Wife's Labor Force Participation and Family Expenditures for Prepared Food, Food Prepared at Home, and Food Away from Home

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This study examines the effects of a wife's participation in the labor force and other socioeconomic factors on family expenditures for prepared food, food prepared at home, and food away from home using the Bureau of Labor Statistics 1992 consumer expenditure survey. On the one hand, results indicate that the number of children, home ownership with mortgage, seasonality, region, wife's age, and income are important determinants of expenditures on food prepared at home. A wife's education and participation in the labor force, on the other hand, affect expenditures on prepared food and food away from home. The impact of both these factors is greater on food away from home than on prepared food expenditures.

Increased attention has been focused on the rising labor force participation rate of women since the 1970s. Since more women have entered the labor force, the distribution of household's production time for food preparation has changed (Redman 1980). Because of increasing time constraints, households with working wives may substitute time-saving goods (e.g., food away from home, prepared food) for their own time (Becker 1965).

A number of studies have examined the impact of women's employment and other socioeconomic factors on food away from home expenditures. However, these studies have presented mixed evidence about the effect of women's employment on food away from home consumption. For example, Kinsey (1983) found that income earned by wives working full-time did not increase the marginal propensity to consume food away from home. Yen (1993), however, revealed that households with working wives were more likely to consume food away from home than were other households. Results on the effects of other socioeconomic factors have also been inconsistent. These mixed results are due to the different data and estimation procedures employed as well as the different time periods covered. The variables used to depict women's employment or time allocation also differ across studies.

An important issue that needs to be examined is the effect of a wife's time allocation on prepared food and food prepared at home as well as food-away-from-home expenditures. For instance, if indeed families with working wives substitute food away from home and prepared food for food prepared at home (home-cooked meals), then it would be interesting to know if there are differences between the effect of a wife's employment on food-away-from-home and prepared food expenditures. No known study has simultaneously examined the effect of women's labor time and other socioeconomic factors on family expenditures for prepared food, food away from home, and food prepared at home. Redman (1980), using the Bureau of Labor Statistics 1972–73 and 1973–74 consumer expenditure surveys, revealed that employed wives buy more prepared foods but not more away from home meals. In addition, using the 1980 consumer expenditure survey, Lippert and Love (1986) found that a wife's employment was associated with higher expenditures for food away from home and prepared foods. These studies, however, have used relatively older data sets and, therefore, their empirical results may no longer be valid.

The purpose of this article is to determine the effect of a wife's participation in the labor force and other socioeconomic factors on family expenditures for prepared food, food away from home,

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and food prepared at home. Household's containing both a husband and a wife are examined using the 1992 consumer expenditure survey.

Model Specification

The basis for the model specification is household production theory. Household production theory implies that market goods and services are used to produce commodities that increase the utility of household members. Thus, the household is viewed as both a producing and a consuming unit (see Lancaster 1971, Becker 1965): Based on this theory, the basic model is specified as:

$$(1) \qquad X_{ij} = X_i(\mathbf{P}_j, Y_j, W_j, \mathbf{D}_j)$$

where X_{ij} is the jth household's consumption of the ith market good, $\mathbf{P}_j$ is the vector of market prices faced by the jth household, Y_j is the jth household's income, W_j is the value of time for the jth household, and $\mathbf{D}_j$ is a vector of variables reflecting the environment. These environmental factors could reflect various household characteristics or sociodemographic elements (McCracken and Brandt 1987). Therefore, this model 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).

Following Yen (1993), equation (1) can be multiplied by $\mathbf{P}_{ij}$ to yield expenditure functions. The form of these expenditure functions with all prices normalized at unity is:

$$(2) \qquad \mathbf{E}_{ij} = f_i(Y_j, W_j, \mathbf{D}_j) \quad i = 1, \ldots, n.$$

The analyses are based on cross-section data that do not contain price information. Although relative prices could be the same for all households, some differences in household expenditures may represent urban-rural, regional, and quality price variations. This specification is commonly used in studies dealing with food away from home (e.g., McCracken and Brandt 1987, Kinsey 1983, Redman 1980, Sexauer 1979, and Yen 1993).

