A BUDGETED ANALYSIS OF FRESH VEGETABLE MARKETING ALTERNATIVES

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ABSTRACT

Marketing costs and contributions to production costs for fresh vegetables marketed through four direct marketing alternatives and through wholesale channels are compared. Budgets derived from empirical observations were the bases for the comparisons. The results favor an elaborate roadside market, which sells a large quantity of items purchased for resale. Farmers' markets and pick-your-own operations were also found to be potentially more profitable than wholesale marketing.

INTRODUCTION

In densely populated regions vegetable growers have several alternative ways of selling their produce. Direct marketing to consumers and wholesale marketing are the basic choices. In the Northeast, roadside markets are the primary type of direct marketing, accounting for 64 percent of direct vegetable sales in New Jersey and 46 percent in Pennsylvania in 1978 (Henderson and Linstrom). Other types of direct marketing include farmers' markets and pick-your-own (PYO) operations. Though direct marketing is used by many farmers, wholesale marketing is the main outlet. It occurs at auctions and terminal markets or through brokers and commission agents. Processing vegetables are also produced under seasonal contracts, but this is uncommon in fresh vegetables. Some fresh vegetable producers sell directly to retail food stores or chains, but this is also uncommon.

A number of factors must be considered when the choice of marketing outlet or method is made.[1] These include the amount of investment required, operating costs, labor requirements, and expected revenues. Location in terms of access to consumers or a wholesale market is critical. The ability and desire to deal with consumers must be weighed. The willingness and capacity to assume risk are also of major importance.

This paper provides a comparison of the major marketing alternatives available to medium-sized vegetable growers. It primarily addresses the more quantifiable factors, leaving, for the most part, such individualistic considerations as location, consumer relations, and risk-taking for each grower to resolve. First, direct marketing alternatives are analyzed and compared. These are then contrasted with a major wholesale marketing alternative.

ESTABLISHMENT OF THE MODEL SITUATIONS

Analysis of the fresh vegetable marketing alternatives was accomplished by budgeting model situations for direct marketing and comparing these results with updated and adjusted information from published work of wholesale vegetable marketing costs. The direct marketing model situations were based on empirical observations taken in New Jersey.[2] Roadside market operators were surveyed to obtain information regarding facilities and equipment used, crops grown and sold, prices received, and labor requirements. Based upon the information obtained, two medium-sized model roadside markets were budgeted. Both were assumed to sell 20 acres of home-grown produce. One was a rather basic operation, at which the home-grown produce represented 90 percent of the gross receipts. The other roadside market was more service and quality oriented and more products bought for resale were offered. Home-grown produce represented just 30 percent of the gross receipts at this market.

The farmers' market model was based on a survey of the farmers selling at a New Jersey "city" farmers' market.[3] Information obtained from these farmers was similar to that otained from the roadside market operators. A farmers' market model was then developed depicting one grower marketing 35 acres of produce. A PYO operation was based on a previous survey (Fabian and Hunter).[4] This farm had 30 acres devoted to PYO crops.

Development of the model situations included specification of buildings and equipment, crops sold, prices charged, operating periods, labor and containers used, and determination of the resulting operating and ownership costs. All investments were based on 1980 replacement costs. Ownership costs included allowances for depreciation, interest, storage, insurance, and repair. Labor costs were based on prevailing wage rates for skilled and unskilled work according to the

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[1] Although some producers use more than one outlet, we assume throughout that only one method is used.

[2] More detail on the development of these and other direct marketing model situations is provided in Tracy, Dhillon and Varner.

[3] The market in question was consistent with the definition of a "city" farmers' market used by Bell.

[4] The acreages and cropping patterns used in the four direct marketing models were based on the empirical observations.

work activity performed. Management time at the roadside markets was assigned a wage equal to that obtained by supermarket produce department managers. Management at farmers' markets was assumed to be primarily a market-wide activity done by the market manager and to be included in the rental fee. Management cost for the PYO and wholesale marketing was estimated to be equal to 7 percent of all costs other than container cost, in line with the procedures recommended at the workshop on agricultural costs organized by the USDA (Van Arsdall). Only the costs of marketing home-grown produce were estimated and compared. Inputs used in both production and marketing were allocated to each and only the costs associated with marketing were included in the analysis.

