Potential local markets for fresh produce

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Consumers in some areas could get nearly half their fresh fruits and vegetables from local growers

Local and regional consumers represent a multimillion-dollar market for California growers of fresh produce. Selling produce locally also saves expensive fuels and other transportation costs. Information on statewide patterns of production, consumption, and transportation of fresh produce in California is important to distributors and to farmers who want the higher returns and lower transportation costs that direct marketing can bring.

Consumption and production

Precise figures on what people actually buy and eat are difficult to obtain. Different sources within the U.S. Department of Agriculture (USDA) disagree even on national averages (table 1). But the diets of Californians and "westerners" (about half of whom are Californians) are apparently quite different from national averages. We eat more of many items, especially lettuce, bananas, and tomatoes, and less of others, such as cabbage and sweet potatoes.

According to USDA's "unload" reports on produce deliveries, roughly 3 million tons of fresh fruits and vegetables are delivered to the Los Angeles and Oakland/San Francisco regions each year on their way to California consumers. The Los Angeles area distributes twice as much as does the San Francisco Bay area; together they distribute nearly all produce destined for California consumers, although some distribution also occurs via Sacramento, Stockton, Fresno, and San Diego. A conservative estimate of the value of California's consumption of fresh fruits and vegetables, based on USDA unloads and recent farm-gate prices, is over half a billion dollars. The corresponding retail value is two or even three times as great.

California is unusual in that its farmers produce large amounts of many fruits and vegetables across a wide variety of seasons. The state's annual production of 19 of the top 20 kinds of fresh produce in the U.S. diet (all those in table 1 except bananas) is roughly enough to meet California consumption needs, plus much more in most cases. But because both production and consumption vary throughout the season, the two do not coincide quite as well as annual totals might suggest.

Of the ten most important fresh fruits and vegetables in the California diet (excluding bananas), four are produced year-round in amounts well over those needed to satisfy all in-state demand (lettuce, oranges, celery, and carrots). Consumption of these four is not very seasonal, and virtually all of California's supply is produced in-state, except for some winter Valencia oranges shipped from Texas. In contrast, production and consumption of cantaloupes and watermelons are extremely seasonal, both peaking in midsummer, but out-of-state producers meet some of the very early-season demand that California does not. California's production of tomatoes, onions, potatoes, and apples is quite seasonal, but consumption is less so, with out-of-season demand met by out-of-state producers. Potatoes, apples, and onions come into California from other states year-round.

These ten crops together account for nearly 60 percent of California's consumption of fresh fruits and vegetables. When they are added together, the overall pattern is this: (1) production greatly exceeds consumption; (2) both are seasonal (production more so than consumption) with peaks in July; and (3) California production should be able to meet about 80 percent of statewide demand. Actually, because of such factors as varietal, quality, and price differences and competition among states (among buyers for California-grown produce and among producers for California markets), only about 60 percent of the fresh produce that Californians consume is grown by California farmers, according to the USDA's data on unloads.

TABLE 1. Estimates from various sources of United States, western, and California levels of consumption of major fresh fruits and vegetables.

Crop	Estimated consumption			
	ERS US*	NFCS US†	NFCS West†	Unloads California‡
	Pounds per person per year			
Potatoes, table	49.3	49.1	39.8	39.8-53.2
Lettuce, all	24.9	18.3	27.4	22.8-30.5
Bananas	20.8	21.7	27.1	23.1-30.9
Apples	16.0	23.4	24.0	14.6-19.5
Oranges	15.2	15.3	23.0	13.1-17.6
Tomatoes	11.4	9.2	15.5	14.4-19.3
Watermelons	10.3	12.4	16.0	7.8-10.4
Onions, dry	10.2	6.2	8.5	12.6-16.9
Cabbage	8.4	11.7	10.6	5.4- 7.2
Grapefruit	7.8	11.1	15.3	4.8- 6.5
Celery	7.3	3.4	5.6	8.2-11.0
Cantaloupe	6.6	7.9	16.8	6.4- 8.6
Corn, sweet	6.6	4.5	5.2	3.6- 4.9
Carrots	6.1	5.7	9.9	8.2-11.0
Peaches	5.4	4.5	4.4	3.0- 4.1
Cucumbers	4.0	3.0	4.3	3.8- 5.0
Grapes	3.6	2.1	3.7	4.8- 6.4
Sweet potatoes	3.4	2.3	1.4	1.7- 2.3
Peppers, bell	3.3	1.5	2.7	2.7- 3.6
Pears	2.4	2.1	3.3	2.8- 3.7

* Estimates from the USDA's Economic Research Service of retail weight, 1980.
† Estimates from the 1977-1978 National Food Consumption Survey of the USDA. "West" refers to an 11-state western region.
‡ Low and high estimates extrapolated by the author from USDA reports of unloads of fresh produce into San Francisco and Los Angeles, 1979-81.

The vertical text reads: Chet Fukushima

The potential market for local production of the ten leading fruit and vegetable crops in California is estimated at $140 million and is substantial year-round.

