US-China Economic and Security Review Commission (USCC)

Congressional Hearing on

CHINA'S AGRICULTURAL POLICIES: TRADE, INVESTMENT, SAFETY, AND INNOVATION

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1. *What vulnerabilities exist in the U.S. food safety regime with respect to food imports from China? How can U.S. food safety measures be improved to mitigate risk from food imports?*

U.S imported about $6.1 billion food and drink products from China in 2017, with the major categories as fish and shellfish ($2.7B), fruit and vegetable products ($1.6B), snack foods, and tea (US Census, 2018). There exist vulnerabilities in the U.S. food safety regime for imported food from foreign countries, including China and other countries as well.

The majority of food imported to the U.S. is not physically inspected at the port of entry, which is a vulnerability in the import system for potential safety problems from imported food. U.S. Food and Drug Administration (FDA) is responsible for the safety inspection of imported food. FDA has staff working at the U.S. ports of entry to inspect the products shipped over and also working overseas to inspect production and transportation facilities. Due to the cost of inspection, only a small sample of imported goods get inspected, 1% during 2006 to 2013 (Beach, 2016). For seafood, this is less than 2% (Ortega et al., 2015). Instead of completely random draws, FDA targets goods with high potential of regulation violation based on its experience in an attempt to maximize the catching of substandard products under limited budget. This opens the first door for problematic food products entering the U.S. market.

Another vulnerability is in the recall system. Recalls can be made voluntarily by private firms of their own products or by FDA. It rarely happened that foreign firms recall food products exported to other country's markets because they may not have quick information about the safety problems from foreign markets, they may not have good channels to issue recalls when working with layers of traders, or they may not care much about those issues. FDA issued recalls account for only a small percentage, and its recalls may not be delivered to end users efficiently as they only put those with very large impacts in major media, while seafood and processed fruits and vegetables from China are mostly small varieties. There is a lack of effective means to confine and mitigate the damages caused by problematic food already in markets.

Thirdly, even the imported food products are traceable to some extent, the punishment is often not sufficient to deter future violations. For example, unlike firms and individuals can be persecuted under the criminal law for food safety violations, FDA blocks firms that has a history of violating the safety rules from exporting to the U.S. but doesn't pursue legal or financial punishment against them in general because they are outside the country.

Measurements can be considered for each of the aforementioned vulnerabilities. Actually, USDA and FDA have made efforts along the lines. For example, agents have been sent to inspect the production sites in foreign countries, China, specifically, and third party certifications of such suppliers are required in some problem prone food categories. USDA and FDA have also worked with Chinese government to enhance Chinese domestic food safety regulation inspections. FDA branch offices were opened to aid the Chinese government in addressing potential safety risks of food exports to the United States (Ortega et al, 2014b). These efforts reduce the chance for substandard foods reaching the port of entry (Gale and Buzby, 2009). Random inspection can only inspect a small portion, either at the ports of entry or at the production sites. Now, surveillance cameras have been installed in processing plants widely and even farms in China, accessing these videos can be a supplemental to the physical inspection.

Traceability is important for effective recalls. Tracing the flows of the imported food and food ingredients can result in targeted recalls, should safety problems found. The 2011 Food Safety Modernization Act holds U.S. importers accountable to their foreign suppliers' compliance to the food safety regulations of our standards (FDA, 2011). Importers can then pursue legal persecution in the origin countries if their suppliers violate the food safety regulations at home or breaching the contracts.

2. *Do Chinese food exports pose a larger risk to U.S. consumers than exports from other countries?*

A short answer is not seriously. This is because the scale of Chinese food exported into U.S. is not large, and because food safety problems in the Chinese exports is comparable with those from other major food exporters outside the OECD developed country group in the US market.

Among the total U.S. food import of $137.8 billion, imports from China accounts for only 4.45%, remotely after the two largest exporters, Mexico, 19.0% and Canada 17.7%, and closely followed by a few exporters such as France, Italy, and India, etc. (ERS, 2016). Disease outbreaks in this decade associated with imported food accounts for about 7% among all outbreaks, much lower than the 19% share of imported food (Gould et al, 2017). The 7% outbreaks are primarily in seafood and produce, traced to Latin American and Asian countries, China among them. Statistics do show an increase in numbers of disease outbreaks caused by imported food and boarder refusals, the size is still far from significant.

