Table 2. Estimated Implicit Prices of Food Nutrients[a] (Standard Errors Parentheses)

Nutrient	$\hat{\beta}$	Coefficient of Variation
Protein (grams)	.00440 (.0001)	3.44
Fat (grams)	.00248 (.00003)	.69
Carbohydrates (grams)	.00021 (.00002)	4.78
Minerals (milligrams)	.00012 (.000002)	1.33
Vitamin A (international (unit)	-.00001 (.0000004)	-2.98
Vitamin B (milligrams)	.02335 (.00003)	2.64
R^2	.19[b]	

[a]For the pooled sample, a total of 101,649 food items were used. The estimated coefficients are significant at the .01 level.

[b]R^2-like value computed as the ratio of the sum of predicted variations $(\hat{P}_i - \bar{P})^2$ to the sum of the total variations, $(P_i - \bar{P})^2$.

It is not feasible to present the estimated hedonic price equations for each household. Some insight regarding household nutrient valuations can be gained through a pooled regression as shown in Table 2. In addition, this table presents the coefficients of variation for the seven nutrients for the $\hat{\beta}_i^h$ obtained from the individual household regressions. All of the estimated coefficients for the pooled sample are highly significant, and the R^2 is fairly high, especially in light of cross-section data for individual households. The coefficients of variation column indicates that there appears to be enough variation across households for these estimates to be used in the next set of regressions.

Each estimated coefficient in Table 2 is a measure of the average household's valuation of the respective nutrient. Positive coefficients indicate the incremental amount the representative household is willing to pay for an additional unit of the nutrient. For example, the average household is estimated to be willing to pay $.004 for an additional gram of protein. The negative coefficient for vitamin A may be due to its presence in a very limited number of foods and small servings provide all of the RDA [Pennington]. It may be, then, that consumers are not concerned with vitamin A in their diets, yielding a negative coefficient.

Given the average implicit prices of the nutrients, how well does the pooled sample equation predict market prices? An indication is provided in Table 3. Selected items from various food categories are shown. Using the estimated coefficients of Table 2 multiplied by the s_{ij} provided in the NFCS generated the predicted prices of food items associated with (1). Consequently, the predicted prices represent average predicted prices, since the coefficients were obtained from the pooled survey data. Predicted prices reflect, on average, the valuation consumers give to the respective food item based upon nutritional content alone.

Table 3. Estimated and Actual Prices: Selected Foods, 1977

	Food Item				
Nutrient	Steak* (lb)	Milk (gal)	Tomatoes (lb)	Bread (lb)	Oranges (lb)
Protein	$ .31	$ .52	$ .02	$ .17	$ .01
Fat	.04	.34	0.00	.04	0.00
Carbohydrates	0.00	0.00	0.00	.05	.01
Minerals	.08	.86	.02	.11	.02
Vitamin A	0.00	0.00	0.00	0.00	0.00
Vitamin B	.39	.34	.10	.42	.05
Vitamin C	0.00	.09	.16	0.00	.27
Total (predicted price)	$ .86	$2.15	$ .30	$ .79	$ .36
Actual avg. 1977 price	$1.83	$1.68	$ .68	$ .60	$ .22

*U.S. choice sirloin steak.

Whenever the predicted price is greater than (less than) the actual price, an interpretation is that the average consumer's valuations of the nutrients contained in the food are greater than (less than) the market's valuation. For example, consumer valuation of a pound of U.S. choice sirloin steak is less than the market price. Furthermore, its valuation is based primarily on protein and B vitamins. This result is consistent with declining beef consumption in recent years. Milk is also undervalued by the market, and its consumer valuation reflects a much broader base of nutrition. The discrepancies for tomatoes and oranges may be due, in part, to seasonal variations in prices versus an annual average.

Given the food expenditure data and the nutritional content of foods, levels of nutrient consumption can be generated. These values are the dependent variables in (3). Given the $\hat{\beta}_j^h$ and

other respective household data, weighted least squares can be used to generate estimated coefficients.[6] Table 4 (on the following page) presents the results. R^2s in every case indicate relatively high proportions of the total variations have been explained by the respective equation, given cross-section household level data. Notice that none of the intercepts is significant. This is consistent with a household having no income, food stamp bonus, net meals, or members having no nutrient demand.

Five of the nutrients have significant own-price coefficients. Of these, four have their expected negative signs: fat, minerals, B vitamins, and vitamin C. In these instances increases (decreases) in the implicit own-prices of nutrients result in decreases (increases) in quantities of the respective nutrients consumed. Vitamin A has a significant positive coefficient. This is consistent with the sign reversal noted in the hedonic price equation.

Very few significant cross-price effects are present. They are also negative and relatively small when significant. In terms of significant cross-price effects, nutrient levels of protein and B vitamins are most responsive to price changes. Carbohydrate levels, on the other hand, are the least affected. Price changes in fats and carbohydrates have the broadest impacts across nutrients. Vitamins A and C are associated with smaller price effects on nutrition levels. Space limitations preclude presenting the elasticities for significant coefficients, but they indicate inelastic demands and complementary cross-price effects.

Income effects are all positive and significant, except for carbohydrates. Although not shown, the associated income elasticities indicate normal goods. Thus, increases in income are estimated to lead to less than proportional increases in nutrient demands, except for carbohydrates. Similar interpretations apply to the food stamp bonus coefficients, with the exception of vitamin C. These coefficients are larger than those for income, leading to the inference that a dollar increase in food stamps has a larger effect on nutrient levels than a dollar increase in income. This suggests that the program was quite successful in raising the nutrient intakes of the poor.

Turning to the other independent variables, their effects can be summarized easily. Family size is always positive and significant. Race has a varying impact on nutrition demand. Blacks vis-a-vis whites demand significantly more protein, fat, and vitamins A and C. Whites consumed significantly more fat, minerals, vitamin A, and B vitamins than other race categories. Educational level of the homemaker has a varied impact indicating that nutritional awareness is not an increasing function of educational attainment. Meal adjustment is always positive and significant. The results also indicate that the homemaker working outside the home does not lead to increased nutrition demands. Finally, suburban and city residents demand significantly more of all nutrients except fat and carbohydrates.

