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Supermarkets to Buy Advertised Specials: An Analysis.**

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Abstract

This study analyzed the influence of demographic and behavioral characteristics on the likelihood of a consumer to read food advertisements in grocery brochures and the likelihood of a consumer to shop at more than one store to purchase advertised specials. Overall, 73% and 46% of respondents read food advertisements and shop multiple stores to purchase advertised specials, respectively. Consumer characteristics which are shown to influence the reading of food advertisements and shopping at more than one food store to buy advertised specials were the possession of education beyond the 2/4 year college degree and the tendency to read ingredient labels.

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Introduction

Food promotion through newspapers and brochures is an important marketing technique for grocery stores. Positive food advertising in general has been shown to help improve market appeal for food products, even in the face of competing media exposure of negative information (Chang and Kinnucan, 1991). Price discounts in particular effectively attract customers to purchase food items, and many grocery stores offer discounts through newspaper advertisements and grocery brochures. It has been shown, however, that shoppers who avidly follow specials, sometimes referred to as “cherry-pickers” reduce retailer profitability compared to other shopper segments (Walter and Jamil, 2003). Furthermore, studies have shown that there is a general lack of customer loyalty towards any specific store chains and that a significant number of consumers switch stores to take advantage of price discounts (Kumar and Leone, 1988; Keng and Ehrenberg, 1984). Ascertaining the characteristics of consumers who read grocery brochures for advertised specials would help retailers effectively target audiences for advertising campaigns. Additionally studying the characteristics of consumers who switch supermarkets to purchase specials may help retailers target and develop customer loyalty programs. Based on consumer demographic characteristics, this analysis seeks to predict which consumers are more likely to read for advertised specials and which consumers are more likely to switch stores to take advantage of these specials. This study also attempts to measure how significant each of various demographic characteristics is to making such predictions.

There exist no widely accepted theoretical or empirical guidelines for analyzing the influence of demographic characteristics on the likelihood of a consumer to read grocery brochures or to switch stores to purchase discounts. There is however, adequate justification supporting the use of socio-economic characteristics to study which consumers read grocery brochures and which switch stores to buy advertised specials (Govindasamy and Italia, 1999).

To begin, the main motive of reading food advertisements and of switching stores to purchase specials is price comparison. Consumers who search for price discounts through grocery brochures typically have an above-average concern for price. Many studies support that

demographic characteristics affect household food expenditures and price sensitivity. Various household characteristics have been shown to influence fresh produce expenditures (Ritzman, 1982; Blaylock and Smallwood, 1985; Nayga, 1995; Stewart, Blisard, and Jolliffe, 2003). Other studies have suggested that price sensitivity is also affected by demographic characteristics (Govindasamy and Italia, 1997; Ainslie and Rossi, 1998) such as ethnicity (Ackerman and Tellis 2001).

Furthermore, the act of reading grocery brochures, like reading nutritional labels, is a form of information acquisition. Even though the gain in reading grocery brochures differs from reading nutritional labels—the former is price-associated and the latter is health-associated—both have some common characteristics. In both activities, the consumer gathers information to make improved shopping decisions. Gathering information involves an investment of time and effort on the part of the consumer—a process originally described by Stigler (1961). In the example of nutritional labels, it has been found that consumers will continue to acquire information if the gain overrides the expense (Guthrie et al., 1995; Nayga 1996). In the case of reading grocery brochures, the value of the gain, monetary savings through price discounts, is influenced by price sensitivity, which as discussed earlier, has been illustrated to differ among demographic segments (Govindasamy and Italia, 1997; Ainslie and Rossi, 1998; Ackerman and Tellis, 2001).

Moreover, there is reasonable support that demographic characteristics influence the process of information acquisition itself. Studies have already shown that age (Cole and Balasubramanian, 1993) and a consumer's personal attributes (Katona and Mueller, 1955) influence information acquisition. Additionally, information acquisition is certainly influenced by factors that impact different consumer households--such as literacy in English, time limitations, and the marginal effect of price changes on a specific household's demand for food commodities. These factors also vary among different demographic groups, further justifying the hypothesis that socio-economic characteristics affect which consumers read grocery brochures.

Switching stores to buy specials involves both finding the advertised specials and traveling to multiple stores. As noted, finding advertised specials is a form of information acquisition, which can be done through reading grocery brochures or browsing other media outlets. As discussed earlier, there is justification that demographic characteristics influence

information acquisition and which consumers read food advertisements. Beyond information acquisition, the act of traveling to multiple stores to buy specials is price-motivated and affected by price sensitivity, which, as mentioned earlier, has been shown to vary among demographic segments (Govindasamy and Italia, 1997; Ainslie and Rossi, 1998; Ackerman and Tellis, 2001). Therefore, there is justification that demographic characteristics influence which consumers switch stores to purchase specials.

From midway through the 20th century, there have been many significant demographic changes that have influenced food advertising and marketing. The United States population has become more metropolitan; the median age has increased; the number of people per household has decreased; and racial and gender compositions have changed (U.S. Department of Commerce, 2002). It is important to take demographic changes such as these into account to be able to effectively market products. Demographic changes, for example, are already considered for generic food advertising; indeed, a study has shown that over time, changes in generic advertising campaigns have been most affected by changes in ethnic make-up, age make-up, and known trends in food expenditures outside the household (Schmit and Kaiser, 2004).

Food expenditure and consumption behavior have been shown to differ among regions in the United States. Studies done by R. M. Nayga, Jr. revealed variations in nutritional label usage (1996) and fresh vegetable expenditure (1995) across different regions of the country. Limiting this analysis to a local area may reduce inconsistencies present in some countrywide studies. In particular, a study focused in New Jersey, a densely populated, metropolitan area, is likely to be relatively applicable to areas of a similar demographic composition, particularly the Northeast.

Through a logit framework, this study aims to quantify and analyze how demographic characteristics influence the likelihood of a consumer to read grocery brochures, and to switch supermarkets to purchase advertised specials.