Figure 1 obtained from Gale and Buzby (2009) shows a comparison of border refusal reasons between imported food from China and from all countries. The changes of categorical shares

among all categories between all counties and China over these years reflect the import volume relative shares.

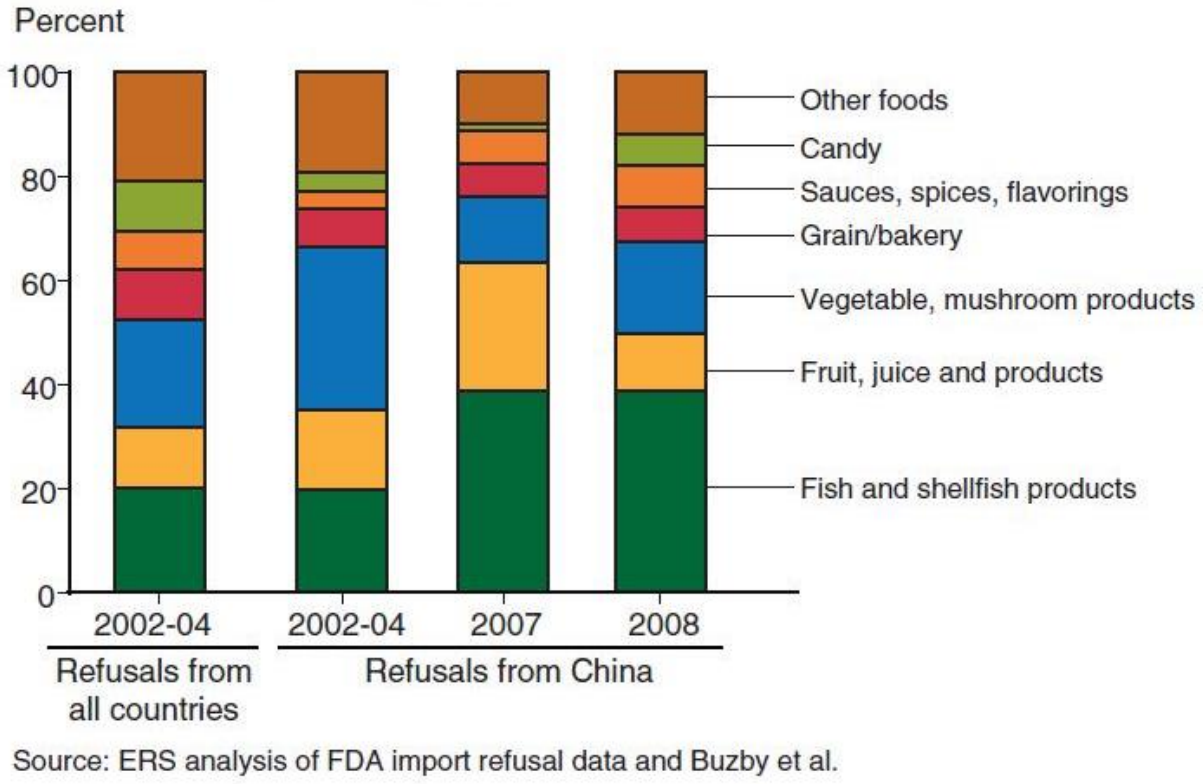
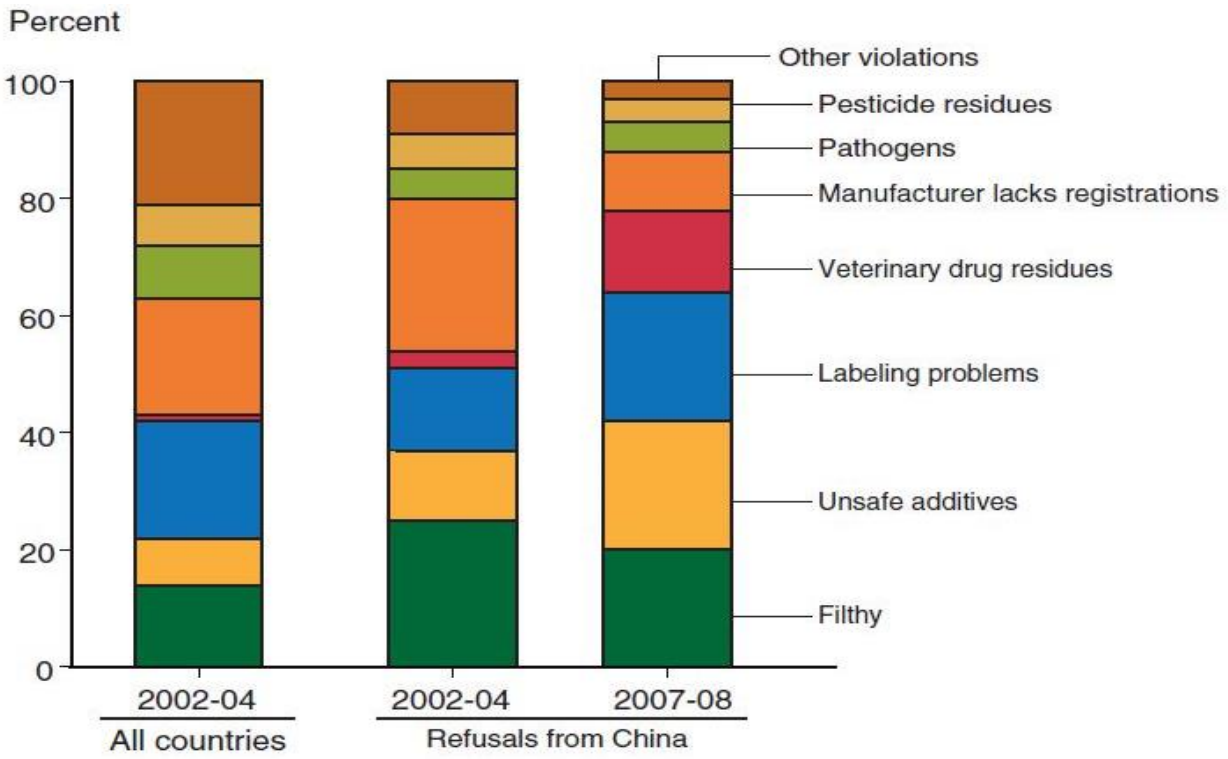