This study considers weekly family expenditures on prepared food, food away from home, and food prepared at home as the dependent variables. Unlike food prepared from home (i.e., home-cooked meals), prepared foods are items bought from retail stores that do not need much preparation time in household production (e.g., frozen meals, prepared salads). The focus is on husband-and-wife families and on the effect of the wife's number of hours in the labor market. The independent variables are listed in table 1.

Table 1. Variables in the Models and Their Sample Statistics

Variable	Mean	Standard Deviation
Weekly expenditure ($)[a]		
Prepared food	4.31	8.02
Food prepared at home	62.34	49.29
Food away from home	32.74	42.43
Number of children	1.00	1.22
Homeowner with mortgage	0.53	0.49
Seasonality		
Quarter1	0.24	0.42
Quarter2	0.23	0.42
Quarter3	0.22	0.41
Region		
Northeast	0.21	0.40
Midwest	0.25	0.43
West	0.24	0.42
Wife's education		
High school	0.60	0.49
College	0.24	0.43
White	0.88	0.32
Wife's labor hours per week	25.06	19.33
Household income ($)	34,485.83	29,147.36
Wife's age (years)	44.75	14.86

[a]Mean of full sample (N = 5,542). Proportion of nonzero observations for prepared food, food prepared at home, and food away from home are 0.94, 0.78, and 0.58 respectively. Mean weekly expenditures among the nonzero observations are $7.45 for prepared food, $66.15 for food prepared at home, and $41.53 for food away from home.

Since this study examines only households with both a husband and wife, the number of children is included to capture effects associated with household size and presence of children.[1] The dummy variables reflect home mortgage payment, seasonality, region, and wife's education and race. Home mortgage payment is included because homeowners with a mortgage may have a lower cash flow for a given income and, therefore, may have lower expenditures on food away from home and prepared foods but higher expenditures on food prepared at home than do others.

Because of the absence of prices, the regional variables are added to capture possible geographic price effects. Previous studies mentioned above suggest the significance of a wife's education, which is hypothesized to increase family expenditures on food away from home and prepared foods. White households have also been found to be more likely than others to consume food away from home (McCracken and Brandt 1987, Nayga and Capps 1992).

[1] This variable is not decomposed into different age categories because data are unavailable.

A wife's labor market participation (value and allocation of time) are represented by the number of hours worked per week.[2] Therefore, this variable is expected to positively affect family expenditures on prepared foods and food away from home but negatively affect family expenditures on food prepared at home. Age of wife is another variable included to capture the stage of the household in the life cycle. Younger households are expected to have higher expenditures on food away from home and prepared foods than do others.

As in most previous articles on this subject, total household income is used instead of nonwage income. More recent studies by Bryant (1988) and by Soberon-Fehrer and Dardis (1991), however, have used unearned or nonwage income to remove the wage rate effect implicit in the income effect. This approach was not utilized in this paper because of the large number of missing values in the nonwage-income derived variable.

Statistical Methods

The models specified above are estimated as a system of equations using a generalized Heckman two-step procedure. This estimation procedure has been employed by Heien and Wessells (1990), Heien and Durham (1991), and Nayga (1995) to circumvent the zero-expenditure problem inherent in studies dealing with cross-sectional data. If only nonzero expenditure observations are used in parameter estimation, ordinary least squares procedures would yield inconsistent estimates because of a problem of selectivity bias. Heckman (1979) described sample selection bias as a type of a specification error or omitted-variable problem. Subsequently, Heckman (1979) proposed a technique that amounts to estimating the inverse of Mill's ratio (Z_{ij}) for each observation using probit analysis at the first stage of the estimation process. The dependent variables in these probit regression models are measured by a binary variable reflecting the decision to buy or not to buy the item. These models are then used to compute the inverse of Mill's ratio (Z_{ij}) for the jth household for the ith item using all available observations. These Z_{ij}s, as specified by Heckman (1979) are derived for each equation and are then used as a regressor in the second step estimation of the expenditure relations.

