Food Policy Institute
Publication Number: RR-0404-006.
March 2004

Returns to the Jersey Fresh Promotional Program

The Impacts of Promotional Expenditures on Farm Cash Receipts in New Jersey

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Acknowledgments

The authors wish to acknowledge several individuals who provided useful comments and guidance in the completion of this study. At the New Jersey Department of Agriculture, the valuable input of Secretary Charles Kuperus and Division of Marketing and Development Director Al Murray is especially noted. The constructive feedback of Margaret Brennan, Associate Director of the New Jersey Agricultural Experiment Station and Lou Cooperhouse, Director of the Food Innovation Research and Extension center is also greatly appreciated.

The authors also express their sincere appreciation for the capable research support provided by Dr. Benjamin Onyango, Dr. Edouard Mafoua, and Lucas Marxen at the Food Policy Institute.

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Executive Summary

In 1984, the Jersey Fresh program was implemented by the New Jersey Department of Agriculture and was the first state-funded marketing campaign for agricultural products produced in New Jersey. In an effort to spur demand for New Jersey farm products, this program was designed to increase consumer awareness of the state's agricultural products as well as to encourage food retailers to promote Jersey Fresh products.

With funding from the USDA's Federal-State Marketing Improvement Program, the New Jersey Department of Agriculture commissioned this study to determine the impact of Jersey Fresh promotion on farmer cash receipts in New Jersey. The econometric analysis was focused on the fruit and vegetable sectors, the primary commodity areas expected to benefit most directly from Jersey Fresh promotion.

Study results show that:

- For every dollar spent on the Jersey Fresh Promotional Program through 2000, New Jersey's agricultural fruit and vegetable sector revenues increased by $31.54 (2003 dollars).
- The additional economic activity created in the agricultural industry also had impacts on other parts of the economy, namely agricultural suppliers and service providers. In fact, each dollar spent on Jersey Fresh promotion resulted in an additional $22.95 of sales in agricultural support industries and other related industries.
- In total, each dollar spent on Jersey Fresh promotion resulted in $54.49 of increased economic output in the State.

Adjusting all dollars to 2003 levels, this means that the $1.16 million spent on the Jersey Fresh program in 2000 increased fruit and vegetable cash receipts by $36.6 million and created an additional $26.6 million in economic activity within agricultural support industries. The total statewide economic impact of the Jersey Fresh program was therefore an estimated $63.2 million.

The economic activity generated through Jersey Fresh promotion also impacts local, state, and federal taxes. An analysis of these tax impacts shows that New Jersey's State and local tax revenues increased by $2.2 million in 2000 due to the increased economic activity attributable to Jersey Fresh promotion. Comparing this return to the 2000 program budget of $1.16 million, the Jersey Fresh program appears to be better than revenue-neutral.

Introduction

Brand promotion is largely contingent upon some perceived differentiation among products. In the case of most agricultural products, however, such differentiation is difficult to achieve. Products grown by different farmers are largely undistinguishable. Opportunities for market expansion via brand promotion are therefore quite limited in the agricultural industry unless a farmer occupies a niche market or is differentiable on some other basis (i.e., service, quality, etc.). This, too, is uncommon in agriculture.

Much of agriculture is characterized by competitive markets. Individual farmers are typically incapable of influencing the prices they receive for products and are forced to sell goods at prices determined by the market. Collective promotion of farm products is a potential avenue for expanding markets for particular agricultural products, however, the requisite conditions for this form of promotion typically do not exist in New Jersey. New Jersey agriculture does not have dominant commodity areas within which farmers can formulate effective collective marketing strategies (e.g., constituting marketing cooperatives).

As summarized by Adelaja, Nayga and Schilling (1994), farming in New Jersey does offer advantages that facilitate collective multi-commodity promotion. For instance, New Jersey farmers have proximate access to a vast and affluent metropolitan consumer market within which demand for fresh, high quality farm products is relatively high. Such proximity is an advantage, vis-a-vis producers in other regions of the U.S. or nations, that New Jersey agriculture is capable of capitalizing upon. In recognition of the difficulties associated with a private sector-led mobilization

of farmers to engage in collective promotion (“free riders”, limited perception of opportunities for private gains, etc.), the New Jersey Department of Agriculture initiated the Jersey Fresh Program to promote farm products grown in the state. Along with the promotional program, a quality enhancement or standardization program designed to ensure brand quality was also implemented.