The research can be used to estimate nutrition demand by the specific composition of a household. For example, Table 5 presents predicted household nutrition demands utilizing the estimated coefficients of Table (4). They are for the following household situation. Implicit price values of the nutrients ($\hat{\beta}_i$) are the average estimated pooled household values shown in Table 2. This household has the average income of the sample. There is one child between 2 and 12, and the parents are between 20 and 39. The homemaker has some college education, household members ate the average number of meals away from home, it is a dual working household, it is white, and the residence is either a city or rural area.

Table 5 illustrates how the results can be used to generate estimates of nutrition demand on the basis of socioeconomic characteristics. For example, the differences between the columns estimate the extent of the differences in nutrition demands on the basis of residence. The hypothetical rural household consumes less of all nutrients except for carbohydrates than its city counterpart.

Table 5. Estimated Nutrient Demands for a Three-Person Household for a Week[a]

Nutrient	Residence	
	City	Rural
Protein (grams)	1,727	1,621
Fat (grams)	2,387	2,286
Carbohydrates (grams)	5,458	5,509
Minerals (grams)	598	573
Vitamin A (hundreds of international units)	1,443	1,248
B vitamins (milligrams)	277	247
Vitamin C (milligrams)	2,400	2,018

[a]Household has average estimated implicit prices, income and meal adjustment. The homemaker has some college education and works outside the home. It is a white household with two adults between 20 and 39 and one child between 2 and 12.

[6]Using estimated prices in this equation introduces the problem of stochastic regressors. The extent of the problem depends on the degree of correlation between the stochastic variables and their errors. Weighted least squares are used because estimation occurs across households, and an adjustment for NFCS sampling procedures is required.

Table 4. Nutrient Demand Equations: Nationwide Food Consumption Survey, Spring, 1977

Independent Variables	Protein (gm)	Fat (gm)	Carbo-hydrates (gm)	Minerals (mg)	Vitamin A (I.U.)	Vitamin B (mg)	Vitamin C (mg)
Intercept	-40.85 (.29)[a]	-21.70 (.10)	806.92 (1.58)	-1,757.91 (.38)	12,333.45 (.66)	47.16 (.96)	298.73 (1.00)
Imputed prices ($.001)							
Protein	-6.16[b] (1.93)	-11.33[b] (2.29)	-53.124[b] (4.65)	-508.76[b] (4.87)	-317.98 (.77)	-36.33[b] (3.30)	-5.22 (.78)
Fat	.13 (.01)	-35.81[b] (2.02)	-74.84[b] (1.82)	-488.75 (1.30)	-723.67 (.49)	-44.00 (1.11)	-7.85 (.33)
Carbohydrates	-8.24 (.53)	6.45 (.27)	-44.60 (.80)	-598.06 (1.17)	-3,333.67 (1.65)	-83.14 (1.54)	-25.97 (.80)
Minerals	-158.27 (1.49)	-264.55 (1.61)	-1,499.63[b] (3.95)	-18,214.41[b] (5.25)	15,177.27 (1.10)	-67.41[b] (1.84)	-113.45 (.51)
Vitamin A	1,104.03[b] (2.71)	1,241.19[b] (1.97)	612.12 (.42)	15,572.22 (1.17)	246,640.03[b] (4.67)	47.61 (.34)	2,283.79[b] (2.69)
Vitamin B	-2.16[b] (1.84)	-2.21 (1.22)	-9.78[b] (2.33)	-107.89[b] (2.82)	-251.46[b] (1.65)	-1.72[b] (4.26)	-2.68 (1.10)
Vitamin C	5.85 (.98)	18.47[b] (1.99)	28.56 (1.34)	28.27 (.14)	-533.79 (.69)	-11.48 (.56)	-22.18[b] (1.78)
Income ($100)	1.29[b] (5.36)	1.55[b] (4.15)	.60 (.70)	33.15[b] (4.22)	71.19[b] (2.28)	.39[b] (4.74)	2.39[b] (4.76)
Food stamp bonus	2.34[b] (2.66)	2.36[b] (1.73)	1.90 (.60)	79.15[b] (2.75)	309.15[b] (2.71)	.78[b] (2.57)	2.47 (1.35)
Household size	635.27[b] (34.61)	846.99[b] (29.78)	2,052.87[b] (31.27)	21,035.78[b] (35.03)	43,413.14[b] (18.23)	209.07[b] (33.06)	658.33[b] (17.20)
Location							
City	105.72[b] (2.25)	100.82 (1.38)	-51.27 (.30)	2,577.01[b] (1.67)	19,538.00[b] (3.20)	30.50[b] (1.88)	381.90[b] (3.89)
Suburb	146.08[b] (3.36)	153.97[b] (2.29)	84.62 (.54)	3,644.59[b] (2.56)	14,147.26[b] (2.51)	43.05[b] (2.88)	314.33[b] (3.47)
Northeast	61.84 (1.14)	64.12 (.77)	48.94 (.25)	-835.56 (-.47)	-2,793.41 (.40)	31.47[b] (1.69)	283.74[b] (2.52)
North Central	52.97 (1.01)	53.90 (.66)	78.09 (.41)	-885.12 (.51)	-5,872.60 (.86)	26.65 (1.47)	-21.67 (.20)
South	44.31 (.83)	193.70[b] (2.33)	382.43[b] (1.99)	-317.58 (.18)	-10,664.66 (1.53)	38.50[b] (2.08)	-102.82 (.92)
Net meals	580.18[b] (22.39)	783.46[b] (19.51)	1,658.78[b] (17.89)	16,202.83[b] (19.11)	36,872.78[b] (10.95)	188.20[b] (21.08)	608.62[b] (11.26)
Education							
High School	107.82[b] (1.93)	78.75 (.91)	-7.14 (.04)	3,028.32[b] (1.66)	1,317.24 (.18)	20.77 (1.08)	-37.28 (.32)

Table 4 (Continued)

