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IMPACT OF SOCIO-ECONOMIC AND DEMOGRAPHIC FACTORS ON FOOD AWAY FROM HOME CONSUMPTION IN THE UNITED STATES

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Abstract

This study identifies several socio-economic and demographic characteristics affecting food away from home consumption using the recent 1987-88 National Food Consumption Survey (the individual intake portion). The findings indicate that the following variables significantly affect the number of meals purchased: region, race, ethnicity, sex, household size, age, income, and time of week of consumption. The results also indicate that employed individuals consume more meals away from home than unemployed individuals.

Key words: food away from home, number of meals, type of facility, socio-economic and demographic factors.

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Background

One of most noticeable changes in eating habits of consumers in recent years is the increased incidence of meals eaten outside the home. Very roughly, the change has been from about one meal in four to about one in three, an increase of about 33 percent during the last 25 years (Manchester, 1990). The percentage of disposable income going to food away from home (FAFH) has increased from 5.5 percent in 1970 to 6.2 percent in 1989 (Table 1). In contrast, the percentage of disposable income going to food at home (FAH) has declined monotonically from 10.8 percent in 1970 to 7.6 percent in 1989. These economic trends point to the increasing importance of FAFH consumption relative to FAH consumption.

The move toward eating out is prompted by changes in consumer lifestyles as well as changes in the socio-demographic structure of the U.S. population. Some socio-economic and demographic factors that come into play are: a growing number of women, married and single, in the work force; increasing importance of convenience in eating out; more families living on two incomes; the impact of advertising and promotion by large food service chains; and more people in the age group of 25 to 44 who are inclined to eat out often (Putnam and Van Dress, 1984). Only about seven percent of all households now fit the old stereotype family of a working husband, a wife who does not work for wages, and two children (Kinsey, 1990). Moreover, married couples with children are declining as a share of all households. The one-adult households are fastest growing and are likely to exhibit non-conventional food consumption patterns (i.e. FAFH consumption).

The away from home market is composed of commercial foodservice establishments (i.e. restaurants, fast food places, cafeteria) and noncommercial outlets (i.e. school or military dining rooms, child care centers). Although noncommercial outlets serve more food to more people, they account for only 30 percent of the total retail value of FAFH. A breakdown of nominal expenditures for FAFH by type is given in Table 2. Eating and drinking places have the notable share of expenditures, 67 percent in 1989. Hotels and motels accounted for 5 percent of FAFH expenditures in 1989; schools and colleges almost 8 percent, and all other places nearly 13 percent.

Over the years, the place of consumption has changed within the FAFH market. In the past, full service restaurants accounted for the bulk of the FAFH sales. However, as McCracken and Brandt reported, the number of fast food establishments has more than tripled in the last twenty five years. In terms of sales, the percentage change from 1972 to 1987 in restaurants was close to 300 percent compared to about 500 percent in fast food facilities (U.S. Department of Commerce). These structural changes within the FAFH market will continue to have varying impacts on the various marketing programs and strategies of the different types of FAFH facility.

A number of studies on food away from home (FAFH) (see

below) have been made in recent years. Many of these studies have focused their analyses on socio-demographic and economic factors affecting the away from home food consumption and expenditure using cross-sectional data from national samples. Common socio-demographic factors considered were income, household size, urbanization, region, race, employment, and education. Some of the results from these studies have differed regarding the relative importance of these factors on FAFH consumption or expenditures, primarily due to the use of different consumption models, data bases, and estimation techniques.

Prochaska and Schrimper (1973), using expenditures on meals and the number of meals purchased away from home as dependent variables, found that the value of homemaker's time is an important factor affecting food consumption, when the household is viewed as both a producing and consuming unit. Their results showed a positive effect of opportunity cost of time on away-from-home consumption. Kinsey (1983) tested the effect of various sources of household income on the marginal propensity to consume FAFH for both white and nonwhite households. Kinsey disaggregated the households by intensity of the wife's labor force participation and by income and found that income earned by wives working full time did not increase the marginal propensity to consume FAFH. Redman (1980), on the other hand, examined the effects of women's time allocation and socio-economic variables on the expenditures on meals away from home and on prepared foods. Results indicate that employed wives buy more prepared foods but not more meals away from home compared to unemployed wives.

So far, only the works by McCracken and Brand (1987) examined away from home consumption by type of facility (restaurants, fast-food facilities, and other commercial facilities). Using the 1977-78 National Food Consumption Survey (NFCS) data set and Tobit analysis, they identified and measured the influence of factors affecting FAFH consumption by type of facility. The factors included in the analyses are various socio-economic factors as well as a variable depicting the value of the household's time. They found that increases in income were associated with increases in FAFH expenditure, but at a decreasing rate. As well, the value of the household manager's time was positively related to total FAFH expenditure, fast food, and other commercial expenditures but was only marginally significant for restaurant expenditures.

With the exception of the McCracken and Brandt piece, no studies as yet have analyzed the effect of the individual's employment status and other socio-demographic and economic factors on FAFH consumption by type of facility. Furthermore, McCracken and Brandt's study used the 1977-78 NFCS data set and, therefore, their analysis may not reflect current market conditions. The FAFH industry, particularly the restaurant and fast food industries, would benefit from a study that would provide some information regarding the effect of various demographic and socio-economic factors on FAFH consumption by type of facility. As well, the comparison of the results of a study about FAFH consumption, using

the recent 1987-88 NFCS data set, with those of other studies on FAFH consumption (i.e. McCracken and Brandt; Prochaska and Schrimper) using previous NFCS data sets could provide additional insights about the structural changes that have occurred in the FAFH industry in the past several years.

This article attempts to fill this void by using the Individual Intake phase of the 1987-1988 National Food Consumption Survey. The objective of this study, therefore, is to determine factors affecting FAFH consumption by type of facility, using number of meals purchased as a measure of consumption.

