacity-building relationships with Chinese regulators. By undertaking more aggressive measures to improve its food safety regulation, and in sending numerous food safety delegations to the United States, China is opening up even more opportunities for collaboration with its U.S. counterparts. Ultimately, to protect consumers and improve confidence in food safety globally, it is in the interest of all players to ensure the safety of China's food products.

Chinese Government Actions

In 2007, the Chinese government pledged \$1.2 billion to address food and drug safety.⁸³ By the end of 2007, China's county and township governments were required to have food emergency response systems in place. The government also issued a five-year food and drug safety plan and a food safety white paper, as well as carried out campaigns to close unsafe food processors. In June of 2007, 180 food factories were shut down by AQSIQ for producing contaminated and unsafe products.⁸⁴

Another type of crackdown in the summer of 2007 was the requirement for inspections of hygiene technology within food manufacturing plants and thorough checks for every food container bound for the United States. These measures led to a precipitous drop in food exports from China. For example, that summer national shipments of garlic—a major agricultural export—fell 39 percent from the same time in 2006, with one manufacturer noting that the time it took to fill a shipment to the United States increased from one week to three.⁸⁵ To speed up inspections, in September 2007, the Import and Export Food Safety Bureau of the AQSIQ added 300 employees to its existing staff of 7,000 to conduct inspections at all ports in China. More thorough inspections have yielded results, for example, in January

2008 the Ministry of Agriculture alone reported it confiscated around 2 billion Yuan (\$278 million) worth of counterfeit agricultural products in 2007.

Government prioritization of food quality had been increasing long before 2007. For example, in 2006, the State Administration for Industry and Commerce (SAIC) handled 68,000 counterfeit and unsafe food cases, 48 of which led to judiciary action. In 2006 when 100 percent of turbot fish tested in Shanghai were found to contain carcinogens, the three farms that supplied the fish were highlighted by name in the Chinese news media and were subsequently fined and ordered to suspend sale. Now, in an effort to revive the market, the Shanghai municipal government is experimenting with a promising branding scheme. The new agreement involves a product identification code on each fish package, doubling prices, but enabling the consumer to request information from the supplier on the particular fish purchased. If this project works for turbot, it could be a solution to many of the problems of unaccountability in China's fragmented meat and aquaculture industries.

Structural Changes

Under the Eleventh Five-Year Program (2006-2010) the State Council issued the *National Food and Drug Safety Plan* that aims to establish a food safety guarantee system in China. In 2004, the State Council issued the *Decision on Further Strengthening Food Safety Supervision* to clarify the roles and responsibilities of the different food safety regulators (see Box 4 for overview of major safety regulators in China). This decision set the four pillars of food safety to be the Ministry of Agriculture; AQSIQ; the State Administration of Industry and Commerce, and the Ministry of Health. The decision tasked the State Food and Drug Administration with coordination and enforcement. Under the direction of Wu Yi in 2007, a new governing body, the Leading Group of the State Council on Product Quality and Food Safety began operation to help coordinate food safety efforts between the responsible ministries.

The new *Draft Food Safety Law*, based on the original *Food Hygiene Law*, was submitted to the National People's Congress at the end of 2007 and opened for public comment in April 2008. This new food safety law, which goes into effect in the fall of 2008, is distinctive from its previous version in that it: (1) outlines the specific responsibilities of government bureaus at all levels; (2) places the Ministry of Health as the government entity primarily responsible for food safety; (3) requires all findings be available on the Internet for feedback; and (4) mandates companies that do not recall substandard products face revocation of their production license, fines up to 100,000 Yuan or even jail for life for the owners.⁸⁶ Moreover, officials who do not enforce the law may also be punished. Article 33 of this law under the "Provisions on Food Recall Administration," offers protections for whistleblowers, in that companies cannot restrict them and government bureaus must investigate the complaint immediately and maintain the anonymity of the informant.

Another cornerstone of new food safety legislation is the 2006 *Agricultural Product Quality Safety Law*, overseen by the Ministry of Agriculture, which set out general guidelines for protecting the safety of agricultural products. The law established the

role of the local and central governments in promoting safety, encouraged the use of safety standards, prohibited use of harmful chemicals, and required agricultural enterprises and cooperatives to keep production records.⁸⁷ This law also includes provisions requiring that all food safety emergencies be reported immediately to a higher authority, which has been a weak area in China's regulation of food safety. (See Appendix B for a list highlighting other food safety laws).

Provisions for Emergency Response

China's response system for food and other emergencies is not yet fully functional, particularly surrounding incidents, such as SARS, that initially do not appear to be emergencies. After the SARS epidemic, more than 140 emergency response plans at various levels were formulated in China, although most are sector-based rather than integrated. Two years later a sign of continued shortcomings in managing emergencies occurred when local government cover-ups slowed response to the 2005 PetroChina chemical accident, in which 100 tons of benzene spilled into the Songhua River and led the city of Harbin to shut off water to 10 million citizens for four days. In November 2007, two months before a massive snowstorm struck southern China, the *Emergency Response Law* came into effect. The law, which covers public health disasters, is primarily reactionary and contains little on risk management. Despite the formulation of the State Council's National Emergency Response Office, interdepartmental coordination remains unreliable. Thus, even during the snowstorm, officials were generally slow to report power outages and other problems and the news media failed to publicize some of the emergency information in a timely and accurate manner.⁸⁸

In sharp contrast, following the earthquake in Sichuan in May 2008 the Chinese government was quick in setting up rescue operations and disease control measures. Moreover, immediately after the earthquake Chinese officials were considerably open to the domestic and foreign news media. Notably, China's emergency management system was not quick to release information to the World Health Organization on a concurrent outbreak of hand, foot and mouth disease in eastern China until the disease was reclassified as one requiring public release after a jump in cases, suggesting that public health emergency response is still a fluid and developing field.⁸⁹

Response to food poisoning cases has been swift recently. For example, within a few weeks of a tainted milk supply sickening school children in Guangdong Province in early 2008, the factory was shut down, its products recalled and the public notified. Notably the company provided compensation to the sick.⁹⁰ Additionally, during the international heparin and poisoned dumpling cases, officials made extensive efforts to address concerns by promptly inspecting the responsible factory and allowing their counterparts in the United States and Japan, respectively, to inspect the factory. Although in both cases, China continues to deny fault, communication with foreign governments and the news media has noticeably improved since the early days of SARS.

Food poisoning fits into the category of a clear emergency that provincial and county health bureau officials (BOH and CDC) respond to quickly, for in such out-

breaks mortality rates are generally low and the numbers affected can be significant. Efficiently dealing with food poisoning incidents can reflect favorably on a bureaucracy's record. Alternately, in more unsure emergencies (such as disease outbreaks)—or those that may be interpreted as state secrets, which are exempt from public disclosure laws—agencies may be less quick to react.

After the Songhua spill sparked intense investigative reporting that revealed the severity of local government corruption around the cover-up, the central government passed rules requiring Chinese journalists to obtain permission from editors to report on pollution accidents and natural disasters. These rules, however, were ostensibly nullified by new transparency regulations that were passed in the spring of 2008—twelve days before the massive earthquake in Sichuan. The more permissive environment for journalists during the earthquake suggests that journalists may play a more prominent role in reporting on future disasters and other more sensitive events, such as food contamination cases. A larger media role on food safety problems could pressure better performance by food processors.

Monitoring Immediate and Longer Term Food Safety Threats

Improving monitoring and traceability is an essential step and challenge to the current system of long supply chains in China. With the 2006 *Agricultural Product Quality Safety Law*, farmers are now being encouraged to keep production records.⁹¹ In April of 2008, China announced that a traceability system would be included in the new *Draft Food Safety Law*. The scheme will require all food to display a code so consumers (through a hotline) and officials can track each product throughout production. However, several multinational companies have submitted a petition to the National People's Congress against the plan, arguing that it will be costly (as much as a 15 percent increase in cost of production) and will have little affect on food safety, as it does not account for the safety of raw goods.⁹² Intriguingly, perhaps the largest, but scarcely noted initiatives on creating a strong food monitoring and traceability system—that includes regular audits of producers and suppliers—has been to create a safe food supply for the Beijing Olympics. (See Box 1 in Part 1).

