An Analysis of Household Consumption of Fresh Potatoes in Delaware

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Introduction

During the past three decades, there has been a concerted effort to increase the consumption of potatoes throughout the United States. This effort initially began with an attempt to improve the once negative perception that consumers had about potatoes. The National Potato Marketing Research and Promotion Act, in 1971, created the National Potato Board, which adopted a nutrition advertising, merchandising, and public relations strategy to combat misconceptions about potatoes (Kolasa and Marks, 1994). The assumption of the National Potato Board was that, if the public were better informed about the nutritional content of potatoes, producers would be able to sell more potatoes to consumers. More specifically, the public relations agency of the National Potato Board believed that, if the public image of the potato could be changed from a high-calorie, relatively non-nutritious food to a relatively low-calorie food with other nutritional benefits, a major barrier to increased potato consumption would be eliminated (Kolasa and Marks, 1994)

It is important for Delaware potato producers to remain aware of the changing attitudes and preferences that Delaware consumers have regarding their fresh potatoes. To assist in this effort, the Department of Food and Resource Economics, University of Delaware, and the Delaware Potato Board jointly conducted a mail survey of Delaware households in regard to their purchasing habits, current attitudes, and future consumption of fresh potatoes. Because the focus of this analysis is fresh potato consumption, it is important to clarify the definition of a fresh potato. A fresh potato is any potato that makes it to the market without being processed in any way; any potato that is used in its fresh capacity or in its original form when it gets to the market; fresh potatoes can be from storage.

Objectives

The overall objective of this analysis is to determine what factors influence the patterns of fresh potato purchases by Delaware consumers. Specific objectives are:

- to determine Delaware consumers' level of satisfaction with fresh potatoes;
- to determine how the different uses of fresh potatoes impact consumers' purchases;
- to determine the impact of nutritional value on fresh potato purchases;
- to utilize demographic variables to further analyze purchasing patterns; and
- to make recommendations to Delaware potato producers based on the above findings.

Data and Demographic Profile

A mail survey was sent to 4,000 randomly selected Delaware households, with the first mailing sent in September 1998 and the second mailing sent in October 1998. The Delaware residents were randomly selected through a commercially purchased mailing list (Byrne and Toensmeyer, 1993). The surveys were divided by counties according to their proportion to the population base of the entire state. A total of 550 usable surveys were returned—a 13.7 percent response rate.

In order to understand the purchasing habits of the Delaware consumers who consume fresh potatoes, demographic data was collected. With respect to age, 15.1 percent of the respondents were between the ages of 18 and 34; 37.1 percent were between the ages of 35 and 49; 27.5 percent were between the ages of 50 and 64; and the remaining 20.3 percent were 65 years of age or older. With respect to gender, 72.8 percent of the

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respondents were female, and 27.2 percent were male. In terms of race, 92 percent of the respondents were White/Caucasian; 4.6 percent were Black/African-American; 1.5 percent were Asian/Pacific Islander; 0.5 percent were American Indian; 0.3 percent were Hispanic; and 1.1 percent considered themselves of other descent.

With regard to educational level, 24.2 percent of the respondents had a high school diploma or less; 34.5 percent had experienced some college or attained a technical degree; and 41.3 percent had either a college or a post-graduate degree. As for total household income, 7.4 percent of the respondents grossed $14,999 or less; 9.7 percent grossed between $15,000 and $24,999; 32.6 percent of the respondents grossed $25,000 to $49,999; 24 percent grossed between $50,000 and $74,999; and 26.3 percent grossed $75,000 or more.

Of the 550 surveys returned, 65.8 percent were from New Castle County; 14 percent were from Kent County; and 20.2 percent were from Sussex County. As for the residential area in which the respondent lived, 14.1 percent lived in a rural area; 55.4 percent considered the area in which they lived to be suburban; 13.3 percent lived in a city; and 17.2 percent of the respondents lived in a small town.