Figure 1. Share of FDA refusals by food category

In 2009, approximately 23% of the aquaculture imports originated in China and 16% were sourced from Thailand. Gale and Buzby's (2009) study on U.S. Food and Drug Administration (FDA) import refusals shows a large increase in the share of aquaculture product entry lines from China beginning in 2007, which coincided with the increase in Chinese fish and shellfish export to the U.S. (Becker, 2008). The primary culprits of refusals being filthy and the presence of unsafe additives, veterinary drug residues, and labeling problems (Figure 2).



Note: Chart shows share of violations in FDA import refusal reports. Many refused shipments had multiple violations.

[1]For a description of violation codes, see http://www.fda.gov/ora/oasis/ora_oasis_viol_rpt.html.

Source: ERS analysis of FDA import refusal reports.

Figure 2. Violations cited in FDA refusals of food imports from China

U.S. imports 91% of its seafood with a net import value of approximately $10.4 billion, and Canada, China, Indonesia, Viet Nam, Ecuador, and Thailand are the six major suppliers in the US market. Country of origin label (COOL) is mandated by USDA for seafood, and U.S. consumers use COOL as a signal for the level of food safety (Wang et al., 2013). There has been a higher food safety concern on imports from developing countries than developed countries.

Bovay (2016) published a recent study on the refusal data. He claimed for China that "the food industries with the most shipments in violation mirrored the industries with the most shipments in violation from all countries." Figure 3 from Bovay's study showed the import refusal numbers by food category for Mexico, India and China, they are consistent to each other for the relative import sizes of each country and each category. Bovay also concluded that although refused seafood shipments from China peaked in 2007 and vegetable category peaked in 2013, the patterns do not necessarily indicate increased problems with food safety of food products from China.

A regression analysis is conducted using the country of origin to explain the number of violations for these three countries while having the import value as a control variable, with combined data from Figure 3 and from the study of ERS (2016) over the period of 2005 to 2013. Results are shown in Table 1.

Table 1. Regression for the number of violations of import from Mexico, China and India

	OLS Regression		Panel Data Fixed Effect Regression	
	Coefficient	Standard error	Coefficient	Standard error
Import Value	-0.012	0.03854	0.017	0.017
Mexico	859.97***	370.75	50.87	NA
China	431.67***	118.09	-95.11	NA
India	553.48***	116.56	44.24	NA
Year	17.14	30.18	-2.02	19.71
Constant	NA		4580.65***	790.56

Date source: Author's own analysis.