Conceptual Framework for the Analysis

Due to the unavailability of the household food use or expenditure phase of the 1987-88 NFCS data set during the completion stage of this study, number of meals is used in lieu of expenditures as a measure of FAFH consumption. Prochaska and Schrimper also used the number of meals purchased away from home as a measure of FAFH consumption in their study. The number of meals variable is a measure of the frequency that an individual ate FAFH.

Given the hypothesis that the demand for FAFH differs by type of facility, regression models are estimated separately for the number of meals purchased at restaurants, fast food establishments, and other facilities. Based on past studies and conditioned on the data available in the 1987-88 NFCS data set, the following model specifications are used:

$$MEAL_{ij} = b_0 + b_1urban1_j + b_2urban2_j + b_3region1_j + b_4region2_j + b_5region4_j + b_6race2_j + b_7race3_j + b_8race4_j + b_9hispl_j + b_{10}sex1_j + b_{11}employ1_j + b_{12}fstamp1_j + b_{13}diet1_j + b_{14}hsize_j + b_{15}logage_j + b_{16}logincome_j + b_{17}weekend_j + b_{18}quarter1_j + b_{19}quarter3_j + b_{20}quarter4_j + b_{21}imratio$$

where $MEAL_{ij}$ represents the number of meals purchased by an individual j from food source i , where i corresponds to:

- (1) away from home per unit of time (3 days);
- (2) restaurants per unit of time;
- (3) fast food facilities per unit of time; and
- (4) other away from home facilities per unit of time.

Also, the independent variables consist of:

$urban1_j = 1$ if individual j resides in a central city; 0 otherwise;
 $urban2_j = 1$ if individual j resides in a suburban area; 0 otherwise;

$region1_j = 1$ if individual j is in the Northeast; 0 otherwise;

$region2_j = 1$ if individual j is in the Midwest; 0 otherwise;

$region4_j = 1$ if individual j is in the West; 0 otherwise;

$race2_j = 1$ if individual j is black; 0 otherwise;

$race3_j = 1$ if individual j is Asian or Pacific Islander; 0 otherwise;

$race4_j = 1$ if individual j is of some other race; 0 otherwise;

$hispl_j = 1$ if individual j is hispanic; 0 otherwise;

$sex1_j = 1$ if individual j is male; 0 otherwise;

employ1, = 1 if individual j is employed; 0 otherwise;
 fstamp1, = 1 if individual j is receiving food stamps; 0 otherwise;
 diet1, = 1 if individual j is on a special diet; 0 otherwise;
 hsize, = household size of individual j;
 logage, = the logarithm of age of individual j;
 logincome, = the logarithm of income of individual j;
 weekend, = 1 if the three-day intake of individual j occurred mostly during a weekend; 0 otherwise; and
 quarter1, quarter3, and quarter4 = correspond to a set of binary variables that measure seasonality, (quarter1=1 if January-March; quarter3=1 if July-September; quarter4=1 if October-December) (reference category, April-June).

One classification is eliminated from each group of variables to avoid perfect collinearity among the exogenous variables and the intercept (the so-called dummy variable trap). The base group are individuals who satisfy the following description: reside in a nonmetro area (urban3); located in the South (region3); white (race1); nonhispanic (hisp2); female (sex2); unemployed (employ2); not participating in the food stamp program (fstamp2); not on a special diet (diet2); and the three-day intake occurred mostly during a weekday (weekday). Household income is used instead of individual income because the NFCS data set only provides income information for the household and not for an individual.

The specifications above are also recalculated (without the employment variable) separately for employed and unemployed individuals to obtain different parameter estimates between these two groups of individuals for away from home consumption. Separate sets of parameters are also estimated for each of the three types of FAFH facilities within each of the two employment categories (employed and unemployed). These analyses would provide information on the factors affecting the number of meals purchased away from home by either employed or unemployed individuals.

Due to the relatively high proportion of zero observations in the dependent variables, the Heckman procedure is used in estimating the models. An additional variable (imratio) is, therefore, included as an exogenous variable. The variable "imratio" is the inverse of Mill's ratio and is defined as the ratio of the value of the standard normal density function to the value of the standard normal distribution function. Probit analysis is used in the first stage of the Heckman procedure with the each of the dependent variables being given a value of one if the number of meals purchased is greater than zero and a value of zero if no meals were purchased. The inverse of Mill's ratio, which is a proxy for sample selection bias, is then calculated for each observation and is incorporated as an independent variable in the second stage.

The error structure of the equation used in the second stage of the Heckman procedure is explicitly heteroskedastic. Consequently, the use of generalized least squares in lieu of ordinary least squares (OLS) in the second stage of the Heckman procedure not only produces consistent estimates but also improves

the precision of the estimates. However, the technique developed to correct for heteroskedasticity in the Heckman procedure may break down (see Heckman, 1976 for details). For this reason, OLS is used in the second stage of the Heckman procedure in the "other" facilities model using the whole sample. Generalized least squares is used in the second stage of the Heckman procedure in the regression models for all sources, restaurants, and fast food facilities using the whole sample as well as in all the regression models separately estimated for employed and unemployed individuals.

For this study, meals are defined to include only breakfast, brunch, lunch, dinner, and supper. Snacks, infant feeding, and other eating occasions are, therefore, not considered as meals. In addition, restaurants only refer to those restaurant facilities with waiter or waitress service. On the other hand, fast food facilities refer to self-service food facilities, cafeterias, and food facilities where food is ordered and picked up at the counter. Other facilities include schools, day care centers, vending machines, stores, and community feeding programs.

Previous studies have confirmed the connection between the value of household time and away from home food consumption. These studies stressed the importance of the allocation of time in the household market as a factor affecting FAFH consumption. Furthermore, these studies (e.g. Redman, 1980; Lee and Brown, 1986; Horton and Campbell, 1991) have included an employment status variable in their analyses as a measure of the opportunity cost of time. Theoretically, it is hypothesized that the purchase of goods and services (e.g. FAFH) is substituted for an employed individual's scarce time.