Mathematically, the probit regressions for this study are modeled as follows:

$$(3) \qquad B_{ij} = f_i(Y_j, W_j, \mathbf{E}_j) \quad i = 1,2,3,$$

where B_{ij} is 1 if the jth household consumes the ith item and 0 if the household does not consume the item in question. Prices are not included because of unavailability in the data set used. From the maximum likelihood estimates in equation (3), the inverse of Mill's ratio for the household is derived as:

$$(4) \qquad Z_{ij} = \theta(Y_j,W_j,\mathbf{E}_j)/\Theta(Y_j,W_j,\mathbf{E}_j) \quad \text{for } B_{ij} = 1 \text{ and}$$

$$(5) \qquad Z_{ij} = \theta(Y_j,W_j,\mathbf{E}_j)/(1 - \Theta(Y_j,W_j,\mathbf{E}_j)) \quad \text{for } B_{ij} = 0,$$

where θ and Θ are the standard normal density and cumulative probability functions, respectively.

The second step in the generalized Heckman procedure involves the estimation of the three expenditure equations as a system using all the observations in the sample. These expenditure relations are specified as:

$$(6) \qquad E_{ij} = f_i(Y_j, W_j, \mathbf{E}_j, Z_{ij}) \quad i = 1,2,3.$$

Each equation has the same set of regressors except for the Z_{ij}'s. The three equations are estimated using the seemingly unrelated regression technique to gain efficiency and to account for possible contemporaneous correlation among the disturbance terms. According to Lee (1978) and Heien and Wessells (1990), the two-step estimator resulting from this procedure is consistent and asymptotically more efficient than other two-step estimators.

Saha, Capps, and Byrne (1994) derived a general expression for calculating marginal effects. Previous applications of this estimation procedure (e.g., Heien and Wessells 1990, Heien and Durham 1991, and Nayga 1995) failed to adjust the marginal effects derived directly from equation (6) by not accounting for the impact of the Z_{ij}'s. The adjusted marginal effect of the hth variable of the ith equation, x_{ih}, on $\mathbf{E}_{ij}$ is computed as:

$$(7) \quad \partial \mathbf{E}_{ij}/\partial x_{ih} = \beta_{ih} - \alpha_i\gamma_{ih}[\delta_i(\hat{Y}_i Z_i^A + (Z_i^A)^2) + (1 - \delta i)(\hat{Y}_i Z_i^B - (Z_i^B)^2)],$$

where

β_{ih} = the coefficient of the hth variable in the ith equation of the second estimation stage,

α_i = the coefficient of Z_{ij} in the ith equation of the second estimation stage,

[2] As in most previous studies on this subject, this variable is treated as exogenous. Soberon-Fehrer and Dardis (1991, 387) argued that since many workers face institutional constraints on hours of work and cannot change jobs readily because of imperfect mobility or imperfect information, the household decision process can be treated as sequential.

γ_{ih} = the coefficient of the hth variable in the ith equation of the first estimation stage,
δ_i = the proportion of observations for which $Y_{ij} = 1$,
$\hat{Y}_i$ = the fitted value, evaluated at the means of the variables, from the ith equation of the first estimation stage,
Z_i^A = inverse of Mill's ratio when $B_{ij} = 1$, evaluated at the sample means,
Z_i^B = inverse of Mill's ratio when $B_{ij} = 0$, evaluated at the sample means (see Saha, Capps, and Byrne 1994 for details).

Note that β_{ih} represents the conventional expression for calculating the marginal effect of the hth variable in the ith equation. The expression of the adjusted marginal effect in equation (7) will be equal to β_{ih} when $\alpha_i = 0$. However, this happens only when the covariance between the errors of the first and second stage equations is equal to zero. Saha, Capps, and Byrne argued that this situation is rare, which further justifies the need for adjustment of the marginal effects.