With funding from the USDA’s Federal-State Marketing Improvement Program, the New Jersey Department of Agriculture commissioned this study of the returns to the Jersey Fresh program. The focus of this study is to estimate the return to state expenditures on the Jersey Fresh program. Such an analysis encounters the same challenges faced by Adelaja, Nayga and Schilling in their 1994 study of the returns to Jersey Fresh, namely the selection of the appropriate methodology for evaluating return(s).

The Jersey Fresh Program

In 1984, the Jersey Fresh program was implemented by the New Jersey Department of Agriculture and was the first state-funded marketing campaign for agricultural products produced in New Jersey (Govindasamy et al., 1999; Govindasamy et al., 2001). In an effort to spur demand for New Jersey farm products, this program was designed to increase consumer awareness of the state’s agricultural products as well as to encourage food retailers to promote Jersey Fresh products in displays. The advertisement media utilized under the Jersey Fresh program comprised billboards, ads in newspapers and wholesale trade publications, radio commercials on New Jersey,

New York and Philadelphia stations, television commercials and a variety of other materials including pins, bumper stickers and the like. Private funds were also leveraged under the program by matching the promotional dollars of agricultural organizations seeking to promote specific commodities. In 1984, $50,000 in matching funds was allocated as part of the Jersey Fresh program (NJDA, 1985).

A key factor advanced by the Jersey Fresh program was the freshness and quality of New Jersey's farm products. Proximity to the major tri-state consumer markets helped ensure product freshness at the time of purchase (Govindasamy et al., 1996). Indeed, a Gallup poll in 1984 indicated that freshness was among the most important attributes motivating the purchase of farm products. Sixty percent of individuals surveyed felt that New Jersey farm products were superior to products from other states in terms of freshness while nearly two-thirds of those polled indicated that they would purchase farm products identified as New Jersey grown. Subsequent research by (Govindasamy et al., 1998[a]; Govindasamy et al., 1998[b]; Govindasamy et al., 1998[c]; Govindasamy et al., 1998[d]) documented both a high level of consumer awareness of the Jersey Fresh program, as well as a preference among consumers for produce grown in New Jersey.

Funding for the Jersey Fresh program in its first year was $325,000. As shown in Exhibit 1, funding increased to a level of $1.25 million in 1988 and 1989. Funding, however, declined dramatically over the next 3 years to a level of only $50,000. The 1994 study of the impacts of the Jersey Fresh program on agricultural cash receipts in New Jersey suggested high returns and led policy makers to restore funding of the Jersey Fresh program to its previous level. In 1993, the program's budget was restored

to $1.26 million and was maintained at this level through 1996. In 1997, the Jersey Fresh budget was reduced slightly to $1.16 million due to internal re-allocations of funds within the New Jersey Department of Agriculture. The budget again declined in 2001 to $1.02 million. In 2003, the program's budget was $826,000. Since the program's inception in 1984, the state has allocated a total of $18.1 million to support the Jersey Fresh program.

Table 1: Expenditures on the Jersey Fresh Program (1984-2003).

Year	Jersey Fresh Budget
1984	$325,000
1985	$625,000
1986	$875,000
1987	$1,125,000
1988	$1,275,000
1989	$1,275,000
1990	$825,000
1991	$125,000
1992	$50,000
1993	$300,000
1994	$1,260,000
1995	$1,260,000
1996	$1,260,000
1997	$1,160,000
1998	$1,160,000
1999	$1,160,000
2000	$1,160,000
2001	$1,016,000
2002	$1,016,000
2003	$826,000
Total (1984-2003)	**$18,078,000**

[a] The analysis in this study utilizes Jersey Fresh expenditure data for the 1984-2000 period due to the unavailability of more recent data for a number of dependent variables in the model.

Study Objectives

The purpose of this study is to examine the impacts of the Jersey Fresh program on the agricultural cash receipts of New Jersey farmers and the state in general. Specifically, the return on public expenditures on the Jersey Fresh program accruing to the fruit and vegetable sectors, the primary beneficiaries of the marketing program, will be estimated. The effects of this additional agricultural revenue on other supporting industries will also be estimated. It is anticipated that the results of this study will be useful to policy makers in assessing the benefit of and need for the Jersey Fresh program.