We used both ordinary least square and panel data fixed effect models to check the country effects on the number of violations, when the size of the import and the time effects are controlled. Both regression consistently show that Mexico has the most serious violation problems followed by India and China is the lowest among these three countries.

Country and industry	Most common violations	Year									Total
		2005	2006	2007	2008	2009	2010	2011	2012	2013	
Mexico											
Vegetables and vegetable products	Pesticides	320	261	279	64	153	195	218	95	325	**1,910**
	Filth/filthy	400	192	137	57	213	104	79	78	68	**1,328**
	Salmonella	0	4	6	49	36	52	19	21	128	**315**
Candy without chocolate/specialty candy/gum	Filth/filthy	221	262	88	99	211	99	31	52	40	**1,103**
	Unsafe color	95	87	75	51	60	60	102	44	37	**611**
	Lacks nutrition label	33	14	17	28	87	45	36	7	12	**279**
Fruit and fruit products	*Salmonella*	33	67	21	20	5	49	535	130	32	**892**
	Filth/filthy	92	41	29	37	37	44	30	35	54	**399**
	Pesticides	22	31	38	8	25	36	60	27	69	**316**
India											
Spices, flavors, and salts	*Salmonella*	104	155	221	204	313	318	327	265	216	**2,123**
	Pesticides	21	4	10	13	17	190	128	161	48	**592**
	Filth/filthy	44	32	55	75	43	66	60	65	46	**486**
Bakery products/ dough/mix/icing	Filth/filthy	43	45	39	36	77	19	51	106	103	**519**
	Unsafe color	173	83	106	26	22	14	17	5	5	**451**
	Lacks nutrition label	33	49	36	23	36	30	18	20	17	**262**
Whole-grain/milled grain products/starch	Pesticides	0	0	1	0	0	0	88	425	321	**835**
	Filth/filthy	35	61	31	16	56	37	33	70	68	**407**
	Lacks nutrition label	4	1	9	12	21	4	11	7	2	**71**
China											
Fishery and seafood products	Veterinary drug residues	21	151	179	88	61	156	160	59	45	**920**
	Filth/filthy	50	68	128	57	85	98	156	57	79	**778**
	Unsafe additive	0	11	59	61	22	89	59	37	32	**370**
Vegetables and vegetable products	Filth/filthy	69	56	43	51	59	53	41	57	89	**518**
	Pesticides	124	20	17	12	19	39	48	73	61	**413**
	No information on scheduled process filed	27	51	30	21	46	20	23	26	27	**271**
Fruit and fruit products	Filth/filthy	34	39	47	27	76	77	29	23	10	**362**
	Unsafe color	15	45	63	22	47	61	44	32	25	**354**
	Fails to list saccharin	7	23	32	11	53	26	12	8	14	**186**

Source: USDA, Economic Research Service, based on U.S. Food and Drug Administration OASIS (Operational and Administrative System for Import Support) data.

Figure 3. Most common violations for selected countries and industries.

3. *How have food safety conditions in China changed over the past 10 years? What are China's chief food safety challenges? What progress has been made in addressing these challenges and what shortcomings exist? Have China's policies been in accordance with its food safety goals?*

Food safety problems have existed since the fast economic development in China started to pollute the environment and provide market incentives to cut cost with access to unsafe materials and technologies. They were left unidentified for long until the worst incident, the melamine tinted baby formula, occurred in 2008. Chinese government took an immediate measurement to give strong legal punishments and passed its first Food Safety Law in 2009, to replace the old 1982 Food Sanitation Law.

Although more food safety scandals have been reported in the media since then, such as clenbuterol in pork or swill oil used in restaurant, they are mostly individual small business behaviors without large firms involved in a systematic way. The increased number is a result of more media attention, not necessarily representing more occurrences.

The Food Safety Law was updated in 2015, referred to as the strictest food safety law in history. In addition, Chinese government has paid continuous efforts in food safety supervision. The previously segmented supervision system with ten central government departments and ministries to monitor food safety has been recently synchronized to the State Administration for Market Regulation that incorporates the former food safety supervision functions of State Food and Drug Administration (CFDA) and General Administration of Quality Supervision, Inspection and Quarantine.

Chen and Zhang (2017) summarized the food control system and standards in China and compared them between the current and last decades. They found that China has quite comprehensive standards comparable to those in developed countries in Europe or North America. The regulation compliance rates calculated from national monitoring systems show a consistent improvement. The government is paying serious efforts.