Survey Design

The data in this study has been obtained by a random sample of New Jersey consumers surveyed in January 2004 by researchers from Rutgers University. The survey included questions about Jersey Fresh, food advertisement usage, store-switching, and the demographic characteristics of each respondent. One thousand surveys were mailed to one thousand randomly selected

households in New Jersey; three hundred twenty-one usable surveys were returned. Each survey packet included the questionnaire, a cover letter explain the purpose and importance of the project, a postage-paid return envelope, and one dollar as a small incentive for participation.

Methodology

The logit model was selected for the regression in this analysis because its asymptotic characteristic constrains the predicted probabilities to a range of zero to one. The logit model is also favored for its mathematical simplicity and is often used in a setting where the dependent variable is binary. As the survey utilized in this analysis provided individual rather than aggregate observations, the estimation method of choice was the maximum likelihood estimation (MLE) (Gujarati, 1992). Among the beneficial characteristics of MLE are that the parameter estimates are consistent and asymptotically efficient (Pindyck and Rubinfeld, 1991).

Food Advertisement and Change Shop Models assume that the probability P_i of being a frequent reader of grocery brochures and the probability P_i of changing stores to buy advertised specials are each dependent on a different vector of independent variables (X_{ij}) associated with consumer i and variable j , and a vector of unknown parameters β . The likelihood of observing each dependent variable was tested as a function of variables which included socio-demographic and consumption characters.

$$P_i = F(Z_i) = \frac{F(\alpha + \beta X_{ij})}{1 + \exp(-Z_i)}$$

Where:

P_i = the probability of reading food advertisements in grocery brochures (Model Food Advertisement) or the probability of changing stores to buy advertised specials (Model Change Shop) each depends upon a different vector of independent variables X_{ij} s

$F(Z_i)$ = represents the value of the standard logistic density function associated with each possible value of the underlying index Z_i .

Z_i = the underlying index number or $\alpha + \beta X_{ij}$

And βX_{ij} is a linear combination of independent variables so that:

$$Z_i = \log [P_i / (1 - P_i)] = \beta_{i0} + \beta_{i1}X_{i1} + \beta_{i2}X_{i2} + \dots + \beta_{in}X_{in} + \varepsilon_i$$

Where:

$i = 1, 2, \dots, n$ are observations

Z_i = the unobserved index level or the log odds of choice for the i^{th} observation

X_{in} = the n^{th} explanatory variable for the i^{th} observation

β = the parameters to be estimated

ε = the error or disturbance term

The dependent variable Z_i in the above equation is the logarithm of the probability that a particular choice will be made. The parameter estimates do not directly represent the effect of the independent variables. To obtain the estimators for continuous explanatory variables in the logit model, the changes in probability that $Y_i = 1(P_i)$ brought about by a change in the independent variable, X_{ij} is given by

$$(\partial P_i / \partial X_{ij}) = [\beta_j \exp(-\beta X_{ij})] / [1 + \exp(-\beta X_{ij})]^2$$

For qualitative discrete variables such as the explanatory variables used in this study, $\partial P_i / \partial X_{ij}$ does not exist. Probability changes are then determined by:

$$(\partial P_i / \partial X_{ij}) = [P_i(Y_i : X_{ij} = 1) - P_i(Y_i : X_{ij} = 0)] / [1 - 0]$$

For estimation purposes, in each model, one classification was eliminated from each group of variables to prevent perfect co linearity.

Based on past literature, predictions were made to characterize grocery brochure readers and store switchers. Those who read nutritional labels and those with lower levels of education

were predicted to be more likely to read food advertisements and switch stores (Govindasamy and Italia, 1997; Govindasamy and Italia, 1999) while elderly individuals (Bender and Derby; Cole and Balasubramanian, 1993) were predicted to be less likely to do so.

Food Advertisement Model (A)

$$\text{FOODADV} = \beta_0 + \beta_1 \text{SHO_PRO_SUM} + \beta_2 \text{FOODLABEL} + \beta_3 \text{PLANSHOP} + \beta_4 \text{BUYORGANIC} + \beta_5 \text{HEARDIPM} + \beta_6 \text{SPENDPRODUCE} + \beta_7 \text{URBAN} + \beta_8 \text{YEARSINNJ} + \beta_9 \text{GARDEN} + \beta_{10} \text{BELOWAGE17} + \beta_{11} \text{GENDER} + \beta_{12} \text{AGE51TO65} + \beta_{13} \text{POSTGRADUATE} + \beta_{14} \text{NCOME100K}$$

Where:

- FOODADV = 1 if the respondent regularly reads food advertisements in newspaper/grocery-brochures and 0 otherwise
- SHO_PRO_SUM = 1 if the respondents shop for fresh produce more than once a week during summer
- FOODLABEL = 1 if the respondent always check ingredient label on food when purchasing and 0 otherwise.
- PLANSHOP = 1 if the respondent plans before shopping fresh produce and 0 otherwise.
- BUYORGANIC = 1 if the respondent buy certified organic produce and 0 otherwise.
- HEARDIPM = 1 if the respondent heard about Integrated Pest Management (IPM) and 0 otherwise.
- SPENDPRODUCE = respondent spends (average) on produce in a month.
- URBAN = 1 if the respondent lives in urban area and 0 otherwise.
- YEARSINNJ = respondent lives in New Jersey (average years).
- GARDEN = 1 if the respondent has a garden at home and 0 otherwise.
- BELOWAGE17 = number of person's (average) below age 17 in the house
- GENDER = 1 if the respondent is a female and 0 if the respondent is a male.
- AGE51TO65 = 1 if the respondent's Age between 51 to 65 and 0 otherwise.
- POSTGRADUATE = 1 if the respondent's Education with Post-graduation and 0

otherwise.