Data

The data are from the Bureau of Labor Statistics 1992 consumer expenditure survey (CES). This survey is a national probability sample of households designed to represent the total civilian population of the United States. The eligible population includes all civilian noninstitutional persons (e.g., those living in houses, condominiums, or apartments) and all people residing in group quarters such as housing facilities for students and workers. Military personnel living on bases are not included (U.S. Department of Labor 1993). The CES was designed to collect information on expenditures incurred by respondents during a survey week. The total number of households (diaries) in the survey was 11,412. However, some households did not provide all the information requested in the survey questionnaire. Consequently, households that reported incomplete socioeconomic and demographic information were dropped from the analysis.[3] In addition, only husband-and-wife households were chosen for this study, and the households with negative incomes were deleted from the sample. (It is not clear why some households were reported to have negative incomes.) Consequently, the number of households analyzed in the study is 5,542. The means and standard deviations of the variables used in the analysis are presented in table 1. The final sample analyzed contained no rural households. Consequently, no urbanization variables are included in the models.

Results

The seemingly unrelated regression estimates of the expenditure equations and the adjusted marginal effects are presented in tables 2 and 3, respectively.[4] Differences between the coefficient estimates in table 2 and the adjusted marginal effects in table 3 reflect the average bias that would occur without the adjustment procedure shown in equation (7) above. The inverse of Mill's ratio (Z_{ij}) was significant only in the prepared food equation, indicating that sample selection bias would have resulted if this bias were not captured in the estimation procedure. Because of the significance of Z_{ij} in the prepared food equation, some of the coefficients in the prepared food equation in table 2 differ, in sign and magnitude, from the adjusted marginal effects of the same equation in table 3.

Based on the adjusted marginal effects, results indicate that the number of children is positively related to expenditures on food prepared at home. The number of children is not a significant factor affecting prepared food and food away from home expenditures. An increase of one child in a family increases expenditures on food prepared at home by $8.68 per week. The expenditure elasticity with respect to number of children for food prepared at home is 0.139 (table 4).

Expenditures on food prepared at home and food away from home of families with home mortgages are higher by $6.80 and $4.71 per week, respectively, compared with those of other families. Although home ownership is often found to increase food away from home (Soberon-Fehrer and Dardis 1991), this result represents the first empirical finding concerning families with home mortgages. This result is particularly intriguing because it suggests that families with home mortgages do not

[3] Because of the deletion of households with incomplete sociodemographic information, the sample used in the analyses might not completely represent the civilian population of the United States in 1992. A reviewer suggested that selectivity bias might result if those not providing information were more time constrained than other households, and hence had different expenditure relations than others. This may be true, but the procedure used in the paper to adjust for "sample selection bias" may also adjust for this sort of bias (Bryant 1988).

[4] No degrading collinearity problems are detected in the data based on the collinearity diagnostic tests conducted (Belsley, Kuh, and Welsch 1980).