Empirical Model

Methods for estimating the returns to state agricultural promotion are not well established. The study team is unaware of any comparable studies in other states. Given that time series data is available on Jersey Fresh promotional program expenditures since its inception, the approach taken in this study is to estimate a Promotion Response Function (PRF) for New Jersey agriculture. The approach used in this study represents a refinement of the promotional response function developed by Adelaja et al. (1994) to estimate the impacts of the Jersey Fresh program on farm cash receipts. This methodology is used frequently for similar purposes (Kaiser et al., 1992; Kinnukan and Forker, 1986; Thompson and Eiler, 1975). Appropriate determinants of revenue include determinants of demand and supply and price determinants. Among the demand determinants previously used in similar studies are product price, demographics,

consumer income, price of competing commodities, and trend related variables. Supply determinants include prices of products competing for the same resources, technology proxy and commodity price.

Several different model specifications, based upon the most commonly used determinants of farm cash receipts in the literature, were developed and estimated in this research. In order to provide a more refined and accurate measure of the actual impact of state promotion on New Jersey farmers' sales, several revisions to the 1994 model were made. First, rather than measuring the impact of Jersey Fresh on all cash receipts, it was determined to be more appropriate to focus the analysis on only the fruit and vegetable sectors; the primary commodity groups believed to benefit from Jersey Fresh promotion. Second, to more fully explain variability in farm cash receipts, crop yields were "de-trended" in order to control for factors such as technological changes over time and provide a more pure estimate of the effect of Jersey Fresh promotion on farm sales. Third, the effects of price variability due to inflation were controlled by adjusting all dollars to 2000 dollars. Finally, variables for per capita fruit and vegetable consumption were added to control for the effects of trends in consumer demand for such products.

Models were developed defining three different dependent variables: total cash receipts in the fruit and vegetable sectors, cash receipts in the fruit sector only, and cash receipts in the vegetable sector only. The final models upon which the results of this study are based specify farm cash receipts (defined using each of the three different measures) as a function of real per capita income of New Jersey, real expenditures on the Jersey Fresh program, the aggregate price index for New Jersey farm commodities, the

aggregate price index for United States, real per capita consumption expenditures for United States residents, a dummy variable for the implementation of the Jersey Fresh program (defined as a zero prior to 1984 and one otherwise), U.S. per capita consumption of fruits, and U.S. per capita consumption of vegetables. Data were collected for the period from 1970 to 2000.

The cash receipts variables were constructed as composites of crop acreage, yield per acre, and unit price for the major fruits and vegetables in New Jersey in order to control for effects such as price fluctuation and technological change impacts.[1] This allowed for the estimation of several different dependent variable specifications, including:

(1) deflated commodity prices;

(2) deflated commodity prices and de-trended yields; and,

(3) deflated commodity prices and adjusted de-trended yields.

For all models, dollar values were deflated using the consumer price index (CPI) for Northeast urban consumers (all items) from Bureau of Labor Statistics. All values were deflated using a 2000 index for easier interpretation of results.

De-trending the yield eliminates the increase in yield due to technological improvements over time and captures true increase in production due to Jersey Fresh

[1] Fruits included in the fruit sector cash receipts composite are apple, blueberry, cranberry, peach, and strawberry. The vegetable sector comprises asparagus, cabbage, cucumber, eggplant, escarole, lettuce, pepper, snap bean, spinach, sweet corn, and tomato.

promotional program. Yields were de-trended using two different methodologies, as follows. Specification 2 ("de-trended yields") was derived as follows:

Consider the following equation,

$y_t^a = a + bt$ +e, (1)

where,

$y_t^a =$ actual non-de-trended crop yield

$y_t^T = a + bt$ is the trended crop yield (2)

$e = y_t^D =$ random component or de-trended crop yield (3)

From (1), (2) and (3) we can derive

$y_t^a = y_t^T + y_t^D$ (4)

Since the residual e may be positive or negative, from (1)

$y_t^a - bt = a + e = y_t^D$

One can estimate de-trended crop yield as

Model 1: $y_t^D = y_t^a - bt$ or (5)