Besides monitoring individual food products, understanding broader trends in food safety could help China focus its investment and enforcement work in areas of highest risk. For example, in 2002, China conducted its first health census—the National Survey on Diet and Health Status—which will be conducted every 10 years. Surveys and food samples were taken from 132 sites in 31 provinces and consisted of four parts: (1) questionnaire, (2) physical examination, (3) laboratory tests, and (4) household dietary surveys. With a focus on microorganisms, additives, and heavy metals, this census identified microorganisms as the chief threat to China's food safety.⁹³

Two other ways that China monitors broader trends in food safety include the Nationwide Food Contamination Monitoring Network and the Total Diet Study (TDS). The network operates in 17 provinces and focuses on monitoring concentrations of contaminants for the purpose of early detection for emergency response.

Four rounds of the TDS have been conducted since 2000 in 12 provinces with the goal of monitoring and analyzing trends in food safety. The TDS has a smaller sample size than National Survey on Diet and Health Status and focuses on assessing exposure to contaminants, including specific emerging contaminants such as chloropropanol and acrylamide.⁹⁴

Tracing the source of the contamination is a central goal of the TDS initiative, which highlights its utility for regulating and monitoring agencies in China. For example, the 2000 study showed that between 1990 and 2000, cadmium contamination in vegetables, grains and roots fell dramatically, but rose considerably in meat sources, especially seafood. During the survey, scientists were able to trace the contamination to a specific species of crab in Liaoning Province. Seafood, in fact, emerged frequently in the survey as a major source of contamination including HCH, dioxins/PCBs, and organic tin. These findings, combined with repeatedly rejected exports, have lead regulators to target the seafood industry.

When a producer consistently demonstrates exemplary quality, a variety of government agencies (e.g., AQSIQ, China's State Food and Drug Administration, and local bureaus of health) can make public announcements indicating the producer will be freed from frequent future inspections. Conversely, government regulators will publicly condemn producers that fail to meet standards and subject them to repeat investigations, confiscate products, or even close their operations. If the producer knew the product to be dangerous, legal sanctions are imposed by AQSIQ or another relevant government agency. To regulate small-scale producers the government: (1) requires their products be inspected before shipping to make sure they meet basic safety and hygiene standards, (2) restricts them from selling produce outside of their locality, and (3) prohibits them from using packaging that may be mistaken for a licensed producer.

A white paper released by the State Council in 2007 on food safety outlines the current strategy for regularly monitoring food safety at the local level, called the Responsibility System. According to the paper, responsibility rests on a fixed number of food safety reporters, inspectors in the local Supervision and Inspection Departments, and township level government coordinators, who submit regular reports to the government at the next higher level. The Responsibility System relies on a "three enters, four graphs" reporting scheme. The "three enters" refers to entering villages, households and enterprises to identify and set up records for all food producers. The "four graphs" aim to map out clearer roles for regulators by outlining information on the distribution and location of food producers and clarifying responsibilities of supervisory agencies and precautions they should take.

End-Product Certification

The Certification and Accreditation Administration is responsible for administering, standardizing and implementing certification and accreditation for foodstuffs. There are currently three domestic voluntary food safety certifications—hazard-free, green, and organic—operating in China, with several somewhat ad hoc inter-

Safe food comes at a high price in China, with grocery brands selling for as much as 500 percent more than traditional wet-market goods. In order to avoid social instability over this inequity of safety, China's government will have to alleviate some of these dualities.

Photo Credit: Fred Gale, USDA ERS



national standards also being followed. A study by China's Ministry of Commerce reported that demand for safety certified products is growing rapidly with 60 percent of urban residents willing to pay more for food certified safe or organic.⁹⁵ There is notably little coordination between departments that issue different certificates on food safety, which can confuse consumers and those being regulated. Chinese producers also are participating in various management certification regimes (e.g., good agricultural practices, HACCP, and ISO 9001).

Hazard-Free Food. The Chinese government enacted the 2001 *Hazard-free Food Action Plan* to control highly toxic residues and dangerous veterinary medicines. It has a three-pronged approach to food safety including: (1) a system of production licensing, (2) compulsory inspections, and (3) quality and safety (QS) labeling. AQSIQ has issued about 107,000 QS certificates to groups of farmers that form "production bases," totaling about one-fifth of China's agricultural land. Participation in QS labeling is voluntary and certification is free. The government estimated that by mid-2007, 90 percent of marketed foods came from licensed producers. Further, due to the success of compulsory inspections, some 1,300 licenses had been revoked. AQSIQ makes lists of the companies with licenses public.⁹⁶

Green Food. Green food products (*lüse shipin*) represent a certification category in China that signifies foods with lower pesticide residues and fewer chemical additives than hazard-free foods, but they are not organic and include processed products. This is also a voluntary program, but requires a small fee for certification.⁹⁷ In the last 5 years, exports of certified green foods are up 40 percent. To date, 5,015 Chinese enterprises use the green food logo. In 2005, China consumed or exported \$13.3 billion worth of green food.⁹⁸

Organic Food. There are approximately 600 enterprises using the organic certification logo to sell domestically in China and 12,000 companies have organic permits to export.⁹⁹ The international market continues to absorb most of China's

organic production: more than doubling between 2003 and 2005, from \$142 million to \$350 million. However, domestic demand is rising as more food safety scares emerge. For example, in Carrefour stores consumer demand for organic products rose 50 percent in 2007, and in Wal-Mart demand rose 88 percent in 2006.¹⁰⁰ China's organic standards—issued initially in 1999 and revised in 2005 by the Ministry of Environmental Protection's Organic Food Development Center—are based on international organic standards, but are treated as a high premium safety certification. Unfortunately, it is likely that some products marketed as organic may not meet organic standards as farmers are often attracted by the high profits without fundamental understanding of what it means to grow organic. Although China is one of the world leaders in organic production in terms of absolute volume, organics make up just 1 to 2 percent of the country's total food supply and 0.6 percent of farmland.¹⁰¹

Process or Management Certification Regimes

Good Agricultural Practices (GAP). GAP is term that describes a collection of land, soil, water, animal welfare, and biodiversity practices that aim to address environmental and economic sustainability for on-farm processes. The goal of using such practices is to produce safe and high-quality agricultural food. China began experimenting with GAP pilot programs in 2005 with 286 export enterprises and agricultural demonstration areas in 18 provinces.¹⁰² The broad lack of knowledge of these international standards to promote sound agricultural practices that protect food quality, the environment and human health, as well as the cost of producing to these standards may prohibit them from becoming common practice in China. Building capacity for GAP in China could be a fruitful area for international cooperation.

Hazard Analysis and Critical Control Points (HACCP). HACCP is a series of procedures to identify potential food safety threats and prevent them at all stages of production—although it does not lend itself well to primary production. China requires use of HACCP for 6 types of food exports and currently 2,675 enterprises comply.

Good Manufacturing Practices (GMP) and ISO 9001. These two regimes provide third-party verification of good processes or practices to help encourage better management of manufacturing, which can be applied to food processors. Like HACCP and GMP, ISO 9001 is adopted voluntarily by a small fraction of food manufacturers in China, mostly those who want to export to countries that require these certifications. ISO 9001 includes a collection of standards for quality management systems in any industry. ISO 9001 is a good example of a third-party verification process; however, it does little to improve the regulation of goods in China. Corruption plagues these voluntary systems so that they do not necessarily guarantee the safety of a particular batch of food from a specific company.

Another area of certification essential to ensuring food safety is good manufacturing practices (GMP), which can impact food safety through processor certification and through pesticide, feed and manufacturing veterinary medicine. In China, pesticides and veterinary medicine and information on how to use them are distributed by local shops, which historically were a source of counterfeits and misinformation. Even today, private companies trying to sell their products are often more actively engaged with shopkeepers—who maintain close relationships with farmers—than is the government.

Over the past few years, there also has been a Ministry of Commerce effort to promote “rural chain stores” that aim to control the quality of agricultural inputs sold, particularly shoddy farm chemicals and feeds.¹⁰³

Laboratory Accreditation

There are approximately 3,913 food testing laboratories that have passed laboratory accreditation of the China National Accreditation Service for Conformity Assessment, 48 of which are state-level and 35 are considered key national laboratories under AQSIQ.¹⁰⁴ Individuals at the U.S. Department of Agriculture (USDA) believe the technology of these labs to be superior, but training and implementation of testing within the labs continues to lag.¹⁰⁵ There are also agricultural product quality inspection centers at all levels of government.