Survey Results

The respondents were asked to report how often they purchased fresh potatoes at selected outlets. The most popular outlet where fresh potatoes were purchased was the supermarket with 494 responses, followed by the roadside stand, wholesale club, and convenience store with 85, 32, and 11 total responses, respectively. Of those respondents who purchase fresh potatoes at the supermarket, 44.5 percent buy them monthly; 35.5 percent buy them every two weeks; 16.8 percent buy them weekly; and 3.2 percent buy them twice a week. For the respondents who purchase fresh potatoes at a wholesale club, 81.3 percent buy them monthly; 15.6 percent buy them every two weeks; and 3.1 percent buy them weekly. Of the respondents who purchase their fresh potatoes at a convenience store, 9 percent buy them monthly; 36.5 percent buy them every two weeks; 45.5 percent buy them weekly; and 9 percent buy them twice a week. As for the roadside stand, 60 percent of the respondents buy them monthly; 23.5 percent buy them every two weeks; 13 percent buy them weekly; and 3.5 percent buy them twice a week. When the respondents were asked to explain some of the other outlets at which they purchased fresh potatoes, the responses included produce store, farmer's market, Amish market, military commissary, and potato farm.

Size and Important Influences on the Size of Fresh Potatoes Purchased

Respondents were asked to rank the size of the bag in which they had purchased fresh potatoes most often during the past two months. Of the sizes ranked number one, 43.1 percent were for the 5-pound bag; 32.1 percent were for the loose form; 11.2 percent were for the 10-pound bag; 4.1 percent were for the 1–2-pound bag; 2.9 percent were for the 3-pound bag; and the other sizes received minimal first rankings (Table 1).

Table 1. Size of Fresh Potatoes Purchased Most Often by Survey Respondents, Delaware, 1998.

Size (of Bag)	Percent Ranking Number One
5-lb. Bag	43.1
Loose (Poundage)	32.1
10-lb. Bag	11.2
1–2-lb. Bag	4.1
3-lb. Bag	2.9
50-lb. Bag	1.8
Bulk	1.8
20-lb. Bag	1.4
8-lb. Bag	0.4
Other	0.4
Tray of Potatoes	0.4
Bushel/Half Bushel	0.2
4-lb. Bag	0.2
Total	100.0

Source: Consumer Survey and Calculations.

Issues Concerning the Delaware Local Region

The respondents were asked if they preferred fresh potatoes that are grown in any particular state. Of the 530 responses, 70 percent of the respondents did not have a preference whereas 30 percent of the respondents did (Table 2). Of the respondents who had a preference for the state in which their fresh potatoes were grown, 61 percent preferred potatoes grown in Idaho; followed by 24.5 percent who preferred potatoes grown in Delaware; 8.6 percent who preferred potatoes grown in Maine; and 2 percent who preferred potatoes grown in New Jersey. The other preferred states totaled 3.9 percent of the responses collectively (Table 3). This low preference for a state identity raises questions as to whether local promotion is of any value.

Table 2. Consumer Preference for Fresh Potatoes Grown in a Particular State, Delaware, 1998.

	Number of Responses	Percent
Respondents who do *not* have a preference	371	70.0
Respondents who have a preference	159	30.0
Total	530	100.0

Source: Consumer Survey and Calculations.

Table 3. States Most Preferred by Consumers With a Preference, Delaware, 1998.

State	Number of Responses	Percent
Idaho	100	61.0
Delaware	40	24.5
Maine	14	8.6
New Jersey	3	2.0
Other States	6	3.9
Total	163	100.0

Source: Consumer Survey and Calculations.

Participants were asked if they had seen or heard of the "Delaware Agricultural Products" logo on products, on packages, or in advertising. The results show that 77.5 percent of the respondents had not seen or heard of the logo; 22.5 percent indicated that they had seen or heard of the logo (Table 4).

Table 4. Consumer Familiarity With the "Delaware Agriculture Products" Logo on Packages, Products, or Advertisements, Delaware, 1998.

	Number of Responses	Percent
Respondents who had *not* seen or heard of the logo	404	77.5
Respondents who had seen or heard of the logo	117	22.5
Total	521	100.0

Source: Consumer Survey and Calculations.