INCOME100K = 1 if the respondent's annual average income is \$100,000 or more and 0 otherwise

Change Shopping Model (B)

$$\begin{aligned} \text{ADVSPECIAL} = & \beta_0 + \beta_1 \text{CHANGESHOP} + \beta_2 \text{FOODLABEL} + \beta_3 \text{PLANSHOP} \\ & + \beta_4 \text{BUYORGANIC} + \beta_5 \text{HEARDIPM} + \beta_6 \text{GARDEN} \\ & + \beta_7 \text{BELOWAGE17} + \beta_8 \text{GENDER} + \beta_9 \text{AGE51TO65} \\ & + \beta_{10} \text{POSTGRADUATE} \end{aligned}$$

Where:

ADVSPECIAL = 1 if the respondent regularly shop at more than one food store in order to purchase advertised special and 0 otherwise

CHANGESHOP = 1 if the respondent definitely consider changing their usual shopping market to be able to purchase fresh produce and 0 otherwise

FOODLABEL = 1 if the respondent always check ingredient label on food when purchasing and 0 otherwise.

PLANSHOP = 1 if the respondent plans before shopping fresh produce and 0 otherwise.

BUYORGANIC = 1 if the respondent buy certified organic produce and 0 otherwise.

HEARDIPM = 1 if the respondent heard about Integrated Pest Management (IPM) and 0 otherwise.

GARDEN = 1 if the respondents has a garden at home and 0 otherwise.

BELOWAGE17 = number of person's (average) below age 17 in the house

GENDER = 1 if the respondent is a female and 0 if the respondent is a male.

AGE51TO65 = 1 if the respondent's Age between 51 to 65 and 0 otherwise.

POSTGRADUATE = 1 if the respondent's Education with Post-graduation and 0 otherwise.

Descriptive Statistics:

Who Reads Food Advertisements in Newspapers/Grocery-Brochures Regularly?

Overall, 73% of respondents read food advertisements in grocery brochures regularly. Among household sizes of both one and six, 67% of respondents read advertisements in grocery brochures, while among household sizes of both three and five, 76% of respondents read advertisements in grocery brochures. Of those in household sizes of two and four, respectively 72% and 77% of respondents read grocery brochures (Table 1). In the case of gender, 65% of the respondents who read food advertisements were female (Graph 1). Also, 67% of male respondents and 76% of female respondents read food advertisements in grocery brochures (Table 2).

As can be seen from Table 3, in the case of age, among the 21-35 age segment, 59% of respondents read food advertisements in brochures; this age segment also constitutes 9% of the total number of respondents who read food advertisements in brochures (Graph 2). In addition, 71% respondents in the 36-50 age segment and 70% of respondents in the 51-65 age segment read food advertisements in brochures. Of those in 65 years and above age segment, 83% read food advertisements in brochures (Table 3). About half of the people who read food advertisements were 51 years or older (Graph 2).

In general, those with higher levels education tended to read food advertisements less than those with lower levels education. Among those who had up to a high school education, 76% of respondents read advertisements in brochures. Furthermore, 73% of respondents with a two or four year college degree and 66% of post graduate respondents read food advertisements in grocery brochures (Table 4). Of the total number of respondents who read food advertisements, 44% had up to a high school education, 39% had a 2/4 year college degree, and 17% were postgraduates (Graph 3).

Table 5 indicates that in the case of occupation, 85% of respondents in the retired segment and 74% of respondents in the self-employed segment read food advertisements in grocery brochures. Among those employed by others, 65% of respondents read food advertisements in brochures while among homemakers, 78% of respondents read food

advertisements in brochures. Of those in the “other” segment, 73% of respondents read advertisements in grocery brochures. Among the occupation segments, consumers employed by others compose the largest percentage (43%) of respondents who read food advertisements; retirees make up the second largest percentage about 27% (Graph 4).

As can be seen from Table 6, among the households in the \$20,000 and \$20,000-39,000 income groups, 72% of respondents in each group read food advertisements in grocery brochures. Additionally, 67% of respondents in the \$40,000-59,000 household income group read food advertisements in brochures. Of those in the \$60,000-79,000, \$80,000-99,000, and \$100,000 or more household income groups, respectively 73%, 83%, and 70% of respondents read food advertisements in brochures. Of the respondents who read food advertisements, 30% earned \$100,000 or more, 12% earned \$80,000-99,000, 14% earned \$60,000-79,000, 16% earned \$40,000-59,000, 17% earned \$20,000-39,000, and 11% earned up to \$20,000 (Graph 5).

In regards to marital status, 80% of respondents in the widower/widowed segment read food advertisements in grocery brochures. Among those in the single marital status segment, 58% of respondents read food advertisements in brochures. Also, 67% of respondents in the separated segment, 76% of respondents in the married segment, and 58% of respondents in the divorced segment read food advertisements in brochures. Among those in the other category, 75% of respondents read food advertisements in brochures (Table 7). Of the respondents who read food advertisements, 69% were married, 11% widowed, 9% single, 7% divorced, 3% other, and 1% separated (Graph 6).

Who Shops at more than one Food Store in order to Purchase Advertised Specials Regularly?

In total, 46% of the respondents have shopped at multiple stores to purchase advertised specials. Of the households occupied by one person, 35% of respondents have shopped at more than one store to buy advertised specials. Of households occupied by two, three, four, five, six, and seven people, 52%, 49%, 38%, 48%, 47%, and 100% of respondents respectively have shopped at more than one store to purchase specials (Table 11). In the case of gender, 49% of male respondents and 44% of female respondents have shopped at more than one store to buy advertised specials (Table 12). Of the respondents who have shopped at multiple stores to purchase advertised specials, 60% were female (Graph 7).

As can be seen from Table 13, in regards to age ranges, 41% of respondents in the 21-35 age group and 37% of respondents in the 36-50 age group have shopped at multiple stores to purchase specials. Additionally, 42% of respondents in the 51-65 age group and 68% of respondents in the 65+ age group have switched stores to take advantage of advertised specials. Of the age segments, the 65+ age group composes the largest percentage (34%) of respondents who have switched stores to buy advertised specials; consumers 36-50 make up the second largest percentage (31%) (Graph 8).

Table 14 indicates that in the case of education, among those with up to a high school education, 53% of respondents have switched stores to buy advertised specials. In addition, 44% of respondents holding a two or four year college degree and 34% of post graduate respondents have shopped at more than one store to purchase advertised specials. About half of the respondents (48%) who have shopped at more than one store to buy specials had up to a high school education (Graph 9).