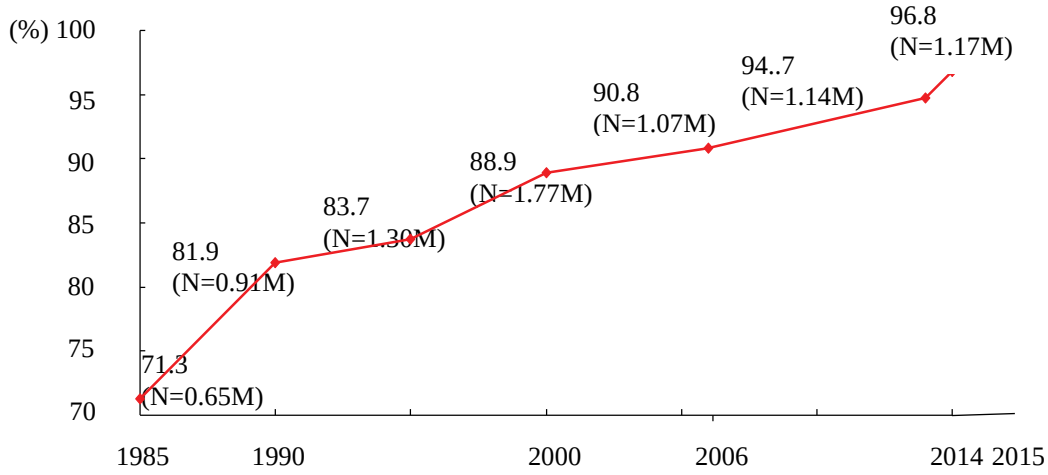


Figure 4. Changes in total food compliance rate in China (1985–2015) Note: numbers in brackets are sample numbers in millions. Source: Chen and Zhang (2017).

However, the food adulteration or food fraud exists as pointed out by Chen and Zhang (2017) and many others. The large number of segmented small scale farms and layers of small wholesalers and retailers in markets make it very difficult and costly to monitor, inspect and supervise by the government (Ortega et al, 2014). Although such type of violations are illegal and should be persecuted under criminal law, farmers are generally low income people, it is hard to persecute a large number of poor law breakers without causing social unrest.

The urban development has brought modern supermarkets to replace the old fashioned wet farmers market, and branded food products emerged as food processing firms grow. The government also promotes large agribusiness to serve as "dragon heads" to coordinate with small farmers, hoping they can do the first level of quality control and then it is easier for the government to supervise and inspect the larger firms. Traceable systems, safety certification systems, and recall systems have been established gradually.

4. *How do environmental conditions, such as soil and water contamination, affect the safety of Chinese food products?*

Chinese polluted environment, soil, water and even air, is a major factor causing unsafe food. Chinese grain production heavily depends on irrigation. Untreated sewage water, industrial wastewater, and agricultural chemicals pollute surface and underground water, which is used for agricultural irrigation. Chinese National Bureau of Statistics (NBS, 2013) showed that 17.7% of the 176,000 kilometers of rivers assessed by it was not safe for irrigation, but they are used anyway. Heavy metals such as chromium, copper, lead, zinc, cadmium and mercury are the major pollutants, with copper and cadmium contents increasing in the last few decades (Lu. et al, 2015). These metals come primarily from sewage and industrial waste water. Pollutants are absorbed by crops right after irrigation, or accumulated in the soil and will be picked up by crops in the future. At least 12 million tons of food were found containing high level of pollutants (Lu et al. 2015).

Heavy metals are also found in agricultural land at a high level beyond the safe threshold. The Ministry of Environment Protection published a survey in 2014 indicating that 16.1 % of arable land is polluted, and particularly excessive cadmium is found in 7% of surveyed sites. Cadmium in rice started to attract public attention and generate concerns recently because excessive intake of Cadmium over a prolonged period poses serious health risk, and rice, the major crop grown in the polluted area and a crop quite absorbent for Cadmium, is Chinese staple food. (Teng et al. 2014).