Potential for NGOs and News Media as Stronger Monitors

In both monitoring and certification China tends to focus only on end products, which means upstream issues, such as a strong farm assurance certification system for consumers, are lacking. In the United Kingdom, NGOs have been successful in working with farmers to improve farm and food safety, for example, the Royal Society for the Prevention of Cruelty to Animals (RSPCA) created a farm assurance certification scheme called Freedom Food. Under this scheme, RSPCA representatives work with farmers to bring their products up to a high standard of animal welfare that is both profitable for the farmer and safer for the consumer.¹⁰⁶ This scheme is very successful, but the small size and weakness of Chinese NGOs and the large size of the country represent a significant challenge to such a nongovernmental approach to farm assurance. A more promising route could be local government-led farm assurance certification and training scheme, managed by the provincial governments and/or agricultural universities.

The role of the news media is often emphasized by food safety experts in China. In its description of the Food Safety Responsibility System, AQSIQ includes local reporters as one of three pillars ensuring food safety at the local level. Wu Yongning from China CDC emphasized in a talk at the Woodrow Wilson Center the need to strengthen communication with the news media to prevent unscientific information

from reaching the public, and to use the media as an integral part of emergency response.¹⁰⁷ This aspect of the news media, as a government-to-people communication tool, is the major role of the media in China. However, the news media also has the capacity to act as a consumer-to-government communication tool, acting on tips of malpractice or other safety threats. This role for journalists tends to be controversial in China, especially since a supposedly fabricated report by a Chinese journalist about dumplings stuffed with cardboard was published in international newspapers in 2007. The reporter in this case was tried criminally, fined and sentenced to one year in jail.

International Assistance

The extensive global linkages in food trade underscore the need for stronger international cooperation in the area of food safety. Chinese food safety regulators are reaching out to international partners to discuss issues of mutual interest. Additionally, the recent international food safety scares also have revealed deficiencies in the ability of U.S. regulators to protect consumers, thus opening up opportunities for joint collaboration. China has been very active in approaching other countries and organizations for technical and financial assistance in the food safety sector.

Multilateral Organizations

World Organization for Animal Health & Food and Agriculture Organization

Multilateral organizations such as the United Nations (UN) have placed high priority on global food safety issues, but are particularly concerned with controlling pandemic disease. In May 2007, China formally joined the World Organization for Animal Health (OIE), which deals with food safety related to slaughter and animal diseases, including aquaculture. The OIE is setting up collaborative centers in member countries. Specifically, China has requested technical assistance with veterinary services and avian influenza.

The UN's Food and Agriculture Organization (FAO) is working on many aspects of food safety in China, including several programs on avian influenza. FAO's Rural Land Registration and Certification Piloting Project, conducted between 2005 and 2007 in one township with 3,000 to 5,000 households, aims to develop a sustainable framework for rural land registration and certification in China that can eventually be applied nationwide. The FAO team will help local leaders develop and adopt feasible legal and technical field registration processes and methodologies for ensuring the safety of farmland.

Another important ongoing food safety project, equally funded by the Yunnan Provincial government and FAO, is a pilot project implementing Integrated Pest Management (IPM) on small-scale vegetable farms. In this project's midterm report

in 2005, FAO stated that the project in China appeared sustainable and the practices were quickly taking hold in the pilot area. IPM is an ecological way of reducing crop damage from pests by encouraging pest predators rather than using pesticides. In fact, the use of pesticides, in addition to other harmful affects such as toxic residues on food, often causes “resurgence of pest populations due to the destruction of their natural enemies.”¹⁰⁸ The greatest challenge to this program is farmer education, as IPM requires a different solution to every pest, rather than a single product to destroy all pests. However, IPM can be a cost effective way to manage pest damage more thoroughly than pesticides. During the second phase of this project (2002-2007) the government was encouraged to institutionalize farmer training.

World Health Organization

The WHO also has been working on food safety projects in China. The WHO works primarily at the national rather than the provincial level, particularly with the Ministry of Health and the State Food and Drug Administration, to improve national food safety policies, laws and regulations. WHO also acts as a consultant on compliance with international standards on food safety and hygiene, and evaluates the effectiveness of China’s food safety system as compared to other relevant countries. WHO focus areas in China include avian influenza, risk assessment and food-related emergency surveillance and management.

Together, the FAO and WHO work with China to comply with the international Codex Alimentarius Commission, which is the international food standards setting body. China is very active within the commission and currently is the host country for the Committee on Pesticide Residues and the Food Additives Committee. These committees meet to decide the acceptable levels of various food contaminants on internationally traded goods.

World Trade Organization

China also agreed to the World Trade Organization’s Agreement on the Application of Sanitary and Phytosanitary Measures, or SPS Agreement. The SPS Agreement sets constraints on food safety regulations of member countries in an attempt to protect human health and free trade. In October 2007, the WTO launched a new website called the SPS Information Management System whereby consumers and enterprises can search for information on each country’s SPS measures, which they are required to provide regularly to the WTO. However, currently there does not appear yet to be comprehensive information on China’s measures on the SPS website.¹⁰⁹

Asian Development Bank

As far back as 2003, the Chinese government approached the Asian Development Bank (ADB) for technical assistance to strengthen China’s food safety regulatory structure by assisting the newly created State Food and Drug Administration. In 2004, the ADB initiated the China National Food Safety project, which was funded by the Japan Special Fund Regulatory and Strategic Framework with technical assis-

tance from WHO. To date, this ongoing project has circulated draft recommendations to non-line ministries and submitted an Observations and Suggestions policy note at the State Council. ADB staff believes that their work in late 2006 and early 2007 helped inform the decision to create the Leading Group on Product Quality and Food Safety. This leading group potentially could be more effective, however, if it focused solely on food rather than covering safety of all products.¹¹⁰

World Bank

The World Bank, in partnership with the Jilin Provincial Department of Finance, also had a food safety program up for concept review in May 2008. The objective of this project is to improve food quality and safety in Jilin Province and includes investment into testing laboratories, cleaner water supply systems, and providing small loans to small and medium enterprises to assist them in producing safe, high-quality foods.

Association of Southeast Asian Nations

In October 2007, China signed an agreement with the Association of Southeast Asian Nations (ASEAN) to collaborate on food safety called the Nanning Joint Statement at the China-ASEAN Ministerial Conference on Quality Supervision, Inspection and Quarantine. Under the Joint Statement, countries agreed to share information on food safety regulations and standards, exchange technical expertise, and establish contact points to share information quickly.

Bilateral Work

China works with numerous countries to help its exports meet market standards. Major bilateral partners are the United States, the EU, and Japan, each primarily focused on helping China's exports meet their own safety standards. However, some work is being conducted to improve the domestic food safety situation in China.

The United States

Notably, China and the United States have greatly increased food safety cooperation since 2007. In June 2008 at the Fourth Cabinet-level Strategic Economic Dialogue, China's General Administration of Quality, Supervision, Inspection and Quarantine (AQSIQ) and the U.S. Department of Health and Human Services (HHS) designed a work plan under their Agreement on the Safety of Food and Feed; the U.S. Department of Agriculture and AQSIQ are preparing a memorandum of understanding on food safety, and the two countries agreed to jointly confront emergency preparedness and improve consumer confidence.

In addition to working with China on U.S. certification compliance, such as HACCP application and National Shellfish Sanitation Program (NSSP) approval, the United States government has stepped up other efforts to ensure safety of imports from China. In December 2007, the HHS, under Secretary Mike Leavitt, signed a memorandum of agreement with AQSIQ, which allows U.S. inspectors access to

Chinese factories and establishes a detention list of risky products for which every container will be inspected upon entry into the United States. Individual companies can get off the detention list by passing 5 consecutive inspections: as of spring 2008 only one company has been removed. In the future, the new agreement requires all Chinese exporters to register with AQSIQ and submit to annual AQSIQ facility inspections that are shared with HHS and the FDA in the United States. AQSIQ also agreed to set up a secure bilateral electronic database, whereby unique export certification numbers will be assigned to each container bound for the United States and tracked through the electronic system. HHS/FDA will then communicate with AQSIQ when shipments from unregistered companies or without a valid certification number reach the United States. This memorandum of agreement also commits both sides to communicate within 48 hours of detecting of a food safety threat, and to hold regular discussions on implementation through a bilateral working group.