In the case of occupation, 64% of respondents in the retired category and 41% of respondents in the self-employed category have shopped at more than one store to purchase advertised specials. Among those employed by others, 36% of respondents have shopped at more than one store to purchase specials while among homemakers, 43% of respondents have shopped at more than one store to purchase specials. Of those in the other segment, 73% of respondents have shopped at more than one store to buy advertised specials (Table 15). Of the respondents who have shopped more than one store to purchase specials, 39% were employed by others, 33% were retired, 11% were homemakers, 11% were self-employed, and 6% were in the other category (Graph 10).

Based on Table 16, respondents earning lower incomes tended to shop more than one store to buy advertised specials more than those earning higher incomes. Among the respondents in the \$20,000 income group, 45% of respondents have shopped at more than one store to buy specials. Additionally, 53% of respondents in the \$20,000-39,000 income group and 52% of respondents in the \$40,000-59,000 income group have switched stores to buy specials. Of those in the \$60,000-79,000, \$80,000-99,000, and \$100,000 or more income groups, respectively 32%, 48%, and 39% of respondents have shopped at more than one store to buy specials (Table 16). Of the respondents who have shopped at more than one store to purchase specials, 28% earned \$100,000 or more, 11% earned \$80,000-99,000, 10% earned \$60,000-

79,000, 20% earned \$40,000-59,000, 20% earned \$20,000-39,000, and 11% earned up to \$20,000 (Graph 11).

In terms of marital status, 39% of respondents in the single category and 33% of respondents in the separated category have shopped at more than one store to buy advertised specials. Among the respondents in the widowers/widowed category, 57% have shopped at more stores to buy advertised specials. In addition, 38% respondents in the divorced category and 47% of respondents in the married category have switched stores to purchase specials. Of those in the other category, half of the respondents have shopped at multiple stores to buy specials (Table 17). Of the respondents who have switched stores to purchase specials, 67% were married, 12% were widows or widower, 10% were single, 7% were divorced, 3% were in the Other category, and 1% were separated (Graph 12).

Logit Model Analyses

Summary of Explanatory Variables:

Tables 8 and 18 each show frequency of yes or no responses, percent/mean, and standard deviation tabulations of the explanatory variables used in the two analyses.

Table 8 describes the explanatory variables that were tested in the model as factors for predicting which consumers read food advertisements in grocery brochures. About 64% of respondents shop based on the availability and quality of fresh produce. Respondents also spend an average of approximately \$70 per month on produce. Respondents have lived on average 37 years in New Jersey. About 12% of respondents live in urban areas and about 27% of respondents earn an annual average income of \$100,000 or more.

Table 18 describes the explanatory variables that were used in the model as factors for predicting which consumers shop at more than one food store to purchase advertised specials. About 20% of the respondents definitely consider changing their usual shopping market to be able to purchase Jersey Fresh. The results also indicate that there is less than one child under the age of 17 in the average respondent's household.

Both analyses used several of the same explanatory variables. These variables included FOODLABEL, PLANSHOP, BUYORGANIC, HEARDIPM, GARDEN, BELOWAGE17, GENDER, AGE51TO65, and POSTGRADUATE. Both tables indicate that about 22% of respondents always check ingredient labels when purchasing food products. The tables also

show that about three quarters of respondents plan before shopping for fresh produce and the same fraction of respondents buy certified organic produce. Relatively few respondents, about 11%, have heard of Integrated Pest Management. About 46% of respondents had a garden at home. Furthermore, both tables show that of the respondents, about 63% were female, 26% were in the 51-65 age category, and 18% were post graduates.

Model Explanation: Who Reads Food Advertisements in Newspapers/Grocery-Brochures Regularly?

Tables 9 and 10 show the results from the logit regression model A. Based on a consumer's demographic and behavioral characteristics, the logit model predicts the likelihood that he or she will read food advertisements in grocery brochures. A total of 309 observations were used in this model, of which 224 respondents (72%) read food advertisements in grocery brochures and 85 respondents (28%) do not. The model correctly predicted the outcome of the dependent variable in 78.6% of total observations. The chi-square statistics rejected the null hypothesis that the explanatory variables as set were insignificant in explaining variations in dependent variable at 0.0001 levels and the McFadden's R^2 was 0.18.

Of the fourteen explanatory variables tested in the logit model, seven were significant. Average monthly produce spending, years living in New Jersey, and being a post graduate each had significance at 10%. Planning fresh produce shopping and shopping based on availability and quality of fresh produce each had significance at 5%. Reading ingredient labels when buying foods and purchasing certified organic produce each had significance at 1%.

Those who shopped based on the availability and quality of fresh produce were 13% more likely to read food advertisements in grocery brochures than consumers who didn't shop that way. This may be because consumers who shop based on availability and quality of fresh produce are likely to take the extra time and effort to acquire knowledge about different grocery store offers on produce. Reading grocery brochures would be a helpful way to acquire this knowledge.

In addition, those who checked ingredient labels on food products were 22% more likely to read food advertisements in grocery brochures than those who did not check ingredient labels. As noted earlier, reading food ingredient labels, like reading grocery brochures, takes an

investment of time and effort. Consumers who check food labels possibly have an above average concern for grocery shopping, which could motivate them to read grocery brochures.

Those who planned before shopping for fresh produce were 13.5% more likely to read food advertisements in grocery brochures than those who didn't plan before shopping for fresh produce. Planning shopping trips could involve exploring different grocery store offers and discounts, in which case reading food advertisements in grocery brochures would be useful.

Furthermore, those buying certified organic produce were found to be 22% less likely to read food advertisements in grocery brochures than those not buying certified organic produce. Certified organic produce is typically more expensive than non-organic produce. People who are willing to spend the money on organic produce may be less concerned with price than other consumers and would have less incentive to read food advertisements in grocery brochures.