In addition to comparing the marketing costs of the marketing alternatives, revenues were also estimated. Prices observed at direct marketing establishments varied considerably. The prices used in the model situations were within the range of the observed prices, and were set at levels that were appropriate for the type of model. They are, however, probably better considered to be illustrative rather than representative prices. Prices for wholesale marketing were an average of the average annual prices received at the Vineland, New Jersey, auction in 1979 and 1980.[5]

COMPARISON OF THE DIRECT MARKETING ALTERNATIVES

Total investments in marketing facilities and equipment varied by as much as $56,000 between the four direct marketing alternatives (Table 1). Roadside market investments were the largest, with buildings being the principal reason for the higher investments. Roadside Market 2 required a larger, more elaborate building than Roadside Market 1 (32'x50' versus 25'x40'). The roadside markets were also furnished with walk-in coolers to store unsold produce for the next day. Also, in addition to regular shelves and tables used in both roadside markets, Roadside Market 2 had retail-type produce cases.

A one ton truck was the largest investment for the Farmers' Market model. Pick-ups were used at the roadside markets. No road-hauling equipment was needed for the PYO. Both the Farmers' Market and the PYO required less expensive, portable check-out equipment than the roadside markets.

In keeping with general practices, the roadside markets offered a greater variety of home-

[5] The two year average was used because 1980 prices for some crops were thought to be abnormally low.

Table 1. Capital Investments for Marketing, Direct Marketing Alternatives New Jersey, 1980

Investment Category	Marketing Alternatives			
	Roadside Market 1	Roadside Market 2	Farmers' Market	PYO
Building[a]	$ 18,921	$ 31,316	$ 100	—
Truck[b]	7,000	7,000	10,000	—
Tractor & Wagon[b]	9,500	9,500	9,500	9,200
Scales	1,000	1,800	80	160
Cash registers[c]	450	1,125	10	10
Baskets	85	225	165	—
Cooler	6,000	7,300	—	—
Produce cases	—	8,000	—	—
Total	$ 42,956	$ 66,266	$ 19,855	$ 9,370

[a] Includes plumbing, electrical wiring, parking lot, and shelves and tables at the roadside markets. Includes only a table in the case of the Farmers' Market.

[b] A truck and tractor and wagon would also be required for wholesale marketing. For an existing farm using wholesale marketing expenditures for these items would not be necessary.

[c] Includes adding machines for Roadside Market 2 but only a cash box for Farmers' Market and PYO.

grown products than the Farmers' Market model or the PYO (Table 2). Difficulty in hauling and handling a wide variety of items would reduce the offering of individual sellers at farmers' markets. Each farmer selling at a farmers' market may offer a different group of crops, so that the total market provides a broad selection of products. The number of products sold at the PYO was limited by the fact that some crops do not lend themselves to the PYO method and the tendency of individual farmers not to grow all possible crops. In all four models the acreages of the crops generally reflect their relative importance among the crops sold by the respective methods.

As previously stated, the prices that were budgeted were based on prices observed at the types of markets modeled. This resulted in prices at Roadside Market 1 being for most crops not greatly above wholesale prices (Table 3). The highest prices of all four direct marketing models were associated with Roadside Market 2. This was based upon its service and quality image. In general, its prices were nearly equal to retail prices. Prices at the Farmers' Market were, for most items, between those of the roadside markets. The lowest prices were found at the PYO. Prices would not be expected to be high at PYO operations, since the customer provides the harvesting labor.

Annual marketing costs for home-grown produce were affected by the investments in marketing facilities and equipment and by the proportion of total receipts represented by home-grown produce (Table 4). Thus, Roadside Market 1, which had the second highest investment and a small proportion of items bought for resale had the the highest marketing cost for home-grown items. Roadside Market 2, which had the highest investment but at which items bought for resale represented a large proportion of gross receipts, had a lower cost of marketing home-grown produce than Roadside Market 1. In the case of Roadside Market 2, a greater proportion of the cost of inputs used for both home-grown produce and items purchased for resale was applied to the latter. The Farmers' Market model had the second highest cost of marketing home-grown produce and the PYO the lowest. Labor and management were the major costs, together accounting for between 58 and 65 percent of the marketing costs across the four direct marketing alternatives.