Most of the studies previously mentioned on FAFH based their analysis on household production theory. Household production theory implies that household time as well as market goods and services enter the assumed utility maximization process. Thus, the household is viewed as both a producing and consuming unit (Becker, 1965; Lancaster, 1966, 1971). This theory also suggests that an individual's employment could cause a shift from consumption of time-intensive toward goods-intensive commodities (Horton and Campbell, 1991). Based on this theory and due to the increased attention given to the value of time as a significant determinant of away from home consumption, the employment status of the individual is included in the analysis as a measure of the opportunity cost of time. Also, separate analyses are done between employed individuals and unemployed individuals to determine the differences in the impact of the socio-economic and demographic factors on away from home consumption between these two groups of individuals.

Employed individuals are expected to purchase more meals away from home than unemployed individuals. Likewise, income is hypothesized to be positively related to the number of meals purchased away from home. Based on Redman's results, household size is expected to have a negative effect on the number of meals purchased. As well, individuals in central cities or suburban

areas are expected to purchase more meals away from home than those in non-metro areas due to availability of more eating establishments in metro areas. Based on previous studies, non-whites are expected to consume less meals away from home than whites. Additionally, food stamp recipients and individuals on special diet are hypothesized to purchase less meals away from home than their counterparts.

Data Description

The data set used in this study is the Individual Intake phase of the 1987-88 National Food Consumption Survey (NFCS) from the United States Department of Agriculture. The number of days in which food intake information was available varied across individuals. Thus, for some individuals, the information was provided for only a two-day or one-day period. Due to the different interview processes that were employed in each of the three days of intake, only individuals who had completed three day intakes are included in the analyses.

As in any cross-sectional study, several issues arise in handling the data set. The process of coming out with the final sample of observations (screening procedure) for the analysis is handled in a sequential manner. First, the original data which contains 11,045 individuals are edited with respect to individuals without three days of completed intake. After deleting individuals without three days of completed intake, the data set contained 8468 observations. Subsequently, after deleting observations with missing individual relevant socio-economic and demographic information, the data set contained 6274 observations. Of these 6274 observations (individuals), 3640 are employed individuals and 2634 are unemployed individuals. As mentioned earlier, separate analyses are conducted in each of these three samples: whole, employed, and unemployed sample of individuals.

The descriptive statistics of the variables used in the regression analyses are exhibited in Table 3. About 21 percent of the whole sample reside in central city areas; 49 percent in suburban areas; and 30 percent in nonmetro areas. Most of the individuals (35 percent) included in the whole sample come from the South. Eighty six percent are white; 96 percent are non-Hispanic; 45 percent are male; 58 percent are employed; 95 percent are non-recipients of the food stamp program; 14 percent are on a special diet; and about 16 percent ate food mostly on a weekend during the three-day survey period. Moreover, the average age of the individuals in the whole sample is about 43 years while the average household size is approximately three. Average household income in the whole sample is close to \$30,000. On the other hand, 10 percent of the unemployed individuals are food stamp recipients compared to only two percent of the employed individuals. Likewise, average income for employed individuals is higher than that of unemployed individuals.

The NFCS data set also provides the sources of food away from home. An overview of the proportion of individuals with three days

of completed intake eating food away from home by source of food is given in Table 4. About 48 percent of the individuals had not consumed any FAFH meal during the three day survey period. In addition, larger portions of the individuals have not consumed food in either restaurants, fast food facilities, or other facilities. For example, less than 30 percent of the sample consumed food from either restaurants, fast food facilities, or other facilities.

The descriptive statistics of the dependent variables used are shown in Table 5. For the whole sample, the maximum number of meals purchased by an individual is nine from either all sources or restaurants. The maximum number of meals purchased from fast food facilities or other facilities by an individual is eight. The average number of meals purchased, on the other hand, from all sources is 1.05. By type of facility, the average number of meals purchased from restaurants, fast food facilities, and other facilities is 0.38, 0.50, and 0.17, respectively. As expected, the average number of meals purchased by employed individuals in every type of facility is higher than that of the unemployed individuals.

Empirical Results

In this section, the Heckman procedure results are reported separately for the number of meals purchased away from home and for the number of meals purchased from restaurants, fast food facilities, and other away from home facilities. The results on the separate regression analyses on employed and unemployed individuals are presented subsequently.

Number of Meals Consumed Away from Home

The Heckman procedure results (using the whole sample) for number of meals purchased away from home and by type of eating facility are exhibited in Table 6. The Heckman procedure estimates for the number of meals purchased away from home indicate that the regional variables as a group are statistically significant as indicated by the joint F test. In particular, individuals from the Midwest and the West generally purchase fewer meals away from home than individuals from the South. Redman's study revealed that households in the North Central region generally have lower expenditures from FAFH compared to households in the West. The race dummy variables as a group are also statistically significant. Interestingly, individuals of "other" races purchase more meals away from home than whites. In contrast to the results from the Prochaska and Schrimper study, non-whites (i.e. blacks, Asians, Pacific Islanders) do not consume fewer meals away from home than whites. Hispanics, however, consume fewer meals away from home than non-Hispanics.

Males purchase more meals away from home than females. In contrast to the result in Redman's study on women, employed individuals purchase more meals away from home than unemployed individuals. This result supports the hypothesis that individuals with higher opportunity cost of time (i.e. employed individuals

vis-a-vis unemployed individuals) purchase and consume more meals away from home. Not surprisingly, individuals on special diet consume fewer meals away from home than those who are not on special diet.

Household size is negatively related to the number of meals purchased away from home. This result is consistent with the finding in the McCracken and Brandt study which used FAFH expenditures. Interestingly, individuals who consumed FAFH during the weekend purchased fewer meals away from home than those individuals who consumed FAFH during the weekday. As expected, age (income) is negatively (positively) related to the number of meals purchased away from home..

