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Constraints and Opportunities In Vegetable Trade*

by

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Abstract

The objective of this article is to provide an overview on constraints and opportunities for increased vegetable trade in the Americas. The realization of this potential will likely be constrained by the extent of the market, immigration reform in the United States, lack of investment capital in Latin America, high transportation costs of fresh produce, and quality and health concerns of consumers. Opportunities are more apparent in selected world areas (Asia, European Community, United States, and Canada), for high quality, fresh rather than processed vegetables with safe or zero levels of pesticide and chemical residues, especially due to consumers' concern for a healthier diet. Whether or not the potential for expanding vegetable trade will be realized depends on how producers, traders, and governments respond to the challenges involved, especially those involving production and marketing

strategies to respond to evolving consumers' tastes and preferences.

Introduction

World trade in fresh vegetables has increased fourfold in the last two decades; yet fresh vegetable exports from Latin America actually declined by 20 percent while U.S. exports of vegetables increased only twofold in the same period.¹ However, there is a series of forces increasing the pressure to expand production and trade of vegetables in the Americas.

In the United States, farmers are facing the prospects of lower prices for grains, induced by lower world demand for U.S. grains and uncoupling of price and income supports. The extent of immigration reform and the small amount of extra land needed to saturate the market may curb the prospects for vegetable expansion in the United States. In Latin

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America, there is a pressing need to increase foreign exchange earnings to ameliorate the foreign debt crisis and to export high-value crops as markets for traditional commodities shrink. The lack of adequate financial capital and market penetration knowledge may hamper vegetable expansion in Latin America.

Objective

The objective of this article is to provide an overview on constraints and opportunities for increased vegetable trade in the Americas. Historical trends, policies and institutions, and the prospects for increased vegetable production and trade in the hemisphere are presented, paying attention to larger geographical, economic, and political considerations.

Trade Patterns

Although the value of the world fresh vegetable trade is more than 2.7 times larger than that of processed vegetables, their patterns are similar (Tables 1 and 2). Comparing the total trade values in Tables 1 and 2 (1984) with those reported by Sarris² for 1977, fresh vegetable trade expanded from \$5.56 to \$7.88 billion (a 42% increase) while processed vegetable trade expanded from \$2.36 to \$2.85 billion (a 21% increase). Thus, world vegetable trade for fresh vegetables is growing twice as fast (6% per year) than that of processed vegetables (3% per year).

Within the Western Hemisphere, it is clear that the United States is the primary market for fresh vegetables from Mexico, Central America, and the Caribbean, accounting for over 80 percent of their exports (Table 1). For South America, the EC is the primary market. Canada is the most important export market for U.S. fresh vegetables and vice versa. Further, Canada and the United States are net importers of fresh vegetables, while Latin America is a net exporter. In terms of processed vegetables (Table 2), primary export markets and the net trade positions for countries in the Western Hemisphere are similar to those of fresh vegetables.

Table 3 presents an overview of the world trade shifts among major trading regions in fresh vegetables from 1962 to 1982. The most striking change is the emergence of Asia as the world's major net exporter of fresh vegetables and the EC's increasing dominance as both importers and exporters of fresh vegetables. Broad indexes of *export propensity* (exports relative to domestic production) and *import penetration* (imports relative to domestic con-

sumption) for fresh vegetables indicate that the export propensity of the United States and Canada (along with Europe and Asia) increased in the 1962-82 period. These indices also show an increase in two-way trade in the United States and a general decline in fresh vegetable trade in Latin America.

The picture that emerges after 1982 in the Western Hemisphere is dominated by two events: a sharp increase in the value of the U.S. dollar (leading to a large U.S. trade deficit and capital inflow) and a debt crisis in Latin America (leading to structural adjustments and severe cuts in imports).³ By 1986, the United States had a \$500 million deficit in vegetable trade.³ In the 1980s, the United States increased the imports of both fresh vegetables (particularly from Mexico and the Caribbean Basin Initiative [CBI] countries) and processed vegetables (particularly from Spain and Taiwan).⁴ Successful vegetable export expansion across Latin America countries has been concentrated in a few countries.

