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## **TRADE LIBERALIZATION UNDER NAFTA: TRADE IN AVOCADOS**

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The importation of fresh avocados was banned by the United States in 1914 after U.S. plant health officials identified avocado seed weevils in Mexican orchards as pests of quarantine importance (TED Case Study). In the early 1970s, Mexican officials proposed lifting the ban on avocados produced in the states of Michoacán and Sinaloa. All overtures were rebuffed until the early 1990s when bilateral negotiations, conducted with the sanitary and phytosanitary (SPS) provision of NAFTA, led to a resolution of this long standing disagreement.

This paper first briefly reviews the negotiation process leading to the partial lifting of the ban and outlines the elements of the agreement. The second section draws directly from the first by identifying the underlying principles used in reaching an agreement. The third and fourth sections evaluate the market and economic impacts of the partial lifting of the import ban. The paper concludes by drawing some conclusions from the resolution and identifying lessons learned in the process.

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## RESOLUTION OF THE AVOCADO IMPORT BAN

### Process of Resolution

The process leading to a resolution of the import ban was long, costly and, at times, acrimonious. The brief review presented here facilitates evaluation of alternative procedures that might reduce cost of reaching a resolution and to increase its timeliness.<sup>1</sup> The process of addressing the issue began substantively in 1990 with agreement at the Ministerial level to consider the ban, and with the submission of a Mexican work plan in October by representatives to the U.S. Animal and Plant Health Inspection Service (APHIS). The first work plan was rejected because it addressed quality and not pest risk, and scientific proof was requested to establish that proposed areas were free of the quarantine pests.

In 1991, a second work plan was submitted, and the use of a ‘systems approach’ was introduced. By June 1992, APHIS had ‘tentatively’ accepted Mexican evidence that the areas were free of the pests, but disagreed on the protocols to determine if avocados were hosts for fruit flies. A small olive branch was offered to the Mexicans by proposing to allow exports to Alaska. Disagreements on the scientific evidence continued through 1993 leading to an agreement in June, 1994 on scientific protocols. In July, 1995, the proposed administrative rule was published and the period of public comment was open until October. In March, 1996, public comment was reopened at the insistence of the domestic industry and their political representatives. Despite dire predictions that the regulatory agency was a captive of the domestic interests, the Executive Order of February 1997 partially lifted the ban.

### The 1997 Agreement

In February, 1997, APHIS published the final rule that allowed the importation of Hass avocados from the Mexican state of Michoacán into 19 North-eastern U.S. states and the District of Columbia from November to February. (Figure 1). APHIS approval of fresh avocado imports “requires strict compliance with phytosanitary procedures and standards as well as passing a series of

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<sup>1</sup>Numerous historical accounts of the negotiation process are available. A good summary is found in Orden and Romano, pages 7 and 8.

**Figure 1: Approved Avocado Area in Mexico and Import Areas in the United States.**



APHIS inspections during the growing, packing and exporting processes.” (FAS, 1999b) Apparently to mollify domestic interests, APHIS notes that the “Final rule does not guarantee that Mexican avocados can enter the United States; they can enter only if APHIS inspectors determine that the avocados in question have successfully met all of the safeguards.” (APHIS, 1997).

FAS (1998b) reports that the total cost of complying with the strict phytosanitary procedures would cost Mexican producers and packers approximately \$110,000 annually. Reportedly, the state of Michoacán provided loans to growers to pay for the initial cost of the program.

### **Recent Developments**

Illegal shipment of avocados was meant to be thwarted by the requirement that a sticker or label be placed on each fruit. Placing individual labels on each piece of fruit to indicate its origin is common practice in quality management systems and vertically coordinated supply chains, and, so does not represent an onerous cost to packers. Because of problems with transshipments from the approved area to unapproved states outside the Northeast and with failure of Mexican packers to comply with the regulations, APHIS proposed a change in the import regime, first published on June 25, 1999. (Federal Registry, 1999a). APHIS noted that in the 1998/99 marketing season, five distributors had allowed Mexican Hass avocados to be shipped to non-approved states. Subsequently, two U.S. firms, La Hacienda Brands, located in Chicago, and Wal-

mart, the largest U.S. retail chain headquartered in Bentonville, Arkansas, paid civil penalties totaling almost \$100,000. (APHIS News Releases, 1999a and b). Of course, neither firm admitted any illegal intent or activities. APHIS reported that nearly 50 administrative complaints have been received alleging violation of U.S. regulations.