Number of Meals Consumed Away from Home by Type of Facility

The Heckman procedure estimates (using the whole sample) for the number of meals consumed from restaurants, fast food facilities, and other away from home food facilities in Table 6 reveal differences as per significance of the various socio-demographic factors by type of FAFH establishment.

The number of meals consumed from either restaurants, fast food facilities, or other facilities are significantly affected by regional factors. McCracken and Brandt did not find any significant regional effects on expenditures on any FAFH facility. In particular, the regression estimates indicate that individuals from the Northeast consume more meals from restaurants compared to individuals from the South. In addition, individuals from the Midwest and West purchase fewer meals from fast food facilities than individuals from the South. Individuals from the West, however, consume fewer meals from other facilities than individuals from the South. In terms of race, individuals of "other" races consume more meals from other facilities than whites. Males consume more meals from either restaurants or fast food facilities than females.

In accord with prior expectations and with McCracken and Brandt's study on FAFH expenditures, employed individuals consume more meals from fast food facilities but not from restaurants than unemployed individuals. As well, employed individuals do not consume more meals from other away from home food facilities than unemployed individuals. In addition, income is not statistically significant in any of the three FAFH facilities. These findings may suggest that individuals eat at restaurants not only to save time but also to acquire some recreational diversion. These results also suggest that eating away from home in restaurants and fast food facilities depends less on income than on the value of the individual's time assuming that employed individuals have higher opportunity costs of time than unemployed individuals.

Individuals who consumed FAFH during the weekend purchase fewer meals from either restaurants, fast food facilities, or other facilities than those who consumed FAFH during the weekday. Household size, as expected, is negatively related to the number of meals purchased from restaurants and fast food facilities. This

finding on household size indicates a decreasing affinity of eating at either restaurants or fast food facilities with increasing household size. Age is also negatively related to the number of meals purchased from fast food facilities and other facilities. Seasonality, however, is not a statistically significant factor affecting number of meals purchased in any of the three types of facility.

Analyses on Employed and Unemployed Individuals

Separate sets of parameters are estimated for employed and unemployed individuals to determine the various factors affecting FAFH consumption by type of facility between these two sets of individuals. The Heckman procedure is employed in all the regression runs, using generalized least squares in the second stage of the estimation process. The parameter estimates, along with their standard errors are presented in Tables 7 and 8. As expected, the adjusted R-squared of the models are relatively low although reasonable considering the cross-sectional (sample of individuals) nature of the data used.

Joint F-tests are conducted for each of the group of urbanization, regional, race, and seasonal variables. These tests indicate that regional variables as a group are statistically significant in all of the four regression models estimated for employed individuals but not for unemployed individuals. The race variables as a group are statistically significant in two (all sources and other facilities) of the four regression models for unemployed individuals.

As shown in Table 7, the significant factors affecting the number of meals purchased away from home from all sources by employed individuals include region, sex, special diet, household size, time of the week of consumption, age, and income. By the same token, the statistically significant factors in the models for unemployed individuals are only race, sex, and age (see Table 8). Hence, the impact of the variables depicting special diet, household size, and time of week of consumption on the number of meals purchased away from home are not as important for unemployed individuals as opposed to employed individuals.

As well, more socio-economic and demographic factors significantly affect the number of meals purchased in restaurants, fast food facilities, and other facilities by employed individuals than unemployed individuals. Among employed and unemployed individuals for instance, males purchase more meals than females in restaurants and fast food facilities. For employed individuals, those in larger households and those who consumed their food mostly on a weekend purchase significantly less meals in restaurants and fast food facilities than their counterparts. This result contrasts to that among unemployed individuals where the effect of household size and time of week of consumption on the number of meals purchased in restaurants and fast food facilities are not statistically significant. Moreover, the number of meals purchased in restaurants significantly increases with income among employed

individuals but not among unemployed individuals. Among employed individuals, the impact of the following factors: food stamp participation, special diet, household size, time of week of consumption, age, and region on the number of meals purchased in "other" away from home facilities are statistically significant. Race, time of week of consumption, and age are the only statistically significant factors affecting the number of meals purchased by unemployed individuals in "other" facilities.

Concluding Comments

Increased attention has been devoted in recent years to the analysis of FAFH consumption patterns mainly due to the growing appetite by Americans for eating out. This study not only determines the factors affecting total FAFH consumption but also examines, at a disaggregate level, the consumption patterns of the types of facilities within the FAFH industry. The FAFH consumption measure used is number of meals purchased by an individual.

The findings from the model for all types of FAFH facilities indicate that the following variables significantly affect the number of meals purchased: region, race, ethnicity, sex, household size, age, income, and time of week of consumption. Importantly, the results also indicate that employed individuals consume more meals away from home than unemployed individuals. This result supports the hypothesis that individuals with higher opportunity cost of time, assuming that employed individuals have higher opportunity cost of time than unemployed individuals, purchase and consume more meals away from home. Among employed individuals, the significant factors affecting the number of meals purchased away from home are region, sex, special diet, household size, time of week of consumption, age, and income. In contrast, only race, sex, and age are the factors significantly affecting the number of meals purchased away from home by unemployed individuals.

The disaggregate regression estimates for the number of meals consumed from restaurants, fast food facilities, and other away from home food facilities reveal differences in significance of the various socio-demographic factors by type of FAFH establishment. In accord with prior expectations, the results indicate that employed individuals consume more meals from fast food facilities and restaurants than unemployed individuals. Income is not statistically significant in any of the three models on FAFH facilities. These findings may suggest that individuals eat at restaurants not only to save time but also to acquire some recreational diversion. Moreover, these results may suggest that consuming meals away from home in restaurants and fast food facilities depends less on income than on the employment status of the individual.

These results may be of considerable importance for the restaurant, fast food, and other away from home industries. For instance, the findings in this study suggest that marketing efforts by these FAFH industries should be focused on individuals who purchase relatively fewer meals away from home. These individuals

may include those with larger household sizes, females, those who are unemployed, and even those who are on special diets. The fast food industry (includes cafeterias and self-service restaurants this study) also may wish to cater to the tastes of older people in efforts to boost sales.