Due to the differences in acreages the total annual marketing costs for home-grown produce are

Table 2. Crop Acreages, Direct Marketing Alternatives, New Jersey, 1980.

Crop	Marketing Alternative			
	Roadside Market 1	Roadside Market 2	Farmers' Market	PYO
Beets	1/4	1/4		
Broccoli	1/4	1/4		
Cabbage	1/4	1/4		
Carrots	1/4	1/4		
Cauliflower	1	1		
Cucumbers	1/2	1/2	2	
Eggplant	1/4	1/4	2	
Lettuce	3/4	3/4		
Peas	1/4	1/4		5[a]
Peppers	1	1	3	
Pumpkins	3	3		
Radishes	1/2	1/2		
Rhubarb	1/4	1/4		
Snap Beans	2	2	4	5[a]
Spinach	1	1		
Squash	1	1	2	
Strawberries	1/2	1/2	5	20[b]
Sweet Corn	5	5	15	
Tomatoes	2	2	2	5
Total Acres	20	20	35	35

[a] Peas and snap beans were double cropped in the PYO.

[b] Two-thirds in production.

Table 3. Assumed Prices Received, Vegetable Marketing Alternatives, New Jersey, 1980.

Crop	Marketing Alternative				
	Roadside Market 1	Roadside Market 2	Farmers' Market	PYO	Wholesale[a]
Beets	.35/bunch	.49/bunch			.33/bch.(3.92/box)
Broccoli	.59/bunch	.79/bunch			.31/bch.(4.09/box)
Cabbage	.10/lb.	.15/lb.			.10/lb. (5.04/box)
Carrots	.29/bunch	.59/bunch			
Cauliflower	.69/head	.99/head			
Cucumbers	.17/lb.	.19/lb.	.20/lb.		.14/lb. (7.54/box)
Eggplant	.39/lb.	.44/lb.	.20/lb		.13/lb. (4.25/box)
Lettuce	.39/head	.39/head			.18/hd. (4.29/box)
Peas	.39/lb.	.99/lb.		.20/lb.	.39/lb.(11.61/box)
Peppers	.20/lb.	.25/lb.	.25/lb.		.18/lb. (5.96/box)
Pumpkins	.12/lb.	.13/lb.			
Radishes	.25/bunch	.25/bunch			.15/bch.(5.37/box)
Rhubarb	.39/bunch	.39/bunch			
Snap Beans	.27/lb.	.49/lb.	.39/lb.	.20/lb	.22/lb. (6.66/box)
Spinach	.45/lb.	.79/lb.			.24/lb. (4.80/box)
Squash	.13/lb.	.39/lb.	.33/lb.		.19/lb. (4.00/box)
Strawberries	.76/qt.	1.39/qt.	1.10/qt.	.75/qt.	.76/lb.(12.08/box)
Sweet Corn	1.25/doz.	2.00/doz.	1.80/doz.		
Tomatoes	.20/lb.	.49/lb.	.39/lb.	.10/lb.	.20/lb. (6.15/box)

[a] 1979-1980 average prices received at the Vineland Co-operative Produce Auction, Vineland, NJ. No prices were reported for carrots, cauliflower, pumpkins, rhubarb and sweet corn.

not directly comparable across all four direct marketing models. The distortions resulting from the acreage differences are reduced by examining the marketing costs per acre of home-grown produce (Table 5). Marketing cost per acre of produce, like total marketing cost, was lowest for the PYO operation and highest at Roadside Market 1. The Farmers' Market model and Roadside Market 2 had the second and third lowest per acre marketing costs, respectively.

Total revenue and contribution to production costs (see Table 5) further the comparison of direct marketing methods. In terms of contribution to production costs per acre of produce, Roadside Market 2 ranked first. Ranking second and third in contribution were the Farmers' Market and the PYO, respectively. Roadside Market 1 was the least desirable alternative. It had the lowest total and per acre contribution to production costs and the highest marketing cost per acre. In comparison to Roadside Market 1, Roadside Market 2 had higher prices and more items purchased for resale to bear some of the marketing costs. Roadside Market 2 is shown to be the most preferable alternative. In addition, its overall total revenue and total contribution to production costs are understated because home-grown produce represented only 30 percent of total revenues.[6]