APHIS proposed that all handlers and distributors be required to enter into compliance agreement. The compliance agreement is meant, as much as a regulatory device, to educate handlers, second-handlers and distributors to the legal requirements. In addition, APHIS proposed that any boxes used for re-packaging imported avocados in the United States must be clearly marked with the same information that must be placed on the original boxes at the Mexican packinghouse.

A second issue with the stickers, which were required to differentiate program fruit from that sold in the domestic or other export markets, was that they were being placed on all fruit from a packing house. So, fruit could be sold in the domestic Mexican market or exported to Canada, for example, and then reexported to the United States. APHIS proposed that in addition to the packing house identification number, the stickers bear the letters "M/US". Mexican officials objected that this placed requirements on domestic commerce within Mexico and so was not acceptable.

The rule became effective on January 6, 2000, with its publication in the Federal Registry. An interesting issue raised by this case is what is the outcome if the importing country cannot enforce its own laws and regulations while, at the same time, the exporting country faithfully meets all import requirements?

## **PRINCIPLES USED IN THE RESOLUTION**

### **Risk Assessment**

APHIS prepared a quantitative pest risk analysis examining the likelihood of pest introduction into susceptible areas of the United States. The APHIS quantitative risk assessment estimated that the probability of a seed pest or fruit fly infestation would occur less than once every million years, and of a

stem weevil outbreak might occur once every 11 thousand years. Firko estimated that the maximum probability of an infestation of any of the quarantine pests at 0.00345, and of minimum value for a stem weevil infestation at  $1.35 \times 10^{-6}$ . (Orden and Romano, 1996)

APHIS (1997a) also reported the results of a study by The University of California Center for Exotic Pest Research. That study examined ‘the quality of the entomological background for the proposal, and ... the validity of the systems approach methodology and risk assessment.’ This study was submitted as a comment opposing APHIS’ July 1995 proposed rule. In their analysis, the authors question the validity of many of the assumptions on which APHIS based its proposal. The authors concluded that “APHIS does not have a suitable basis of scientific information upon which to move forward with a credible and reasonable plan for the importation of Mexican Hass avocados.”

Any import regime that limits imports will create economic rents that may induce illegal activities to circumvent the limitations. Clearly, an incentive exists to ship avocados from groves that are not registered for export. The agreement allegedly provides an incentive for group actions to prevent that from happening by threatening to cut off all exports from a municipality if a pest is found in any shipments from that area. If imports cause regional price differences in the United States, there will be an incentive to illegally transship avocados to other regions. The cost of these transshipments is increased by requiring that each fruit carry a sticker indicating its origin.

### **System Method**

A 1994 proposal, subsequently augmented by APHIS, utilized a number of risk mitigation measures intended to individually and cumulatively reduce pest risk. According to APHIS “the system consists of nine safeguards designed to operate sequentially to progressively reduce risk to an insignificant level.” (APHIS, 1997a). In general, a systems approach identifies the requisite steps for reducing risk to an acceptable level. (Roberts, 1977). The components of the systems approach for Mexican avocados are:

***Host Resistance:*** Fruit fly infestations of the Haas avocado are not known to occur outside laboratories.

**Field Surveys:** Appropriate field inspection techniques to determine the presence of the pest. Individual orchards will be certificated on the results of the surveys. Municipalities must be shown to be free of the pests at a 95 percent confidence level.