Model 2: $y_t^D = a + e$ (6)

Specification 3 (“adjusted de-trended yield”) was derived as follows. Adjusted de-trended is calculated as: de-trended yield plus actual yield average minus de-trended yield average. Therefore, adjusted de-trended yield can be calculated as:

$$y_t^{AD} = y_t^D + (\overline{y_t^a} - \overline{y_t^D}) \quad (7)$$

Adjusted de-trended values more accurately eliminates increases in yield due to technological factors and better isolates the impact of Jersey Fresh promotional program. The results from all three models are presented for comparison.

Data and Estimation

Data were collected from various sources. Per capita income of New Jersey residents was collected from Bureau of Economic Analysis of U.S. Department of Commerce. Jersey Fresh budget information was collected from New Jersey Agricultural yearbooks. Since New Jersey price index is not readily available, the index was calculated as the Thornquist-Theil index of all community prices. The data pertaining to U.S. price index of farm commodities and U.S. per capita expenditure were obtained from Bureau of Labor Statistics of US Department of Labor. U.S. per capita consumption of fruits and vegetables were collected from Economic Research Service of United States Department of Agriculture.

An ordinary least squares model (OLS) was used to estimate the results, assuming a linear relationship between cash receipts and its determinants as:

$$X_i = \alpha_0 + \alpha_1 \text{DPCAPITAY} + \alpha_2 \text{DJFBUDGET} + \alpha_3 \text{NJPRIC} + \alpha_4 \text{USPRICES} + \alpha_5 \text{DUSPCEXPND} + \alpha_6 \text{JFDUMMY} + \alpha_7 \text{PCC\_FRUITS} + \alpha_8 \text{PCC\_VEG} + U; \quad (8)$$

Where i = 1 to 9.

Where,

X_1 is deflated actual revenue of vegetables (dollars),

X_2 is deflated actual revenue of fruits (dollars),

X_3 is deflated actual revenue of fruits and vegetables (dollars),

X_4 is deflated detrended revenue of vegetables (dollars),

X_5 is deflated detrended revenue of fruits (dollars),

X_6 is deflated detrended revenue of fruits and vegetables (dollars),

X_7 is deflated adjusted revenue of vegetables (dollars),

X_8 is deflated adjusted revenue of fruits (dollars),

X_9 is deflated adjusted revenue of fruits and vegetables (dollars),

DPCAPITAY is the deflated per capita income of New Jersey (dollars),

DJFBUDGET is deflated expenditure on the Jersey Fresh program (dollars),

NJPRIC is the aggregate price index for New Jersey farm commodities,

USPRICES is the aggregate price index for United States,

DUSPCEXPND is deflated per capita consumption expenditure of Unites States (dollars),

JFDUMMY is a dummy variable defined as a zero prior to 1984 and one otherwise,

PCC_FRUITS is U.S. per capita consumption of fruits (lbs.) and

PCC_VEG is U.S. per capita consumption of vegetables (lbs.).

The intercept term is represented by α_0 while other coefficients are represented as α_1 through α_8. The error term is represented by U and is assumed to be normally and independently distributed with a mean of zero and constant variance. The coefficient for JFBUDGET (α_2) provides the marginal impact of a Jersey Fresh Program dollar on cash receipts of New Jersey farmers.

Study Results

The estimation results for each of the 9 models are presented in Tables 2, 3, and 4. The interpretation of findings will focus on the results of the "deflated, adjusted de-trended" promotion response function models estimated for the (1) fruit and vegetable sectors, (2) fruit sector, and (3) vegetable sector.

The Fruit and Vegetable Model

The estimation results of the promotion response function for the combined fruit and vegetable sectors are presented in Table 2. The adjusted R-square for the deflated, adjusted de-trended model is 0.9281. The adjusted R-squares for deflated and deflated/de-trended models are 0.8814 and 0.922, respectively. All three models are significant at 1%, which indicates that collectively the independent variables significantly explain the variation in fruit and vegetable cash receipts. In the case of the deflated model, DPCAPITAY is significant at 5% and DJBUDJET is also significant at the 5% level. In the case of deflated/de-trended model, DPCAPITAY is significant at the 10% level, while DJBUDGET and JFDUMMY are significant at the 5% level. In the case

of the deflated adjusted de-trended model, DPCAPITAY, DUSPCEXPND and PCC_VEG are significant at 10% level. DJBUDGET and JFFUMMY are significant at 5% level.