Independent Variables	Protein (gm)	Fat (gm)	Carbo-hydrates (gm)	Minerals (mg)	Vitamin A (I.U.)	Vitamin B (mg)	Vitamin C (mg)
Attended College	67.59 (.99)	-25.42 (.24)	-197.29 (.81)	3,624.27 (1.62)	14,113.21 (1.59)	-1.98 (.08)	201.46 (1.41)
College Graduate	-52.87 (.71)	-270.85[b] (2.39)	-239.54 (.90)	-56.47 (.02)	4,480.77 (.46)	-43.11[b] (1.67)	292.29[b] (1.87)
Percent age distribution							
2 or younger	-1,274.93[b] (6.54)	-1,501.94[b] (4.97)	-2,269.36[b] (3.25)	-26,994.97[b] (4.23)	-86,541.57[b] (3.42)	-435.70[b] (6.49)	-828.15[b] (2.04)
2 through 12	-542.73[b] (4.25)	-634.51[b] (3.21)	-437.91 (.96)	-18,279.44[b] (4.38)	-48,437.36 (2.93)	-126.26[b] (2.87)	-214.11 (.80)
13 through 19	257.38[b] (1.84)	263.05 (1.21)	1,123.08[b] (2.25)	8,231.85[b] (1.80)	-19,255.81 (1.06)	40.81 (.85)	409.51 (1.41)
20 through 39	-21.59 (.33)	-2.16 (.02)	-149.28 (.63)	-1,010.79 (.47)	-15,057.23[b] (1.76)	-24.50 (1.08)	-373.39[b] (2.72)
65 and older	-147.49[b] (2.13)	-350.34[b] (3.27)	-246.85 (1.00)	-1,444.19 (.64)	-1,983.72 (.22)	-45.82[b] (1.92)	-71.68 (.50)
Race							
White	155.03 (1.64)	464.31[b] (3.16)	356.49 (1.05)	11,071.22[b] (3.57)	20,446.14[b] (1.66)	47.52 (1.46)	305.40 (1.55)
Black	267.26[b] (2.49)	586.64[b] (3.53)	-50.18 (.13)	3,122.07 (1.64)	63,092.70[b] (4.54)	60.50 (1.64)	419.71[b] (1.88)
Homemaker employed	-2.72 (.07)	-25.78 (.42)	-51.30 (.36)	1,118.24 (.86)	-4,010.25 (.78)	-5.25 (.38)	-90.66 (1.10)
R^2	.64	.58	.60	.64	.32	.63	.35
F	131.96	100.22	108.83	130.08	35.08	122.93	39.73

[a]Items in parentheses are t-ratios.

[b]Significant at .05 level.

CONCLUSIONS

A characteristics model of consumer choice has been developed and estimated. This model is for a situation in which the goods being studied provide a common set of attributes without any unique characteristics. Individual household data were used to obtain estimates of a household's implicit valuations of nutrients. These results were used to generate predicted market prices. Comparisons of the predicted prices to the actual market prices suggested instances where the market price was either greater or less than the average consumer's valuation.

Nutrient demand equations were estimated. Results indicated the relevance of the hedonic approach. The overall fits were quite good. The limited impacts of nutrient valuations, as reflected in the magnitudes of significant coefficients, is consistent with the role of nutrients as necessities. The effects of changes in income and household characteristics can be projected, assuming there are no changes in consumer preferences over time. Increases in income will not lead to very large increases in nutrient demand. An older population will have a significant negative effect on protein, fat, and B vitamins. Changes in the racial composition of the population toward a higher proportion of blacks will increase protein, fat, and vitamins A and C consumption. Continued increases in the proportion of working homemakers will not affect nutrient demand levels.

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FEMALE LABOR FORCE PARTICIPATION AND EXPENDITURES ON FOOD AWAY FROM HOME

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ABSTRACT

Increases labor supply of married females decrease the time available for household production, including meals. A sample of dual earner households is used to analyze the effects of the price of time and other variables on expenditures for food away from home (FAFH). Tobit corrects for sample selection bias and allows the estimated coefficients to be broken down into two components. The conditional effect is found to be more important than the participation effect on FAFH expenditures.

Increasing labor supply of females in two adult households has implications for how home production activities are conducted. A rise in the wage rate increases the cost of time, including time spent in home production. Economic theory predicts that when the price of time increases, a household may substitute out of the use of time and into the use of purchased inputs in home production. Decreases in time available for household production can be linked to food away from home (FAFH) consumption as a less time intensive approach to meal production. This study concentrates on how changes in labor supply patterns affect expenditures on FAFH as an input into home meal production.

Statistics indicate reasons why one might expect changes in the way meals are produced in the household. In 1960, 29.6 percent of white, married households had two earners. By 1980, that figure had increased to 55.0 percent. The figures for blacks are 40.8 percent and 63.1 percent respectively (Hagye 1983). During the same period, the share of food expenditures spent on FAFH has remained relatively stable (USDA 1985). This constant share constitutes a real increase of 15.8 billion dollars over the twenty-three year period, 1960-1983.

Review of Literature

Previous research has included both single and dual earner households in the analysis of FAFH expenditure behavior. If single and dual earner, two adult households, elicit different behavior, then examining dual earner households separately can yield information not previously available pertaining to this growing segment of the popluation.

Two basic approaches have been taken in the estimation of the effect of female labor supply and other socio-economic variables on consumption of FAFH. Both approaches are based on household production theory. The first approach utilized ordinary least squares regression (OLS) analysis (Prochaska and Schrimper 1973; Redman 1980). These studies generally report positive effects of income and negative effects due to family size and the presence of small children. The effect of the price of time, measured by the wage rate in Prochaska and Schrimper's study and by employment of the wife, a proxy for the price of time, in the Redman study prove inconclusive. In the former case, wage elasticities ranged from negative to positive, depending on the subsample utilized. In the latter, the variable was insignificant.