In regards to average monthly produce expenditure, those spending more per month on produce were less likely to read food advertisements in grocery brochures. Unlike the variables discussed in this section, average monthly produce expenditure is a continuous variable, and the change in probability can be interpreted as follows. Those spending more than a dollar on produce per month were found to be 0.07% less likely to read food advertisements in grocery brochures than those spending less than a dollar. A higher monthly expenditure on produce possibly indicates that the consumer is less concerned about price, which may relate to less interest in reading food advertisements in grocery brochures.

Length of stay in New Jersey, like average monthly produce expenditure, is also a continuous variable, and the change of probability can be interpreted in a similar fashion. Those who have lived longer than a year in New Jersey were 0.3% more likely to read food advertisements in grocery brochures than those who have lived less than a year in New Jersey. A possible reason is that newer residents may be occupied with settling in their households and have less concern or time to read food advertisements in brochures.

Finally, in regards to education level, post graduates were 17% less likely to read food advertisements in grocery brochures than non-post graduates. Those with higher education levels tend to earn higher salaries and may be less price-sensitive. A consumer with lower price-sensitivity would not have as much incentive to read food advertisements in brochures as a consumer with higher price sensitivity.

Model Change Shop: Who Shops at more than one Food Store in order to Purchase Advertised Specials Regularly?

Tables 19 and 20 show the results from the logit regression model B. Based on a consumer's demographic and behavioral characteristics, the logit model predicts the likelihood that he or she will shop at more than one food store to buy advertised specials. A total of 309 observations were used in this model, of which 141 respondents (46%) shop at multiple stores to buy advertised specials and 168 respondents (54%) do not. The model correctly predicted the outcome of the dependent variable in 62.5% of total observations. The chi-square statistics rejected the null hypothesis that the explanatory variables as set were insignificant in explaining variations in dependent variable at 0.0030 levels and the McFadden's R^2 was 0.07.

Of the ten explanatory variables used in the logit model, four were significant. Gender had significance at 10%. Education beyond a 2/4 year college degree and the self-reported tendency to consider changing stores to buy Jersey Fresh each had significance at 5%. Finally, reading ingredient labels when buying foods had significance at 1%.

Those who considered switching stores to purchase Jersey Fresh products were found to be 27% more likely to change stores to buy advertised specials than those who did not consider switching stores to purchase Jersey Fresh products. Switching stores to buy a particular kind of item requires an investment of time and effort. Those who are willing to make this investment would probably seek to gain the most benefit out of it. Thus, those who shop at different stores to buy Jersey Fresh products would probably take advantage of advertised specials at those stores as well.

In addition, it was found that those who checked ingredient labels on food products were 8% more likely to change stores to purchase advertised specials than those who did not check ingredient labels. Since the reading of food ingredient labels, like shopping at more stores, takes an investment of time and effort, it is possible that those who check food labels have an above average concern for grocery shopping. This could motivate them to shop at more than one store to purchase specials as well.

In the case of gender, men were found to be 11% less likely to switch stores to buy advertised specials than women. This is possibly because in many households, women are the

central grocery shoppers and make a majority of grocery shopping decisions, including shopping at multiple stores to buy discounted products.

Furthermore, according to the logit model results, post graduates were 18% less likely to shop at more stores to purchase advertised specials than non-post graduates. Those with higher education levels tend to earn higher salaries. Those with higher salaries may be less sensitive to price and less concerned with advertised specials

Conclusions

This study attempted to quantify the effect of demographic and behavioral characteristics on the likelihood of a consumer to read food advertisements in grocery brochures and the likelihood of a consumer to switch stores to purchase advertised specials. From a marketer's perspective, this analysis can be used to targeting specific groups for advertising campaigns.

Targeting characteristics that were found to increase the likelihood of a consumer to read food advertisements—such as lower education levels, reading labels, shopping based on availability and quality of fresh produce—may help increase response to marketing campaigns. On the flip side, some characteristics were found to decrease the likelihood of a consumer to read food advertisements, and targeting these characteristics may reduce response to marketing campaigns. These characteristics include buying certified organic produce and higher monthly produce spending.

In addition, gauging which consumers would be more likely to shop at more than one store to buy specials can help marketers target specific groups for customer loyalty campaigns. Post graduates and males were found to be less likely to shop at more than one store to buy specials. Other characteristics—such as reading food labels and changing stores to buy Jersey Fresh—were found to increase the likelihood of a consumer to shop at more than one store to buy specials. Targeting these characteristics in grocery brochures may positively influence response to grocery store specials. Also, considering these characteristics could be useful for targeting audiences and tailoring features for customer loyalty programs.

Though this study has revealed several significant variables that can be helpful in targeting marketing campaigns, some restrictions should be considered when applying the findings of this study. The socio-economic characteristics of the sample area—such as the high population density and the relatively higher incomes and education levels of local consumers—

should be taken into account. Additionally, the concentrated regional make-up of respondents and the small sample size should be noted.

This study analyzed the influence of demographic and behavioral characteristics on the likelihood of a consumer to read food advertisements in grocery brochures and the likelihood of a consumer to switch stores to purchase advertised specials. The findings may be helpful for food marketers and advertising campaigns.

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Food Advertisement Model Tables and Charts

Table 1: Consumer Who Reads Food Advertisements Newspapers/Grocery-Brochures Regularly by Household Size

Household Size	Read Advertisements in Newspapers/Grocery-Brochures					
	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
1	34	67%	17	33%	51	100%
2	72	72%	28	28%	100	100%
3	45	76%	14	24%	59	100%
4	44	77%	13	23%	57	100%
5	16	76%	5	24%	21	100%
6	10	67%	5	33%	15	100%
7+	2	100%	0	0%	2	100%
Total	223	73%	82	27%	305	100%

Table 2: Consumer Who Reads Food Advertisements in Newspapers/Grocery- Brochures Regularly by Sex

Sex	Read Advertisements in Newspapers/Grocery-Brochures					
	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Male	77	67%	38	33%	115	100%
Female	146	76%	47	24%	193	100%
Total	223	72%	85	28%	308	100%

Table 3: Consumer Who Reads Food Advertisements in Newspapers/Grocery-Brochures Regularly by Age