Another indicator of U.S. commitment to the import safety issue is the recent decision to open 3 FDA offices in China, the first foreign operation by the FDA.¹¹¹ These offices, to be located in Beijing, Shanghai and Guangzhou, will be staffed by a total of 8 U.S. inspectors and 5 Chinese nationals charged with ensuring Chinese exporting factories meet U.S. standards. The inspectors are slated to start work in China in October 2008.

The European Union

The European Union actively works with China on food safety and sanitary and phytosanitary (SPS) issues through a variety of mechanisms. In 2002, the EU and China established a Joint Technical Group to handle bilateral regulatory questions. The EU-China Trade Project was launched in 2004 as a joint project between the European Commission and the Ministry of Commerce. With a budget of more than EUR 200 million this project is the EU's largest trade-related technical assistance program worldwide and "includes over 100 projects covering social and economic reform, sustainable development and good governance."¹¹² Additionally, in January 2006, an important memorandum of understanding was signed by AQSIQ and the European Commission's Director General for Health and Consumer Protection in order to facilitate better communication between the two organizations on food safety and SPS issues.

Japan

Unlike the United States and the EU, Japan has no longstanding bilateral food safety relationship with China and no NGOs working on the import food safety issue. Only after Premier Wen Jiabao's trip to Japan in April 2007, did bilateral negotiations regarding food safety really emerge. In December 2007, the officials of AQSIQ and the Japanese Agriculture, Forestry and Fisheries Department agreed to further food safety cooperation, but with few concrete objectives. Following the case of poisoned dumplings reaching Japan, Li Changjiang of AQSIQ noted the urgent need for a long-term food safety cooperation mechanism with Japan.¹¹³ The

notable civility of this incident, as the two countries sent delegations to inspect the entire supply chain of the dumplings, is a positive step towards closer food safety ties between China and Japan, as inspectors from both countries tested the products and discussed possible solutions.

The Japanese Positive List System for Agricultural Chemical Residues in Foods, enforced by the Japanese Ministry of Health, Labour and Welfare, has provided a potential platform for regular dialogue between China and Japan. The Positive List, which went into effect in May of 2006, set stringent maximum residue limits for 758 products and required rigorous inspections resulting in a dramatic 1.2 percent drop in total food exports from China.¹¹⁴ The inspections led to numerous bans against many Chinese products and slowed imports of many other goods. Since then, China has entered into negotiations to exempt more products from mandatory inspection and to get technical assistance from Japan to help Chinese enterprises understand and meet the new requirements. Three demonstrations and eight special training workshops were held to help China's food export enterprises further standardize the use and administration of pesticide and veterinary medicines, improve the quality tracing system and guarantee the quality and safety of food exported to Japan.

International Business and NGOs

International companies and NGOs include a large and diverse group of international food safety players, such as international environmental and consumer organizations, private enterprises and trade associations, all of whom have a stake in China's food. The international business community directly improves China's food safety situation through training and capacity building work with Chinese regulators, business partners, suppliers, and producers. A recent example of this is Cargill's memorandum of understanding with AQSIQ to bring Chinese food safety enforcers to the United States for training with U.S. enforcers and researchers. They will learn how U.S. regulators interact with NGOs and trade organizations to execute scientific risk assessment.¹¹⁵ The German Metro Group—owner of Makro (similar to Costco's) and other retail chains—followed suit in May 2008 with the “Metro Agricultural Products Sourcing Base Project” in collaboration with the Ministry of Commerce to standardize and upgrade the agricultural supply chain. This project funds the first farm consultancy company in China, a third-party group that will ensure the safety of Metro suppliers. An estimated 100 Chinese agricultural companies will attend Metro's training sessions.¹¹⁶

Private enterprises do a lot to address challenges to food safety and ensure international food safety simply by protecting their own brand name. Most multinationals working with food in China monitor their supply chains from farm to fork and inspect their wholesalers and suppliers more regularly than either their home government or AQSIQ. A priority in monitoring the supply chain is employee education. Companies such as Cargill and McCormick educate all employees in the value of food safety in addition to how to meet certification standards. Suppliers of farm products, sometimes leaders of farm cooperatives representing several farms,



A fundamental challenge to food safety is the structure of China's food system with 78 percent of food processors having less than 10 employees and most farms being 2 acres or less. The numerous small farms combined with a cash-based and very large and fragmented food production system make traceability very difficult.

Photo Credit: Bill Coyle, USDA ERS

are responsible for educating producers in safe practices for the farmers, the land and the products—services that these farmers would likely not get if they were operating independently. These private suppliers fill a gap in public service in China stemming from the millions of small-scale farmers. Businesses also ensure product traceability, often through a “one-up, one-down” system where each person on the supply chain knows who they received the product from and who they sent it to and keeps good records to prove it.

Trade and industry associations in the United States act to represent the interests of businesses to government and also regulate themselves to ensure consumer confidence in their product. This structure of influence has proven a good model; however, in China, trade associations tend to have too narrow a scope to truly impact the market. China's trade associations are small and act more like information networks of prices and new technologies than lobbyists or market regulators. Although most require membership fees, many of these associations are state owned, usually under the Ministry of Commerce, and serve the purpose of communicating between businesses and from the government to business, rather than the other way around.

These associations do involve themselves with quality standards and food safety, at least in principal. The China Condiment Industry Association, for example, conducted random quality tests on 12 soy sauce producers in 2007. Those that fail to meet national standards should be punished under the new food safety law due out late 2008, culminating eventually in closure and seizure of their entire stock. More importantly, the association allows a venue for discourse on the setting of standards, although the level to which business-government discussion is carried out is unclear. The broader Food Industry Association (<http://www.cfiin.com.cn/>) serves the same purpose of communicating news and regulations to businesses.

Some international food associations have started to develop. Their primary goal is to unify standards around the world to reduce costs for businesses. They also work to ensure their member companies' brand names in food safety. CIES – The Food Business Forum is an independent global retail-driven food business network

with nearly 400 member companies. In 2000, it launched the Global Food Safety Initiative (GFSI), which benchmarks existing food standards against food safety criteria, and also looks to develop mechanisms to exchange information, raise consumer awareness and review existing good retail practices. A central component of this initiative is a “once certified, accepted everywhere” concept, in which retailers will accept suppliers that meet GFSI benchmarks.¹¹⁷ Several major food retailers working in China already have agreed to employ GFSI, which could help push better transparency among Chinese food industries.¹¹⁸

While the NGO sector in China has grown considerably since 1994 when the first regulations to permit their registration were passed, civil society groups still face considerable obstacles in registering and operating. NGOs must locate a government-related organization to act as a sponsor for registration, moreover, Chinese civil society groups are not permitted to set up branch offices or create a paying membership base. Moreover, a functioning donations law does not exist, which has meant nearly all Chinese NGOs must depend on international funding. The largest sector of Chinese NGOs is in the environmental sphere, due in part to a significant presence in China of international groups working on pollution, conservation, energy issues, and increasingly poverty alleviation linked to resource degradation. International green groups and foundations have helped fund and train many Chinese environmental NGOs. In the food safety area, the authors have only uncovered a handful of registered Chinese NGOs that work on organic food or assist farmers with finding alternatives to using pesticides.¹¹⁹ International NGOs are quite active in China working on environmental, poverty alleviation, and health issues, but there does not yet appear to be any significant presence of international groups involved with Chinese partners on food safety.

Box 4

Main Policy Players Regulating Food Safety in China

Compiled from the U.S.-China Business Council's *Food Safety & Inspection in China* brief¹²⁰ and conversations with food safety experts.