The second approach to estimation has been to use limited dependent variable techniques (LDVT) to estimate the effect of female labor supply and other socioeconomic variables on FAFH consumption (Kinsey 1983; McCracken 1984; Lee and Brown 1986). Tobit and two-stage Probit estimation are relevant in the case of FAFH expenditures, since in any survey period it is expected that not all respondant will make these types of purchases. This indicates a sample is censored and LDVT become necessary (Maddala 1983). Compared with OLS estimation, the studies using LDVT also report positive income effects and negative effects of family size and presence of small children. Kinsey utilized employment of the wife as a proxy for the price of time and found the variable to be insignificant. McCracken found positive and significant wage elasticities. Lee and Brown found that wife's employment depressed expenditures on FAFH.

Conflicts in previous research make it difficult to sort out the effects of increases in the price of a woman's time on FAFH expenditures. When the wage rate is omitted from the estimation, the income effect also includes the effect of a change in the wage rate on time use. OLS estimation, even when it includes the opportunity cost of time, provides biased and inconsistent estimates of parameter coefficients (Maddala 1983). When the price of time is measured by hours of labor supply in a household production framework, the estimates suffer from simultaneous equation bias, since the framework assumes that all uses of time and goods are simultaneously determined.

The present study utilizes pieces of previous research in its formulation along with a more recent data source. A household production model is used in which groceries and FAFH are permitted to be direct substitutes for one other. The opportunity cost of a woman's time is explicitly accounted for, as are socio-economic variables which account for productivity and taste differences across households. An attempt is made to identify directly prices of FAFH and of substitute food at home (FAH), as well as the usual method of including regional dummy

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variables to account for price differences due to geographic area. Tobit estimates are obtained. Finally, elasticities representing the effect of the price of time on the consumption of FAFH if there are FAFH purchases and the effect the price of time on the probability of consuming FAFH are calculated.

Theoretical model

The theory of consumer behavior provides a framework for analyzing how increases in female labor supply affect the way in which household goods are produced. Commodities which yield utility, such as meals and all other household produced goods, are produced using non-market time and inputs purchased in the marketplace. Utility is maximized subject to a households' total time and income constraints. If one considers that meals can be produced at home, or purchased in the market, and that non market time can be used in preparing meals at home or for ordering and waiting for restaurant meals, the production function for meals can be written as a function of the inputs. If all other things are produced with time and other purchased inputs, then the production function for those goods is also a function of the inputs. Implicit in these functions is the assumption of no joint production. The time used to obtain a restaurant meal is only an input into the production of meals, not a source of utility. In addition shopping and food preparation at home do not produce utility. The model can be written

$$\text{maximize } U(M(X_r, X_m, h),\ O(X_o, h_o)) \quad (1)$$

subject to

$$wM_s + v = P_r X_r + P_m X_m + P_o X_o \quad (2)$$

$$H = h + h_o + M_s \quad (3)$$

where X_r = restaurant food
X_m = groceries
h = time used in meal production
X_o = purchased inputs in other home production
h_o = time inputs into other goods
w = wage rate
M_s = labor market time
P_r = price of restaurant food
P_m = price of groceries
P_o = price of other goods
H = total available time

Empirically estimating this model can test the hypotheses that restaurant and grocery purchased inputs are substitutes and that increases in the price of a woman's time and increases in non wage income impact positively on expenditures for FAFH.

The Data

The 1980 Consumer Expenditure Survey is used. The sample is representative of the U.S. population. Data was collected on demographic and socio-economic variables, as well as on expenditures on food away from home (FAFH), not including school lunches, alcohol, or snacks. A subsample of two adult, two earner households was selected. Variables computed from the sample include wage of the wife, calculated using salary, hours worked, and weeks worked information. This was deflated by the price of all other things, or left as is, depending on the estimating equation used. The price information was calculated using regional consumer price indices for food at home (FAH), food away from home (FAFH), and all other things (Bureau of Labor Statistics 1980). Regional dummy variables were included in the specification which did not include prices explicitly. The non-wage income variable was also computed, using before tax income minus salary income. Since women have historically been the major meal preparer in two adult households, male wage income is included in the wife's non wage income term. In the estimating specification including prices, this variable was deflated by the price of other things[1]. In order to account for productivity and taste differences, family composition variables are included. Productivity in a household can increase when there are children in the family. For example, preparing the same meal for four versus two persons does not take twice as much time. In addition, a dummy variable for race and occupation of the wife were included to account for taste differences. Means of variables used in the analysis are presented in Table 1.

The final subsample included 1131 observations with variables: WAGESP= wage of the wife; WAGESPD= deflated wage of the wife; PROFSP= occupation dummy (white collar= 1); RACESP= race of the spouse (1= white); KIDS18= number of children under age 18; AGE64=number of adults over age 64; NWYMALE= non-wage income, including husband's salary; NWYMALED=NWYMALE deflated; PHOME= price of FAH (calculated by dividing the CPI for FAH by the CPI purged of food); PAWAY=price of FAFH (calculated as above, subsituting FAFH for FAH); EXPFAFH= expenditures for FAFH, excluding snacks, alcoholic beverages, and school lunches; NE NC W S= Dummy variables for region.

Table 1. Means and Standard Deviations of variables affecting expenditures on food away from home in the U.S., 1980-81.

VARIABLE	MEAN	STANDARD DEVIATION
KIDS	18.980	1.080
AGE	64.042	.234
WAGESP	6.040	4.230
WAGESPD	.044	.032
NWYMALE	18329.000	9608.900
NWYMALED	136.220	71.9400
PAWAY	.973	.0077
PHOME	.983	.0120
EXPFAFH	24.690	20.0500
% WITH EXPFAFH	.849	

Empirical model

The theoretical model implies that demand for X_r can be written

X_r = f(own price, prices of complements and substitutes, nonwage income; productivity shifters) (4)

Two empirical specifications are included. The first attempts to include prices explicitly in the specification, as theory indicates that a quantity dependent demand function is a function of prices and income. The second specification simply uses regional dummy variables as a proxy for price variation. Both approaches were tried because price variables calculated from the consumer price index reveal little variation and therefore need to be compared with the historical method of accounting for price differences in cross section in order to determine superiority.

