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Consumption of Home-Delivered Foods: Results from an Exploratory Survey

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Abstract: This study examines the effect of various factors on the decision to consume home-delivered foods. The results of the study suggest that the decision to order food for home delivery is determined by gender, price consciousness, number of adults and children in the household, employment status, education level, ownership of microwave oven and, to some extent race, age and income. Specifically, the results suggest that less price-conscious, employed, higher-educated, white males within the 25 to 34 age group, in a household with a microwave oven, with smaller number of adults, but with children are more likely to purchase home-delivered food than others.

Key Words and Phrases: Consumption, Home-delivered food, Logit analysis.

Recent trends in food consumption indicate an increased interest in convenience food products (products that transfer the time and activities of preparation from the consumer to the processor or retailer). Examples of convenience-driven food products and services include take-out food, fast food, frozen entrees, microwavable dishes, and home-delivered food (Kinsey). A recent survey indicated that grocery store executives believe demand for convenience foods will increase as a portion of the total market basket by the year 2000 (Russo and McLaughlin). The Food Institute recently revealed that approximately 45 percent of the food dollar goes to food away from home and the remaining 55 percent is spent on food prepared at home. However, food prepared at home also includes convenience food products. In essence, roughly one in every two dollars spent on food is now going to convenience food marketers and away-from-home food outlets. Furthermore, there is evidence of growth in in-store food service. A report prepared for the International Foodservice Manufacturers Association by Hale Group Ltd. indicates 43 percent of the consumers who use take-out or home-delivered food to satisfy their convenience food requirements do so instead of cooking at home. Thirty-seven percent use

take-out services rather than drive-through and 20 percent use take-out instead of eating out (Ghetia).

Home delivery of prepared foods is a value-added service that brings convenience to the consumers in the consumption of food. The Lampert Report (Sanson) predicts that the home delivery market may grow by 30 percent per year over the next few years. Home delivery of food is not merely limited to prepared meals from fast-food outlets and restaurants. Supermarkets are also entering the home delivery market through subcontracting the job to independent companies that specialize in distribution and delivery of food (Fensholt; Lipton; Riell; Miller).

Innovations and technology have made significant contributions to the development and growth of the home-delivered food industry. Using computer technology, telephone lines, facsimile machines and modems, customers can order food delivered to their door steps (Fensholt; Lipton). Moreover, developments are being made in designing special packaging for fresh prepared meals so its freshness and taste can be preserved while the food is *en route* (Waldsmith).

Demand for home-delivered food is driven by the increasing value (opportunity cost) of time in society. Due to increased value of time, consumers today want the food they buy to be easy and quick to prepare. Many Americans are tired and hungry at the end of the day and do not want to cook, but want the comfort and ease of eating at home (Senauer et al.). Similar trends are observed in other industrialized nations, such as Japan and the European countries (Fields; Jones).

The increasing popularity of home-delivered food is also prompted by changes in consumer demographics and lifestyles (Miller). Some socioeconomic and demographic factors that come into play are: a growing number of women, married and single, in the work force; more families living on two incomes; the impact of advertising and promotion by large food service chains; and the growth of one-adult households (Nayga and Capps). Another reason for the growth of home-delivered food industry in the United States is the aging American population. As people grow older they may not want the hassle of going out to shop or eat, instead preferring to stay in the comfort of their homes (Rager; Hertneky).

In essence, several factors might have contributed to the outward shift in demand for home-delivered foods. However, information concerning the impact of these factors on the decision to consume home-delivered food is scant. No known empirical study has determined the factors affecting the consumption of home-delivered foods. Specific knowledge of consumer attitudes and preferences is essential so that suitable marketing strategies can be designed by food processors, retailers and other operators involved

in home delivery of food. This information will allow producers, processors and distributors to anticipate trends in home delivery markets, to improve planning, and to provide better customer service.

The objective of this exploratory study, therefore, is to examine several demographic and psychographic characteristics of consumers who have purchased home-delivered food. The aim of the research is to provide information that can be used as a guide to improve the efficiency of the marketing system and the quality of home delivery service of food.