Special Coordinators

Leading Group of the State Council, Committee on Product Quality and Food Safety (CPQFS) was created in 2007, formerly led by Vice Premier of the State Council Wu Yi. CPQFS coordinates work of government agencies, particularly on development of laws and regulations. http://en.chinagate.com.cn/reports/2007-08/28/content_8757123.htm

Ministry of Health's State Food and Drug Administration (SFDA) is led by Vice Commissioner of Health Shao Mingli. Created out of the Ministry of Health in 2003, SFDA is the main food safety policy implementer—inspecting food, food service (catering and canteens) and overseeing crisis management. In March 2008, SFDA was moved back under MOH and is no longer an independent agency, though it is widely expected to continue its coordinating role on food safety issues. <http://eng.sfda.gov.cn/eng/>

Pillars

Ministry of Health (MOH) is led by Minister of Health Chen Zhu. MOH is the main food safety agenda setter and supervisor in China, coordinating all domestic food product safety inspections and developing food safety legislation. <http://www.moh.gov.cn/2.htm>

General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ) is led by Li Changjiang. AQSIQ inspects animal slaughter, and all food production, processing, shipping, certification, and hygiene for imported and exported food products. <http://english.aqsic.gov.cn/>

Ministry of Agriculture (MOA) is headed by Sun Zhengcai. In terms of food safety, MOA supervises agriculture and animal husbandry and oversees certification of organic food. www.agri.gov.cn

State Administration for Industry and Commerce (SAIC) is led by Zhou Bohua. SAIC inspects market circulation and distribution, consumer protection, issues business licenses and works with transportation industries on food shipping. <http://gsyj.saic.gov.cn/wcm/WCMData/pub/saic/english/default.htm>

Other Important Players

Ministry of Science and Technology (MOST) coordinates all scientific research and development to inform food safety policy.

Chinese Centers for Disease Control and Prevention (CDC) (Under MOH) carries out public health management for food safety and acts as a working group for emergency relief and public information dissemination. <http://www.chinacdc.net.cn/n272562/>

Ministry of Commerce (MOFCOM) regulates alcohol, hog slaughter, and tea shipped from autonomous regions. <http://english.mofcom.gov.cn/>

Certification and Accreditation Administration (under AQSIQ) sets plans for industry regarding the administration, standardization, and implementation of certification and accreditation of food and agricultural products from farm to table. It became the lead agency for organic certification in 2004.

General Administration of Customs (under AQSIQ) inspects all imports and exports from China and handles quarantine and clearance procedures.

Ministries of Railways and Transportation deal with transport safety issues, including logistics such as cold chain management. The Ministry of Railways is currently led by Minister Liu Zhijun and the Ministry of Transportation is led by Minister Li Shenglin.

Ministry of Environmental Protection, headed by Zhou Shengxian, is responsible for supervising agricultural and food processing activities, such as packaging.

National Development and Reform Commission, led by Zhang Ping, plans and develops policy to develop and regulate the food industry.

Part Four

Fixing Weak Links in Global Food Safety: Steps Forward for China and the United States

A successful food safety regulation structure must include the active collaboration of the government, food safety technology leaders, and the food industry. In addition, an effective food safety system must be comprehensive, for relying solely on testing imports is reactive and potentially expensive if done in isolation. Conversely, simply depending on a third party or exporting country to conduct tests is risky and requires monitoring to ensure tests are done well. Ideally, food safety regulations would be internationally harmonized; however, that has not yet happened. Among exporting countries, Japanese and EU legislation has long been considered the most stringent.

Challenges to food safety globally are varied and at times much of what is highlighted in the news media is sensational rather than a true threat. Even experts sometimes disagree on what are the most urgent food safety threats. For example, many global health advocates believe high-caloric diets that contribute to obesity represent a much greater threat to human health than chemical contaminants. Others believe the growth in industrial agriculture may be the greatest threat to food safety, not just in China, but globally. Additionally, while chemical contaminants make good headlines, it is microbial contaminants that are often the main killers.

Many people we interviewed were concerned China was developing a dual food system, one that supplied most of its safe food to urban and international markets, while leaving poor Chinese with mainly unsafe food. A similar situation is arguably developing in the United States, with wealthier people able to access and afford healthier food, while poorer residents can only afford highly unhealthy food that leads to diabetes, obesity and other diet-based diseases.

Globally, such a dual system for food production is not uncommon, particularly in developing countries where standards are evolving. In the absence of globally accepted harmonized standards, many countries operate “export only schemes” where food is produced in accordance with the standards of the intended recipient country. However, this is not only risky, but also does nothing to promote the production of safer food destined for domestic markets or for foreign markets where the regulations are less stringent. While adoption of common standards and systems regulating all food production is more arduous, it is the only effective way to eradicate bad practices and will ultimately lead to a much more cost-effective system of food safety regulation.

Recent changes to strengthen the Chinese food safety system have been rapid and mostly positive. This success is due in part to a willingness to consult with other governments, multinationals and businesses for their recommendations. In this spirit, we have collected a series of suggestions on improving China's capacity to better regulate food safety, which includes opportunities for international cooperation. Due to the decentralized structure of China's government, many of our interviewees stressed the need to target Sino-U.S. bilateral projects at building the capacity of local governments in China. China's local governments are much more motivated to improve food safety due to the higher penalties for overlooking a potential food safety threat.

Solutions to China's numerous food safety challenges begin with stronger risk assessment capacity, our first recommendation, but also require basic improvements to the judicial system and enforcement bodies to ensure that equipment is purchased and used and all required records are kept. Besides the need to drastically improve bilateral communication and joint work, we also include some discussion of changes needed in the United States to improve its monitoring capacity, which could add pressure to Chinese exporters.

Scientific Risk Assessment and Standards

At a December meeting of the China Environment Forum, Wu Yongning of the Chinese Centers for Disease Control and Prevention (CDC) highlighted the need for technical assistance, particularly in the areas of risk assessment and data collection. Although the Ministry of Science and Technology and the CDC have been working to increase the quality and quantity of data collected on the threats to food safety in China, there are many holes in this newly collected data, which make it difficult to detect trends. Without sound data, it is also hard to prove causation and build scientifically based regulations on allowable levels of contaminants.

Many businesses trying to import food into or out of China have encountered an increasingly slow and expensive system of regulation and laboratory testing. While laboratory equipment in China is some of the best in the world, it is often either not used, or not accompanied by personnel with the training and authority to pass or fail a product based on an assessment of hazard. Further, AQSIQ ostensibly has a monopoly on testing food exports in China, from which the agency draws funds. AQSIQ needs to allow more random third-party testing as a check on AQSIQ laboratories. Encouraging greater competition in the food testing laboratories in China could speed up imports and exports and further ensure safety.¹²¹ A solution to this problem is to create more flexible food safety laws, which—for example—declare it unlawful to sell products for human consumption that clearly harm human health, rather than the typically more detailed laws outlining specific products and substances that may not be sold for human consumption. Several experts believe it is this type of detail that is delaying the current food safety law from being released. Stronger trade associations may also be a good way of ensuring standards. Stronger

Box 5

The GrapeNet Program in India— A Model for Chinese Food Exporters

By Paul B. Young

Food is often produced with a specific export market in mind and will only be tested to ensure it is compliant with the standards of the recipient country if necessary. A program called GrapeNet, operated by the Agricultural & Processed Food Products Export Development Authority of India (APEDA), is an excellent example of regulators, scientists and food producers working towards a common goal of increasing exports (and export prices) for China to follow. The price of table grapes varies significantly worldwide, but the price commanded in European countries is usually much higher than elsewhere (often more than 3 times that of the United States). However, the standards with regards to pesticide residues are also demanding and are not yet fully harmonized across the EU, often resulting in different tolerances in each EU member state. This complicates the process of ensuring compliance for the grape growers and their exporting agents.

GrapeNet is a comprehensive scheme aimed only at those grapes destined for the EU. It involves an Internet-based traceability system, which allows importers to trace grapes back to the farm of origin and view details of the laboratory inspection. It also requires rigorous export certification testing, which detects and quantifies the presence of regulated pesticides in grapes after harvesting. Growers and exporters have taken advantage of the system by adopting self-funded pre-harvest analyses to determine where the grapes should be exported for maximum price and acceptance. In 2007, this scheme allowed Indian grape exports to command a 40 percent increase in price over the previous year. Additionally, the rejection rate has dropped from 25 percent of consignments to less than 3 percent in just a few years of testing, indicating the importance of grower education and awareness.