Constraints and Opportunities

The range of vegetable cultivars available, the wide variation in climatic conditions, and the land, water, and labor endowments within the largest or smallest countries in the Western Hemisphere suggest that the availability of natural resources is *not* an important constraint to the production and trade of vegetables.⁵ The following identifies some key factors underlying constraints and opportunities that may prove critical in expanding trade of vegetables.

Supply Factors

Although seasonality of vegetable production can be seen as a constraining factor, it can also provide opportunities associated with "market windows" to countries with seasonal deficits. Coordination of supply sources with different production seasons may be opportune to supply retail and buying institutions year-round.^{6,7} Expansion of vegetables is predicated on either the presence of a local entrepreneurial class or through foreign investment. As a case in point, U.S. investment has been critical to the expansion of Mexico's production and exports in the 1980s.⁸ The lack of availability of investment capital may prove to be a significant constraint in enhancing exports from Latin America.

High transfer or transportation costs for vegetables are a challenge to enhanced trade. The cost of international freight and insurance for bulky/perishable items, such as fresh vege-

Table 1
World Trade Matrix for Fresh Vegetables, U.S. \$Million, 1984

Exporting Region	Importing Region									Total Exports
	CAN	USA	MX	CC	SA	EC12	MFE	JP	ROW	
Canada (CAN)	0	102.4	.1	24.2	22.0	34.5	5.9	8.1	26.4	223.4
USA	254.4	0	15.7	34.5	64.2	95.7	46.4	84.8	20.1	615.8
Mexico (MX)	21.8	442.9	0	5.8	19.0	40.5	NA	9.7	.6	515.4
C. America/ Carib. (CCA)	25.1	496.2	NA	33.9	.3	42.7	.1	NA	.7	599.0
S. America (SA)	1.1	12.2	NA	4.1	44.7	38.7	2.9	2.0	.7	106.3
European Com. (EC12)	10.3	65.1	1.3	32.9	18.6	3,021.3	87.9	19.7	396.5	3,653.2
Middle/Far East (MFE)	3.2	16.4	NA	1.6	.6	854.5	198.7	345.6	20.9	1441.5
Japan (JP)	.1	4.3	NA	n	.1	.5	15.5	0	.5	21.0
Others (ROW)	2.0	15.0	1.3	.1	.7	365.5	48.5	168.3	74.8	680.8
Total Imports	318.0	1,154.7	18.4	137.1	170.2	4,493.8	405.8	638.3	545.0	7,881.2

SOURCE: Computed from United Nations, *1984 Commodity Trade Statistics Yearbook*, and *1984 Supplement to the World Trade Annual*, Vols. I-IV.

NOTES: Totals may not add up exactly due to rounding errors. An "n" indicates that the reported figure was less than \$50,000 (.05 million). An "NA" indicates lack of reporting or zero trade.

Table 2
World Trade Matrix for Processed Vegetables, U.S \$Million, 1984

Exporting Region	Importing Region									Total Exports
	CAN	USA	MX	CC	SA	EC12	MFE	JP	ROW	
Canada (CAN)	0	4.3	NA	0.7	.1	13.6	1.5	1.0	5.8	26.9
USA	26.6	0	.7	9.7	3.4	25.0	9.5	18.5	15.8	112.3
Mexico (MX)	1.7	32.7	0	.1	.1	6.2	.1	.1	4.9	45.9
C. America/ Carib. (CC)	0.5	9.9	NA	1.1	.1	.3	NA	.1	n	12.1
S. America (SA)	3.6	7.9	NA	n	.8	10.4	NA	2.7	2.0	27.4
European Com. (EC12)	36.7	252.3	NA	25.2	1.2	1,105.3	116.4	11.9	224.2	1,772.4
Middle/Far East(MFE)	17.1	194.6	NA	.1	.4	97.0	57.6	107.8	40.5	515.1
Japan (JP)	2.3	15.6	NA	.1	0.9	1.0	80.7	0	1.2	101.8
Others (ROW)	14.3	69.6	NA	.5	.1	106.1	2.9	5.6	30.9	233.5
Total Imports	102.7	586.9	.7	37.6	7.3	1,367.9	267.8	147.6	329.0	2,847.6

SOURCE: Computed from United Nations, *1984 Commodity Trade Statistics Yearbook*, and *1984 Supplement to the World Trade Annual*, Vols. I-IV.