The participants who were aware of the logo were asked to specify where they had seen or heard of it. The majority (41.7 percent of the responses) of those who had seen the logo had seen it on agricultural products, followed by 25 percent of the respondents who indicated that they had seen the logo at the grocery store/produce stand. Television accounted for 19.4 percent of the responses; billboards, posters, and highway signs totaled 5.5 percent of the responses; and radio and newspaper each totaled 4.5 percent of the responses (Table 5).

Table 5. "Delaware Logo" Seen or Heard by Respondents, Delaware, 1998.

	Number of Responses	Percent
Agriculture Products	30	41.7
GroceryStore/Produce Stand	18	25.0
TV	14	19.4
Billboard, Poster, or Highway Sign	4	5.5
Radio	3	4.2
Newspaper	3	4.2
Total	72	100.0

Source: Consumer Survey and Calculations.

Respondents were asked whether they would show preference toward the product if they had seen the "Delaware Agriculture Products" logo, assuming that price, quality, etc. were comparable. The results showed that 78.8 percent would show preference; 6 percent would not show preference; and 15.1 percent did not know whether they would show preference toward the logo (Table 6). The responses indicate that a joint effort between the Department of Agriculture and the Delaware Potato Board to promote the use of the Delaware Logo might be useful.

Table 6. Consumer Preference for Products With the "Delaware Logo," Assuming Prices, Quality, and Other Characteristics Are Comparable, Delaware, 1998.

	Number of Responses	Percent
Would show preference	406	78.8
Would *not* show preference	31	6.0
Don't Know	78	15.1
Total	515	100.0

Source: Consumer Survey and Calculations.

Varieties of Fresh Potatoes

The participants of the survey were asked to specify their favorite variety and favorite brand of fresh potatoes, and if they did not have a favorite, they were instructed to write "none." About 50 percent of the respondents did not have a favorite variety; 27.3 percent selected the red variety; 13.6 percent selected the russet variety; 4.3 percent chose white as their favorite; 3.1 percent selected yukon gold; and 1.5 percent chose yellow as their favorite variety. In terms of favorite brand, 79 percent of the respondents did not have a favorite brand of fresh potatoes; 7.8 percent selected Idaho potatoes; 7 percent selected store brand; 4.4 percent selected Green Giant; and others brands received minimal responses. These numbers are not surprising since potatoes are receiving more national attention via advertising. Delaware potatoes have a limited availability from July through September. Thus, it would be difficult for Delaware consumers to remember local brands. Thus, the logo would be a better alternative.

Consumption Patterns and Age Group Influences on Fresh Potato Purchases

The respondents were asked to rank the age groups within the household that has the most influence on their fresh potato purchases. The 35–44 age group received the most first rankings with 22.7 percent, followed by the 45–54 range with 19.8 percent, the 55–64 age group with 17.2 percent, and the 65–75 range with 16.6 percent of the responses (Table 7). The 35–54 age group is interested in convenience; thus, it is important to emphasize value-added potato products that meet this need.

Table 7. Age Groups Within the Household That Have the Most Influence on Consumer Purchases of Fresh Potatoes, Delaware, 1998.

Age Groups	Percent Receiving a *First* Ranking
4 and Under	1.2
5–14	2.8
15–24	3.4
25–34	13.2
35–44	22.7
45–54	19.8
55–64	17.2
65–75	16.6
75 and Older	3.1
Total	100.0

Source: Consumer Survey and Calculations.

When the respondents were asked whether there had been any changes in the quantity of fresh potatoes in the past five years, 57 percent of the respondents stated that there had been no change; 27.3 percent stated that they had been purchasing less; and 15.7 percent stated that they had been purchasing more (Table 8).

Table 8. Fresh Potato Consumption Patterns of Respondents During the Past Five Years, Delaware, 1998.

	Number of Responses	Percent
No Change	300	57.0
Consumer Purchasing Less	144	27.3
Consumer Purchasing More	83	15.7
Total	527	100.0

Source: Consumer Survey and Calculations.

Some of the most important reasons that respondents gave for purchasing more fresh potatoes were that fresh potatoes can be used in many ways; fresh potatoes keep well; age of household members; and price, with 25.4 percent, 18.3 percent, 13.7 percent, and 12 percent of the responses, respectively (Table 9).