This system has proven so successful that it has been extended to mangos, with other fruits destined to follow. A similar certification scheme has been put in place by APEDA for mangos destined for Japan, which also includes comprehensive pesticide analysis on each harvest. However, it is notable that mangos destined for the United States are not obliged to undergo testing for the presence of pesticides.

More information on the GrapeNet Program can be found at <http://www.apeda.com/GrapeNet/index.htm>.

food industry associations (akin to the U.S. Grocery Manufacturers Association/GMA), even government-organized, are needed to bring together businesses with policymakers to develop standards and laws. A strong GMA-like entity could increase business compliance by giving them a voice in shaping laws and standards and by requiring compliance to continue their membership.

In China's new *Draft Food Safety Law* there are provisions to create a committee for assessment of hazards in food. This body will be tasked with adopting a scientific approach to risk assessment and developing a set of food safety standards. This legislation does not specifically address the methods of risk analysis to be employed or whether international standards may be implemented. This draft legislation also proposes the creation of a National Sampling Plan and testing program to monitor compliance with the standards. However, since no details are given regarding the scale or frequency of the sampling plan it is difficult to predict the efficacy of the resulting program. Chinese policymakers are considering setting food safety standards that go so far as to prescribe methods of analysis. However, while guidance on the methods is often useful, the rigid prescription of analytical methods can significantly limit the ability of laboratories to adopt new technologies offering more cost-effective analyses, with higher throughput and more rapid turnaround times.

Consolidation of Food Producers and Processors

In the United States, the top 3 slaughterhouses account for 65 percent of the meat, while in China, the top 3 only process 5 percent of the meat, demonstrating a significant opportunity for consolidation.¹²² While there is no reason for China to consolidate to the extent of the United States, some consolidation—already underway in the export market—will improve the average education of food producers and increase the efficacy of government monitoring. This is particularly true for the purpose of eliminating the development of a dual system, where exported products are safer than domestic products. To date, much of the advances in the safety of China's food exports have come from consolidation, often funded by international companies.

Consolidation may also expedite the development of a strong Chinese food brand. Domestically, in the dairy and meat sectors some companies have increased their dominance, in great part due to greater safety of their products. In both supermarkets and wet markets, meat sellers usually display a sign describing the company from which they source their meat. Although there are several brands of food in China that are well known nationwide, few, if any, are recognized globally in the same way as Kellogg's, Cargill, Coca-Cola, and McDonalds.

Farmer coordination could be strengthened without formal consolidation through government efforts, such as voluntary farmer organizations that offer incentives for farmers to produce safe food. One example is India's GrapeNet program, which allows farmers to tailor their produce towards a specific market to ensure the great-

est profit. (See Box 5). Another example is farmer associations, which could ease government food safety regulation and address rural poverty. Despite 28 years of economic reforms, the income gap between urban and rural areas in China continues to deepen, which has made rural development a major government priority. Government programs to train and regulate farmers in safer food practices have been difficult because many farms are small and remote. Currently, due to little legal or regulatory guidance or support, only about 2 percent of China's farmers are members of such organizations.¹²³ Most existing associations are directly funded and run by the Chinese government, rather than being truly grassroots organizations. One World Bank report suggests that increased farmer-organized associations would allow farmers to take advantage of economies of scale and better ensure the sustainability and safety of their operations. The Chinese government has already begun to encourage such entities with the 2006 *Specialized Farmers' Cooperatives Law*.¹²⁴

Unbiased, Scientific Agricultural Extension

Early in U.S. history, agriculture employed most of the population and thus agricultural extension was a natural role of the central government. In China, agriculture continues to employ two-thirds of the population, yet agricultural extension remains limited and plagued with conflicts of interest. The U.S. model of the central and state governments paying universities to conduct scientific agricultural research and outreach could be ideal for rural China where citizens are skeptical of the local government but respectful of academia. Further, China's decentralized political structure mirrors that of the United States in terms of provinces (like states) having their own budgets and agricultural agendas. Thus state-province agricultural outreach and research partnerships could easily become a model of exchange between Chinese and U.S. researchers and a tool to build the scientific capacity of China's farmers.

Food Handler and Consumer Education

Chinese consumers of food are even more numerous than the processors and farmers. Also, many employees of canteens and in-home consumers are less likely to understand basic food safety strategies, such as the fact vegetables should not be cut by the same knife as raw meat, or that red-yoked eggs signal harmful dyes not healthy ducks raised on shrimp. Further, better education on farm food safety allows consumers to choose healthier food and thus reward safer food practices, such as organic.

Education programs run through primary schools are a good place to start such a consumer education campaign, as China has high primary school attendance rates. Such programs have been successful with environmental and family planning programs in China and represent a familiar model in the country. Shanghai's Food and

Drug Administration has begun another type of awareness-raising scheme of “face labels” to increase awareness and help consumers reward good practices.¹²⁵ The smiley face labels are placed on restaurants and grocery stores indicating good sanitation practices and safe food. The government plans to extend the labels to street food and rural eateries.

Grassroots Monitoring and Consumer Activism

Currently, China’s civil society is ostensibly inactive on issues of food safety. A robust civil society has the power to fill many of the enforcement shortcomings inherent in China’s top-down government structure. First, NGOs could serve as local industry and government watchdogs alerting the news media to unsafe and corrupt practices that would be difficult for the central government to discover. As part of this activity, NGOs could set up local anonymous whistleblower hotlines. Currently, China has laws allowing whistleblowers, but little regulation actually protecting them from indictment or job loss. If whistleblowers could be guaranteed anonymity and legal protection, more food safety violations might be reported and solved, provided people at the grassroots are educated about the laws and food safety hazards.

The U.S. NGO community has long been active in environmental and rural poverty alleviation activities in China and some of these groups could potentially expand their work to encompass training and capacity building of food producers and processors, and in educating consumers about safe food and food handling, and environmental health impacts of food production. Pesticide Action Network North America offers a successful model to follow, for in the 1990s this NGO worked to build the capacity of some Chinese environmental groups to work with farmers and consumers on adopting pesticide alternatives. U.S.-based food safety watchdog organizations—such as Food and Water Watch and Institute for Agriculture and Trade Policy—also offer insightful models to strengthen bottom-up checks on government and industry implementation of food safety policies and regulations.

Strengthening U.S. Food Safety Monitoring

The FDA’s import oversight system requires a complete transformation because it lacks sufficient funds, legal tools and a strong mandate to prevent unsafe food from reaching U.S. markets. These challenges highlight a need for Congress and the Administration to act. The President’s Food Safety Working Group issued an initial framework report on 10 September 2007, which highlighted (without much detail) three organizing principles for the U.S. food safety system to: (1) build prevention upstream; (2) intervene to address identified hazards; and (3) respond rapidly to contain problems. A crucial element not yet adequately addressed revolves around verification procedures. Clearly prevention is of paramount importance,



Outside of China's booming urban centers, many rural areas remain underdeveloped and food safety practices are lax. In many rural areas, microbial contamination remains the main threat from food due to lack of hygiene and poor food handling practices, such as the meat market depicted in this photo.

Photo Credit: Bill Coyle, USDA ERS

but in the absence of robust compliance monitoring programs, hazards are unlikely to be identified until they are injurious. Indeed this policy of relying on outbreaks of food-related illnesses to guide action on problems (listed as one option in the FDA's own action plan) is unlikely to find favor with consumers. Consumer confidence is more likely to be assuaged by implementation of robust monitoring programs employing state-of-the-art scientific detection systems. Better monitoring by FDA also offers an incentive for companies to ensure the quality of food they export to the United States.

Michael Taylor—a former FDA official speaking at a China Environment Forum in September 2007—emphasized that while the government plays a key role in monitoring food, the private sector is central to ensuring food safety in the United States—an argument that was echoed in the GMA's 2007 action plan for strengthening the quality of imported food.¹²⁶ The four pillars of the action plan were: (1) requiring all importers of record to adopt a foreign supplier quality assurance program and verifying that imported ingredients and products meet FDA food safety and quality requirements; (2) establishing a program to allow food companies/importers to qualify their products as lower risk by sharing test results, data and supply chain information confidentially with the FDA; (3) working with foreign governments to facilitate foreign food safety standards that are more closely aligned with those of the FDA; and (4) expanding the capacity of FDA with increased staff and funding.