Table 2. Seemingly Unrelated Regression Estimates

Variable	Prepared Food	Food Prepared at Home	Food Away from Home
Intercept	−4.396*	23.608*	5.631
	(0.735)	(4.350)	(3.685)
Number of children	0.021	8.664*	−0.713
	(0.099)	(0.618)	(0.517)
Homeowner with mortgage	−0.164	6.773*	5.029*
	(0.224)	(1.398)	(1.188)
Quarter1	0.056	−3.703*	1.772
	(0.273)	(1.738)	(1.474)
Quarter2	−0.158	−4.629*	1.168
	(0.277)	(1.760)	(1.495)
Quarter3	0.148	−3.421*	0.159
	(0.283)	(1.793)	(1.523)
Northeast	0.066	9.650*	−0.146
	(0.287)	(1.827)	(1.554)
Midwest	0.239	4.215*	1.413
	(0.276)	(1.750)	(1.486)
West	−0.757*	6.982*	1.470
	(0.289)	(1.761)	(1.496)
Wife high school educated	0.372	2.067	7.467*
	(0.296)	(1.883)	(1.601)
Wife college educated	1.192*	2.524	11.737*
	(0.354)	(2.236)	(1.900)
White	−0.262	2.178	3.931*
	(0.3211)	(2.023)	(1.717)
Wife's labor hours per week	0.010*	−0.050	0.174*
	(0.005)	(0.037)	(0.031)
Household income	0.00001*	0.0002*	0.0003*
	(0.000003)	(0.00002)	(0.00002)
Wife's age	−0.004	0.335*	−0.038
	(0.008)	(0.052)	(0.044)
Z_{ij}	8.739*	0.00002	−0.001
	(0.433)	(0.001)	(0.001)

*Statistically significant at the 0.05 level.
NOTE: Standard errors are in parentheses.

necessarily decrease their expenditures on food away from home.

According to the likelihood ratio test results in table 5, seasonality affects expenditures on food prepared at home. In particular, weekly expenditures on food prepared at home during the fourth quarter of the year are higher by at least $3.40 than during either the first, second, or third quarter of

Table 3. Adjusted Marginal Effects

Variable	Prepared Food	Food Prepared at Home	Food Away from Home
Number of children	0.145	8.682	−0.661
Homeowner with mortgage	−0.131	6.801	4.714
Quarter1	0.020	−3.693	1.719
Quarter2	−0.240	−4.646	1.053
Quarter3	−0.006	−3.435	0.132
Northeast	−0.052	9.642	−0.133
Midwest	0.442	4.227	1.393
West	−0.303	6.973	1.558
Wife high school educated	0.349	2.066	7.047
Wife college educated	0.949	2.495	11.349
White	0.177	2.203	3.535
Wife's labor hours per week	0.010	−0.051	0.168
Household income	0.00001	0.0002	0.0003
Wife's age	−0.005	0.336	−0.025

Table 4. Expenditure Elasticities with Respect to Number of Children, Wife's Labor Hours per Week, and Income[a]

Equation	No. of Children	Wife's Labor Hours per Week	Income
Prepared food	0.034	0.058	0.080
Food prepared at home	0.139	−0.021	0.111
Food away from home	−0.020	0.129	0.316

[a]Evaluated at sample means and based on adjusted marginal effects.

the year (table 3). This result is expected because of the holidays (i.e., Thanksgiving and Christmas) during the fourth quarter of the year. Seasonal price differences could also be a factor.

Regional differences exist in both the prepared food and the food prepared at home expenditures (table 4). Western families, in particular, spend slightly less ($.30) on prepared foods per week than do southern families. However, southern families spend $9.64, $4.23, and $6.97 less on food prepared at home per week than do northeastern, midwestern, and western families, respectively. Because of the absence of prices in the models, these results may reflect regional price differences.

The likelihood ratio tests reveal that a wife's level of education is a significant factor in the prepared food and food away from home equations. Specifically, families with college-educated wives spend slightly more (close to a dollar more) on prepared food per week than do families with less-than-high-school-educated wives. This result is contrary to Redman's finding (1980) using the 1972–74 Consumer Expenditure Survey. In the present study, the wife's level of education is positively related to food away from home expenditures. This result is consistent with Lee and Brown's finding (1986) using the 1977–78 Nationwide Food Consumption Survey. Families with high-school-educated wives spend about seven dollars more per week on food away from home, while families with college-educated wives spend even more ($11.35) per week on food away from home, than do families with less-than-high-school-educated wives. These results are consistent with prior expectations since education normally increases the opportunity cost of time of wives.

Table 5. Likelihood Ratio Test Statistics for Season, Region, and Education Variables (F Values)

Equation	Season	Region	Education
Prepared food	0.366	4.206*	7.002*
Food prepared at home	2.851*	10.612*	0.726
Food away from home	0.612	0.633	19.191*

*Statistically significant at the 0.05 level.