Method

A telephone survey of randomly selected households was conducted over the second quarter of 1994. In order to keep costs of the study low, the target areas selected were within the local calling exchanges of central New Jersey. Respondents' phone numbers were not obtained from the phone book to reduce sampling biases. Instead, the random digit dialing method was used. Calls were made on weekdays between 7:00 p.m. and 9:00 p.m. or on Saturdays and Sundays between 10:00 a.m. and 1:00 p.m. The details of the random digit dialing procedure and the exchange numbers used in the study are available from the authors upon request. The length of the phone interview was short. It took at most four minutes to complete the questionnaire once the respondent agreed to participate in the survey.

The disposition table of the survey is shown in Table 1. Of the 530 calls made, two of the respondents disconnected the line while the phone interview was still in process; 14 refused to participate; and 420 calls resulted in no one being contacted because of no answer or no service. Thus, 94 respondents completed the phone survey. Based on the disposition table, the gross response rate is 17.8 percent (the number of completed surveys divided by the total number of calls) while the basic response rate is 85.4 percent (calculated as the number of completed surveys as a percent of all eligible respondents).

Because of the classic notion of capital-labor substitution in household meal production, the home-delivered food market is analyzed based on household production theory. Household production theory implies that household time as well as market goods and services are used to produce commodities, such as meals, that increase the utility of household members. Thus, the household is viewed as both a producing and consuming unit (Becker; Lancaster). Since time and purchased goods can substitute for each other in the household production function, consumers can substitute

Table 1.

Disposition Table of the Telephone Survey^a

| Disposition Category | Number of Calls |
|-----------------------------------|-----------------|
| a. Contacted But Did Not Complete | 2 |
| b. Refusals | 14 |
| c. Completed Surveys | 94 |
| d. Not Contacted ^b | 420 |
| e. Total Number Dialed (a+b+c+d) | 530 |
| Gross Response Rate (c/e) | 17.8% |
| Basic Response Rate [c/(a+b+c)] | 85.4% |

^aSuggested disposition table format by Gripp, Luloff and Yonkers.

^bIncludes calls made to telephones not in service and those not answered.

delivered meals for home-cooked meals by substituting capital for their labor time in meal production.

The basic model as presented below uses m to identify meals and z as all other commodities produced at home, t is time and x is all purchased goods and services. Utility is maximized by increasing the number of commodities produced and consumed:

$U_{max} = u(m, z, t)$ where m and z are commodities produced according to a production function:

$$M, Z = f(t, x).$$

The additional constraints on the utility function are the income constraint and the total amount of time available for various activities including labor market work. This theory also suggests that an individual's employment could cause a shift from consumption of time-intensive commodities toward goods-intensive commodities since increased employment increases income to purchase goods and services and reduces time for household production (Horton and Campbell). Moreover, this theory implies that consumer behavior varies not only because of differences in income and "tastes and preferences," but also because of changes in environmental factors, i.e., demographic characteristics.

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Based on this theory and because the importance of value of time in home-delivered food consumption, the employment status of the individual is included in the analysis as a measure of the opportunity cost of time. In addition, data on dinner cooking time and microwave oven ownership are collected. Other factors analyzed to control for differences in various consumer characteristics (Lee and Brown) include respondent's price consciousness, fat consciousness, sex, length of residency in the area, number of adults and children in household, education level, race, age and income. These factors are commonly used in cross-sectional food consumption studies (Capps, Moen, and Branson; Nayga).

Data

Descriptive statistics of the variables are exhibited in Table 2. The means of the binary variables reflect proportions of consumers that fall into particular categories. Price and fat consciousness are measured using a seven point rating scale where "1" is not at all conscious and "7" is extremely conscious. This rating scale is commonly used in marketing research (see Tull and Hawkins). In this sample, the average price and fat consciousness of the respondents on a seven point scale are 4.85 and 4.90, respectively. Males comprise about 47 percent of the sample. About 84 percent of the respondents are employed and about 52 percent have lived for more than five years in the area. The average number of adults and children in the household are 2.28 and 0.80, respectively. In terms of education, about 36 percent either had no formal education or had reached only primary or secondary schooling and 64 percent had reached at least the university or graduate level. About 80 percent of the 94 respondents had microwave ovens in their households.

