

**THE CHALLENGE OF INCREASING GLOBAL TRADE:
HOW TO ADDRESS LINKAGES AND BARRIERS**

Drawing lessons from two specific examples: Avocados and Apples

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It is well known that trade barriers related to pest risks can block or significantly impede market access for agricultural products. One approach to easing these barriers is to shift from import bans to a systems approach to risk management, whereby a set of compliance measures are specified that reduce the pest risk associated with trade of a commodity. Adoption of systems approaches rest on a firm foundation in the World Trade Organization (WTO). The Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) states that Members shall ensure that their measures “are not more trade-restrictive than required to achieve their appropriate level of sanitary or phytosanitary protection.”

When do countries change their regulations along these lines? On conceptual grounds and from practical experience five determining factors often are necessary to achieve new SPS regulations that increase trade. These factors are: economic opportunity (clear incentives for trade arising from price differentials that would lead to exports); scientific assessment (evidence of limited risk); traceability (to ensure pest infestations can be traced back to their origin); persistence (on the part of potential exporters); and joint political will (to reach an accord by the negotiating governments).

Two specific cases of trade regulation are examined in this presentation. In the case of avocados from Mexico, the U.S. market has been opened following more than a decade of related rule making. Substantial imports now occur. In a second case, China has expressed interest in exporting fresh apples to the United States. There is not a related regulatory process underway, but China received approval to export fresh apples to Canada in 2004.

The avocado case is used to demonstrate how the five determining factors cited above interacted to result in a new trade opportunity. Issues that arise about regulation of fresh apples from China are examined in this context. The analysis draws on recent research studies of these cases under a project sponsored by the Program on the Economics of Invasive Species Management (PREISM), Economic Research Service, USDA and the Australian Centre for International Agricultural Research. This brief paper presents a synopsis—essentially in bullet point form. Full discussion of these complex issues is presented in the journal articles, book chapters and research papers cited at the end. The official documents from the avocado case are available on the APHIS web site. Opinions expressed in this presentation are those of the authors only.

The Avocado Case

This case involves importation of fresh Hass avocados from approved orchards and packing houses in approved municipalities of Michoacán, Mexico into the United States under specified risk-mitigation

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measures. From 1914 until 1993, phytosanitary restrictions precluded entry of Mexican avocados into the United States due to prevalence in Mexico of certain avocado-specific pests and fruit flies. In 1993, Hass avocados from Mexico were permitted entry only into Alaska. In November 1997, fresh Hass avocados from Mexico were allowed entry into 19 northeastern states and the District of Columbia during November through February. In 2001, the area approved for imports was expanded by an additional 12 states, and the period of importation was extended to six months, October 15 to April 15. The remaining geographic and seasonal restrictions were eliminated in a November 2004 rule that allows year-around importation of Mexican avocados initially into 47 states (California, Florida, and Hawaii were excluded) and to all states starting in February 2007. Progressive easing of the avocado import ban demonstrates successful application of a systems approach which has opened the U.S. market to approved Mexican producers and created more than a \$100 million annual export industry.

How did this outcome occur? Examining the five determining factors, everything aligned rightly over quite a long period of time for changes in the regulations to be made. This occurred despite intense initial opposition from domestic avocado growers in California.

Opportunity: Prior to opening of the U.S. market wholesale prices of export-quality Mexican avocados in Canadian and European cities were substantially lower than prices in U.S. cities. Mexico is a large, geographically-proximate avocado producer with substantial capacity to increase its exports. Partial opening of the U.S. market was assessed to bring prices down slightly in economic models. In the two years October 2001-October 2003 when some Mexican avocados were entering the U.S. they sold at average wholesale prices below California avocados during the months and states where both were available, suggesting consumer preference differentiation by source. Economic models also suggested that full opening of the market in 2004 would cause U.S. prices to fall about 10-15 percent. Earning of U.S. producers would decline but consumers would gain from lower prices and increased availability of domestic and imported fruit.

Science: Five avocado-specific pests generally not found in the United States (stem weevil, *copturus aguacatae*; seed weevils *Conotrachelus aguacatae*, *C. perseae*, and *Heilipus lauri*; and seed moth, *Stenomoma catenifer*) are prevalent within Mexico's production areas, particularly within non-commercial (backyard) orchards. Additional attention has focused on four Mexican fruit flies (*Anastrepha fraterculus*, *A. ludens*, *A. serpentine*, and *A. striata*) that adversely affect numerous horticultural crops and are subject to local quarantine and eradication programs when discovered at U.S. sites. Mexican growers and sanitary authorities have always acknowledged the presence of the avocado pests but have argued that they can be effectively controlled in approved commercial orchards with relatively minimal measures. They have also argued that Hass avocados are not a host for fruit flies, so that compliance measures required to monitor for fruit fly infestations are unnecessary.

Bilateral technical discussions over possible avocado exports were initiated in the early 1990s. It took four years of procedural negotiations, data collection and analysis before USDA agreed to consider a Mexican plan for easing the avocado quarantine under a systems approach to pest risk mitigation. The technical debates centered on assessment of pest populations, the host status of Hass avocados for fruit flies, the adequacy of various proposed pest-risk mitigation strategies, and on the data requirements, research design and interpretation of research results concerning possible lifting of the import ban.