NOTES: Totals may not add up exactly due to rounding errors. An "n" indicates that the reported figure was less than \$50,000 (.05 million). An "NA" indicates lack of reporting or zero trade.

Table 3
Shifts in World Trade of Fresh Vegetables

Country Blocks:	1962			1982		
	Net Trade (1,000 MT)	Exports as % of Output	Imports as % of App. Cons.	Net Trade (1,000 MT)	Exports as % of Output	Imports as % of App. Cons.
Latin America	36.5	.530	.450	-31.7	.280	.320
USA	364.5	2.14	1.00	317.2	3.13	2.47
Canada	-212.2	7.36	12.76	4.2	11.67	11.61
Europe	-929.5	1.46	2.32	-9,059.2	2.53	10.76
EC	-53.5	NA	NA	-9,374.4	NA	NA
Other Europe	-876.1	NA	NA	315.2	NA	NA
Middle East	126.7	1.72	.520	207.2	.880	.430
Asia	-33.2	.014	.025	7,192.6	1.98	.140
Africa	546.3	1.13	.205	-128.3	.375	.503

SOURCE: Adapted from A.L. Sparks.

NOTES: Net Trade = Exports (X) - Imports (M) in 1,000 MT.

Exports as a % of Output = [Exports (X)/Output (O)] x 100.

Imports as a % of Apparent Consumption = [Imports (M)/Apparent Consumption (O-X+M)]x100.

tables, may equal or exceed the value of the products shipped.⁹ Not surprisingly, then, trade in fresh vegetable usually takes place mostly among neighboring countries or regions. Despite dramatically lower labor and production costs in Latin America than in the United States, market penetration is adversely affected by higher packaging, marketing, and transportation costs.¹⁰

Technological change is also a supply factor of importance to future competitiveness. Technological change improves international competitiveness by reducing production costs of existing commodities or by introducing new or modified ones. Improved technology often results in varieties that withstand transport better and are more uniform in quality and appearance.² Plant genetics and biotechnology may provide opportunities for new product development crucial in targeting vegetable crops to specific market niches.⁹ Postharvest technology and development of an efficient export infrastructure can significantly affect product quality and acceptability by final consumers.

Demand Factors

A steady increase in the demand for vegetables is a prerequisite for increased export opportunities. Such opportunities are offered by recent demographic shifts toward an older population; changing lifestyles, such as eating away from home, and increased diet, nutrition, and health concerns, especially in the United States, Canada, and the European Community. In the United States, the per capita consumption of vegetables continues to expand while consumption for processed vegetables is, at best, stagnant.⁷ An increase in the consumption of fresh vegetables has been boosted by releases of research results that link increased consumption of fruit and vegetables to a reduction in the risk of cardiovascular diseases and cancer.

Ongoing sociodemographic changes have increased the relative importance of vegetable consumption expenditures.¹¹ Increased income and lifestyle changes, fostering an increasing demand for variety, quality, and convenience, favor domestic and foreign vegetable trade, particularly when sales are tailored to specific needs and preference of market niches.⁹ In terms of growth in purchasing power and size of the market, it is clear that the United States, Canada, the European Community, and especially Asia represent growing markets for vegetables. Latin America's potential to import vegetables will continue to be constrained by heavy indebtedness and declining real per capita

incomes (Table 4). These conclusions are supported by findings of a recent survey among U.S. exporters, which point out Asia as having the most promising growth potential and Latin America as having a low potential for U.S. exports.¹²

The role of *quality* and *safety* concerns in shaping future trade opportunities cannot be overemphasized in developing or sustaining export markets. Consumers in the growing markets for vegetables are endowed with relatively high purchasing power so that *value* and *quality* rather than just price will play a critical role in satisfying these markets.⁷ Quality standards may also become an obstacle to trade when selected vegetables are subject to quality and grade standards, such as those governing U.S. marketing orders.