Age Distribution	Read Advertisements in Newspapers/Grocery-Brochures					
	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
0-20	1	100%	0	0%	1	100%
21-35	20	59%	14	41%	34	100%
36-50	85	71%	34	29%	119	100%
51-65	59	70%	25	30%	84	100%
65 and Above	59	83%	12	17%	71	100%
Total	224	72%	85	28%	309	100%

Table 4: Consumer Who Reads Food Advertisements in Newspapers/Grocery-Brochures Regularly by Education

Educational Levels	Read Advertisements in Newspapers/Grocery-Brochures					
	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
No Formal Schooling	0	0%	2	100%	2	100%
Up to High School	97	76%	30	24%	127	100%
2/4 College Degree	87	73%	32	27%	119	100%
Post Graduate	38	66%	20	34%	58	100%
Total	222	73%	84	27%	306	100%

Table 5: Consumer Who Reads Food Advertisements in Newspapers/Grocery-Brochures Regularly by Occupation

Occupation	Read Advertisements in Newspapers/Grocery-Brochures					
	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Retired	61	85%	11	15%	72	100%
Self-employed	29	74%	10	26%	39	100%
Employed by others	97	65%	52	35%	149	100%
Homemaker	28	78%	8	22%	36	100%
Others	8	73%	3	27%	11	100%
Total	223	73%	84	27%	307	100%

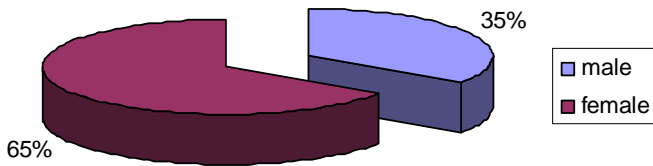
Table 6: Consumer Who Reads Food Advertisements in Newspapers/Grocery-Brochures Regularly by Income

Income (dollars)	Read Advertisements in Newspapers/Grocery-Brochures					
	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Up to 20,000	21	72%	8	28%	29	100%
20,000-39,000	34	72%	13	28%	47	100%
40,000-59,000	31	67%	15	33%	46	100%
60,000-79,000	27	73%	10	27%	37	100%
80,000-99,000	24	83%	5	17%	29	100%
100,000-More	60	70%	26	30%	86	100%
Total	197	72%	77	28%	274	100%

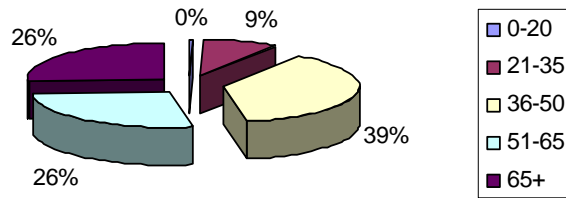
Table 7: Consumer Who Reads Food Advertisements in Newspapers /Grocery-Brochures Regularly by Marital Status

Marital Status	Read Advertisements in Newspapers/Grocery-Brochures					
	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Single	21	58%	15	42%	36	100%
Separate	2	67%	1	33%	3	100%
Widower(d)	24	80%	6	20%	30	100%
Divorced	15	58%	11	42%	26	100%
Married	156	76%	48	24%	204	100%
Other	6	75%	2	25%	8	100%
Total	224	73%	83	27%	307	100%

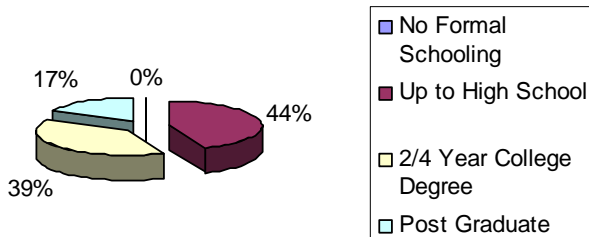
Graph 1: Respondents who Regularly Read Food Advertisements in Grocery Brochures/Newspapers By Gender



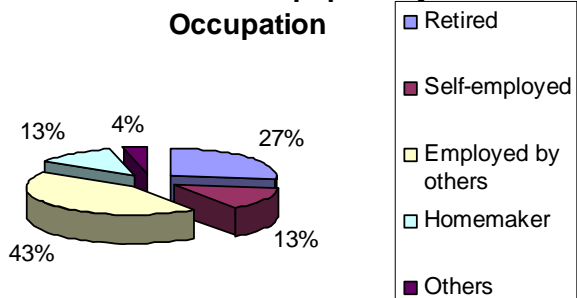
Graph 2: Respondents who Regularly Read Food Advertisements in Grocery Brochures/Newspapers By Age



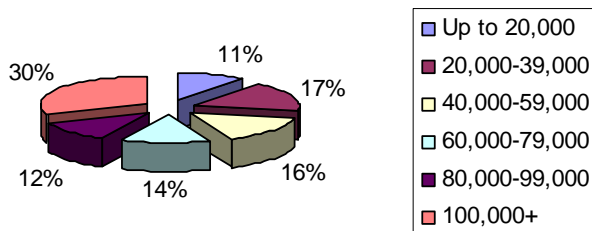
Graph 3: Respondents who Regularly Read Food Advertisements in Grocery Brochures/Newspapers By Education



Graph 4: Respondents who Regularly Read Food Advertisements in Grocery Brochures/Newspapers By Occupation



Graph 5: Respondents who Regularly Read Food Advertisements in Grocery Brochures/Newspapers By Income



Graph 6: Respondents who Regularly Read Food Advertisements in Grocery Brochures/Newspapers By Marital Status