**Trapping and Field Bait Treatments:** Prescribes trapping practice to detect and, if detected, eliminate fruit flies.

**Field Sanitation Practices:** Details practices reducing chance of insect infestation.

**Post-harvest Safeguards:** Prescribes production and packing practices to reduce risk of post-harvest infestation.

**Winter Shipping:** Shipping from November to February to cold climates reduces risk of infestations.

**Packinghouse Inspections and Fruit Cutting:** Inspection of facilities and of fruit leading to detection of pests will cause rejection of the shipments and potential cancellation of the packing house registration.

**Port-of-arrival Inspections:** Lays down physical inspection and paper review requirements.

**Limited U.S. Distribution<sup>2</sup>:** Limiting shipments to the Northeast reduces risk that transported pests will survive due to the cold weather and the lack of suitable hosts.

APHIS contended that the systems approach “operates as a ‘fail-safe’ system” in that if one measure fails the other safeguards insure that the risk continues to be reduced and managed. (APHIS, 1997a). Individual shipments are sealed at the packinghouse in Mexico, and reopened at the port of entry where a visual inspection is carried out and fruit cuttings are taken. Upon successful completion of the inspection, the truck is then resealed and proceeds along roads in an approved corridor to a terminal market. The truck is met at the terminal market by an APHIS inspector who unseals the truck and carries out a final inspection of the produce.

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<sup>2</sup>The approved states include Connecticut, Delaware, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia and Wisconsin.

The United States exports products to a number of foreign markets using a system approach: citrus to Japan; plums to Mexico; and apples and pears to Taiwan. APHIS also uses this approach to facilitate interstate commerce in the United States.

## **MARKET EVOLUTION AND IMPACTS**

### **Overview of the Industry**

California, which has grown avocados since 1971, is the world's second largest producer of avocados, accounting for about 15 percent of global production. More than 90 percent of avocados groves are located in California, and about half of all U.S. production occurs in San Diego County. Almost all U.S. production is the Hass variety, with a small amount of a West Indian variety produced in Florida. From five to ten percent of production is exported with the remainder consumed as fresh or processed products.

Mexico is the world's largest producer of avocados, with an annual production varying between 700 and 900 thousand tons. Stanford reports that the state of Michoacán produces more than 80 percent of the Mexican crop, and accounts for between 35 and 40 percent of global production. The overwhelming majority of avocados, more than 80 percent in all years, are consumed in the national market as fresh fruit. In a typical year with normal weather, from five to ten percent are exported and three to five percent are converted to processed products. (FAS, 1998a)

Mexican exports have grown significantly in the 1990s, expanding from about 13 thousand tons in the early 1990s to almost 50 thousand tons in the last few years. France is by far the largest export destination, followed by nearby countries in Central America, Canada, Japan and the United Kingdom.

About 6000 Mexican producers, with orchards varying from as small as one hectare to commercial operations with as many as 1000 hectares, can produce avocados year-round. However, peak production and highest quality fruit is produced from November to April. The majority, perhaps as high as 80 percent, are small producers owning 10 hectares or less, while a handful of commercial producers operate more than 1000 hectares. FAS (1998a) reported

that avocado production employs 65 thousand people on a full-time basis, and thousands more during the harvest season.

Natural production advantages and low wages favor Mexican producers. Avocado production requires large amounts of water, which must be obtained from relatively expensive irrigation water in California. In Michoacán, normal rainfall is sufficient for production and only about half of the groves are irrigated. Mexican yields vary from seven to nine metric tons per hectare, but a mature grove can produce up to 15 metric tons per hectare. California yields are reported to be somewhat lower at about five metric tons per hectare.