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Table 1. Percent of Disposable Personal Income Spent for Food at Home; Food Away from Home: Selected Years, 1970-1989.

| Year | Food at Home | Food Away from Home |
|------|--------------|---------------------|
| 1970 | 10.8 | 5.5 |
| 1975 | 10.5 | 6.0 |
| 1980 | 9.7 | 6.3 |
| 1982 | 9.1 | 6.2 |
| 1983 | 8.9 | 6.3 |
| 1984 | 8.6 | 6.1 |
| 1985 | 8.3 | 6.0 |
| 1986 | 8.1 | 6.1 |
| 1987 | 8.0 | 6.4 |
| 1988 | 7.7 | 6.3 |
| 1989 | 7.6 | 6.2 |

Table 2. Nominal Expenditures for Food Away from Home by Type, Selected Years (in \$)

| Year | Eating & Drinking Places ¹ | Hotels and Motels ¹ | Retail Stores ² | Recreational Places ³ | Schools ⁴ | All Other ⁵ | Total |
|------|---------------------------------------|--------------------------------|----------------------------|----------------------------------|----------------------|------------------------|---------|
| 1960 | 10,505 | 1,028 | 1,716 | 421 | 2,082 | 3,855 | 19,607 |
| 1965 | 14,444 | 1,409 | 2,162 | 522 | 3,062 | 4,598 | 26,197 |
| 1970 | 22,617 | 1,894 | 3,325 | 721 | 4,475 | 6,551 | 39,583 |
| 1975 | 41,384 | 3,199 | 4,952 | 1,369 | 7,060 | 10,145 | 68,109 |
| 1980 | 75,883 | 5,906 | 8,158 | 3,040 | 11,180 | 16,363 | 120,530 |
| 1981 | 83,358 | 6,639 | 8,830 | 2,979 | 11,816 | 17,941 | 131,563 |
| 1982 | 90,390 | 6,888 | 9,253 | 2,887 | 12,415 | 18,889 | 140,722 |
| 1983 | 98,746 | 7,567 | 9,810 | 3,145 | 13,152 | 19,852 | 152,272 |
| 1984 | 105,873 | 8,199 | 10,231 | 3,351 | 13,791 | 21,648 | 163,093 |
| 1985 | 111,801 | 8,828 | 10,281 | 3,519 | 14,518 | 22,516 | 171,463 |
| 1986 | 121,756 | 9,176 | 10,764 | 3,743 | 15,599 | 23,919 | 184,957 |
| 1987 | 135,944 | 10,295 | 11,190 | 4,092 | 16,812 | 25,536 | 203,869 |
| 1988 | 146,952 | 11,163 | 11,877 | 4,439 | 18,048 | 27,146 | 219,625 |
| 1989 | 154,643 | 11,473 | 12,617 | 4,849 | 18,129 | 29,074 | 230,785 |

¹ Includes tips.² Includes vending machine operators, but not vending machines operated by other organizations.³ Motion picture theaters, bowling alleys, pool parlors, sports arenas, camps, amusement parks, golf and country clubs.⁴ Includes school food subsidies.⁵ Military exchanges and clubs; railroad dining cars; airlines; foodservice in manufacturing plants; institutions, hospitals, boarding houses, fraternities, and sororities, and civic and social organizations; food supplied to military forces and civilian employees; child daycare.

Source: U.S. Department of Agriculture

Table 3. Descriptive Statistics of the Independent Variables Used in the Analyses

| Variable | Whole Sample | | | Employed Ind. | | | Unemployed Ind. | | |
|-----------------------------|--------------|-------------------|----------------|---------------|--------|-----|-----------------|--------|-----|
| | Mean | S.D. ^b | R ^c | Mean | S.D. | R | Mean | S.D. | R |
| Urbanization | | | | | | | | | |
| Central City | 0.21 | 0.4044 | 0-1 | 0.19 | 0.3928 | 0-1 | 0.23 | 0.4192 | 0-1 |
| Suburban Area | 0.49 | 0.5000 | 0-1 | 0.53 | 0.4991 | 0-1 | 0.45 | 0.4978 | 0-1 |
| Non-metro Area ^a | 0.30 | 0.4567 | 0-1 | 0.28 | 0.4487 | 0-1 | 0.32 | 0.4664 | 0-1 |
| Region | | | | | | | | | |
| Northeast | 0.20 | 0.3997 | 0-1 | 0.20 | 0.3996 | 0-1 | 0.20 | 0.4001 | 0-1 |
| Midwest | 0.27 | 0.4452 | 0-1 | 0.28 | 0.4507 | 0-1 | 0.26 | 0.4370 | 0-1 |
| South ^a | 0.35 | 0.4762 | 0-1 | 0.34 | 0.4736 | 0-1 | 0.36 | 0.4798 | 0-1 |
| West | 0.18 | 0.3843 | 0-1 | 0.18 | 0.3821 | 0-1 | 0.18 | 0.3873 | 0-1 |
| Race | | | | | | | | | |
| White ^a | 0.86 | 0.3380 | 0-1 | 0.88 | 0.3237 | 0-1 | 0.85 | 0.3563 | 0-1 |
| Black | 0.10 | 0.2970 | 0-1 | 0.09 | 0.2828 | 0-1 | 0.11 | 0.3158 | 0-1 |
| Asian/Pacific Islander | 0.01 | 0.0906 | 0-1 | 0.01 | 0.0873 | 0-1 | 0.01 | 0.0950 | 0-1 |
| Other race | 0.03 | 0.1571 | 0-1 | 0.02 | 0.1519 | 0-1 | 0.03 | 0.1641 | 0-1 |
| Origin | | | | | | | | | |
| Hispanic | 0.04 | 0.1855 | 0-1 | 0.03 | 0.1828 | 0-1 | 0.04 | 0.1893 | 0-1 |
| Non-Hispanic ^a | 0.96 | 0.1855 | 0-1 | 0.97 | 0.1828 | 0-1 | 0.96 | 0.1893 | 0-1 |
| Sex | | | | | | | | | |
| Male | 0.45 | 0.4968 | 0-1 | 0.53 | 0.4990 | 0-1 | 0.32 | 0.4674 | 0-1 |
| Female ^a | 0.55 | 0.4968 | 0-1 | 0.47 | 0.4990 | 0-1 | 0.68 | 0.4674 | 0-1 |
| Employment Status | | | | | | | | | |
| Employed | 0.58 | 0.4935 | 0-1 | - | - | - | - | - | - |
| Unemployed ^a | 0.42 | 0.4935 | 0-1 | - | - | - | - | - | - |
| Food Stamp Participation | | | | | | | | | |
| Recipient | 0.05 | 0.2219 | 0-1 | 0.02 | 0.1324 | 0-1 | 0.10 | 0.2988 | 0-1 |
| Non-recipient ^a | 0.95 | 0.2219 | 0-1 | 0.98 | 0.1324 | 0-1 | 0.90 | 0.2988 | 0-1 |
| Special Diet | | | | | | | | | |
| Yes | 0.14 | 0.3495 | 0-1 | 0.10 | 0.3065 | 0-1 | 0.19 | 0.3957 | 0-1 |
| No ^a | 0.86 | 0.3495 | 0-1 | 0.90 | 0.3065 | 0-1 | 0.81 | 0.3957 | 0-1 |