Roughly 46 percent of the respondents indicated they spent an average of 30 minutes or less cooking dinner while 54 percent averaged more than 30 minutes cooking dinner. About 45 percent of the respondents were white, 22 percent were black, 15 percent were Hispanic, and 18 percent were of other races. Sixteen percent of the respondents were between 16 and 24 years of age, 46 percent were between 25 and 34 years of age, 26 percent were between 35 and 49 years of age, and 12 percent were 50 years of age or older. Approximately 14 percent of the respondents had annual household incomes of less than \$15,000; 43 percent had incomes of between \$15,000 and \$39,999; 23 percent had incomes of between \$40,000 and \$74,999; and 20 percent had incomes in excess of \$74,999. Fifty-four percent of the respondents had tried home-delivered food. Comparative

Table 2.

Descriptive Statistics of the Variables Examined (Whole Sample)

| Variable | Mean | Std. Dev. | Range |
|----------------------------------|------|-----------|-------|
| Price consciousness ^a | 4.85 | 1.62 | 1-7 |
| Fat consciousness ^a | 4.90 | 1.73 | 1-7 |
| Male | 0.48 | 0.50 | 0-1 |
| Employed | 0.84 | 0.37 | 0-1 |
| More than 5-year resident | 0.52 | 0.50 | 0-1 |
| No. of adults in household | 2.28 | 1.13 | 1-7 |
| No. of children in household | 0.80 | 1.21 | 0-5 |
| Education | | | |
| No formal - secondary | 0.36 | 0.48 | 0-1 |
| University - graduate | 0.64 | 0.49 | 0-1 |
| Owned a microwave oven | 0.80 | 0.40 | 0-1 |
| Average cooking dinner time | | | |
| 30 minutes or less | 0.46 | 0.50 | 0-1 |
| Greater than 30 minutes | 0.54 | 0.50 | 0-1 |
| Race | | | |
| White | 0.45 | 0.50 | 0-1 |
| Black | 0.22 | 0.42 | 0-1 |
| Hispanic | 0.15 | 0.36 | 0-1 |
| Others | 0.18 | 0.39 | 0-1 |
| Age | | | |
| 16 - 24 years old | 0.16 | 0.37 | 0-1 |
| 25 - 34 years old | 0.46 | 0.50 | 0-1 |
| 35 - 49 years old | 0.26 | 0.44 | 0-1 |
| 50 years old and over | 0.12 | 0.32 | 0-1 |
| Annual household income | | | |
| Less than \$15,000 | 0.14 | 0.35 | 0-1 |
| \$15,000 - \$39,999 | 0.43 | 0.50 | 0-1 |
| \$40,000 - \$74,999 | 0.23 | 0.43 | 0-1 |
| \$75,000 and over | 0.20 | 0.40 | 0-1 |
| Purchased food for home delivery | 0.54 | 0.50 | 0-1 |

^aOn a seven point scale (1 = not at all conscious and 7 = extremely conscious).

means of the variables for respondents who had and had not purchased home-delivered foods are exhibited in Table 3.

Compared to the U.S. population profile (U.S. Bureau of the Census), this sample is over-representative of individuals who have at least reached a college level of education; blacks; and those in the 25 to 34 age group. On the other hand, this sample is under-representative of whites and those 50 years old or older. The average number of children per household is also below the national average.

Empirical Model and Results

A logit model was developed to evaluate the hypotheses that a set of variables influence the decision to consume home-delivered food. The logit model estimates the independent effect of explanatory variables on the probability of using home-delivered foods. It is a model that is based on the cumulative logistic probability function and is specified as:

$$Pr = f(Z) = f(X_i'\beta) = 1/(1 + e^{-Z}) = 1/(1 + e^{-(X_i'\beta)})$$

where Z is a theoretical index determined by a set of explanatory variables X (listed in Table 2); $f(Z)$ is the cumulative logistic function; e represents the base of natural logarithms (approximately equal to 2.718); and Pr is the probability that an individual will make a certain choice, given the knowledge of X .