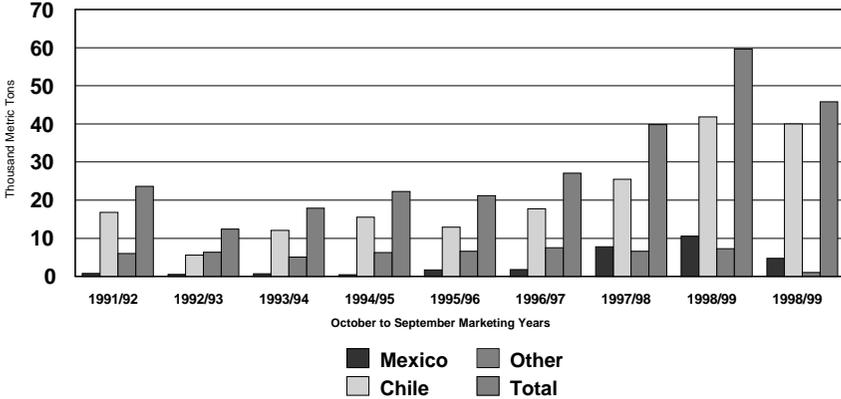
### **Import Market**

Until the 1995/96 marketing year, imports from Mexico, which were only allowed to Alaska, never exceed a thousand metric tons. (Figure 2). In the first year that shipments were allowed to the Northeast, exports grew to almost eight thousand tons and in 1998/99 exports exceeded 10 thousand tons for the first time. Shipments in the 1999/00 season are running just slightly ahead of the previous year. During the same period, total U.S. imports grew from about 25 thousand metric tons to almost sixty thousand tons. Avocado imports from Chile, which had languished in the mid to lower teens in the early 1990s, grew to more than 25 thousand tons in 1997/98 and more than forty thousand tons in 1998/99.

The Mexican share of the import market increased from less than ten percent in the early and mid 1990s to about twenty percent in the past two marketing years and in the current year. The growth in the Mexican penetration has come at the expense of Caribbean exporters as the Chilean market share has stayed in the range of 60 to 70 percent.

The growth of Mexican imports has been significant, but far less than some analysts had predicted when Mexican producers gained access to the U.S. market. At that time, some Mexican analysts predicted that the U.S. market would absorb as much as twenty percent of Mexican production, about one hundred thousand tons. So, while imports have grown significantly, access to the U.S. market has not been a boom to Mexican avocado producers.

**Figure 2: U.S. Imports of Avocados by Origin, 1991/92 to 1998/99.**



Sources: 91/92 to 96/97- USDA/Foreign Agricultural Service, Avocado Situation in Selected Countries  
 97/98- USDA/Economic Research Service

**Mexican Developments**

FAS (1998a) reported that, as of January 31, 1997, APHIS had approved 65 Mexican growers and five exporters in four municipalities of Michoacán. The financial requirement that producers bear the cost of inspection and certification activities led to formation of a growers and packers association to apportion costs among exporters. (Stanford). By December 1997, 51 growers had joined the organization and they accounted for more than 80 percent of the export volume. Prior to the start of the marketing year, most forecasts of export volume ranged from five to 25 thousand metric tons, and FAS (1998a) forecast exports in the range of 10 to 15 thousand metric tons. Some Mexican sources predicted that the market could grow to 100,000 tons. The first year, 1997-98, was judged a success because although only 8,000 tons of avocados were exported, not one shipment was rejected, nor were any participants in the marketing chain suspended from the program.

The Mexican fruit and vegetable industries have a long history of costly disputes with U.S. producer groups, dating back to the tomato wars of the 1960s. Undoubtedly reflecting concern with the potential of U.S. producers initiating antidumping or other action to restrict imports, Mexican officials felt that exports to the U.S. market should expand slowly. But at the start of the 1998-99

season, almost 250 groves, encompassing 4400 hectares of avocados, were certificated for the U.S. export market. By November 15, 1998, only two weeks into the new season, more than 2000 tons had been exported, almost a third of the amount exported during the previous season. Stanford reports that market prices for Mexican avocados collapsed, falling to \$10 per box, while supplies from Chile sold for \$20 per box and from California for \$40. By the beginning of December, exports to the U.S. market had all but ceased.