Table 3 Cont.

| | Whole Sample | | | Employed Ind. | | | Unemployed Ind. | | |
|-----------------------|------------------------|----------------------|----------------|---------------|---------|-------|-----------------|---------|-------|
| | Mean | S.D. ^b | R ^c | Mean | S.D. | R | Mean | S.D. | R |
| Week Variable | | | | | | | | | |
| Weekend | 0.16 | 0.3682 | 0-1 | 0.19 | 0.3889 | 0-1 | 0.13 | 0.3349 | 0-1 |
| Weekday ^a | 0.84 | 0.3682 | 0-1 | 0.81 | 0.3889 | 0-1 | 0.87 | 0.3349 | 0-1 |
| Seasons | | | | | | | | | |
| Quarter1 | 0.29 | 0.4554 | 0-1 | 0.29 | 0.4552 | 0-1 | 0.29 | 0.4557 | 0-1 |
| Quarter2 ^a | 0.41 | 0.4899 | 0-1 | 0.41 | 0.4915 | 0-1 | 0.39 | 0.4875 | 0-1 |
| Quarter3 | 0.14 | 0.3508 | 0-1 | 0.14 | 0.3448 | 0-1 | 0.15 | 0.3589 | 0-1 |
| Quarter4 | 0.16 | 0.3689 | 0-1 | 0.16 | 0.3673 | 0-1 | 0.17 | 0.3713 | 0-1 |
| Age | 43.3 | 18.37 | 15-99 | 38.5 | 13.30 | 15-85 | 49.8 | 22.01 | 15-99 |
| Household Size | 3.03 | 1.46 | 1-12 | 3.13 | 1.40 | 1-12 | 2.91 | 1.54 | 1-12 |
| Income | 29621.8 | 23927.8 ^b | | 34531.1 | 24577.7 | | 22841.4 | 21219.4 | |
| | 3-300,000 ^c | | | 30-300,000 | | | 3-300,000 | | |

^aRefers to the omitted category in the analysis.^bRefers to the standard deviation.^cRefers to the range.

Table 4. Percent of Sample Individuals with 3 Days of Completed Intake of Food Away from Home: Total and by Source of Food

| Source of Food | Number of Meals ^a | | | | |
|----------------------|------------------------------|------|------|-----|-----|
| | 0 | 1 | 2 | 3 | >3 |
| All Sources | 47.7 | 22.4 | 14.0 | 9.5 | 6.4 |
| Restaurants | 78.7 | 14.4 | 4.4 | 1.7 | 0.8 |
| Fast Food Facilities | 71.6 | 18.4 | 6.0 | 2.5 | 1.5 |
| Other Facilities | 83.7 | 7.0 | 4.6 | 3.7 | 1.0 |

Source: U.S. Department of Agriculture

^aRefers to the total number of meals that the individual consumed away from home during the three day survey period.

Table 5. Descriptive Statistics of the Dependent Variables Used in the Analyses

| Dependent Variable ^a | Mean | Standard Deviation | Median | Maximum | Minimum |
|---------------------------------|------|--------------------|--------|---------|---------|
| <u>Whole Sample</u> | | | | | |
| All Sources | 1.05 | 1.39 | 1 | 9 | 0 |
| Restaurants | 0.38 | 0.82 | 0 | 9 | 0 |
| Fast Food Facilities | 0.50 | 0.94 | 0 | 8 | 0 |
| Other Facilities | 0.17 | 0.60 | 0 | 8 | 0 |
| <u>Employed Sample</u> | | | | | |
| All Sources | 1.72 | 1.69 | 1 | 9 | 0 |
| Restaurants | 0.62 | 1.05 | 0 | 8 | 0 |
| Fast Food Facilities | 0.51 | 0.91 | 0 | 6 | 0 |
| Other Facilities | 0.54 | 1.00 | 0 | 8 | 0 |
| <u>Unemployed Sample</u> | | | | | |
| All Sources | 0.93 | 1.31 | 0 | 9 | 0 |
| Restaurants | 0.32 | 0.76 | 0 | 9 | 0 |
| Fast Food Facilities | 0.22 | 0.57 | 0 | 6 | 0 |
| Other Facilities | 0.36 | 0.87 | 0 | 9 | 0 |

^aRefers to the number of meals purchased.