Broughton and Walker (2010) found that 70% of the world's farmed fish food came from China and it is the largest exporter. Diseases can be easily caused and spread among fish and shellfish raised densely in net cages in water polluted by sewage and other discharged wastes, and thus routine and overdose use of antibiotics to prevent and treat the diseases is common among aquaculture farmers. The drugs are even premixed in the fish feed with or without clear labeling to inform users. Antibiotics are found in the Bohai Bay in Chinese north coastal area carried by Chinese major rivers (Zou et al., 2011) and in the Beibu Bay in Chinese south coastal area (Zheng et al., 2012). The antibiotics polluted coastal water then affects the fish and shell fish raised in the area in turn. Heavy metals are another pollutant. They enter the water bodies

from industry wastewater and urban sewage, can be absorbed and concentrated in fish and shellfish, and then bring health hazards to consumers. Heavy metals have been found in fish at a higher level than the safe threshold (Wang et al 2012; Cheung et al 2008).

Air pollution can also contribute to unsafe food through crops, although not as recognized by the public as water and soil pollution. Chen (2014), a Chinese ecologist, explained how plant leaves can absorb heavy metals from the air in addition to the soil with scientific evidences, and claimed that leafy vegetables grown in air pollution areas such as near polluted cities, highways, industrial sites are prone to heavy metal problems. Leafy vegetables account for a major share of Chinese vegetable intake, and drinking tea is also very popular among Chinese, both of which can cause subtle health problems to consumers. The wide spread smog problems are only one indicator of the severe air pollution in China, which can directly damage food safety.

5. *How does food safety play into China's concerns about social stability, urbanization, and other high-level issues?*

The frequently occurred food safety scandals have damaged Chinese people's trust on the food system. It generates market opportunities for nontraditional food sources, from reputable sources such as long standing brands either imported or domestic, new sources with innovative production technologies such as organic farming with round the clock online surveillance video, to sources with attractive advertisement but ambiguous safety effect. It also dampens people's trust on the government administration.

Under this lack of trust for the food system, any exposure of a food safety incident not only ruins the firm's own reputation but also damages the market for the entire industry, which can be an overreaction from the unsecured consumers. Rumors can be spread out quickly over the widely used social media to an audience that is lack of scientific knowledge and critical thinking skills.

Large transaction cost is imposed in the economy, which may not be reflected in the GDP loss but definitely social welfare loss. For example, consumers have to spend a high price premium on food products labeled safer which are actually at the same safety level as the common products, just like the farms with 24-hour surveillance cameras in the fields connected to internet. They also pay high price premium to foods imported from credible sources, mostly developed countries. For example, bottled water and liquid milk transported from European countries are largely seen in Chinese markets.

It also destroys the traditional interpersonal trust. Chinese used to agree that farmers are the honest group of people, better than the profit seeking businessmen or the power seeking officials. Now, it is widely believed that farmers do not eat what they grow for sale because they intentionally use unsafe but profitable inputs, and most food safety incidents do originate at the farm level. Farmers' market is a place symbolized cheap and poor quality food instead of fresh and local grown high quality food. Small street vendors are considered the same.

Further, the public lost their trust to the government, or at least the administrative ability of the government (Jiao, 2013). Corruption is always to be blamed for any inefficiencies in the government administrative process. Food safety incidents passed through the government's supervision can often be interpreted as a result of the officials' intentional permitting the private sectors' illegal endeavors in exchange of personal benefits. People do not trust the food safety information provided by the officials and/or from the major media controlled by the government, and extend their distrust on all other topics from the official media.

Food safety can also be used to hold against imported food, especially food from particular countries. For example, U.S. as the largest food importing source country, food safety problems can have controversial effects on Chinese patriotism or nationalism. Psychologically rejecting genetic modified organism (GMO) in many U.S. products in Chinese market is one case, and boycotting U.S. brands like KFC and McDonald for food safety incidents in 2014 is another.

6. ***The Commission is mandated to make policy recommendations to Congress based on its hearings and other research. What are your recommendations for Congressional action related to the topic of your testimony?***

Summarizing the discussion above, we can recommend the following. 1) Food safety problems in imports from China are at the similar severity as those from other major developing country exporters like Mexico and India, and there exists room for the government to further improve its control including increasing the sample size at the port of entry, monitoring the production process using web based technology, tracing the imported food to enhance the recall efficiency, and increasing the level of punishment to violators. 2) FDA and USDA shall collaborate with the Chinese government on food safety control in the area of standard setting, testing technology transfer, and best production practice sharing, which are to the best interests of China also as it will satisfy its domestic consumers' safety need and also improve China's reputation in the global market. 3) U.S. agribusiness shall be careful to protect the good reputation of its food products so that they can compete in Chinese higher end market with products from other strong international competitors.

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