Stanford reports two differing explanations for what the Mexicans viewed as a disastrous 1998-99 season. The failure to control the flow of a product and to uphold quality standards is linked to potential supply greatly exceeding the capacity of the U.S. market to absorb it, and to the inexperience of Mexican trading companies. The proponents of a second explanation allege that the two largest U.S. avocado packing companies, Calavo and Mission, both grower-owned California cooperatives, established relations with packing houses in Michoacán, offered high prices to local producers, and flooded the U.S. market with low quality Mexican produce. The conspiracy theorists conclude that the objective of the U.S. firms is to force Mexican producers to sell to them and so “reap the benefits of exporting to the U.S. market.” (Stanford)

Stanford concludes that both versions hold some truth. The movement of multinational firms to offer branded products, even fresh fruits and vegetables, would prompt U.S. firms, actually California grower cooperatives, to enter the Mexican market to expand their supply of a high-quality product. The ability to offer a consistent, high-quality product on a year-round basis might create a competitive advantage for these firms, and so they could command a premium price and higher margins.

## **ECONOMIC AND SOCIAL IMPACTS**

### **U.S. Producers and Consumers**

Roberts reports that the APHIS estimated grower losses ranging from \$1.4 to \$6.4 million under differing scenarios. They also estimated consumer gains ranging from \$3.3 to \$19 million, and net economic benefits ranging from \$1.9 to \$12.5 million. Orden and Romano estimated that under a complete liberalization of trade and no pest infestation, domestic consumption would

increase 68 percent, production would fall by 47 percent and price would fall from \$1385 per ton to \$878. They estimated that consumer surplus would rise by \$87.5 million, producer surplus would fall by \$55.2 million and the net welfare gain would be \$32.3 million, or about 14 percent of the initial consumer surplus. Using APHIS estimates of a worst-case scenario, the net welfare gain is reduced to \$13.9 million. Orden and Romano conclude: "Thus, even when free trade is bad phytosanitary policy, it is good economic policy, in the sense of raising net welfare." (Orden and Romano, p. 33) The partial liberalization of trade leads to a significant reduction in consumer surplus, and, with worst-case infestation scenarios, to net welfare losses. They conclude that the partial lifting of the ban might be both bad economic and bad phytosanitary policy.

The reality of the first two marketing seasons, and of the partial results from the current year, is that the level of imports, and the resulting gains in economic welfare have been toward the lower end of estimated outcomes. Consumer gains, based on observed prices and changes in consumption, have been very small. The producer losses have been small, as well, and no losses have occurred from the introduction of the quarantine pests. Welfare gains have been small, and may be exceeded by the cost of inspection procedures.

### **Mexican Producers**

The production and export of winter fresh fruits and vegetables to the United States has always been problematic for Mexico. Typically, the export industries have been owned and controlled by the Mexican agricultural elite and the economic surplus has not been shared by workers and small landowners. This has led many to call for the production of food for domestic consumption rather than production of fruits and vegetables for the rich market to the North. Stanford (p. 14) admirably summarized the policy developments and dilemma:

*. . . state governments now face the challenge of defining new political relations with agricultural producers and their organizations. In Michoacán, and particularly in the case of the avocado industry, this process has led to a tenuous alliance between regional representatives of SAGAR and the state government of Michoacán in their efforts to provide support*

*for avocado exports while they attempt to control and regulate avocado production and commercialization. State regulation of the phytosanitary campaign was successful, given the state's control over export permits, mandatory programs to register orchards, and state policing of fruit shipments. Furthermore, reflecting financial interests, this phytosanitary campaign primarily provides benefits for export producers. Yet these actions essentially reflect an agricultural policy of triage, in which limited resources are directed at those most able to compete commercially, while those farmers most in need of state support are abandoned.*