Table 9. Most Important Reasons That Respondents Purchased More Fresh Potatoes in the Past Five Years, Delaware, 1998.

Reasons	Number of Responses	Percent
Can Be Used in Many Ways	55	25.4
Keep Well	40	18.3
Household Age	30	13.7
Price	26	12.0
Other	22	10.0
Increased Availability	16	7.3
Improved Quality	15	6.9
Storage Space	14	6.4
Total	218.0	100.0

Source: Consumer Survey and Calculations.

For the respondents who were purchasing less fresh potatoes in the past five years, household size, followed by household age, use of non-potato substitutes, use of potato substitutes, and storage space were the most important reasons, with 38 percent, 11.6 percent, 11 percent, 8.5 percent, and 7.9 percent of the responses, respectively (Table 10). Of the 487 responses to the question about how future levels of fresh potato purchases will change, 71.7 percent anticipate that their purchasing level will remain the same; 16.2 percent anticipate that their purchasing level will increase; and 12.1 percent anticipate that their purchasing level will decrease (Table 11).

Table 10. Most Important Reasons for Respondents Purchasing Less Fresh Potatoes in the Past Five Years, Delaware, 1998.

Reasons	Number of Responses	Percent
Household Size	111	38.0
Age of Household Members	34	11.6
Use of Non-Potato Substitutes	32	11.0
Use of Potato Substitutes	25	8.5
Storage Space	23	7.9
Other	23	7.9
Price	14	5.0
Poorer Quality	13	4.4
Nutritional Value	8	2.7
Can Be Used in Too Few Ways	5	1.7
Lack of Availability	4	1.3
Total	292	100.0

Source: Consumer Survey and Calculations.

Table 11. Anticipation of Household Level of Fresh Potato Consumption in the Next Five Years, Delaware, 1998.

Consumption Level	Number of Responses	Percent
Will Remain the Same	349	71.7
Will Increase	79	16.2
Will Decrease	59	12.1
Total	487	100.0

Source: Consumer Survey and Calculation.

The participants of the survey were asked about their present eating habits versus their eating habits of a year prior to the survey and were given different types of potato forms from which to select. Of the respondents eating more at the time of the survey than they were a year before, 50 percent ate more fresh potatoes; 17.7 percent ate more potato chips; 16.5 percent ate more frozen potatoes; 12 percent ate more dehydrated potatoes; and 3.8 percent ate more canned potatoes.

Consumer Opinions Toward Quality of Fresh Potatoes

Participants were asked to rank what they felt were the best indicators of good quality for fresh potatoes. Of the responses receiving a first ranking, no bruises was the best indicator, with 37.5 percent of the total responses; followed by firmness, with 21.5 percent; size, with 8.5 percent; state in which potatoes were grown, 7.5 percent; smell, with 5.2 percent of the responses; selected price, with 4.9 percent; and shape, color, grower recognition, variety name, and packer recognition, with 4.7 percent, 3.8 percent, 1.7 percent, and 0.6 percent of the responses, respectively (Table 12).

Table 12. Consumer Rankings of the Best Indicators of Good Quality for Fresh Potatoes, Delaware, 1998.

Indicators	Percent Receiving a *First* Ranking
No Bruises	37.5
Firmness	21.5
Size	8.5
State in Which Potatoes Were Grown	7.5
Smell	5.2
Price	4.9
Shape	4.7
Color	4.1
Grower Recognition	3.8
Variety Name	1.7
Packer Recognition	0.6
Total	100.0

Source: Consumer Survey and Calculations.

Respondents were given different attributes about fresh potatoes that they find at their favorite store and were asked to give a rating, with a high rating relating to the positive attribute and the low rating relating to the negative attribute. The results were that more than 80 percent of the respondents gave a high rating for firmness and non-rotten potatoes (Table 13). More than 50 percent of the respondents gave an average rating for size and a high rating for potatoes with no cuts. The responses receiving a high rating for no blemishes and clean potatoes totaled 45.4 percent and 49 percent, respectively. Almost 55 percent of the respondents gave a high rating for their fresh potatoes having few eyes and being new to the market, while 44.4 percent gave an average rating for their fresh potatoes varying in size.