Table 2: Promotion Response Function Model Coefficients for Fruits and Vegetables.

Variables	Parameter Estimates		
	Deflated	Deflated De-trended	Deflated adjusted De-trended
INTERCEPT	780822119***	798387086***	91224098***
DPCAPITAY	-12564**	-11915*	-11733*
DJBUDGET	26.66**	25.37**	29.10**
NJPRIC	-142733	-196008	-192550
USPRICES	143311	80796	103552
DUSPCEXPND	46353	43592	50932*
JFDUMMY	-38604628	-50338356**	-52461551**
PCC_FRUITS	-1586883	-1939063	-2057551
PCC_VEG	-1354405	-1117451	-1823560*

* Variables are statistically significant at the 10 percent level.
** Variables are statistically significant at the 5 percent level.
*** Variables are statistically significant at the 1 percent level.

The Fruit Model

The estimation results of the promotion response function for the fruit sector are presented in Table 3. The adjusted R-square for the deflated adjusted de-trended model is 0.758. The adjusted R-squares for deflated and deflated/de-trended models are 0.5522 and 0.735, respectively. All three models are significant at 1%, which indicates that the independent variables significantly explain the variation in fruit cash receipts. In the deflated and deflated/de-trended models, PCC_VEG is significant at the 10% level and in the deflated adjusted de-trended model PCC_VEG is significant at the 5% level.

Table 3: Promotion Response Function Model Coefficients for Fruits.

Variables	Parameter Estimates		
	Deflated	Deflated De-trended	Deflated adjusted De-trended
INTERCEPT	360677728***	391525485***	438201133***
DPCAPITAY	-5966.04	-5897.59	-5769.61
DJBUDGET	2.01	2.36	3.41
NJPRIC	37196	19395	27308
USPRICES	47585	1966.79	14275
DUSPCEXPND	24620	27924	24904
JFDUMMY	2932906	-3191113	-28644414
PCC_FRUITS	-249265	-584876	-502217
PCC_VEG	-1225368*	-1190350*	-1409493**

* Variables are statistically significant at the 10 percent level.
** Variables are statistically significant at the 5 percent level.
*** Variables are statistically significant at the 1 percent level.

The Vegetable Model

The estimation results of the promotion response function for the vegetable sector are presented in Table 4. The adjusted R-square for the deflated adjusted de-trended model is 0.9505. The adjusted R-squares for the deflated and deflated/de-trended models are 0.9249 and 0.9451, respectively. All three models are significant at 1%, which indicates that the independent variables collectively significantly explain the variation in vegetable cash receipts. In the case of the deflated model, DPCAPITAY, NJPRIC and USPRICES are significant at the 10% level. DJBUDJET and JFDUMMY are significant at the 1% level. In the case of the deflated/de-trended model, USPRICES became insignificant but NJPRIC became significant at 5%. In the case of the deflated adjusted de-trended model, all variables are significant except PCC_VEG. DPCAPITAY, USPRICES, DUSPCEXPND and PCC_FRUITS are significant at the 10% level. NJPRIC is significant at the 5% level. DJBUDGET and JFFUMMY are significant at the 1% level.

Table 4: Promotion Response Function Model Coefficients for Vegetables.

Variables	Parameter Estimates		
	Deflated	Deflated De-trended	Deflated adjusted De-trended
INTERCEPT	420144392***	406861600***	474092965***
DPCAPITAY	-6598.22*	-6017.27*	-5963.68*
DJBUDGET	24.65***	23.01***	25.69***
NJPRIC	-179929*	-215402**	-219858**
USPRICES	95726*	78829	89277*
DUSPCEXPND	21733	15668	26028*
JFDUMMY	-41537534***	-47147243***	-49597137***
PCC_FRUITS	-1337618	-1354188	-1555334*
PCC_VEG	-129037	72899	-414067

* Variables are statistically significant at the 10 percent level.
** Variables are statistically significant at the 5 percent level.
*** Variables are statistically significant at the 1 percent level.