Given that the data only has information on expenditures on FAFH, the dependent variable, quantity of FAFH purchased, must be multiplied by the price of FAFH. The same multiplication is made for each exogenous variable. The resulting linear expenditure functions are

$$P_rX_r=b_0 + b_1KIDS18 + b_2AGE64 + b_3RACESP + b_4PROFSP + a_5PAWAY + b_6PHOME + b_7NWYMALED + b_8WAGESPD \quad (5)$$

$$P_r X_r = b_0 + b_1KIDS18 + b_2AGE64 + b_3RACESP + b_4PROFSP + b_5NE + B_6NC + b_7W + b_8WAGESP + b_9NWYMALE \quad (6)$$

where $b_i = a_i * P_r$ for $i = 1,2,\ldots,10$

Computing elasticities from expenditure functions is straightforward:

$$\frac{\partial P_rX_r}{\partial wagesp}\ \frac{wagesp}{P_rX_r} = \frac{b_8\ wagesp}{P_rX_r} \quad (7)$$

but, since b_8 is equal to a_8P_r,

$$\frac{a_8\ P_r\ wagesp}{P_rX_r} = \text{wage price elasticity} \quad (8)$$

A similar exercise can be used to compute income elasticities.

Since the sample has characteristics of a censored sample, there are no observations for the dependent variable if expenditures on FAFH equal zero. Therefore Tobit estimation, which accounts for the truncation of the normal error term which occurs with a zero cut off, is used (MacDonald and Moffitt 1980). It is noted here that since the estimate is the sum of two parts, it IS NOT equal to the change in expenditures on FAFH given a change in an exogenous variable, and calculating elasticities in the usual way from the results is inappropriate. However, the Tobit estimated coefficients can be broken down into two parts. The total change in the dependent variable is the sum of two parts: the change in expenditures on FAFh for those observations above zero, weighted by the probability of having a non zero value, and, the change in the probability of having a non zero observation weighted by the expected value of expenditures on FAFH given it is above zero (Judge, et. al. 1983).

The two pieces of information contained in the Tobit coefficients can be expressed in elasticity form. The conditional elasticity expresses the change in EXPFAFH due to the influence of the exogenous variables given EXPFAFH is positive. The elasticity of the probability of consumption expresses the change in EXPFAFH due to becoming a participant in the FAFH market (Huang and Raunikar 1983). The decomposition of Tobit estimated coefficients can be derived following MacDonald and Moffit and Huang and Raunikar (1984, 1983).

The derived conditional elasticity associated with positive expenditures is

$$(\partial[Y^*]/\partial X_i)(X_i/e[Y^*]) \quad (9)$$

where Y^* = expected value of EXPFAFH for those above zero

X_i = socioeconomic factors affecting EXPFAFH

and the participation elasticity expressing the change in the probability of having positive expenditures on FAFH is

$$(\partial F(z)/\partial X_i)(X_i/F(z)). \quad (10)$$

where F(Z) = cumulative normal density function.

Results

Results of Tobit estimation are presented in Table 2. Estimates did not differ significantly for variables included in both equations, with the exception on non wage income. However, explicit specification of price variables in Model 1 led to unexpected results. Both PAWAY and PHOME were insignificant and were of a sign other than was hypothesized[2]. One explanation is that the lack of variation in prices across region when measured by the CPI led to poor prediction. The inclusion of regional dummy variables as a proxy for price also yielded insignificant results. In addition to little price variation captured in the dummy variables, region captures other differences as well.

The nonwage income variable did not perform well in model 1, while it was significant in model 2, and positive in sign, as expected. As income rises, EXPFAFH rise, indicating FAFH is a normal good. The coeficient on WAGESP is positive and significant. This supports the hypothosis that goods may be substituted for time in meal production.

Given the statistical superiority of Model 2, it is used in the remainder of the analysis. The coefficient on PROFSP is positive in sign, though not as significant as expected. Separating white-collar workers from blue collar workers was an attempt to incorporate both education and effect of present job on EXPFAFH. RACESP was positive, indicating that white persons are more likely than other races to have expenditures on

FAFH. This is explained by taste differences, though specific effects of other variables by race could be extracted if the sample were split by race and the equations re-estimated. KIDS18 was of the expected sign, but insignificant. AGE64 was insignificant, though positive, perhaps indicating that increased disposable income associated with age affects preferences for FAFH positively.

Table 2. Tobit results estimating expenditures on food away from home.

VARIABLE	MODEL 1	MODEL2
CONSTANT	14.703 (81.096)*	9.3866 (2.5459)
KIDS18	-1.0801 (.61287)	-1.1221 (.61316)
AGE64	-.27527 (2.7568)	.18920 (2.7769)
RACESP	2.9535 (1.9452)	3.0620 (1.9452)
PROFSP	1.6626 (1.5563)	1.7184 (1.5549)
PAWAY	33.033 (111.76)	-
PHOME	-38.462 (74.687)	-
NE	-	-1.8111 (1.8472)
NC	-	0.24302 (1.7198)
W	-	-1.2041 (1.7966)
NWYMALED	-0.46446E-01 (.91843E-02)	-
NWYMALE		.34295 (.68045E-04)
WAGESPD	103.59 (21.628)	-
WAGESP		-.79565 (.16114)

* Standard errors are presented in parentheses.

Decomposition of the Tobit estimates from the Model 2 can yield more information. Specifically, the marginal effects of being above the limit, in this case having positive expenditures for FAFH, can be separated from the marginal effects of a change in the probability of having positive FAFH expenditures. Calculating the proportion of the total marginal effect due to the conditional marginal effect and the market participation effect is simply the ratio of each effect to the total marginal effect. For WAGESP, 82 percent of the total effect can be explained by those who already consume FAFH (.552/.675), while 18 percent is due to the market participation effect. For NWYMALE, 82 percent of the variation is due to those above the limit observation, and 18 percent was due to the market participation effect. To examine whether different incomes affect EXPFAFH differently, income levels one standard deviation above and below the mean were disaggregated into their respective effects[3].

For high incomes (one standard deviation above the mean), the conditional marginal effect accounts for 85.2 percent of the total effect, while for lower incomes it accounts for 74.9 percent. This leads one to believe that there are differences in income class that affect EXPFAFH differently. For lower income households (one standard deviation below the mean), the participation effect increases, although this study indicates that for all groups, the effect of those already purchasing FAFH is greater than that of the probability of consuming.