This statistical technique uses maximum likelihood estimation on a regression equation where the dependent variable is the ratio of the probability of using home delivered food over the probability of not using home delivered food. Maximum likelihood coefficients are consistent and asymptotically normally distributed. Therefore, conventional tests of significance are applicable. The significance level chosen in this analysis was 0.05. The McFadden R^2 is 0.35 and the percentage of correct predictions using the 50-50 classification scheme is 0.82. These values are reasonable considering the nature of the (cross-sectional) data used. The maximum likelihood parameter estimates of the model are exhibited in Table 4.

The empirical results indicate that more price-conscious individuals are less likely to purchase home-delivered food than less price-conscious individuals. This finding is not surprising considering the fact that home-delivered foods generally cost more than home-prepared foods. For example, restaurants and supermarkets charge a higher price for home-

Table 3.

Sample Means of Purchaser and Non-purchaser of Home-Delivered Food

| Variable | Purchaser (N = 51) | Non-Purchaser (N = 43) |
|----------------------------------|-----------------------|---------------------------|
| Price consciousness ^a | 4.59 | 5.16 |
| Fat consciousness ^a | 4.90 | 4.91 |
| Male | 0.55 | 0.40 |
| Employed | 0.84 | 0.84 |
| More than 5-year resident | 0.45 | 0.60 |
| No. of adults in household | 2.12 | 2.47 |
| No. of children in household | 0.73 | 0.88 |
| Education | | |
| No formal - secondary | 0.25 | 0.49 |
| University - graduate | 0.75 | 0.49 |
| Owned a microwave oven | 0.84 | 0.74 |
| Average cooking dinner time | | |
| 30 minutes or less | 0.55 | 0.35 |
| Greater than 30 minutes | 0.45 | 0.65 |
| Race | | |
| White | 0.51 | 0.37 |
| Black | 0.25 | 0.19 |
| Hispanic | 0.05 | 0.26 |
| Others | 0.18 | 0.19 |
| Age | | |
| 16 - 24 years old | 0.20 | 0.12 |
| 25 - 34 years old | 0.49 | 0.42 |
| 35 - 49 years old | 0.20 | 0.35 |
| 50 years old and over | 0.12 | 0.12 |
| Annual household income | | |
| Less than \$15,000 | 0.22 | 0.05 |
| \$15,000 - \$39,999 | 0.37 | 0.49 |
| \$40,000 - \$74,999 | 0.20 | 0.28 |
| \$75,000 and over | 0.22 | 0.19 |

^aOn a seven point scale (1 = not at all conscious and 7 = extremely conscious).

Table 4.

Maximum Likelihood Estimates of the Logit Model

| Variable | Parameter Estimate | Standard Error |
|-------------------------------|--------------------|----------------|
| Intercept | 1.891 | 1.745 |
| Price consciousness | -0.505* | 0.203 |
| Fat consciousness | -0.132 | 0.174 |
| Male | 1.826* | 0.794 |
| Employed | 2.773* | 1.207 |
| More than 5-year resident | -1.141 | 0.635 |
| Number of adults | -0.984* | 0.344 |
| Number of children | 0.975* | 0.391 |
| No formal/secondary education | -1.693* | 0.757 |
| Owned a microwave oven | 1.710* | 0.888 |
| Cooking time > 30 minutes | 0.035 | 0.626 |
| Black | 0.305 | 0.788 |
| Hispanic | -2.639* | 1.087 |
| Other race | -0.722 | 0.880 |
| 16 - 24 age category | -0.431 | 0.984 |
| 35 - 49 age category | -1.569* | 0.808 |
| 50 and over age category | -1.290 | 1.074 |
| Less than \$15,000 income | 3.479* | 1.383 |
| \$40,000 - \$74,999 income | 0.333 | 0.730 |
| \$75,000 and over income | -0.464 | 0.978 |
| McFadden R ² | 0.351 | |
| % of correct predictions | 0.819 | |

Note: Asterisk (*) indicates statistical significance at the 0.05 level.

delivered foods or require a minimum dollar amount of order to waive the home delivery surcharges (Fensholt; Lipton). Moreover, customary tips are usually given to the delivery personnel which adds about 10 to 20 percent to the cost of the food ordered.