## **LESSONS LEARNED AND CONCLUDING COMMENTS**

While the level of exports has fallen far short of Mexican expectations, the procedures codified in NAFTA and the SPS Agreement of Uruguay Round, have led to a resolution of the ban on the importation of Mexican avocados. An important element that allowed settlement is the sub-national treatment of import markets, and of threatened trade actions. If a municipality in Mexico is found to be in violation of the phytosanitary requirements, exports from only that area, and not the entirety of Mexican exports, are banned. This innovation in application of phytosanitary import requirements significantly lowers risk to foreign producers. Similarly, basing import restrictions on sub-national, or regional markets, allows a partial lifting of phytosanitary or sanitary bans while establishing an acceptable level of risk for domestic production. The lifting of an import ban that had been placed in the early 1900s, and elimination, or at least reduction, of the acrimonious international dialogue, against the vocal opposition of the domestic industry, has to be viewed as a major accomplishment. With that said, the emphasis was on finding a politically acceptable solution and not on finding a solution that maximized economic efficiency and welfare gains in the two nations. Neglected, as well, in the analysis were any externalities, positive or negative, and equity considerations, which often loom large in the political and social equilibrium in developing nations. The resolution of the avocado issue should be viewed as a starting point, and not as an ending to research and analysis of the imports of trade liberalization.

Regional treatment, on both the import and export side, places regulatory emphasis on transportation and inspection protocols for movements from an infestation-free production area to the allowed consumption areas. The systems approach, at least as applied in Mexican avocado trade, requires redundant and costly risk mitigation practices and multiple inspections of the produce before it reaches the final consumer. The requirement that municipalities follow the prescribed practices, enforced by the threat that exports will be disciplined on that geographic basis, increased production and social costs without an assurance or institutional arrangements that the benefits of export sales are shared along with the costs.

A reasonable question is whether some other approach might be less costly while accomplishing the objective of reducing risk to a minimal level. Exporters in developing countries argue that product inspection on individual shipments, and the chance of a costly rejection of the shipments, would reduce risk of pest transportation to an acceptable level. The next level of a penalty should be the exporting firm and its import agents as they are the offending party, and not the innocent producers and packers in the geographic area where the offending firm operates. But, leveling penalties against a small geographic area is a decided improvement over banning imports on a national basis.

The negotiation of the components of the risk-mitigation systems approach between the appropriate sanitary and phytosanitary agencies in the two countries has been time consuming, costly and potentially leads to capricious outcomes. In even the best of circumstances, the strategic economic and political importance of the potential source of imports cannot help but influence the outcomes of the bilateral negotiation of risk-mitigation practices. But, beyond the political influence on scientific outcomes, the length of the process would have been greatly reduced by the acceptance of internationally accepted procedures to determine disease-free areas and the host status of a plant and its fruit.

It seems clear that the cost of reducing the level of risk to that of the avocado import regime exceeds its benefits. But, lacking an international consensus on the acceptable level of risk, on accepted risk mitigation systems and on the appropriate techniques and methods to carry out an economic assess-

ment, the negotiated systems approach, and reducing the risk to near zero, may be the only acceptable alternative.

Development economists will find little comfort in the social and economic impacts of the opening of the U.S. market to Mexican avocados. As imports are increasingly determined by strategic alliances between dominant producers and packers in the United States and Mexico (who will be producing and packing a branded product), small producers will be progressively excluded from participation in the lucrative export market. But, small producers are required, at the same time, to carry out the costly phytosanitary practices required of all producers in order to gain export certification for that region.

Consideration of equity and the distribution of the gains from trade should be a more important part of the analysis of trade liberalization carried out by agricultural economists. Not to do so, risks the danger that trade liberalization will become the victim of a domestic and international backlash against perceived unequal and undesirable outcomes. Certainly, the failure of the WTO negotiations in Seattle, against the backdrop of street riots and violent disturbances, suggests the need for a broadened and deepened research agenda.

Some elements of that agenda are found in the analysis of sociologists and anthropologists, such as that of Stanford. They reason that the social and economic institutions that were adequate in autarky are not sufficiently robust to maintain social and equity goals in a globalized market environment. The case for continued gains in economic efficiency from further trade liberalization would be strengthened by policy prescriptions and marketing innovations to at least partially address social and equity considerations. After all, the case for free trade is made without consideration of positive and negative externalities despite the obvious fact that the world is resplendent with both.

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