Table 6. Heckman Procedure Regression Results for Number of Meals Purchased Away from Home, and by Type of Eating Facility (Whole Sample)

| Independent Variables | FAFH | Restaurant | Fast Food Facilities | Other Facilities |
|-----------------------|--------------------------------|-------------------------------|----------------------|--------------------|
| Intercept | 2.551* (0.393) ^a | 0.853* (0.490) | 1.875* (0.432) | 2.169* (0.622) |
| Urban1 | -0.036 (0.068) | -0.100 (0.073) | 0.104 (0.069) | -0.192 (0.121) |
| Urban2 | -0.032 (0.056) | -0.088 (0.061) | 0.094 (0.057) | -0.179* (0.091) |
| Region1 | 0.028 (0.069) | 0.249* (0.070) | -0.107 (0.068) | 0.108 (0.108) |
| Region2 | -0.212* (0.059) | 0.080 (0.064) | -0.265* (0.059) | -0.241* (0.105) |
| Region4 | -0.240* (0.069) | 0.033 (0.073) | -0.295* (0.072) | 0.146 (0.122) |
| Race2 | -0.022 (0.090) | 0.042 (0.132) | 0.090 (0.086) | 0.067 (0.128) |
| Race3 | -0.015 (0.282) | 0.320 (0.288) | 0.054 (0.404) | -0.053 (0.363) |
| Race4 | 0.561* (0.185) | -0.076 (0.228) | 0.135 (0.184) | 1.662* (0.271) |
| Hisp1 | -0.296* (0.171) | -0.056 (0.205) | 0.054 (0.162) | -0.512* (0.285) |
| Sex1 | 0.249* (0.046) | 0.293* (0.049) | 0.130* (0.047) | 0.005 (0.076) |
| Employ1 | 0.269* (0.054) | 0.092 ^d (0.056) | 0.280* (0.054) | -0.112 (0.097) |
| Fstamp1 | -0.146 (0.146) | 0.261 (0.193) | 0.080 (0.151) | -0.237 (0.202) |
| Diet1 | -0.108 (0.072) | -0.030 (0.070) | -0.068 (0.079) | -0.291 (0.157) |
| Hsize | -0.075* (0.021) | -0.054* (0.021) | -0.056* (0.018) | 0.024 (0.029) |
| Weekend | -0.326* (0.064) | -0.104* (0.062) | -0.331* (0.060) | -0.678* (0.100) |
| Logage | -0.367* (0.075) | 0.082 (0.067) | -0.142* (0.060) | -0.270* (0.130) |
| Logincome | 0.098* (0.037) | 0.039 (0.037) | 0.039 (0.031) | 0.055 (0.057) |

Table 6 Cont.

| Independent Variable | FAFH | Restaurant | Fast Food Facilities | Other Facilities |
|--------------------------------------|-------------------|-------------------|----------------------|-------------------|
| Quarter1 | -0.034 (0.056) | 0.106* (0.059) | -0.075 (0.057) | 0.034 (0.091) |
| Quarter3 | 0.048 (0.072) | 0.107 (0.078) | 0.031 (0.069) | -0.074 (0.121) |
| Quarter4 | -0.022 (0.067) | 0.065 (0.072) | -0.098 (0.067) | 0.054 (0.109) |
| Imratio | -0.030 (0.066) | -0.159 (0.128) | -0.099 (0.169) | 0.100 (0.071) |
| Joint F-Tests ^b | | | | |
| Urbanization | 0.205 | 1.285 | 1.618 | 2.206 |
| Region | 8.215* | 4.521* | 9.041* | 4.245* |
| Race | 3.096* | 0.479 | 0.520 | 12.546* |
| Season | 0.442 | 1.367 | 1.393 | 0.349 |
| Adj. R-square | 0.062 | 0.049 | 0.066 | 0.186 |
| Second stage estimation ^c | GLS | GLS | GLS | OLS |

^aNumbers in parentheses are the estimated standard errors; * indicates significance at the 0.05 level.

^bThese are F values from the joint F tests.

^cThe type of least squares estimation used in the second stage of the Heckman procedure. GLS refers to generalized least squares while OLS refers to ordinary least squares.

^dSignificant at the 0.10 level.

Table 7. Heckman Procedure Regression Results for Number of Meals Purchased Away from Home by Employed Individuals

| Independent Variables | FAFH | Restaurant | Fast Food Facilities | Other Facilities |
|-----------------------|--------------------------------|--------------------|----------------------|--------------------|
| Intercept | 2.782* (0.537) ^a | 0.708 (0.543) | 2.174* (0.580) | 3.630* (0.995) |
| Urban1 | 0.004 (0.090) | -0.106 (0.092) | 0.073 (0.088) | -0.199* (0.097) |
| Urban2 | -0.003 (0.073) | -0.125 (0.077) | 0.072 (0.069) | -0.050 (0.079) |
| Region1 | -0.019 (0.089) | 0.091 (0.087) | -0.031 (0.084) | 0.171* (0.092) |
| Region2 | -0.277* (0.079) | -0.066 (0.079) | -0.173* (0.073) | -0.085 (0.084) |
| Region4 | -0.251* (0.090) | -0.179* (0.090) | -0.226* (0.087) | 0.233* (0.095) |
| Race2 | -0.029 (0.113) | 0.005 (0.136) | 0.128 (0.106) | 0.189 (0.116) |
| Race3 | 0.013 (0.360) | 0.114 (0.315) | 0.486 (0.629) | -0.369 (0.340) |
| Race4 | 0.070 (0.255) | -0.032 (0.283) | 0.290 (0.222) | -0.138 (0.277) |
| Hisp1 | -0.233 (0.208) | 0.014 (0.233) | -0.022 (0.195) | 0.170 (0.220) |
| Sex1 | 0.166* (0.059) | 0.143* (0.060) | 0.166* (0.056) | 0.042 (0.063) |
| Fstamp1 | 0.236 (0.254) | -0.191 (0.300) | 0.207 (0.283) | 0.556* (0.262) |
| Diet1 | -0.244* (0.098) | 0.022 (0.094) | -0.062 (0.104) | -0.274* (0.111) |
| Hsize | -0.155* (0.026) | -0.053* (0.024) | -0.036* (0.021) | -0.045* (0.023) |
| Weekend | -0.238* (0.089) | -0.354* (0.076) | -0.235* (0.069) | -0.337* (0.080) |
| Logage | -0.617* (0.109) | 0.050 (0.089) | -0.218* (0.088) | -0.190* (0.095) |
| Logincome | 0.263* (0.047) | 0.090* (0.052) | 0.022 (0.042) | -0.020 (0.043) |