Males are more likely to purchase home-delivered food than are females. Employment is positively related to the likelihood of purchasing home-delivered foods. This finding is consistent with prior expectations and household production theory since working individuals generally have higher opportunity cost of time and, therefore, are more likely to buy time-saving, convenience items like home-delivered foods.

Results of the logit model also indicate that the number of adults in a household is negatively related to the probability of purchasing home-delivered foods. The reason for this finding is not clear. However, it is possible that households with more adults may prefer to eat out instead of ordering food for home delivery. On the other hand, the more adults there are in the household, the more expensive it is to order home-delivered food. The number of children in a household is positively related to the likelihood of purchasing home-delivered foods. This result may be related to the fact that children sometimes prefer to eat home-delivered foods such as pizza rather than home-cooked meals. Moreover, households with more children may prefer home-delivered foods than eating out for the sake of convenience.

Individuals with no formal education or individuals who have reached secondary level of education are less likely to order home delivery of food than those individuals who have attained at least a college or university level of education. Households with microwave ovens are likely to order home delivery of food. This result is consistent with prior expectations. The results also suggest that Hispanics are less likely to order home delivery of food than are whites. The reason for this pattern is not clear. However, Nayga and Farooq, in their study about the consumption of convenience meat products, also observed that a small proportion of Hispanics in the sample purchased convenience meat products.

In terms of age, the empirical results indicate that individuals belonging to the 35 to 49 age category are less likely to order home-delivered food than individuals in the 25 to 34 age category. Individuals with household incomes of less than \$15,000 a year are more likely to order home-delivered food than individuals with household incomes of between \$15,000 and \$39,999. This result may be due to the presence of college and university students in the study area. Although students generally have low incomes, they tend to have a higher propensity to order home-delivered food due to time constraints.

Conclusions

This pilot study explored some of the factors affecting the decision to consume home-delivered food. No known study in the past has examined or analyzed the effect of consumer characteristics on the decision to consume home-delivered foods. Factors important to the decision by consumers to buy home-delivered foods are gender, price consciousness, number of adults and children in household, employment status, education level, ownership of a microwave oven and, to some extent, race, age and income. Specifically, the results suggest that less price-conscious, employed, higher-educated, white males within the 25 to 34 age group, in a household with a microwave oven, with smaller number of adults but with children are more likely to purchase home-delivered food than others.

Although this study was conducted as an exploratory effort, the empirical results should assist in the identification of target groups inclined to order home-delivered food. This information will allow producers, processors and distributors to anticipate trends in home delivery markets, to improve planning, and to provide better customer service. However, one important caveat is in order. Due to the smallness of the sample and the limited scope of the survey, care must be taken when generalizing results of this study to regional or national levels since the community-specific results may not contribute to broad regional or national inferences. To provide more definitive information to retail marketers, future research should be conducted on a much larger scale, i.e., regional or national, and expenditure as well as price information should be collected and analyzed if possible. The availability of price and consumption/expenditure data will allow the estimation of price elasticities that are crucial in the development of marketing strategies. Other factors that could be examined include the quantity of food ordered, the form of the meal ordered, distance of the restaurant and/or supermarket from home, and use of various forms of telecommunication devices. Contingent upon the availability of data, future studies could focus as well on the possible interrelationships among the demand for home-delivered foods and other convenience products and services, i.e., take-out foods, convenience/processed/microwavable foods. A study about the demand for different types of home-delivered foods and their nutritional value relative to comparable home-cooked meals should also be of interest to marketers.

Notes

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