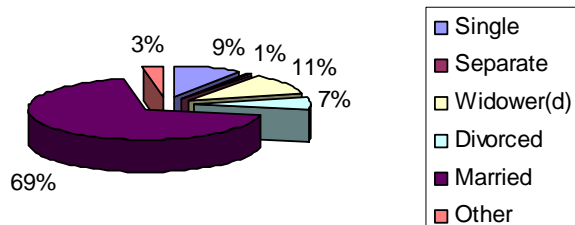


Table 8: Descriptive Tabulation of Explanatory Variables

Variable		Frequency	Percent/ Mean	Std. Dev
Those who shop based on the availability and quality of fresh produce				
SHO_PRO_SUM	YES	114	64.49	0.48
	NO	207	35.51	0.48
Those who always check ingredient label on food when purchasing				
FOODLABEL	YES	72	22.43	0.42
	NO	249	77.57	0.42
Those who plan before shopping fresh produce				
PLANSHOP	YES	237	74.53	0.44
	NO	81	25.47	0.44
Those who buy certified organic produce				
BUYORGANIC	YES	226	74.83	0.44
	NO	76	25.17	0.44
Those who heard about Integrated Pest Management (IPM)				
HEARDIPM	YES	32	10.67	0.31
	NO	268	89.33	0.31
Those who spend (average) on produce in a month				
SPENDPRODUCE		238	70.17	65.27
Those who live in urban area				
URBAN	YES	38	11.84	0.32
	NO	283	88.16	0.32
Those who live in New Jersey (average years)				
YEARSINNJ		312	37.00	21.77
Those who have a Garden at home				
GARDEN	YES	145	46.33	0.50
	NO	168	53.67	0.50
Number of persons below age 17 in your household				
BELOWAGE17		304	0.66	1.04
Gender by Male/Female				
GENDER	Male	116	37.18	0.48
	Female	196	62.82	0.48

Age between 51 and 65				
AGE51TO65	YES	84	26.17	0.44
	NO	237	73.83	0.44
Education with Post-graduation				
POSTGRADUATE	YES	59	18.38	0.39
	NO	262	81.62	0.39
Annual Average income \$100,000 or more				
INCOME100K	YES	87	27.10	0.45
	NO	234	72.90	0.45

**Table 9: Logit Modeling – Consumer who Reads Food Advertisements
Newspapers/Grocery-Brochures Regularly**

	Parameter Estimate	Standard Error	Change in Probabilities
INTERCEPT	-0.2267	0.6396	
SHO_PRO_SUM**	0.9420	0.4197	0.130
FOODLABEL***	2.0388	0.6300	0.219
PLANSHP**	0.7962	0.4068	0.135
BUYORGANIC***	-1.2095	0.4233	-0.216
HEARDIPM	0.8887	0.6025	
SPENDPRODUCE*	0.0048	0.0029	-0.001
URBAN	-0.0945	0.5484	
YEARSINNJ*	0.0168	0.0093	0.003
GARDEN	0.4221	0.3589	
BELOWAGE17	-0.0353	0.1729	
GENDER	0.2882	0.3827	
AGE51TO65	-0.1670	0.4288	
POSTGRADUATE*	-0.9398	0.4221	-0.168
INCOME100K	0.4639	0.4156	

*** Significant at 1%
** Significant at 5%
* Significant at 10%

Table 10: Predictive Accuracy of Logit Model

		<i>Predicted</i>			<i>Correct</i>
		0	1		
<i>Actual</i>	0	16	39	16/55	
	1	9	160	160/169	

Number of correct predictions: 176
 Percentage of correct predictions: 78.6 percent

Change Shop Model (Tables and Charts)

Table 11: Consumers’ shop at more stores to buy Advertised Specials by Household Size

Household Size	Consumers’ shop at more stores to buy Advertised Specials					
	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
1	18	35%	33	65%	51	100%
2	52	52%	48	48%	100	100%
3	29	49%	30	51%	59	100%
4	22	38%	36	62%	58	100%
5	10	48%	11	52%	21	100%
6	7	47%	8	53%	15	100%
7+	2	100%	0	0%	2	100%
Total	140	46%	166	54%	306	100%

Table 12: Consumers’ shop at more stores to buy Advertised Specials by Sex

Sex	Consumers’ shop at more stores to buy Advertised Specials					
	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Male	56	49%	59	51%	115	100%
Female	85	44%	109	56%	194	100%
Total	141	46%	168	54%	309	100%

Table 13: Consumers' shop at more stores to buy Advertised Specials by Age

Age Distribution	Consumers' shop at more stores to buy Advertised Specials					
	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
0-20	0	0%	1	100%	1	100%
21-35	14	41%	20	59%	34	100%
36-50	44	37%	76	63%	120	100%
51-65	35	42%	49	58%	84	100%
65 and Above	48	68%	23	32%	71	100%
Total	141	45%	169	55%	310	100%

Table 14: Consumers' shop at more stores to buy Advertised Specials by Education

Educational Levels	Consumers' shop at more stores to buy Advertised Specials					
	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
No Formal Schooling	0	0%	2	100%	2	100%
Up to High School	67	53%	60	47%	127	100%
2/4 College Degree	53	44%	67	56%	120	100%
Post Graduate	20	34%	38	66%	58	100%
Total	140	46%	167	54%	307	100%

Table 15: Consumers' shop at more stores to buy Advertised Specials by Occupation

Occupation	Consumers' shop at more stores to buy Advertised Specials					
	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Retired	46	64%	26	36%	72	100%
Self-employed	16	41%	23	59%	39	100%
Employed by others	54	36%	95	64%	149	100%
Homemaker	16	43%	21	57%	37	100%
Others	8	73%	3	27%	11	100%
Total	140	45%	168	55%	308	100%

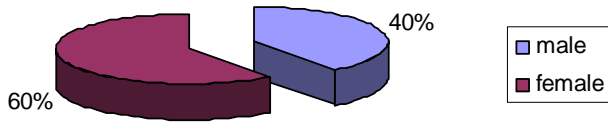
Table 16: Consumers' shop at more stores to buy Advertised Specials by Income

Income (dollars)	Consumers' shop at more stores to buy Advertised Specials					
	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Up to 20,000	13	45%	16	55%	29	100%
20,000-39,000	25	53%	22	47%	47	100%
40,000-59,000	24	52%	22	48%	46	100%
60,000-79,000	12	32%	25	68%	37	100%
80,000-99,000	14	48%	15	52%	29	100%
100,000-More	34	39%	53	61%	87	100%
Total	122	44%	153	56%	275	100%