Interpretation of Findings

Impact of the Jersey Fresh Program on Farm Cash Receipts

The variable of interest in the promotion response function is DJBUDGET. The parameter coefficient for this variable demonstrates the impact of a dollar spent on promotion via the Jersey Fresh program on the cash receipts of New Jersey farmers. The models estimated in this study indicate that for every dollar the state spent on the Jersey Fresh Program between 1984 and 2000, cash receipts in the fruit and vegetable sectors were increased by $29.10 (in 2000 dollars). Adjusting this figure by the Consumer Price Index to 2003 dollars suggests that the return to Jersey Fresh promotion in 2003 was $31.54 for each dollar spent on the program. This means that in 2000, the $1.16 million spent on the Jersey Fresh program increased fruit and vegetable cash receipts by an estimated $36.6 million in current dollars.[2]

[2] The econometric model estimated the returns to Jersey Fresh promotion through 2000. To facilitate the discussion and interpretation of findings, all impact figures were adjusted to 2003 levels using the consumer price index for urban residents. Economic data in the following sections are in 2003 dollars.

The results of the promotion response functions estimated for the fruit sector and vegetable sector (individually) suggest that the benefits of Jersey Fresh program are accruing disproportionately to New Jersey vegetable producers. Each dollar spent on Jersey Fresh promotion enhanced vegetable sector revenues by an estimated $25.69 (2000 dollars). Fruit revenues were similarly enhanced, but by only $3.41 (2000 dollars) per promotional dollar. Adjusted to 2003 dollars, the returns to the fruit and vegetable sectors were $3.70 and $27.84, respectively.

Impact of the Jersey Fresh Program Outside of Agriculture

The benefits of the Jersey Fresh program do not accrue entirely to New Jersey farmers. Agriculture provides many pecuniary as well as non-pecuniary benefits. For instance, farmland offers state residents highly valued open space, air and water recharge areas, wildlife habitat, recreational opportunities, pastoral scenery, and a host of other rural amenities. In addition, there are important cultural and lifestyle aspects of farming. From a fiscal standpoint, agriculture encourages economic diversity and is widely viewed as a good tax ratable. Thus, policy actions that contribute to the retention of farms also benefit non-farm residents. In light of the historic decline in New Jersey agriculture and the diminished profitability characterizing many New Jersey farms today, the Jersey Fresh program is a critical mechanism for sustaining agriculture in New Jersey and ensuring the continuation of the economic and non-economic benefits it confers to the state and its residents.

From an economic standpoint, agriculture is also integrally linked with many other industries. As output expands in the farm sector, other supporting industries

similarly experience a “rising tide” effect. The expansion in sales revenues attributed to Jersey Fresh program therefore has ripple effects that extend throughout the New Jersey economy. Economic impact analysis allows for the quantification of these effects.

Economic impact analysis involves the examination of changes in output, value-added, or employment that occur in a region’s industries as a result of an event occurring within the region. Such studies provide generalized estimations of economic inter-relationships and dependencies and are useful for examining the effects of changes in one industry on other industries. Such analysis requires the development of economic factors (called multipliers) that reflect the infusion of dollars into a region based on the direct introduction of new dollars and the re-spending of those dollars by employees and industries and by reallocation of tax dollars. Multipliers in this analysis were generated using IMPLAN Professional® Version 2.0, a widely used input-output modeling system.

Economic multiplier effects may be decomposed into both indirect and induced economic effects. *Indirect impacts* represent the response by all industries within New Jersey to output changes in a single industry (in this case, the agricultural industry). Industries producing goods and services utilized by the farm sector expand their output as demand for such goods and services grows with farm output. Industries supporting these farm support industries also face increased demand for their goods and services, and so forth. These backward linkages continue until leakages (imports, wages, profits, etc.) stop the cycle. *Induced impacts* represent the change in household spending due to the changes in production within the agricultural industry and supporting industries.