Movement within California

This study attempted to determine how the produce travels from farmer to consumer in California: how long the average trip is, how much fuel is used, and how much direct marketing can save. Most produce is shipped by truck from packing sheds or farm fields to wholesalers or chain-store warehouses in either the Los Angeles or the Oakland/San Francisco area, and from there to retailing points near consumers. This centralized distribution system for most produce can be contrasted with a decentralized system more similar to direct marketing, in which produce travels directly from producer to consumer.

While little or no quantitative information is available on trip lengths, fuel use, and the like, of produce in either the conventional centralized system or in existing decentralized alternatives such as farmers' markets, the patterns of movement for each system can be simulated on a computer. The simulation is based on known data concerning production and consumption and on qualitative descriptions of how the movements occur (total amounts, through what cities, based on what routing criteria). For this study, the amounts of production and consumption of ten crops were entered into a computer for each county and each month of the year (based on 1979-81 data from county agricultural commissioners' reports on production and from USDA unload reports on consumption), along with all the distances between counties within California. A computer program then played "central dispatcher," figuring out exactly how much of each crop to ship from each producing county to each consuming county in each month to minimize transportation costs while meeting as much demand as possible, given available supply. The program was run two different ways: once with all produce passing through either the Bay Area or the Los Angeles area (centralized example) and once with all produce going directly from producing county to consuming county (decentralized example).

A deliberately simplified computer model like this cannot be correct in all details. For example: in actuality, no one acts as "central dispatcher" for the entire state; some produce passes through Sacramento, Stockton, Fresno, or San Diego rather than one of the two major distribution areas used in the model; some produce probably travels a more circuitous route rather than the shortest one; and truck loading factors (assuming 20 tons) and fuel efficiency (assuming 5 miles per gallon) vary from trip to trip. Some of the models' assumptions are likely to cause overestimation of trip lengths and related measures; others are likely to cause underestimation. While the overall model results (quantities moving through one distribution city versus another, for example) are in accordance with reality, it is impossible to check many of the specific results owing to a lack of real-world data. For these reasons, the results reported here should be considered not precise quantities, but approximations most useful for the patterns they reveal regarding heretofore unknown and unestimated quantities.

Transportation

Once the model determines a set of produce flows, the results can be added together and compared across crops, seasons, and regions within the state. The figures on amounts and distances can be converted to amounts of energy used and transportation costs on the basis of per-unit costs, truck load size, and fuel efficiency. (More information on the costs and other assumptions used, and detailed results by crop, county, and season, are available from the author.)

On average, fresh produce travels a little over 200 miles from producer to consumer in the centralized example, and just over 150 miles in the decentralized example. Over 1.5 million tons of produce make the trip from California farmers to California consumers, costing $40 million to $50 million in transportation charges and using 3.1 to 3.8 million gallons of fuel in the centralized example. Distribution according to the decentralized example could save one-third of the transportation cost ($13 million to $16 million) and one-fourth of the fuel. In both situations, fuel use is greatest in the early summer when production and consumption, and thus amounts shipped, are greatest, with a secondary peak in the winter, when amounts transported are less but the average trip is longer.

Potatoes are shipped the longest distances, followed by melons; these commodities thus have the highest transportation costs and fuel use in both examples. Potato and melon growers may therefore be the most adversely affected if transportation costs rise. Oranges are shipped the shortest distances. Produce travels the farthest to reach consumers in the extreme northern part of the state: more than 400 miles in the centralized example and more than 300 miles in the decentralized example. The potential savings through decentralization is greatest for produce traveling to very northern counties (Modoc, Siskiyou) and to central California (Madera, Fresno, Kings, Tulare, Kern, San Luis Obispo, and Santa Barbara). Farmers who can market directly to consumers in these counties should be the most competitive against the existing system.

Local markets

Growers wishing to sell directly to consumers might want to concentrate on local (100 miles or less from the producer to consumer) rather than statewide markets (table 2). Each of the ten crops studied would show substantial local volume in a decentralized system, from 38,900 tons for cantaloupes to 145,200 tons for lettuce. This potential local volume is very seasonal for those crops with quite seasonal production (such as melons, potatoes, tomatoes), but also for crops for which California's production is more

TABLE 2. Amounts of produce that could be sold to local consumers, by crop and month, their approximate farm-gate value, and their relation to total statewide production and consumption

Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
							Tons (x1,000)						
Potatoes	7.0	6.1	7.2	4.1	2.3	2.8	16.6	21.4	19.6	21.9	15.6	12.6	137.3
Lettuce	2.1	2.8	17.9	21.7	20.5	9.1	7.2	6.9	7.6	13.4	19.2	16.9	145.2
Apples	3.2	2.4	2.0	2.5	3.8	3.1	2.9	2.8	5.8	7.7	7.3	5.2	48.7
Oranges	13.4	12.7	13.7	13.9	13.0	8.8	6.9	5.5	6.0	7.3	9.6	12.6	123.3
Watermelon	0.0	0.0	0.0	0.0	0.1	6.4	26.2	13.6	7.4	4.6	0.3	0.0	58.7
Tomatoes	1.0	0.0	0.0	0.0	0.2	4.9	7.4	8.8	8.6	9.9	7.6	2.1	50.6
Onions, dry	3.3	2.7	3.1	2.3	3.3	6.3	7.6	6.2	7.5	9.3	8.0	5.6	65.1
Celery	6.3	5.6	5.7	4.7	5.3	6.2	6.3	2.1	2.1	2.5	7.9	7.7	62.5
Cantaloupe	0.0	0.0	0.0	0.0	0.1	9.3	15.6	6.3	2.2	4.8	0.5	0.0	38.9
Carrots	6.6	5.7	6.1	5.4	7.8	6.2	2.5	2.1	2.1	2.3	2.2	5.0	54.1
10-crop total	42.9	38.1	55.8	54.8	56.2	63.2	99.4	75.7	68.8	83.7	78.1	67.7	784.4
							$ million						
10-crop value	7.5	6.4	9.2	9.1	9.6	12.0	18.1	14.5	13.6	16.6	15.1	12.0	143.7
							%						
% of total consumption	29	27	35	34	32	33	47	42	39	50	53	45	39
% of total production	10	10	14	12	8	7	11	11	11	14	17	15	11

than adequate year-round but for which the location of production within the state shifts seasonally (lettuce, carrots, celery).

The farm-gate value of the potential local production of these ten crops is estimated at $140 million and is substantial year-round, although somewhat reduced in winter and early spring. This local volume could satisfy nearly 40 percent of California's demand for these ten items. Local markets could absorb only a small proportion (11 percent) of total production, since California's total production is so great. Local marketing is obviously not an option for all of California's farmers, but $140 million in just ten crops would be a sizable market for many of the state's smaller scale farmers. The figures described here are based on current production and consumption patterns and farm-gate prices; shifts in production patterns to meet local demand and the higher prices usually received in direct marketing could increase all of the figures.

The local markets are best for producers in the central and southern parts of the state (fig. 1). Riverside County, with its abundant and diverse production and its proximity to Los Angeles consumers, has the greatest local market potential, given current production patterns. The geographic distribution of actual sales of all agricultural products sold directly to consumers, as reported in the U.S. Census Bureau's 1978 Census of Agriculture for California, roughly reflects the pattern of potential local markets discovered here for fresh produce.

From the standpoint of consumers, those in a dozen counties could get over 45 percent of their fresh fruits and vegetables from local growers, with Kern and Riverside counties in the lead.

Major changes in the food distribution system would be required to achieve the transportation savings and local market potential decribed here. It is not the point of this study to advocate that the entire system be reorganized to this end, but rather to show the size of the opportunity. Until recently, the information management required to bypass the centralized system was unavailable or prohibitively expensive. The increasing availability and affordability of microcomputers such as the one used to run the models in this study will make information on local supply, demand, prices, transportation availability and routing, and the like, much more accessible to smaller growers, distributors, and retailers who aim to meet local and regional demand.

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1,000 - 9,999
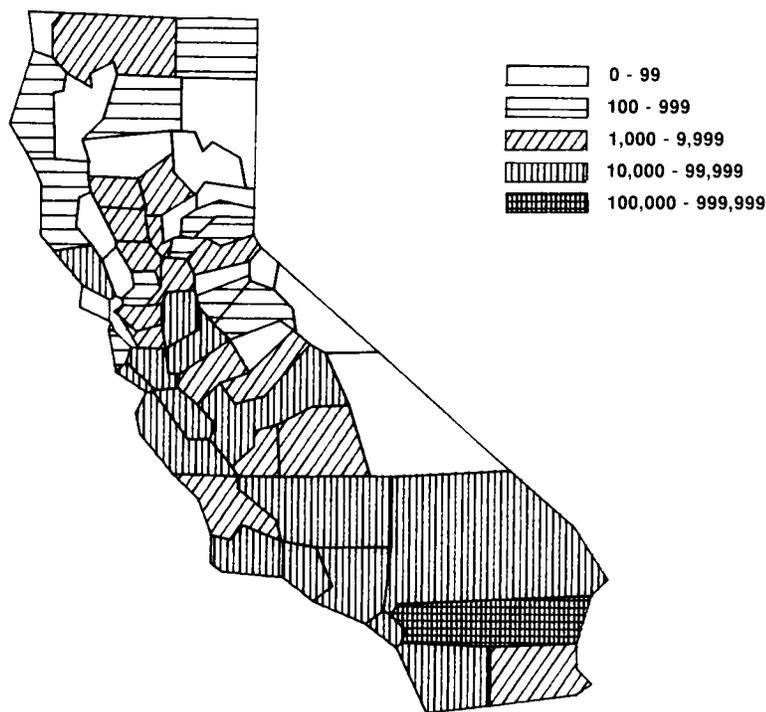10,000 - 99,999
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Fig. 1. Local markets are best for producers in central and southern California.