Income and wage elasticities calculated at the means of and one standard deviation above and below the mean income of the data are presented in Table 3. Because there are two parts to every Tobit estimated coefficient, there are two wage and income elasticities associated with each level of wages or income. The conditional elasticities are found to be greater than the participation elasticities in every case, as expected. Given the large proportion of dual earner households already consuming FAFH, the probability of entering the market for the first time is low. The results indicate that a 1 percent change in WAGESP will increase EXPFAFH by .145 for those already in the market, while a 1 percent change in WAGESP affects the probability of entering the FAFH market by .028 percent. The income elasticities indicate that for two adult earner households, a one percent increase in NWYMALE increases EXPFAFH by .199 percent, while a one percent increase in NWYMALE increases the probability of consumption of FAFH by .0016 percent. These results indicate that for two adult earner households increases in non wage income, including the husbands' wages, impact positively on EXPFAFH, a normal good.

Table 3. Conditional and Probability elasticities for EXPFAFH, U.S., 1980.

VARIABLE	CONDITIONAL ELASTICITY	PROBABILITY ELASTICITY
WAGESP	.145	.028
MEAN NWYMALE	.199	.0016
HIGH INCOME	.297	.00161
LOW INCOME	.101	.0011

Summarizing, although results from a sample including only two earner housholds is not directly comparable to research which has included both single and dual earner household, this study appears to indicate that two earner households have a greater propensity to consume FAFH than single earner households when compared

to the probability of consuming found in other studies. The conditional income expenditure elasticity for dual earner households explains more of EXPFAFH than does the participation elasticity. Lower income and wage expenditure elasticities than presented in other studies may indicate the length of adjustment period to changes in income and wages.

Discussion

Further research may be helpful in identifying more specific relationships between labor supply patterns and consumption and expenditures for various types of FAFH. A breakdown of FAFH into composite categories such as fast food versus full-service restaurant food would reveal information as to where the food dollar is being spent. A larger study might also look at both single and dual earner households as separate groups. Previous research including both types of households found that the effect of entering the food away from home market had a greater impact on total FAFH expenditures than did the effects of the exogenous variables on those who already purchased FAFH. This study, which included only dual earner, two adult households found the opposite. One can infer that for dual earner households marketing strategies which influence the spending per purchase of FAFH will be more effective than a strategy which aims to increase the total number of purchases of FAFH. Future research may also include a more recent data set. The latest data available in previous research is the 1980-81 Consumer Expenditure Survey. Over the last five years, the dual earner household has become the norm, and not a peculiar occurrence in households with certain socioeconomic characteristics. Over this time period, it is possible that society has adjusted to dual earner households as a form of consumer unit which has not socioeconomic boundaries. Bother marketers and households, then, may have made adjustments over time. For this reason, recent data is necessary to compare with older studies in order to identify differences and changes in food consumption patterns. Finally, improvements in this study include finer specifications of certain exogenous variables, including prices. If one believes that there are differences in prices, even in cross section, then collection of actual price data is ideal. Disaggregating children's age categories further will most likely separate the conglomerate effects of children as a whole, since young and older children can be expected to affect time use and expenditures differently.

This study forms the basis identifying the type of detailed information necessary in gaining a clearer picture of who is consuming what type of food away from home and how socioeconomic, demographic, and labor supply characteristics of household affect expenditures on food away from home. This includes a breakdown of types of FAFH purchased and detailed family composition variables. Estimation with all groups combined into a single sample may not reveal information which marketers can use to better serve individual market segments; nor will it give the information necessary for consumers to better plan their food expenditures.

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ENDNOTES

1. Deflating the price and income variables necessarily imposes the homogeneity restriction on the estimates including prices. The reason for the deflating procedure, however, is to decrease the multicollinearity between prices when the price of other things is an index purged of the price of food.

2. Given that Tobit is a maximum likelihood estimator, the usual t-tests of significance are not appropriate. The t-ratios presented are comparable to those used in OLS. They

are most likely based on a Wald, likelihood ration test, or Lagrange multiplier test.

3. This method was chosen as to be as objective as possible about how to groups income. In addition, any regression technique gives the most reliable estimates near the means of the data. To keep statistical integrity and gain reliable answers, examination of "extremes" was restricted to two-thirds of the data.

THE ECONOMICS OF NUTRITION OF U.S. LOW-INCOME HOUSEHOLDS

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ABSTRACT

This paper estimates the impact of price and income on low income household demand for a variety of foods. The demands are then translated into nutrition status for low income households. To do this, a system of demand equations is estimated using the Nationwood Food Consumption Survey from 1977-78.

INTRODUCTION

The economic literature on food and nutrition has largely focused on the impact that food assistance programs have on the diet of the poor [13, 8, 6, 3]. However, very little research has estimated the impact that family composition, food prices and income have on the demand for specific types of food among the U.S. poor.

In recent years evidence on the role of diet in the etiology of chronic diseases has been accumulating, and now food consumption patterns themselves are recognized as an important health concern [10]. To understand nutrient consumption of the poor, the food consumption of the poor, and the role that price, income and family composition changes play in dietary patterns, it is useful to estimate a system of demand equations for a variety of foods using data collected on the U.S. poor. The demand system estimated here uses the Nationwide Food Consumption Survey, Low Income Supplement (NFCS) for 1977-1978.

Cross-section estimates of demand systems are rare. The assumption that prices are constant in cross-section has generally been made as a way to deal with the absence of data on prices faced. However, recent literature has argued that there is considerable price variation within and across local markets [7]. In this paper a household price for food items is computed and used in the demand system estimation.

Modelling the Demand for Food

Most of the food demand literature relies on single equation estimation. This approach is suitable when the focus is on one particular food or all food taken together. However, when considering household demand for the basket of foods, a complete demand system which can take into account the simultaneity of the food consumption choices is more appropriate.