Trade Barriers

In general, processed vegetables are subject to more stringent measures than fresh vegetables (Tables 5 and 6). The United States and Canada are less frequent users of non-tariff barriers than other industrial countries. Nominal tariffs for vegetables are rather low in major industrial markets relative to other commodities. The actual tariff paid on imports from Latin American and other developing countries to industrial markets may be zero or lower than those in Table 5 because of preferential treatment afforded by the Caribbean Basin Initiative and the Lome and Younde Conventions. In Latin America, the most common NTBs used include import quotas, restrictive import licensing, and foreign exchange restrictions.¹³

If successfully implemented, the U.S./Canada Free Trade Agreement is expected to have only a minimal impact on the magnitude or pattern of vegetable trade. Canada already obtains 80 percent of its vegetable imports from the United States (Table 1) and has relatively low tariffs on all vegetable imports and practically no non-tariff barriers (Tables 5 and 6).

Although the Caribbean Basin Initiative Recovery Act (CBI) of 1983 removed U.S. import duties from designated countries from Central America and the Caribbean, stringent NTBs remained for key commodities like sugar and textiles. In fact, overall exports from the area have drastically declined (Table 4). Since the conception of the CBI, most countries that attempted to expand vegetable exports were unsuccessful, especially when they attempted to target the massive vegetable market (tomatoes

Table 4
Main Economic Indicators of Selected World Regions

Country/Region	1985	1985	1984	Real Per	Imports	Exports
	Population (millions)	Per Capita GDP(US\$)	Foreign Debt (% of GDP)	Capita GDP		
				—% Change (1980-1985)—		
United States	239	16,594	NA	14.9	40.7	34.3
Canada	25	13,401	NA	7.1	28.9	-3.5
Latin America	405	1,761	62.8	-7.3	-34.9	-5.7
Mexico	80	2,237	56.8	-2.4	-28.1	42.0
Central America	26	1,111	70.0	-12.4	-13.5	-22.1
Caribbean	28	1,718	44.7	-9.6	-25.0	-39.1
South America	271	1,688	65.9	-7.4	-40.1	-5.1
EC-10	273	8,263	NA	5.5	-14.8	-7.3
Asia	2,492	819	8.2	25.3	25.8	23.8
Africa	572	632	31.4	-6.4	-30.3	-31.8
Middle East	140	2,956	12.9	-17.8	-9.2	-53.0

SOURCE: USDA, *Western Hemisphere Situation and Outlook Report* and World Bank, *World Development Report*, 1986.

Table 5

**Nominal Tariffs Affecting Vegetable Exports
In Major Industrial Country Markets, Percent**

Commodity Group	Canada (M.F.N.)	U.S.A. (M.F.N.)	Japan	E.C.
Fresh Vegetables:				
Asparagus	5.5 cts/lb. (no<15%)(*15.0)	25.0		
Cucumbers	2.25 cts/lb. (no<15%)(*15.0)	3.0 cts/lb (*11.2)		
Onions	2.5 ct/lb. (no<12.5%)(*12.5)	1.75 cts/lb (11.4)	10.0	12.0
Peppers*	2 cts/lb. (no<10%)(*10.0)	25.0 cts/lb (*5.7)		
Potatoes	35.0 cts/100 lb. (*2.9)	35.0 cts/100 lb (*3.9)	5.0	7.0
Tomatoes	2.5 cts/lb (no<15%)(*15.0)	2.1 cts/lb. (*9.1)		
Frozen Vegetables:			10.0	18.0
Asparagus	22.5	25.0		
Broccoli	20.0	17.5		
Brussels sprouts	20.0	25.0		
Cauliflower	20.0	17.5		
Mushrooms	15.0	3.2 cts/lb. + 10%		
Potatoes	10.0	10.0		
Dried Vegetables:				16.0
Beans	1.5 cts/lb.	0.75 ct/lb.	10.0	
Peas	Free	0.4 ct/lb.	10.0	
Canned Vegetables:				
Asparagus	22.5	17.5	16.0	22.0
Peas			20.0	24.0
Corn	12.5	12.5	17.5	8.0+ VC
Tomatoes	13.6	14.7		
Mushrooms	20.0	3.2 cts/lb. + 10%		

SOURCE: Agriculture Canada, *Tariffs on Selected Agricultural Products*, June 1980.

NOTES: An asterisk (*) denotes ad valorem equivalent computed as specific tariff as % of 1985 import unit value. VC = variable component.