As a result of the analysis, consultations and discussions, the proposed systems approach required annual surveys to determine pest incidence and pre-harvest, harvest, transport, packing, and shipping measures designed to reduce pest risks. The distribution of imports was further limited to the northeastern United States in the initial proposed rule, to avoid shipments to regions susceptible to

avocado pests, and to four winter months when the risk of establishment of pests was mitigated by adverse weather. A quantitative risk assessment was completed and discussed at public hearings. Overall, USDA concluded that with the proposed systems approach in place a seed pest or fruit fly outbreak was estimated to occur on average less than once every 1,000,000 years and a stem weevil outbreak might occur on average once every 11,402 years. These were much lower risk estimates than if no risk-mitigation compliance measures were put in place. Peterson and Orden (2008) estimate that the various compliance measures added about \$0.11 per pound to the cost of Mexican exporters (about 11 percent of wholesale U.S. prices) during 2003-05 when the U.S. market was only partially open.

After the partial opening of the U.S. market in 1997, lack of detection of pests from inspected fruit imports provided further evidence of successful risk mitigation. For the 2004 rule additional pest risk assessment was also carried out.

Traceability: Traceability is required, with identification so that any infested fruit detected through inspections can be tracked back to the packing house and orchard from which it originated.

Persistence: Development of modern pesticides and cultural practices has allowed Michoacán to establish an industry of approved export-oriented avocado orchards. These orchards first successfully met the pest control standards of countries such as Canada and Japan, where avocados are not grown. In the process the industry improved its production techniques and organization. The export industry includes participants familiar with U.S. markets and institutions. It is organized through the Michoacán Avocado Packers and Growers Association (APEAM) which has played a sustained role in pressing the argument for access to the U.S. market. As the Mexican export industry grew, the association gained members and financial resource, better positioning it to continue making its case.

Political Will: The avocado trade issue has long historical origins. Twice during the 1970s USDA took preliminary steps to ease the avocado import ban. In both cases no final decision was enacted so the ban remained in place. The issue lay unresolved through the 1980s. Then the NAFTA negotiations provided an opportunity for Mexico to raise this issue again. A phytosanitary rule such as this could not be addressed in the NAFTA text, but negotiation of NAFTA provided the impetus for the necessary technical evaluation process to be initiated and sustained.

Early in the process, the U.S. avocado industry, concentrated in southern California, bitterly opposed opening the U.S. domestic market to Mexican avocados. The industry acknowledged that it received prices above those of Mexican exports, but asserted that it feared pest infestations associated with trade not competition in the marketplace. Thus the regulatory process occurred in an intense political environment, as described in the references cited below. In the context of this domestic opposition, the determining factors of opportunity, science, traceability, persistence and political will must be reinforcing to lead to the outcome of new regulations that open trade.

Did APHIS get it right after this long process of technical evaluation and regulation? Peterson and Orden (2008) address this question using an economic model very similar to the model used for the economic assessment of the 2004 rule. The model for the rule assumed zero risk associated with imports under the required pest risk-mitigation measures. Peterson and Orden extend this analysis using the APHIS pest-risk assessments under different conditions: applying the full systems approach proposed in 2004 versus applying only some or none of the risk-mitigation measures. Their analysis incorporates Mexican compliance costs, pest risks from trade, and U.S. fruit losses and control costs associated with trade-related pest infestations. The conclusion is that the 2004 full opening of the market to imports with the systems approach in place has a positive effect for the U.S.—the benefits to consumers offset lower

earnings of producers and trade-related pest risks and associated losses and control costs are minimal. Compliance costs per pound of avocado exports also falls for Mexican producers and packers as total costs are spread over a larger quantity. Relaxing risk-mitigation measures for fruit flies might lead to small additional expected gains. But without any risk-mitigation measures imposed, the U.S. could end up worse off under the full market opening, with substantial producer losses from pest infestations and less consumer gains. Thus, overall APHIS has the regulations mostly right with the systems approach in place at this point in the long regulatory process.

The Apple Case

A possible case waiting “in the wings” concerns phytosanitary barriers to fresh apple exports from China to the United States. Apple production in China has increased substantially in recent years and now accounts for nearly half of the total global output. Correspondingly, China has highlighted apples (and also pears) as products for which it has sought market access in many of its negotiations with trade partners about agricultural technical barriers. China’s apple exports have skyrocketed as markets have been opened. In the 2004/05, China exported 850,000 metric tons of fresh apples, a nearly five-time increase in the export volume over five years. A large proportion of the increase in Chinese apple exports has gone to Pacific Rim markets.

In North America, the importation of Chinese fresh apples from approved orchards and packers in selected provinces has been authorized by Canada since November 2004 but importation of fresh apples remains banned by the United States. The change in regulation by Canada could signal an eventual larger opening of the North American market to Chinese apples. But how does this case stack up in terms of the five determining factors for trade-opening changes in regulations?