Families in which the wife is white spend about $3.54 more per week on food away from home than do others. White households have been found to be more likely to consume food away from home than are others (Nayga and Capps 1992).

In terms of the effect of a wife's time allocation, the results indicate that the more hours per week the wife spends in the labor market, the higher are the family's weekly expenditures on prepared food and food away from home. These results are expected since families with working wives have less time available for the production of household commodities. Therefore, families must either substitute goods and services for time or improve their production skills (Kinsey 1983). Although the expenditure elasticities with respect to a wife's labor hours per week are inelastic (table 4), they suggest not only that the wife's labor hours positively affect expenditures on time-saving food products like prepared food and food away from home, but that the impact of an increase in a wife's labor hours is greater on food away from home than on prepared food expenditures. This result is critical because some studies in the past have suggested that as housewives devote more time to market activities, consumption of food away from home tends to decrease because the consumption is also time consuming (Yen 1993). For example, Redman (1980) found that employed wives do not buy more meals away from home. Most other studies have found the wife's employment or time value to be positively related as well to food away from home consumption (Kinsey 1983, McCracken and Brandt 1987, Prochaska and Schrimper 1973, Soberon-Fehrer and Dardis 1991, and Yen 1993). None of these studies, however, provided information concerning the impact of a wife's employment on prepared food expenditures.

Although the impact is small, household income is positively related to expenditures on food prepared at home and food away from home. Expenditure elasticities with respect to income are 0.111 and 0.316 for food prepared at home and food away from home, respectively (table 4). These findings suggest that compared with expenditures on food away from home, expenditures on food prepared at home are less responsive to changes in income. The positive effect of income on food away from home expenditures is in agreement with findings from McCracken and Brandt 1987, Redman 1980, Soberon-Fehrer and Dardis 1991, and

Yen 1993. McCracken and Brandt, using the 1977–78 Nationwide Food Consumption Survey, indicated an expenditure elasticity with respect to income of 0.24 while Yen, using the 1989 consumer expenditure survey, found an expenditure-income elasticity value of 0.36.

A wife's age is significant only in the food prepared at home equation. Families with older wives spend more on food prepared at home than do others, *ceteris paribus*. Contrary to Redman's result (1980), families with older wives do not necessarily buy more prepared food than do others. The coefficient estimates of the Z_{ij}'s are statistically significant only in the prepared food equation. Consequently, deleting the observations corresponding to zero expenditure levels for prepared foods would have introduced sample selection bias.

Concluding Remarks

The findings in this study indicate that several factors affect family expenditures on prepared food, food prepared at home, and food away from home. No other known study has examined these three items together using the same data. Notable differences in the significant factors exist between equations. These differences indicate the importance of distinguishing between prepared food, food prepared at home, and food away from home expenditures. For example, although a wife's labor hours and education level do not affect expenditures on food prepared at home, they positively affect both prepared food and food away from home expenditures. However, the impact of these factors is stronger on food away from home than on prepared food expenditures. These results suggest that as more women become more educated and participate in the labor force, increases in husband-and-wife families' expenditures on both food away from home and prepared food can be expected, but the magnitude will be greater for food away from home.

These findings are particularly fascinating given the results from Redman's study (1980), which used the 1972–74 consumer expenditure survey. Redman found that employed wives buy more prepared foods although not more away from home meals, but that education decreases the demand for prepared foods. These differences in the results probably reflect the dramatic changes in women's education levels and labor force participation rates during 1970s, 1980s, and early 1990s. These differences might also reflect large differences in the supply of food away from home over time.

These results have important implications for both the prepared food and food away from home industries. In particular, as increasing numbers of women undertake employment outside the home and as more women become better educated, prepared food and food-away-from-home marketers must continue to gear their marketing campaigns toward families with working and better educated wives.