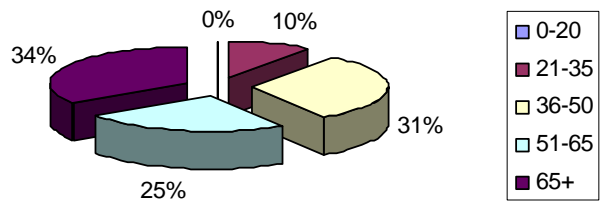
Table 17: Consumers' shop at more stores to buy Advertised Specials by Marital Status

Marital Status	Consumers' shop at more stores to buy Advertised Specials					
	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Single	14	39%	22	61%	36	100%
Separate	1	33%	2	67%	3	100%
Widower(d)	17	57%	13	43%	30	100%
Divorced	10	38%	16	62%	26	100%
Married	97	47%	108	53%	205	100%
Other	4	50%	4	50%	8	100%
Total	143	46%	165	54%	308	100%

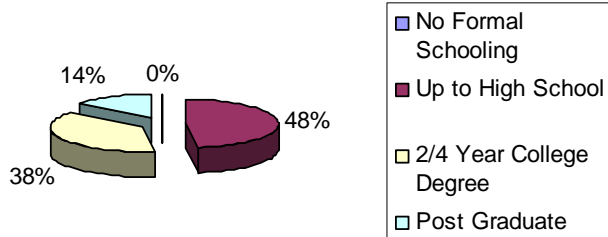
Graph 7: Respondents who shop at more stores to buy Advertised Specials by Gender



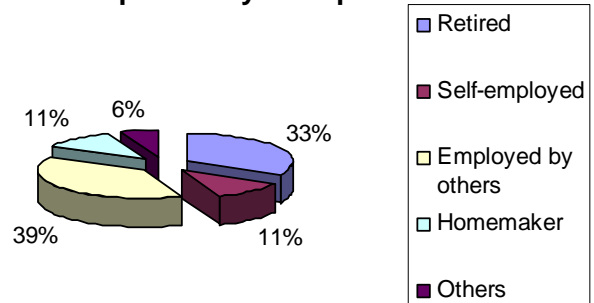
Graph 8: Respondents who shop at more stores to buy Advertised Specials by Age



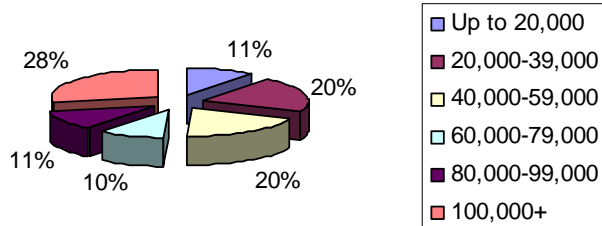
Graph 9: Respondents who shop at more stores to buy Advertised Specials by Education



Graph 10: Respondents who shop at more stores to buy Advertised Specials by Occupation



Graph 11: Respondents who shop at more stores to buy Advertised Specials by Income



Graph 12: Respondents who shop at more stores to buy Advertised Specials by Marital Status

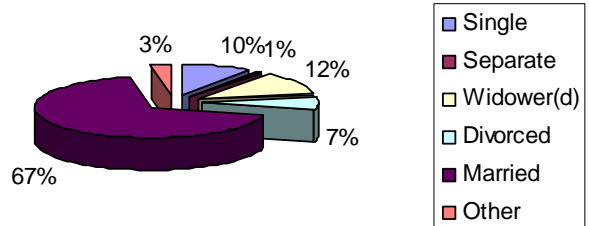


Table 18: Descriptive Tabulation of Explanatory Variables

Variable		Frequency	Percent/ Mean	Std. Dev
Those who definitively consider changing their usual shopping market to be able to purchase Jersey Fresh				
CHANGESHOP	YES	63	19.63	0.40
	NO	258	80.37	0.40
Those who always check ingredient label on food when purchasing				
FOODLABEL	YES	72	22.43	0.42
	NO	249	77.57	0.42
Those who plan before shopping for fresh produce				
PLANSHOP	YES	237	74.53	0.44
	NO	81	25.47	0.44
Those who buy certified organic produce				
BUYORGANIC	YES	226	74.83	0.44
	NO	76	25.17	0.44
Those who heard about Integrated Pest Management (IPM)				
HEARDIPM	YES	32	10.67	0.31
	NO	268	89.33	0.31
Those who have a Garden at home				
GARDEN	YES	145	46.33	0.50
	NO	168	53.67	0.50
Number of persons below age 17 in your household				
BELOWAGE17		304	0.66	1.04
Gender by Male/Female				
GENDER	Male	116	37.18	0.48
	Female	196	62.82	0.48
Age between 51 and 65				
AGE51TO65	YES	84	26.17	0.44
	NO	237	73.83	0.44
Education with Post-graduation				
POSTGRADUATE	YES	59	18.38	0.39
	NO	262	81.62	0.39

Table 19: Logit Modeling – Consumers those who Shop at More than one Food Store in order to purchase Advertised Specials

	Parameter Estimate	Standard Error	Change in Probabilities
INTERCEPT	-0.4488	0.3568	
CHANGESHOP**	0.6588	0.3169	0.270
FOODLABEL***	1.1125	0.3287	0.082
PLANSHOP	0.3330	0.2993	
BUYORGANIC	-0.1064	0.3039	
HEARDIPM	-0.0683	0.4062	
GARDEN	0.2912	0.2586	
BELOWAGE17	0.0236	0.1326	
GENDER *	-0.4408	0.2639	-0.109
AGE51TO65	-0.2389	0.3004	
POSTGRADUATE**	-0.7756	0.3365	-0.183

*** Significant at 1%
 ** Significant at 5%
 * Significant at 10%

Table 20: Predictive Accuracy of Logit Model

		<i>Predicted</i>		
		<u>0</u>	<u>1</u>	<u>Correct</u>
<i>Actual</i>	0	117	38	117/155
	1	68	60	60/128

Number of correct predictions: 177
 Percentage of correct predictions: 62.5 percent