The model estimated here is the Almost Ideal Demand System (AIDS) developed by Deaton and Muellbauer [4]. Household composition is specified as suggested by Barten [2]. The AIDS model is a complete demand system that relates the budget share of each commodity to the logarithm of real expenditure and the logarithm of all commodity prices in the system. Real expenditure is obtained by deflating income by the prices of the goods. The specification is shown in equation (1):

$$w_i = \alpha_i + \beta_i \ln(x/P) + \sum^{j} \tau_{ij} \ln(p_j) \qquad (1)$$

where w_i is the share of the ith good in expenditures, x is expenditures, p_j is the price of the jth good, and P is defined by equation (2).

$$P = \alpha_0 + \sum^{k} \alpha_k \ln(p_k) + (1/2) \sum\sum^{jk} \tau_{jk} \ln(p_j) \ln(p_k) \qquad (2)$$

In the full AIDS specification this specification for P introduces substantial non-linearity into the model. We use a linear approximation to equation (2) suggested by Deaton and Muellbauer [4]:

$$\ln P^* = \sum^{l} W_l \ln(p_l) \qquad (3)$$

where W_l is the mean share of good l and p_l is the household price for good l.

We assume separability in food and other goods so that we need only deal with the food demand equations. Expenditures, x, refer to expenditures on all food. Prices and shares likewise refer to food prices and share of total food expenditure to specific foods.

Household composition is clearly an important determinant of household demand for food. Care must be taken when introducing household composition in a complete demand system so as to preserve the restrictions implied by the theory. The specification used here is one introduced by Barten [2] and further discussed by Pollack and Wales [9]. In this specification, known as demographic scaling, the demographic variables are introduced in a function modifying the price variables. In equation (1) p_i is replaced by $m_i p_i$, where m_i is a function of household composition variables. We have chosen m_i to be the function shown in equation (4)

$$m_i = \prod^{k} D_k^{\theta ki} \qquad (4)$$

where D_k is one plus the number of persons in the household in each of several specified age and sex categories. The weight assigned to different household members in the consumption of one food may differ from that assigned various family

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members in the consumption of other foods. Thus we allow separate scaling factors for each food.

The full specification of the demand equations, including the household composition variables is shown in equation (5):

$$w_i = \alpha_i + \beta_i \ln(x/P^{**}) + \sum^{j} \tau_{ij} \ln(p_j m_j) \qquad (5)$$

where $\ln P^{**} = \sum^{1} W_1 \ln(p_1 m_1)$

Substituting (4) into (5) yields:

$$w_i = \alpha_i + \beta_i \ln(x/P^{*}) + \sum^{j} \tau_{ij} \ln(p_j) + \sum^{k} \phi_{ki} \ln(D_k) \qquad (6)$$

where $\phi_{ki} = \sum^{j} \theta_k(\tau_{ij} - \beta_i W_j)$.

Changes in relative prices affect w_i as indicated by the estimated values of τ_{ij}, with $\sum^{j} \tau_{ij} = 0$ and $\tau_{ij} = \tau_{ji}$. The effect of changes in real total food expenditure are given by the estimated values of the β_i, with $\Sigma \beta_i = 0$. The β_i are positive for luxuries (income elasticities greater than one) and negative for necessities (income elasticities less than one). The effects of household composition enter the model through θ_{ki} but only ϕ_{ki} is estimable. Thus household composition effects are not truly identified. Rather the interaction of household composition, prices, and total food expenditure is estimated.

The final model form is linear and can be estimated using Ordinary Least Squares. Homogeneity is imposed on an equation by equation basis, while symmetry is imposed with cross-equation restrictions.

The Data

The data are taken from the USDA Nationwide Food Consumption Survey, Low-Income Supplement 1977/78 (NFCS). This low income sample was defined by eligibility for food stamps, with about half the sample receiving food stamps and half eligible but not participating in the program. The sample was a disproportionate probability sample of 4500 households from the 48 contiguous states.

Household data were obtained via an interview with the household member most familiar with food preparation. Data were collected on household demographic characteristics, meals served to guests, and household food consumption. For individual household members data were collected on meals eaten from household stores. The household food data relate to all food consumed by the household from household sources over the preceding seven day period. Food acquired and consumed away from the household is not included; food eaten away from home but from household stores is included. The food data include the quantity of food and the expenditure on that food. Price must be computed from the price-quantity-expenditure identity. Food consumption in this data is food disappearance and includes wastage and spoilage.

For the analysis presented here the over 2000 food items recorded in the NFCS were aggregated into eleven composite foods. These groupings were defined to represent separate foods from the point of view of the consumer as well as provide convenient nutritional groups.[4] Condiments and the beverages coffee, tea, alcohol, and sweet drinks were omitted entirely.

Composite foods were aggregated on the basis of caloric content rather than the more conventional weight units, pounds or grams. This is done because we believe consumers implicitly purchase food by number of servings, approximated better by caloric content than by physical weight. Quantity aggregation by energy content is at its best when aggregating foods with varying water content, for example aggregation of dried beans and canned beans, or aggregation of dried milk, condensed milk, and fluid milk. It is likely at its worst for aggregation of vegetables, where serving size and caloric content vary widely, as in the case of lettuce and carrots. Aggregation by calories has the further advantage that the nutrient content of food is more homogeneous when aggregation is by calories.

The food price of interest is not the price paid by the consumer for individual food items, but rather the price faced by the consumer for the composite food. This price is computed by taking the weighted average ratio of the price of each food item purchased by the household to the sample mean price for that item. The weights utilized were based on the relative contribution (over the sample) of each item to the composite food. Thus the price faced by a particular household for the ith composite food, p_i, is:

$$p_i = \sum^{j} ((p_{ij}/ P_{ij})(W_{ij}/(\sum^{j} W_{ij}))\ P_i) \qquad (7)$$

where p_{ij} is the price paid by the household for the jth specific item in the ith composite food group, calculated from the household's expenditures on the specific item given the quantity purchased; P_{ij} is the mean food item price calculated over the entire sample; $W_{ij}/(\sum^{j} W_{ij})$ is the caloric weight for the jth food item in the ith food, scaled to unity for every household; and P_i is the mean price for the ith composite food.