Future research should focus on analyzing consumption or expenditures for disaggregate prepared food and food-away-from-home products to provide detailed and definitive information to the food industry. Further research using scanner data either indirectly (e.g., Information Resources, Inc. [IRI], National Purchase Diary [NPD] data) or directly from supermarkets could provide additional insights into the consumption patterns of U.S. consumers because of availability of information on disaggregated food products.

References

Becker, G.S. 1965. "A Theory of the Allocation of Time." *Economic Journal* 75:493–517.

Belsley, D.A., E. Kuh, and R.E. Welsch. 1980. *Regression Diagnostics, Identifying Influential Data and Sources of Collinearity*. New York: Wiley.

Bryant, W.K. 1988. "Durables and Wives' Employment Yet Again." *Journal of Consumer Research* 15(June):37–47.

Heckman, J.J. 1979. "Sample Selection Bias as a Specification Error." *Econometrica* 47:153–61.

Heien, D., and C. Durham. 1991. "A test of the Habit Formation Hypothesis Using Household Data." *Review of Economics and Statistics* 73:189–99.

Heien, D., and C.R. Wessells. 1990. "Demand Systems Estimation with Microdata: A Censored Regression Approach." *Journal of Business & Economic Statistics* 8: 365–71.

Kinsey, J. 1983. "Working Wives and the Marginal Propensity to Consume Food Away from Home." *American Journal of Agricultural Economics* 65(February):10–19.

Lancaster, K. 1971. *Consumer Demand*. New York: Columbia University Press.

Lee, L. 1978. "Simultaneous Equation Models with Discrete and Censored Dependent Variables." In *Structural Analysis of Discrete Data with Econometric Applications*, ed. P. Manski and D. McFadden, 346–64. Cambridge: MIT Press.

Lee, J., and M. Brown. 1986. "Food Expenditures at Home and Away from Home in the United States—A Switching Regression Analysis." *Review of Economics and Statistics* 68:142–47.

Lippert, A., and D. Love. 1986. "Family Expenditures for Food Away from Home and Prepared Foods." *Family Economics Review* 3:9–14.

McCracken, V.A., and J.A. Brandt. 1987. "Household Consumption of Food Away from Home: Total Expenditure

and by Type of Food Facility." *American Journal of Agricultural Economics* 69(May):274–84.

Nayga, R.M., Jr. 1995. "Microdata Expenditure Analysis of Disaggregate Meat Products." *Review of Agricultural Economics* 17(3):275–85.

Nayga, R.M., and O. Capps, Jr. 1992. "Determinants of Food Away from Home Consumption: An Update." *Agribusiness* 8:549–59.

Prochaska, F.J., and R.A. Schrimper. 1973. "Opportunity Cost of Time and Other Socioeconomic Effects on Away from Home Food Consumption." *American Journal of Agricultural Economics* 55:595–603.

Redman, B. 1980. "The Impact of Women's Time Allocation on Expenditure for Meals Away from Home and Prepared Foods." *American Journal of Agricultural Economics* 62: 234–37.

Saha, A., O. Capps, Jr., and P. Byrne. 1994. "Calculating Marginal Effects in Models for Zero Expenditures in Household Budgets Using a Heckman Type Procedure." *Texas Agricultural Experiment Station Bulletin*. College Station, Texas. September.

Sexauer, B. 1979. "The Effect of Demographic Shifts and Changes in the Income Distribution on Food Away from Home Expenditure." *American Journal of Agricultural Economics* 61:1046–57.

Soberon-Fehrer, H., and R. Dardis. 1991. "Determinants of Household Expenditures for Services." *Journal of Consumer Research* 17:385–97.

U.S. Department of Labor. Bureau of Labor Statistics. *Consumer Expenditures in 1992*. Report No. 861. Washington, D.C.

Yen, S.T. 1993. "Working Wives and Food Away from Home: The Box-Cox Double Hurdle Model." *American Journal of Agricultural Economics* 75:884–95.