FDA began acting on the last recommendation in 2008 by adding 1,300 new employees within the United States and creating 3 new offices in China, but more must be done. These staffing increases and recent requests for increased budgets have long been advocated by the Coalition for a Stronger FDA and various members of Congress.¹²⁷

Improving Communications around Food Safety Trade Incidents

Both within China and internationally there is a need to depoliticize the nature of food safety trade incidents in order to mitigate crises. Improved communications with manufacturers is an essential first step. Perhaps the best approach to reach manufactures is through local government initiatives rather than “through Beijing.” Domestically, examples of local-to-local initiatives already exist, such as between Hong Kong and Guangdong. Hong Kong imports 80 percent of its food from mainland China, and after a failed food safety initiative with the Chinese central government, the Hong Kong government established a formal framework of food safety exchange directly with Guangdong. Since then, Guangdong has registered all fisheries exporting to Hong Kong and has rapidly tracked transgressors.¹²⁸ Such a model may also be relevant to foreign countries trying to ensure food safety.

Establishing a joint task force to both investigate a contentious issue and explore ways to de-escalate crises may also be a viable option. The FDA and the U.S. Department of Agriculture (USDA) are enforcement agencies and need direct channels with Chinese provincial counterparts to work closely with food processors. In this regard, scientific exchange programs, organization of joint training ventures and participation of laboratories in proficiency testing schemes would help to foster an atmosphere of mutual trust and acceptance of laboratory test results. Additionally, bilateral or multilateral agreements on acceptability criteria for analytical methods and quality assurance procedures for testing food would significantly build confidence.

The issue of global food distribution is only just beginning to be addressed as consumers become aware of the potential hazards in their food. Consumers should be guaranteed a high level of confidence in the safety of both domestically produced and imported foods. Rapid and accurate communication between governments, consumers and manufacturers across political boundaries will need to be formalized to keep up with the speed and growing complexity of global food distribution. More dialogue could lead to concrete programs to help both countries strengthen their food safety regulation. Ultimately the food safety fears and suspicions that have arisen between China and the United States today present a valuable opportunity for win-win cooperation.

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Appendix A

International Comparison of Food Safety Regulation

By Paul Young

Food safety regulations and their potential to disrupt international trade are not recent phenomena. Beginning in the 1850s, many European nations implemented legislation regarding the “purity” of food. Many of these laws, such as the British Food and Drugs Act of 1872, were put in place to prevent the intentional adulteration or misbranding of food, which was a widespread problem at the time.

Soon attention in Europe shifted from adulterations to meat production, often as a result of serious health concerns. Throughout the second half of the nineteenth century, trichinosis outbreaks—caused by parasitic worms in pork—resulted in numerous fatalities across Europe. In 1879, microscopic detection of the parasite in imported U.S. pork resulted in bans across Europe. Germany was particularly stringent in enforcing the ban and, despite assurances that U.S. pork was safe, a 12-year “American-German Pork War” ensued, deeply affecting the U.S. pork industry that was worth \$80 million at the time. The restrictions were finally lifted only after U.S. authorities put in place an export certification scheme.

Theodore Roosevelt promulgated the first regulation on food safety in the United States—the Food and Drug Act—in 1906. The Food and Drug Act regulated labeling and adulteration of foods and drugs. This act was subsequently repealed by the Federal Food, Drug and Cosmetic Act of 1938, which is the primary legal instrument governing the safety of food in the U.S. today.

Current Food Safety Controls

As of 2008, the EU consists of 27 member states offering, by and large, freedom of intra-community trade assured through the application of harmonized food safety production standards. Perhaps because of Europe’s 19th century experiences with food contamination, the EU focused much of its food safety attention in the 20th century on regulating contaminants in food of animal origin. European legal instruments to control contaminants can take two forms: self-executing and immediately enforceable in all EU member states (Council Regulations) or requiring transposition into national law (Commissions Decisions and Council Directives). An important

example of a self-executing law is Council Regulation 2377/90, which standardized procedures for measuring maximum residue limits (MRLs) for veterinary medicinal products in food, laid down MRLs for approved products, and banned the use of unauthorized products.

One example of a law requiring transposition is Council Directive 96/23, which acts as a mechanism for ensuring compliance with the above Council Regulation 2377/90 for MRLs and banned products. This directive established the minimum frequency of checks for member states to carry out on food of animal origin and specifies that sampling should be targeted—aimed at monitoring compliance with withdrawal periods for approved substances and with effective detection of unapproved substances. The EU has adopted a sampling frequency based on annual production and sets the number of tests for contaminants according to the relative risk within that sample. For example, 0.4 percent of the annual bovine slaughter must be sampled, but almost two-thirds of this sample is tested for the presence of a relatively small number of unapproved veterinary medicinal products that are deemed to be the most hazardous.

In the United States, the mode of regulating veterinary medicinal products in food of animal origin is broadly similar to that of the EU. The FDA established MRLs for veterinary medicinal products in food, which are detailed in 21 CFR 556. However, the responsibility for monitoring compliance falls to the Food Safety Inspection Service (FSIS) of USDA (with the exception of seafood). The sampling frequency differs from EU requirements in that it is based not on production but on the relative risk of a certain commodity, the availability of methods, and laboratory capacity. Essentially, USDA annually specifies a collection of either 230 or 300 samples for each residue/commodity combination and then adjusts this number according to laboratory capacity. This frequently used method has been calculated to offer a 90 percent or 95 percent probability, respectively, of detecting a true violation rate of 1 percent.

Separation of Risk Assessment and Risk Management

According to the terms of the WTO Sanitary and Phytosanitary Measures Agreement (SPS), food safety regulations must be based on sound scientific reasoning and not influenced by the challenges of risk management. In 2004, the EU began to move towards a more holistic approach to food safety regulation with the establishment of the European Food Safety Authority under Council Regulation 178/2002. This body is intended to act as an independent point of reference for risk assessment with no responsibility for risk management. Additionally this regulation extends the scope of food safety legislation to cover all food, which may be described as any substance which may be consumed by humans, and creates an absolute requirement for traceability through all stages of production.

The United States does not have a centralized body with over-arching responsibility for all aspects of food safety risk assessment and there is much overlap between

government agencies. Some degree of separation is achieved through devolvement of responsibility. For example, with pesticide contaminants, the responsibility for risk assessment lies with EPA whereas the risk management largely falls to FDA. On the other hand, FDA is responsible for risk assessment of veterinary medicinal residues, but the USDA has responsibility for monitoring compliance. However, the fact remains that FDA has responsibility for ensuring the safety of around 80 percent of all food consumed in the United States.

Farm-to-Table Control

Many countries advocate the use of comprehensive systems to control the entire food production process, frequently referred to as a “farm-to-table” approach. The EU has enshrined this concept in Council Regulation 852/2004 addressing hygiene of foodstuffs, which requires all food businesses to register with their country’s authority, and mandates those businesses to employ procedures based on the principles of Hazard Analysis and Critical Control Points (HACCP). However, since primary production does not generally lend itself to application of HACCP, this regulation lays down general requirements for primary production and associated operations. The diligent application of these systems form the most effective first line of defence in ensuring food safety with essential monitoring ensuring compliance with procedures.

U.S. regulations do not yet demand comprehensive application of HACCP principles in all areas of food production. While it is a mandatory under the FDA Food Code for some food business operators—such as meat and poultry establishments (9 CFR 304) and seafood processing establishments (21 CFR 123)—to abide by HACCP principles, for food service and retail establishments, application of HACCP is merely recommended. Moreover, this code is not legally binding and not universally implemented, since even if a state adopts the Food Code, cities or counties within that state may choose not to.

Funding Food Safety Analysis

It is often stated, “we cannot test our way to safe food.” While this statement may be accurate since regulators can only ever test a sub-sample, it underestimates the importance of a robust and effective monitoring program in ensuring legal compliance and building consumer confidence—a lesson learnt during the American-German Pork War. However, unlike the Pork War when German labourers and housewives were ultimately trained to detect the offending parasite microscopically, food safety analysis today is a demanding field requiring state-of-the-art scientific instrumentation and skilled scientists, all of which require a suitable funding mechanism.