Table 13. Consumer Ratings of the Quality of the Fresh Potatoes That They Purchase, Delaware, 1998.

Characteristic	Poor Rating (1 or 2)	Average Rating (3)	High Rating (4 or 5)	% Total
		%		
Soft vs. Firm	2.5	14.8	82.7	100.0
Rotten vs. Not Rotten	8.8	10.1	81.1	100.0
Small vs. Large	10.3	52.3	37.4	100.0
Cuts vs. No Cuts	14.2	30.1	55.7	100.0
Blemishes vs. No Blemishes	15.7	38.9	45.4	100.0
Dirt vs. Clean (Washed)	20.5	30.5	49.0	100.0
Too Many Eyes vs. Few Eyes	16.0	29.1	54.9	100.0
Variety in Size vs. All Same Size	19.8	44.4	35.8	100.0
Old vs. New Potatoes	12.8	32.5	54.7	100.0

Source: Consumer Survey and Calculations.

The present grading system allows for a variety of sizes in a given package; this seems to be a problem with consumers and rightly so. If you purchase a 5-pound bag of fresh potatoes and then expect to use them for baking, you would assume that the potatoes were the same size. However, this is not the case in the present grading system; thus, consumers are frustrated.

Issues Involving Storage of Fresh Potatoes

When the respondents were asked to specify the problems that they encountered after the fresh potatoes were brought home, 29.8 percent stated a problem with sprouting; 25 percent said potatoes get soft; 16.2 percent had problems with rotting; 15.1 percent did not encounter any problems; 10.6 percent had problems with dirt; and 2.6 percent had baking or boiling problems (Table 14). In terms of being able to satisfactorily store fresh potatoes over time in the home, 38.3 percent stated they could store them for two weeks; 31.5 percent said thy could store them for three weeks; 18.5 percent said they could store them for four weeks or more; and 10 percent stated that they could store them for one week. Additionally, data in the survey showed that consumers still consider the area under the kitchen sink to be the best place to store fresh potatoes.

Table 14. Problems That Consumers Encounter After Fresh Potatoes Are Brought Home, Delaware, 1998.

Problems	Percent
Sprouts	29.8
Potatoes Get Soft	25.0
Potatoes Rot	16.2
None	15.1
Dirt	10.6
Do Not Bake/Boil Well	2.6
Other	0.7
Total	100.0

Source: Consumer Survey and Calculations.

Issues, Attitudes, and Concerns Involving Food Preparation

Respondents were asked to rank the most important considerations when selecting a food to prepare for their households. Thirty-five percent of the respondents considered taste most important; 21.8 percent considered fat content most important; 10 percent considered the salt content most important; 9.2 percent considered cholesterol level most important; and 7 percent stated that the vitamin content was most important (Table 15).

Table 15. Consumer Rankings of the Most Important Considerations When Selecting and Preparing Food For Their Household, Delaware, 1998.

Considerations	Percent Receiving a *First* Ranking
Taste	35.0
Fat Content	21.8
Salt Content	10.0
Cholesterol Level	9.2
Vitamin Content	7.0
Additives and Preservatives	4.6
Price	4.2
Sugar Content	2.7
Tradition	2.6
Dietary Fiber	1.7
Other	1.2
Total	100.0

Source: Consumer Survey and Calculations.

Respondents were also given statements to measure their attitudes about their diets and the nutritional value of fresh potatoes. The responses were grouped as strongly or somewhat agree, neutral, and strongly or somewhat disagree (Table 16).

Table 16. Consumer Attitudes Regarding the Nutritional Value of Fresh Potatoes, Delaware, 1998.