Table 6

Nontariff Measures Affecting Vegetable Exports
In Major Industrial Country Markets

Country	Potat., Tomat. Onions	Veg. Frozen	Veg. Prsvd.	Veg.Prsvd. in Brine	Veg.Prsvd. NES	Veg. Dried	Beans Peas
Australia	H					H	H
Austria	*Q/*D				*V		
Canada							
EC	*D/*P *V/*F	*D	*D/*V	*D	*D	*D	
Benelux	*Q/*D			*D/F	*F		
Denmark	*Q	*Q				*Q	
France	*Q/*D	*Q/*D				*Q/*D	*D/H
Germany	*Q				*Q	*Q	
Italy	*D				*D		
U.K.	*Q		*Q		*Q	*Q	
Finland	*D		*D				*D
Japan	*Q/H	H	H	H	H	H	*Q/H
New Zealand	*D			D	*D	*D	*D
Norway	D/P			*D	*Q/D	*D	
Sweden	D	D	D	D	D	D	D
Switzerland	*Q/*D *H	*D		*D	*Q/*D	*D	*Q/D *F
United States	H				*V		

SOURCE: UNCTAD, *Liberalization of Barriers to Trade in Primary and Processed Commodities*, UNCTAD Secretariat, T.D./B/C.1/239, January 1983.

NOTES: Asterisk(*) before a symbol indicates that the measure affects only part of total imports of a product. Measures shown for individual EEC members are additional to those applied at the level of the EEC. Nontariff measures are defined as:

- Q=Quotas, including "voluntary" export restraint.
- D=Discretionary import licensing.
- H=Health, sanitary, and technical standards.
- P=Minimum price systems.
- V=Variable levy or charge.
- F=Fixed fiscal changes based on CIF import value.

and cucumbers).¹⁴ In addition, United States' investment has fallen short of expectations partly due to lack of assurance of duty-free status in the future.

Labor Factors

Because vegetables are labor-intensive, their markets are greatly affected by the combined impact of labor and international trade policies. There appears to be little question that trade in products substitutes for factor movements.¹⁵ This proposition suggests a number of intriguing issues, such as the optimum mix of immigrant workers (legal and/or illegal) and imported vegetable products for the United States. Fresh vegetable harvests, particularly, require relatively large amounts of labor over a short time. Restrictions on vegetable trade place pressure on the labor market. An excess supply of labor develops in countries such as Mexico, while an excess demand for labor is created in the United States, generating incentives for laborers to migrate from Mexico to the United States for seasonal work in vegetables.¹⁶

An argument made by Martin and Thompson¹⁷ is that while increased trade barriers may induce immigration into the United States, it is not necessarily true that an increase in foreign vegetable imports will decrease immigration. Once migration patterns are in motion within Mexico due to an expansion of the Mexican vegetable industry, for example, migration will continue into the United States because of the remaining wage differential. Farm labor contractors have acted as liaison between illegal immigrants from Mexico and U.S. farm employers. For the next decade, it is expected that similar linkages of illegal immigrants will be established between U.S. and Central American labor markets.¹⁷

The heart of the issue is the immigration policy of the United States. The most controversial recent legislation in this regard is the Immigration Reform and Control Act (IRCA) of 1986. IRCA stipulates that employers who knowingly hire undocumented workers face stiff fines of up to a maximum of \$10,000 for each unauthorized alien employed. Additional penalties are applicable if an employer is found to have engaged in a pattern of violation.¹⁸

The real question is whether or not IRCA will be strictly enforced. If the statute is not strictly enforced, the supply of undocumented workers in U.S. farm labor markets will increase, dampening the rise of labor costs, and permitting domestic vegetable producers to

maintain their competitive position vis-a-vis foreign vegetable imports. If IRCA is strictly enforced, the supply of undocumented workers will dry up, farm wage rates will increase, and vegetable imports will increase their share of the U.S. market. Domestic producers will respond with increased attention to labor-saving technology, particularly harvest aides and mechanical harvesters.