IMPLAN analysis shows that for every $1 dollar of output in the New Jersey fruit and vegetable sector, an additional $0.728 of sales are created through indirect and induced activity within other New Jersey industries. As mentioned in the previous section, the results of the econometric model show that through the 2000 promotion year, every $1 dollar in Jersey Fresh expenditures increased New Jersey's agricultural fruit and vegetable sector revenues by an average of $31.54 (2003 dollars). Therefore, as a result of Jersey Fresh promotion (and the ensuing increase in farm sales), multiplier analysis suggests that an additional $22.95 of revenues in other industries is realized through indirect and induced activity for each dollar of Jersey Fresh expenditure. Thus, for every $1 dollar in Jersey Fresh expenditures through 2000, total New Jersey economic activity (output) increased by $54.49.

The 2000 Jersey Fresh budget of $1.16 million generated an estimated $36.6 million in additional revenue for New Jersey fruit and vegetable farmers and an additional $26.6 million in other industries through indirect and induced effects. Overall, the Jersey Fresh promotional program was therefore responsible for $63.2 million worth of economic activity in New Jersey. Table 5 shows the New Jersey industries most impacted by Jersey Fresh promotion activity. Of course the fruit and vegetable sector itself is the number one impacted industry, because of the direct impact on sales ($36.6 million). The second largest total impact is on the wholesale trade industry ($3.8 million). New Jersey real estate industry, the third most impacted, saw an additional $1.5 million in sales due to Jersey Fresh promotion.

Not surprisingly, other industries significantly impacted by the sales expansion created by Jersey Fresh include agricultural service firms (providers of soil preparation, crop planting, crop harvesting, management, and other services to farms), container manufacturers, and transporters and warehousers. Medical and dental service providers also benefit considerably from Jersey Fresh promotion due to the household spending effects ("induced impacts") associated with the economy wide economic activity created by the Jersey Fresh program.

Table 5: Impacts of Jersey Fresh Promotion on New Jersey Industries.

Industry Sector	Direct Impact ($)	Indirect Impact ($)	Induced Impact ($)	Total Impact ($)
Fruits and Vegetables	36,585,956	57,708	12,365	36,656,028
Wholesale Trade	0	3,126,402	739,216	3,865,619
Real Estate	0	982,366	551,325	1,533,691
Petroleum Refining	0	1,257,566	232,946	1,490,512
Owner-occupied Dwellings	0	0	1,142,404	1,142,404
Agricultural, Forestry, Fishery Services	0	1,051,341	953	1,052,294
Paperboard Containers and Boxes	0	1,006,502	23,844	1,030,346
Motor Freight Transport and Warehousing	0	817,444	191,575	1,009,019
Hospitals	0	87	738,504	738,590
Doctors and Dentists	0	0	708,067	708,067
All Other Industries	0	4,474,019	9,504,041	13,978,061
Total	**36,585,956**	**12,773,435**	**13,845,239**	**63,204,630**

* Impact figures adjusted to 2003 dollars.

Impact of the Jersey Fresh Program on Public Sector Revenues

The expanded economic activity generated through Jersey Fresh promotion impacts local, state, and federal taxes. An analysis of tax impacts shows that New Jersey State and local tax revenues increased by $2.2 million in 2000 due to the increased economic activity attributable to Jersey Fresh promotion. Comparing this return to the 2000 program budget of $1.16 million, the Jersey Fresh program appears to be better than revenue-neutral.

Conclusion

The Jersey Fresh program was introduced by the state in 1984 in an effort to expand consumer awareness and purchases of New Jersey farm commodities. This study suggests that the Jersey Fresh campaign has provided, and continues to provide, substantial economic benefits to farmers in the state. In addition, the increased farm output attributable to Jersey Fresh promotion has significant economic impacts in other segments of the New Jersey economy.

Results from an econometrically estimated promotion response function suggest that through 2000, each dollar invested in Jersey Fresh promotion raised the revenues of fruit and vegetable farmers by $31.54 (current dollars). This increased sales volume had ripple effects in other industries in the amount of $22.95 per dollar spent on Jersey Fresh, for a total return to promotion of $54.49 per dollar spent. At the 2000 funding level of $1.16 million, this means that Jersey Fresh raised fruit and vegetable revenues by a total of $36.6 million and created revenues of $26.6 million in supporting industries. The total impact on the New Jersey economy is therefore on the order of $63.2 billion. Analysis of tax impacts suggests that the Jersey Fresh program is better than revenue-neutral.

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