Statements	Strongly or Somewhat Agree	Neither Agree Nor Disagree	Strongly or Somewhat Disagree	Total Percent
	-------------	-------------%	-------------	-------------
a. Potatoes are an important part of healthy diet.	83.2	12.4	4.4	100.0
b. I reduce potato consumption for weight control.	17.9	27.8	54.3	100.0
c. I strive to improve the quality of my life through what I eat.	78.1	15.8	6.0	100.0
d. Potatoes are a good source of dietary fiber - peeled.	45.3	34.5	20.2	100.0
e. Potatoes are a good source of dietary fiber – not peeled.	72.1	21.3	6.6	100.0
f. I am concerned about the fat/cholesterol content of French-fried potatoes.	75.8	13.1	11.1	100.0
g. The food I buy depends on the speed and ease of preparation.	49.7	27.2	23.1	100.0
h. I do not spend large amounts of time in the kitchen cooking.	43.4	21.7	35.0	100.0
i. Potatoes are more healthy than other foods I eat.	34.5	43.5	22.0	100.0
j. Health is more important than the cost of food when making food purchasing decisions.	68.4	23.0	8.6	100.0
k. To be healthy, I must control my weight.	77.6	14.9	7.4	100.0
l. I read nutritional information and ingredients on package labels.	76.5	12.1	11.3	100.0
m. Potatoes are a good source of vitamin C.	50.3	42.3	7.4	100.0
n. I control my intake of salt.	67.5	19.0	13.5	100.0
o. Potatoes are a part of a "quick and easy meal".	68.5	23.0	8.5	100.0
p. Potatoes are filling.	85.7	10.4	3.9	100.0
q. Potatoes are low in calories.	65.3	27.8	7.0	100.0
r. Potatoes are a meal.	49.2	24.0	26.8	100.0
s. Potatoes are a good source of potassium.	62.7	30.5	6.9	100.0
t. Potatoes are low in fat.	75.3	18.9	5.8	100.0
u. Potatoes are high in folate —B vitamin.	44.8	52.5	2.7	100.0

Source: Consumer Survey and Calculations.

About 78 percent of the respondents stated that they sought to improve their quality of life through what they ate, and 68.4 percent stated that health was more important than cost of food when making food purchasing decisions. About 76.5 percent of the respondents read the nutritional information and ingredients on package labels.

A high percentage (83.2 percent) considered fresh potatoes as an important part of a healthy diet. Respondents agree that non-peeled potatoes are a good source of dietary fiber (72 percent); a good source of vitamin C (50 percent); a good source of potassium (62.7 percent); low in fat (75.3 percent); high in foliate—vitamin B (44.8 percent); and low in calories (65.3 percent). Respondents (43.4 percent) also indicated that they did not spend large amounts of time cooking in the kitchen and that the food they bought depends on the speed and ease of preparation (49.7 percent).

The respondents indicated that potatoes are a part of a quick and easy meal (68.5 percent). This response does not match the actual preparation time that is necessary for fresh potatoes, unless a microwave is often used.

Overall, respondents consider fresh potatoes to be a part of a healthy diet, containing several key attributes. Thus, the potato industry has a number of positive attributes that could be utilized in their promotional endeavors.

When the respondents were asked to specify the amount of time spent preparing week-night dinners, 10.5 percent stated that they spent 20 minutes or less; 22 percent stated that they spent 21–30 minutes; 34.6 percent stated that they spent 31–40 minutes; 16.7 percent stated that they spent 41–50 minutes; 10 percent stated that they spent 51–60 minutes; and 6.2 percent stated that they spent more than 60 minutes. The above results substantiate the need for value-added potato products that reduce the need for long preparation time in the home.

Recommendations

The findings from this study suggest that a majority of Delaware consumers would show a preference for the "Delaware Agricultural Products" logo; therefore, it needs to be more visible in the market. New Castle County is where the effort to increase consumer familiarity with the logo needs to be the strongest; nonetheless, all three counties should be targeted. Ultimately, promotional efforts to increase awareness and loyalty of Delaware consumers to their state would improve sales of locally grown potatoes.

Past studies have shown that consumers have a more positive attitude about health, nutritional, and dietary benefits of fresh potatoes although per capita consumption has remained stagnant during the past 20 years (Marotz, 1988). Thus, the promotion of the potato as an essential part of a healthy diet needs to be continued as we enter the new millennium. Also, new fresh value-added potato products need to be introduced in order to accommodate the consumer who prefers convenience when preparing meals. The new product may include unique packaging methods, original flavors, etc., but the end result is that consumers see a mixture of new potato products in fresh form with preparation time reduced. Hence, potato growers and retailers should continue to introduce new value-added fresh potato products.

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