Because of the expected difficulty of U.S. producers to maintain their competitive position in the face of increased wage rates under IRCA, the 1986 statute did broaden the scope of options for employing temporary alien farm workers. The H-2 program of importing legal temporary seasonal workers for U.S. agriculture was broadened to encompass all major farm producing regions (H-2A program). Also, a special guest worker program was added to permit temporary alien replenishment of agricultural workers (RAWs) to work in seasonal farm occupations. While H-2A workers are never eligible for permanent resident status, RAWs workers will be eligible to apply for permanent resident status (and eventually U.S. citizenship) after three years of work in seasonal agricultural occupations.

The Immigration Reform and Control Act (IRCA) provided amnesty to a large number of previously illegal aliens who were continuous residents of the United States for five years. The Act permitted a relatively large number of former illegal immigrants who had performed at least 90 days of seasonal farm work (SAWs) between May 1, 1985, and May 1, 1986, to achieve temporary resident alien status. In either case, these workers are not bound to *continue* in seasonal agricultural work upon achieving temporary resident alien status. Once legalized, SAWs workers have fled to non-farm occupations. Even if IRCA is enforced in the future, the combination of RAWs workers and H-2A workers could conceivably provide U.S. growers with adequate labor supply.

Pesticide and Chemical Residues

Pesticide residues have been shown to be one of the leading health concerns of U.S. consumers.¹⁹ Safety concerns associated with chemicals and pesticide residues or food irradiation represent a major constraint to vegetable trade in the future.²⁰ As consumers become more concerned with possible health risks of pesticide and chemical residues in foods, particularly fruits and vegetables, the demand for government intervention to regulate pesticide content in vegetable production and

trade activities will increase. If implemented, these regulations have the potential to significantly shift comparative advantages.

From a producer's standpoint, pesticide use reduces the private cost of production. In the aggregate, this causes a rightward shift of a supply curve for the commodity in question.²¹ The reduction in private costs arises from reduction in crop losses or substitution of herbicides for labor/energy.

Pesticide or chemical residue restrictions result in a higher equilibrium price as production costs rise and/or consumers are willing to pay a premium for low-chemical vegetables. Whether the quantity of vegetable trade increases, decreases, or stays the same depends on the relative effects of pesticide restrictions on supplies of the trading countries. The realignments of comparative (absolute) advantages under restricted pesticide use depend on how various countries or regions adapt to alternative technologies or methods of production, including low-input, labor-intensive, or integrated-pest-management agriculture. It is likely, however, that Latin American countries, along with other LDCs, would have a disadvantage under stricter health and sanitary standards due to their limited resources for regulating intelligence and monitoring compliance.²²

Conclusions

Enhanced vegetable exports from the Western Hemisphere may be critical to the agricultural economy of many countries or regions by delivering the promise of enhanced income and foreign exchange earnings. Vegetables, however, are by no means a panacea for the larger problems facing farmers and agribusinesses in the hemisphere. In the United States, the extent of the market in relation to potential supply and immigration reform may curb the prospects for expanded vegetable production and trade. In Latin America, lack of adequate financial capital and market penetration knowledge may curb vegetable expansion. Other important constraints are the preference for high-quality, standardized products in the growing world markets and consumers' health concerns with pesticide and chemical residues.

Whether the potential for expanding vegetable trade will be realized in the area depends on how producers, traders, and governments respond to the challenges involved. Given the characteristics of evolving vegetable markets, opportunities are more apparent for fresh rather than processed vegetables, for the targeting of

the fastest growing markets (Asia, EC, United States, and Canada), the development of specialized market niches for high-quality, standardized and safe products, and for the coordination of supply sources to ensure year-round supply at the retail level. For Latin America, such coordination may require direct foreign investment and monitoring of production and marketing activities by entrepreneurs in the importing countries. This is especially true for fresh vegetables because their perishability and quality standards demand a high degree of coordination for successful exports.