Opportunity: It is not as obvious that there is an economic opportunity for Chinese apples in the U.S. market as in the case of Mexican avocados. Chinese apples have obtained only about a 3-percent share of Canadian fresh apple consumption. The Chinese apples imported by Canada are mainly sold in the Asian communities at relatively high prices as a somewhat specialty product. In the European Union, Chinese fresh apples account for only about a 1-percent market share. Imported Chinese apples would similarly be likely to enter the U.S. market as a specialty item. This limits the economic gains but also limits the pest risks which increase a larger volume of trade.

Science: Since there has not been a U.S. risk assessment, the scientific evidence is less cohesive at this point in time. One can examine the risk assessments that Canada and other countries have made and the risk-mitigation measures they have imposed. From this, one can describe a prototype or hypothetical systems approach that might be adopted by the U.S. The decision by Canada provides some evidence that a risk assessment can support Chinese apple imports with feasible risk-mitigation requirements. Canada identifies 10 pests of concern and its risk-mitigation implementation is closely coordinated with Chinese sanitary authorities. But a process of pest identification, data collection, risk assessment and analysis of mitigation measures has only progressed to an early stage for the U.S.

Traceability: Canada requires traceability, as could the United States.

Persistence: China has obviously developed a substantial apple export industry but its knowledge and experience with the North American market is limited. Only a few packers are approved to export to Canada and the initial exporting firm had previous business ties there. With a relatively small volume shipped, the constituency of producers and firms involved in this trade will remain small. Thus, it may

take a long time for a strong Chinese industry voice to emerge to press the case for further market opening.

Political Will: The current political environment does not seem conducive for decisions that open U.S. markets further to imports from China. This can be considered an *understatement*. At the macroeconomic level, there is a large U.S. bilateral trade deficit and arguments are made that the Chinese currency should be revalued. There is concern about industrial competition in general from this lower-wage country. And the safety of products from China, from pet food to pharmaceuticals, has made front-page international news. In this context, it would be difficult for the two governments to agree to intense efforts to reduce phytosanitary barriers for a new product. It can be argued that NAFTA was also controversial when negotiated. But once a high-level political decision was made to reach the NAFTA accord it provided an institutional impetus for various bilateral trade issues to be addressed. There is no similar high-level accord currently under discussion between China and the U.S.

What conditions would it take for imports of fresh apples from China to have net benefits for the United States? Orden et al. (2007) provide a very preliminary assessment based on limited available relevant information.

Without considering pest risk, it is assumed that Chinese exports to the U.S. would achieve about a 3-percent share of the total U.S. apple consumption and sell at a price above the U.S. market average, similar to the situation for Canada in 2003-2004 subsequent to opening of the Canadian market. This does not create a dramatic change in domestic or global markets but there are consumer benefits from increased variety, so there is a small net U.S. economic gain from allowing imports. Likewise there is a very small net gain for China as its apple producers benefit.

Next the outcomes are evaluated with pest risks and related control costs taken into account. Three estimates of fruit losses and control costs related to pest infestations from imported apples are considered based on a literature review of their plausible ranges. The probabilities of U.S. pest outbreaks due to the importation of Chinese fresh apples are not known. Thus, the risk probability levels are estimated that cause the expected change in U.S. welfare due to granting market access to Chinese fresh apples to fall approximately to zero. Higher levels of risk from trade would result in expected welfare losses.

In the case of the assumed lowest costs from pest infestations, an expected frequency of a trade-related pest outbreak of approximately 0.2 per year, or one every five years, leaves U.S. welfare unchanged. For the cases of “average cost” and “high cost,” the expected frequency of an outbreak that leaves U.S. welfare unchanged drops to 0.06 and 0.02 per year, respectively. These estimates illustrate the levels of risk mitigation that a systems approach would have to achieve in order for importation of fresh apples from China by the United States to result in a net U.S. welfare gain.

Lessons from the Analysis

The condition postulated as necessary for technical regulations that ban trade to be changed to a systems approach to risk management that creates trade is that economic opportunity, science, traceability, persistence and political will come together in reinforcing ways. The convergence of these factors over a long period of time that led to opening of the U.S. market to Mexican avocados was reviewed. The conclusion is drawn that several of the necessary conditions are currently lacking in the case of fresh apples from China.

There are several general lessons from this case-study evaluation. In some instances, calls to reduce technical trade barriers may not be matched by real economic circumstances that would result in trade. In other cases, where exporters rightly perceive a real economic opportunity, they face multiple challenges. These challenges should figure into their business calculations and industry strategy. An industry seeking market opening needs to send the “A team” into the fray and even then recognize that its fate depends in part on contextual forces beyond their control. Appreciation is gained of the complex environment in which regulators operate. This may be no surprise for those with experience, but the point needs to be widely understood. Thus for academic and other policy analysts, the complex interplay of factors determining trade regulations suggests a role to increase public understanding and sustain civil dialogue. This will enhance the functioning of the regulatory process. The examples discussed focus on U.S. decisions, but the lessons apply elsewhere as well.

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