EU Council Regulation 882/2004 stipulates that laboratories involved in official

...food safety analysis today is a demanding field requiring state-of-the-art scientific instrumentation and skilled scientists, all of which require a suitable funding mechanism.

food safety control must have equipment capable of correctly identifying hazards according to the official standards. This legislation also addresses the issue of funding official controls, stating that the controls should be funded at least in part through a levy imposed on producers and importers to be calculated taking into account staff salaries, equipment, training, laboratory analysis, and sampling costs. In this way the EU ensures that funding for official food testing controls should remain commensurate with levels of production and importation, making it essentially a self-funded industry.

Responsibility for risk management for the majority of food consumed in the United States lies with FDA. FDA relies on funding from either federal appropriation or, to an increasing extent, on user fees. However, user fees relate only to prescription drugs, veterinary drugs and medical devices. Therefore, food safety, which is the responsibility of FDA's Center for Food Safety and Applied Nutrition (CFSAN) and the Office of Regulatory Affairs (ORA), is entirely reliant upon federal funding. It is worth noting that during the five years between 2003 and 2008, CFSAN funding increased by around 4 percent in real dollars, which equates to an 11 percent reduction in budget at 2003 constant dollars. It should not be surprising, therefore, that CFSAN saw a 20 percent reduction in staff over the same period.

Control of Food Imports

The EU has long asserted demands for EU-equivalent food safety assurances from non-EU exporting (third) countries. To ensure compliance, auditors from the Directorate General for Health and Consumer Affairs' (DG Sanco's) Food and Veterinary Office (FVO) carry out a series of inspections of exporting countries' food safety systems. The inspections exhaustively examine the legal framework for the country's food safety controls and the efficacy of the measures. Only by permitting these audits and annually submitting details of monitoring programs can third countries remain on lists of countries approved to export stipulated commodities to

the EU. The same is true for specific establishments within those countries. In this way, both countries and establishments will be permitted to export only specified commodities to the EU. Compliance with these requirements is monitored through the previously mentioned FVO audits and augmented through import testing.

In addition to inspecting a country's food safety system, Council Directive 97/78 stipulates that no consignment of any commodity can enter the EU without some type of inspection of the consignment taking place. In general, the minimum numbers of consignments subjected to laboratory examination are 20 percent for meat, meat products, fish, and fishery products and 50 percent for poultry meat, honey, and dairy products. The approved country/establishment lists traditionally related only to food of animal origin. However, under article 46 of Regulation 882/2004 this has been extended to other foodstuffs. In an attempt to encourage export certification, this regulation also allows fewer import checks when approved pre-export testing is carried out. Therefore the actual number of import tests will vary by country.

The USDA operates a similar pre-approval scheme for meat, poultry and eggs (excluding seafood). However, in its seafood controls FDA relies largely on voluntary measures. Whereas approval is mandatory for those commodities regulated by USDA, FDA lacks the resources to inspect foreign facilities and instead maintains a list of nominated establishments in only 4 countries—Canada, Japan, New Zealand and Thailand—and *recommends* that importers preferentially source their products from these suppliers. As a consequence, the United States relies significantly on import testing to assure compliance, but with diminishing resources this system is becoming increasingly strained. It has been estimated that only 1 percent of import consignments are inspected, with less than 0.2 percent undergoing laboratory examination. While U.S. import safety requirements may be broadly similar to those of EU, exporting countries regard this lack of enforcement as representing a less stringent set of requirements.

Although both the EU and United States import very large quantities of food and agriculture products, it is important to remember that they are both predominantly self-sufficient—in fact, the United States is a net exporter of agricultural products. Japan, which imports more than 60 percent of its food supply, provides a good example of import control in an import dependent country. Japan does not operate a pre-approval scheme for countries and establishments (except for spinach); instead it depends very heavily on analytical testing at import. Exporting countries do not need to mirror Japan's domestic control program (as EU requires of importers), but compliance must be assured through testing. The end result is that domestic food of animal origin may be tested for approximately 70 veterinary drugs whereas imported food must be tested for perhaps three times as many drugs.

The Japanese authorities (Ministry of Health, Labour and Welfare; MHLW) thus place the onus for compliance with the importers and exact heavy penalties for failures. Japanese importers often demand pre-certification of compliance with Japanese standards and assurance that products comply with the demands of the

Japanese Positive List system, which sets the MRLs of pesticides, additives and veterinary medicines. MHLW monitors compliance through an extensive import testing program, which is risk based and generally results in 10 percent of consignments undergoing government laboratory examination and a significant level of “voluntary” testing on behalf of diligent importers.

Controlling Food Exports

Controlling food exports is altogether a much more complicated business, since food producers must ensure compliance with the standards of the importing country. Most countries demand some form of export certification whose requirements differ depending on the commodity and the importing country’s standards. The USDA Foreign Agricultural Service website offers some indication of the nature and complexity of certification schemes, detailing the nature and content of certificates required for each commodity by country.

Comparative analysis of the global food system exposes some of the weaknesses in U.S. food regulation. As exporters aim to make the greatest profits, they target the high-value markets of Japan and the EU, producing food destined for only those markets under schemes designed to ensure compliance with those countries’ demands. If after testing consignments are not deemed suitable for their intended market, they may be sold into markets where the requirements are either less stringent or are less rigorously enforced, such as the United States.

Paul B. Young was employed in the Department of Agriculture and Rural Development for Northern Ireland (DARDNI) for more than 25 years, before taking an appointment with Waters Corporation in 2007. During his time with DARDNI, he was involved in implementation of EU legislation pertaining to food safety analysis, focusing on the control of chemical contaminants in food of animal origin. He has acted as a “national expert” auditor for the Food and Veterinary Office (FVO) of the European Commission in their inspection program to approve third countries to export foodstuffs to the EU. He can be reached at: Paul_Young@waters.com.

Appendix B

Food Safety Laws and Regulations in China

Compiled by Yang Yang and Catherine Tai

Law and Regulations	Brief Description	Issuer	Effective
Food Safety Law Draft	To improve monitoring and regulation of food	The National People's Congress (NPC)	Draft released on April 20, 2008.
Regulation on the Supervision and Administration of Sanitation of Exported Fruits	Aims to improve the quality of exported fruits	General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ)	December 25, 2006
Regulation on the Management of Food Safety in Distribution	Regulates food supply and distribution	Ministry of Commerce	December 20, 2006
Regulation on the Supervision and Administration of Sanitation for Imported and Exported Food	Strengthens supervision of imported and exported food	AQSIQ	March 1, 2006
Regulation on Food Hygiene License	Regulates licenses for food producers to ensure hygiene standards	Ministry of Health	June 1, 2006
Regulation on Managing Hygiene in Food Additives	Regulates production and use of food additives to prevent contamination	Ministry of Health	July 1, 2002
Regulation on Managing Hygiene in Genetically Modified Food	Strengthens supervision of GMO food to protect consumer health and right- to-know	Ministry of Health	July 1, 2002

Law and Regulations	Brief Description	Issuer	Effective
Regulations on Pig Slaughtering Management	Ensures the quality of pork products	The State Council	December 19, 1997
Regulation on Nutritional Food Management	Aims to ensure the quality of nutritional food (not food for medical purposes)	Ministry of Health	June 1, 1996
Regulation on Management of Hygiene for Radiated Food	Ensures the safety of radiated food	Ministry of Health	April 5, 1996
Food Hygiene Law of the People's Republic of China	Aims to prevent food contamination and harmful substances from reaching consumers	The Standing Committee of the NPC	October 30, 1995
Regulation on Breast Milk Substitutes Sales Management	Aims to protect infant health and encourage breastfeeding	Ministry of Health; General Administration of Press and Publication; State Administration of Radio Film and Television, State; Administration for Industry & Commerce	June 13, 1995
Various Hygiene Management Regulations for Grain, Oil, Tea, Eggs, Sugar, Dairy, and Alcohol	Regulates producers and processors of various products to ensure safety	Ministry of Health	1990
Regulation on Food Hygiene Inspection Organizations	Regulates food hygiene inspecting entities	Ministry of Health	December 2, 1987
Law on Frontier Health and Quarantine	Strengthens health and quarantine inspections to prevent infectious diseases from spreading into or out of the country	The Standing Committee of the NPC	December 2, 1986