COMPARISON WITH WHOLESALE MARKETING

To further the analysis of vegetable marketing alternatives, the direct marketing costs and returns were compared with wholesale marketing. The wholesale marketing costs were based on Dhillon's 1979 study of a model vegetable farm marketing its produce at the Vineland Auction. Cal-

[6] As stated in the text, the prices used with each model were based on prices observed at that type of market. The importance of price is illustrated by the fact that if the Roadside Market 1 operator was able to charge Roadside Market 2 prices his contribution to production cost would be $2,123 per acre, due to chance the same as that of the Farmers' Market. Similarly, the PYO's attractiveness would be enhanced if prices higher than those specified could be charged. But these higher prices do not appear to be generally obtainable at these types of markets.

Table 4. Annual Marketing Costs, Direct Marketing Alternatives, New Jersey, 1980.

Cost Item	Marketing Alternative			
	Roadside Market 1	Roadside Market 2	Farmers' Market	PYO
Building[a]	$ 2,043	$ 1,127	$ 1,368	-
Machinery & Equipment[b]	2,740	2,740	4,738	$ 2,410
Coolers & cases	972	826	-	-
Scales & cash registers	235	158	16	-
Containers	705	1,442	2,429	1,863
Advertising & Insurance	646	831	c	900
Taxes, utilities & other overhead	1,342	1,152	c	143
Labor & management	15,920	11,762	14,643	7,464
	$24,603	$20,038	$23,194	$12,780

[a] Includes rental fee and annual cost of plywood display platform in the case of the Farmers' Market.

[b] Includes fuel and lubrication.

[c] Included in rental fee.

Table 5. Marketing Costs and Contributions to Production Costs, Direct Marketing Alternatives, New Jersey, 1980.

	Marketing Alternative			
	Roadside Market 1	Roadside Market 2	Farmers' Market	PYO
Pounds of produce sold[a]	193,000	193,000	302,350	216,660
Revenue	$42,265	$67,067	$97,502	$73,330
Marketing cost	24,603	20,038	23,194	12,780
Contribution to production cost	17,662	47,029	74,308	60,550
Marketing cost per acre	1,230	1,002	663	365
Contribution to production cost per acre	883	2,351	2,123	1,730

[a] The roadside markets had equal acreages and were assumed to obtain the same yields.

culations were made for the cost of marketing six selected crops: cucumbers, eggplant, peppers, snap beans, squash, and tomatoes. Adjustments were made for lower state-wide average yields than are obtained in Cumberland County for cucumbers, eggplant, peppers, snap beans, and tomatoes. No state-wide yield data were available for squash, so Dhillon's estimate was used. Costs were also updated for 1980 prices of inputs. Investment in a truck and tractor and wagon for the wholesale operation would be similar to that of the Farmers' Market model. In addition, a washing-grading line would be required.

Wholesale marketing costs were budgeted for those activities necessary to replace direct marketing (Table 6). These were hauling the produce from the field, washing and packing, loading, and hauling to market. The cost of containers was the largest item of expense, followed by labor. A selling charge or commission of 3 percent of gross receipts is charged at the Vineland Auction.

The costs of wholesale marketing compared favorably with those of the direct marketing alternatives. The PYO operation had a marketing cost in the lower part of the range of the wholesale marketing costs, and the Farmers' Market had a marketing cost in the upper part of the range of the wholesale marketing costs. Both of the roadside markets had marketing costs higher than that of any of the wholesale crops.

With respect to contributions to production costs, however, wholesaling was generally less desirable than the direct marketing alternatives (Table 7). The exception was Roadside Market 1, which gave a lower contribution than four of the six wholesale crops. Except for squash, the PYO gave a higher contribution to production cost than wholesaling. The PYO operation ranked higher than wholesale marketing primarily because of the former's emphasis on strawberries, which has a high contribution to production costs. In addition, all wholesaling crops yielded lower contributions to production costs than Roadside Market 2 and the Farmers' Market.