Endnotes

- [1] A. L. Sparks, *Simultaneous Econometric Model of World Vegetable Trade: Implications for Market Development*, Ph.D. dissertation, University of Florida, 1987.
- [2] A. H. Sarris, *World Trade in Fruits and Vegetables: Projections for an Enlarged European Community*, U.S. Department of Agriculture, Economic Research Service Agric. Econ. Rep. No. 202, 1984.
- [3] U.S. General Accounting Office, *Agricultural Trade: Trends in Imports of Fruits, Vegetables, and other Agricultural Products*, Washington, D.C.: RCED-87-177FS, 1987.
- [4] S. R. Hamm, "The U.S. Supply of Vegetables," Proceedings of a workshop on Vegetable Markets in the Western Hemisphere: Trends, Policies, and Linkages, Rutgers University, September 1988.
- [5] J. F. Kelly and C. O. Andrew, "A Conceptual Model of International Trade for Vegetables," *The Journal of the Australian Institute of Agricultural Science* 44-29, 25 (1979).
- [6] D. V. Steele, "Non-traditional Winter Crops Called Caribbean Key to Winning Markets," *The Packer*, January 21, 1987.
- [7] B. M. Buxton, "Changes in the U.S. Fruit and Vegetable Markets: Implications for Importers," Paper presented at the International Seminar on Fruits and Vegetables, Buenos Aires, Argentina, December 15-16, 1987.
- [8] R. L. Cook, "From Competition to Coordination in Vegetable Trade: The Case of Mexico and California," Proceedings of

- a workshop on Vegetable Markets in the Western Hemisphere: Trends, Policies, and Linkages, Rutgers University, September 1988.
- [9] H. O. Carter and C. F. Nuckton, *Marketing California's Specialty Crops: Worldwide Competition and Constraints*, Agricultural Issues Center, University of California at Davis, 1987.
- [10] L. C. Polopolus, "The Role of Public Policies in United States Vegetable Production and Marketing," Proceedings of a workshop on Markets for Vegetables in the Western Hemisphere, Rutgers University, September 1988.
- [11] J. R. Blaylock and D. M. Smallwood, *U.S. Demand for Food: Household Expenditures, Demographics, and Projections*, U.S. Department of Agriculture, Economic Research Service, Technical bulletin 1713, 1986.
- [12] G. A. Ashley and J. E. Epperson, *An Analysis of the Potential for Exporting Vegetables Grown in the United States: A United States Exporter's Perspective*, Georgia Agricultural Station, Research Bulletin 366, December 1987.
- [13] U.S. Department of Agriculture, *Trade Policies and Market Opportunities for U.S. Farm Exports*, U.S. Department of Agriculture, Foreign Agricultural Service, December 1987.
- [14] J. L. Seale, Jr., "Vegetable Trade in the Caribbean Basin Initiative," Proceedings of a workshop on Vegetable Markets in the Western Hemisphere: Trends, Policies and Linkages, Rutgers University, September 1988.
- [15] R. D. Emerson, "Trade in Products and International Migration in Seasonal Labor Markets," *American Journal of Agricultural Economics*, 64:339-46, May 1982.
- [16] R. D. Emerson, "Critical Issues in Agricultural Labor Markets," *Southern Journal of Agricultural Economics*, 17:89-98, July 1985.
- [17] P. L. Martin and Gary Thompson, "Labor and International Trade in Vegetables," Proceedings of a workshop on Markets for Vegetables in the Western Hemisphere, Rutgers University, September 1988.
- [18] L. C. Polopolus, "The 1986 Immigration Reform Act and Florida Agriculture," *Florida Food and Resource Economics*, No. 76, May-June 1987.
- [19] E. van Ravenswaay, "How much food safety do consumers want? An Analysis of Current Studies and Strategies for Future Research," in *Consumer Demands in the Marketplace: Public Policies Related to Food Safety, Quality, and Human Health*, K. L. Clancy, Ed., Washington, D.C.: Resources for the Future, 1988.
- [20] W. Gahr, "Food Safety and Quality: A Research Agenda for Competing in the World Marketplace," in *Consumer Demands in the Marketplace: Public Policies Related to Food Safety, Quality, and Human Health*, K. L. Clancy, Ed., Washington, D.C.: Resources for the Future, 1988.
- [21] National Research Council, Committee on Prototype Explicit Analyses for Pesticides, *Regulating Pesticides*, Washington, D.C., 1980.
- [22] C. S. Kramer, "Harmonizing Health and Sanitary Standards in the GATT: Proposals and Issues," Washington, D.C., Resources for the Future, Discussion Paper FAP88-02, February 1988.