Table 7 Cont.

| Independent Variable | FAFH | Restaurant | Fast Food Facilities | Other Facilities |
|--------------------------------------|--------------------|------------------|----------------------|-------------------|
| Quarter1 | -0.130* (0.075) | 0.117 (0.073) | -0.010 (0.068) | -0.005 (0.077) |
| Quarter3 | -0.057 (0.096) | 0.085 (0.094) | -0.001 (0.084) | 0.001 (0.105) |
| Quarter4 | -0.026 (0.085) | 0.116 (0.089) | -0.200* (0.081) | 0.098 (0.091) |
| Imratio | -0.075* (0.027) | 0.177 (0.318) | 0.081 (0.277) | -1.201 (1.071) |
| Joint F-Tests ^b | | | | |
| Urbanization | 0.004 | 1.392 | 0.604 | 2.221 |
| Region | 5.977* | 2.869* | 3.372* | 4.397* |
| Race | 0.049 | 0.050 | 1.211 | 1.425 |
| Season | 1.042 | 1.099 | 2.217 | 0.485 |
| Adj. R-square | 0.042 | 0.041 | 0.047 | 0.051 |
| Second stage estimation ^c | GLS | GLS | GLS | GLS |

^aNumbers in parentheses are the estimated standard errors; * indicates significance at the 0.05 level.

^bThese are F values from the joint F tests.

^cThe type of least squares estimation used in the second stage of the Heckman procedure. GLS refers to generalized least squares while OLS refers to ordinary least squares.

Table 8. Heckman Procedure Regression Results for Number of Meals Purchased Away from Home by Unemployed Individuals

| Independent Variables | FAFH | Restaurants | Fast Food Facilities | Other Facilities |
|-----------------------|--------------------------------|-------------------|----------------------|--------------------|
| Intercept | 3.489* (0.621) ^a | 1.670* (0.818) | 2.776* (0.626) | 2.654* (0.759) |
| Urban1 | -0.185* (0.100) | 0.055 (0.118) | -0.085 (0.102) | -0.248* (0.128) |
| Urban2 | -0.115 (0.084) | 0.077 (0.103) | -0.069 (0.083) | -0.199* (0.106) |
| Region1 | 0.117 (0.105) | 0.107 (0.122) | 0.170 (0.125) | -0.094 (0.132) |
| Region2 | -0.061 (0.093) | 0.006 (0.108) | -0.121 (0.088) | -0.110 (0.124) |
| Region4 | -0.117 (0.105) | -0.028 (0.125) | -0.058 (0.118) | 0.022 (0.139) |
| Race2 | 0.104 (0.140) | 0.015 (0.275) | 0.061 (0.127) | 0.226 (0.162) |
| Race3 | 0.138 (0.403) | -0.025 (0.665) | -0.519 (0.700) | 0.143 (0.368) |
| Race4 | 0.891* (0.265) | -0.125 (0.379) | -0.401 (0.248) | 2.133* (0.327) |
| Hisp1 | -0.336 (0.260) | -0.170 (0.353) | 0.234 (0.263) | -0.374 (0.316) |
| Sex1 | 0.352* (0.075) | 0.241* (0.087) | 0.252* (0.072) | 0.102 (0.092) |
| Fstamp1 | -0.040 (0.156) | 0.151 (0.259) | -0.124 (0.151) | -0.058 (0.180) |
| Diet1 | -0.119 (0.098) | -0.146 (0.104) | 0.047 (0.130) | -0.199 (0.131) |
| Hsize | -0.053 (0.036) | -0.087 (0.055) | -0.024 (0.030) | 0.019 (0.037) |
| Weekend | -0.110 (0.103) | 0.144 (0.121) | -0.048 (0.099) | -0.436* (0.121) |
| Logage | -0.321* (0.116) | 0.082 (0.113) | -0.099 (0.086) | -0.353* (0.104) |
| Logincome | -0.035 (0.050) | -0.043 (0.064) | -0.068 (0.052) | -0.023 (0.057) |

Table 8 Cont.

| Independent Variable | FAFH | Restaurant | Fast Food Facilities | Other Facilities |
|--------------------------------------|-------------------|-------------------|----------------------|-------------------|
| Quarter1 | 0.091 (0.089) | -0.005 (0.101) | -0.098 (0.084) | 0.065 (0.110) |
| Quarter3 | 0.151 (0.111) | 0.137 (0.131) | 0.028 (0.101) | 0.074 (0.140) |
| Quarter4 | 0.238* (0.105) | 0.063 (0.122) | -0.040 (0.101) | 0.347* (0.132) |
| Imratio | 0.063 (0.072) | -0.021 (0.336) | -0.335 (0.240) | 0.766* (0.384) |
| Joint F-Tests ^b | | | | |
| Urbanization | 1.832 | 0.290 | 0.464 | 2.566* |
| Region | 1.407 | 0.382 | 1.913 | 0.475 |
| Race | 3.879* | 0.038 | 1.198 | 14.52* |
| Season | 1.884 | 0.477 | 0.637 | 2.350 |
| Adj. R-square | 0.063 | 0.046 | 0.079 | 0.186 |
| Second stage estimation ^c | GLS | GLS | GLS | GLS |

^aNumbers in parentheses are the estimated standard errors; * indicates significance at the 0.05 level.

^bThese are F values from the joint F tests.

^cThe type of least squares estimation used in the second stage of the Heckman procedure. GLS refers to generalized least squares while OLS refers to ordinary least squares.