Other wholesale marketing outlets appear even less attractive. They generally include a higher commission, such as the 15 percent commission charged at the Philadelphia Produce Center. This would add $250 to the cost of marketing an acre of cucumbers, for example. Whether hauling costs would be higher or lower for other wholesale outlets, in comparison with the Vineland example, would depend on the location of the farm. The net effect of these differences in marketing costs would, of course, depend on any differences in the prices received.[7]

CONCLUSIONS AND FURTHER CONSIDERATIONS

An attempt to compare vegetable marketing alternatives is a multifaceted undertaking involving many subjective factors. In addition, the facilities and equipment needed for each alternative differ, and the crops grown for one alternative may not be appropriate for another. These problems complicate making comparisons of marketing alternatives.

Consideration of marketing costs favors the PYO alternative. This results from the small investment in marketing equipment. Operating a service oriented roadside market that offers a substantial number of items bought for resale is the best from the standpoint of contribution to production costs. The Farmers' Market alternative compares favorably from both perspectives, whereas a basic roadside market focusing on homegrown produce was found to be the least attractive from both points of view.

Wholesale marketing of the crops budgeted appears to be generally less attractive than direct marketing, with the exception of a basic roadside market. Wholesale marketing may, however, represent a more certain market. Wholesaling also allows the operator to concentrate on farming and avoid dealing with consumers. In addition, wholesale vegetable farmers may raise one or more specialty crops, for which returns may be higher than for the crops budgeted in this study. The wholesale-retail marketing channel is also more convenient than direct marketing for many consumers.

Thus, the choice of marketing alternative will depend largely on what is best for the farmer's particular situation. No one alternative is clearly optimal. Some form of direct marketing may provide a higher return than wholesaling. Direct marketing may provide a way to utilize management talents in pricing and other aspects of merchandising to obtain greater returns. But not all farms are ideally located for a PYO or roadside market and a farmers' market may not be available. A PYO or roadside market can be opened, but customers may not come. At a farmers' market, each farmer is in direct competition with the others. Therefore, greater risks are likely to be associated with the possibly higher returns to direct marketing.

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[7] Putting the comparisons on a per pound of homegrown produce basis gives similar results. Roadside Market 1 and wholesale marketing offer low per pound contributions to production costs. The major difference is that on a per pound basis the PYO gives a slightly higher contribution than Roadside Market 2 or the Farmers' Market, which have similar per pound contributions to production costs.

Table 6. Wholesale Marketing Costs Per Acre for Six Vegetables, New Jersey, 1980

Operation	Crop					
	Cucumbers	Eggplant	Peppers	Snap Beans	Squash	Tomatoes
Hauling from field						
Machinery & Equipment	$ 11.52	$ 19.04	$ 8.52	$ 8.51	$ 15.03	$ 6.51
Skilled labor	10.83	17.90	8.01	8.48	14.13	6.12
Unskilled labor	25.19	41.61	18.62	--	32.85	14.24
Washing & packing						
Machinery & equipment	8.25	13.57	5.99	5.96	19.95	7.45
Unskilled labor	90.52	148.92	65.70	26.28	219.00	81.76
Loading						
Unskilled labor	5.48	9.49	4.02	3.29	7.30	5.11
Hauling to market[a]						
Machinery & equipment	56.30	93.84	40.22	24.13	80.43	53.62
Skilled labor	39.56	65.94	28.26	16.96	56.52	37.68
Containers	235.45	370.40	162.40	90.00	375.00	234.60
Management[b]	6.28	10.15	4.44	2.39	10.66	5.81
Selling charge[c]	17.34	28.72	12.55	6.55	31.16	14.87
General overhead[d]	62.66	59.03	36.30	23.98	90.00	50.92
Total	$569.38	$878.61	$395.03	$216.53	$952.03	$518.69

[a] Based on a round trip distance of 42 miles and a waiting time of 4.5 hours at the Vineland Auction.

[b] 7 percent of labor and machinery cost.

[c] 3 percent of gross receipts.

[d] 1.3 percent of all costs except management fee and selling charges.

Table 7. Wholesale Marketing Costs and Contributions to Production Costs Per Acre, New Jersey, 1980.

	Crop					
	Cucumbers	Eggplant	Peppers	Snap Beans	Squash	Tomatoes
Pounds of Produce sold	14,700	15,300	6,700	3,600	16,875	8,300
Revenue[a]	$2,089	$1,968	$1,210	$799	$3,000	$1,697
Marketing cost	569	879	395	217	952	519
Contribution to production cost	1,520	1,089	815	582	2,048	1,178

[a] Based on per box prices of produce.

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