This price computation is based on the assumption that prices within a composite food are colinear, such that whatever items the household consumes from a composite food provides a proxy for the price of that composite food. In the absence of any purchase from a composite food the mean price for that composite food must be used. Table 1 presents the mean caloric contribution, the budget shares, and the mean prices for the eleven composite foods. Total food expenditure is

[4]The food groups are diary, fats, starches, bread and cereals, sweets, meats, fish and poultry, eggs, vegetables, fruits, and all other foods.

computed as the sum of expenditures on each of the eleven foods in the system.

TABLE 1. Price and Shares of Eleven Foods.

Food	Caloric Share	Expenditure Share	Price $/1000Kcals		Percent Households Consuming
Dairy	.10	.13	.81	(.20)	98
Fat	.13	.04	.19	(.05)	90
Starch	.18	.07	.29	(.11)	97
Bread & Cereal	.12	.08	.43	(.13)	99
Sweets	.12	.06	.36	(.16)	96
Meat	.22	.30	.94	(.20)	98
Fish & Poultry	.03	.10	1.87	(.64)	87
Eggs	.02	.03	.82	(.21)	95
Vege-tables	.02	.09	2.49	(.97)	96
Fruit	.03	.07	1.44	(.44)	89
Other	.03	.03	.82	(.24)	69

The household demographic variables are created from the meal counts for each family member provided in the NFCS. Each demographic variable is defined as the number of meals eaten from household stocks by a person of the relevant age and sex characteristics. Meal counts, rather than number of household members is appropriate to examine the effect of household size on food demand. The number of meals served over a week is more closely related to food consumption than the nominal household size, as determined by persons under one roof. A full week of meals is taken to be 21 meals. Originally nine age/sex groups were defined, but examination of coefficients and testing of full versus reduced models showed four groups adequately fit the data. The four age/sex groups are: 1) boys and girls under age 12, 2) boys and girls between age 12 and age 17, 3) men 18 years and over, 4) women 18 years and over. Based on work by Kennedy, et. al [5], meals were weighted such that breakfast and lunch received a weight of .25 and dinner a weight of 0.5. These weights are based on caloric contribution to the daily intake from each meal. An advantage of using this specification is that household composition becomes a continuous variable. However, care should be taken in interpreting results, as household size in this specification refers to meal consumption, and not persons living together. In these data the mean household contained 3.32 members; the mean meal consumption is equivalent to 2.91 members.

A set of dummy variables are used to account for the systematic variation in preferences. Race (white or black), region (northeast, north central, south, or west), food stamp use, residence (urban, suburban, rural), and ethnic group (Hispanic or non-Hispanic) are used in the specification as dummy variables.

Results

In Table 2 the price elasticities and income elasticities and the elasticities of demand with respect to the household composition variables are shown. These elasticities are computed at the mean values of the variables.[5] Two of the income elasticities in Table 2, the income elasticity of demand for Meat and the income elasticity of demand for Sweets, are greater than one, indicating that these two foods can be considered luxury goods. The income elasticities of demand for Dairy, Starch, Bread & Cereal, and Eggs are less than one, indicating that they can be considered necessities. The remaining foods, Fats, Fish & Poultry, Vegetables, Fruit, and Other, have income elasticities not significantly different from one.

TABLE 2. Food Quantity Demand Elasticities: with Respect to Income, Food Prices, and Household Composition.

		EXP*	P1	P2	P3	P4	P5	P6	P7
1	Dairy	.877-	.709	-.027	-.038	-.060			
2	Fats		-.104	-.330			-.148	-.112	
3	Starch	.864	-.006		-.519			-.161	
4	Bread & Cereal	.772	-.089			-.602		-.034	
5	Sweets	1.122		-.094			-.814		
6	Meat	1.173		-.022	-.061	-.053		-.764	-.110
7	Fish Poultry							-.267	-.559
8	Eggs	.640	-.161			-.087		-.144	
9	Vegetables								-.084
10	Fruit								
11	Other			-.172		-.163		-.224	

TABLE 2 (continued).

		P8	P9	P10	P11	D1	D2	D3	D4
1	Dairy	-.051				-.087	-.032		
2	Fats				-.157			.041	
3	Starch					.056	.050	.092	.058
4	Bread & Cereal				-.066	.102	.075		
5	Sweets	-.064							-.078
6	Meat	-.035			-.031	-.042	-.022		-.055
7	Fish Poultry		-.072			-.066			.143
8	Eggs	-.218	-.102				.057	.111	
9	Vege-tables	-.051	-.776	-.069		-.063	-.023	-.037	.097
10	Fruit		-.090	-.648		-.036	-.083	-.104	.084
11	Other				-.274	.120		-.097	-.300

*EXP refers to expenditure, Pi refers to Price of the ith food, and Di refers to age/sex group.

[5] The estimated coefficients can be obtained from the authors on request.

All the own-price elasticities are negative and significantly different from zero at the .05 level. None of the own price elasticities exceed one in absolute value; the largest are for Sweets (-.81), Vegetables (-.78), Meat (-.76) and Dairy (-.71), while Fat, Eggs, and Other are very price inelastic. The cross price elasticities are quite small. All of the cross price elasticities that are significantly different from zero at the .10 level are negative, indicating that these foods are complements.

In order to illustrate the effects of total food expenditure, prices, and household composition, the estimated equations were used to calculate demand for various foods using varying values of the independent variables. Food prices were initially set at the sample mean values; starting values for total food expenditure and household composition were obtained by defining a representative household type. We arbitrarily selected the single mother with two minors. This was done by selecting all 3-person households with one adult female and two minors. A single mother heads about one third of all households in this sample with two or more minors. In addition to the female-headed household, a 4-person household consisting of one adult male, one adult female, and two minors was specified.

The effects of different total food expenditure levels on budget share and quantity of food consumed are presented in Table 3. Household composition is specified as the consuming equivalence for the 3-person female-headed household, and food prices are held constant the mean values, total food expenditure is set at the level of the 25th centile for this family type and at the mean level. As can be seen, when weekly food expenditures increase from $27.5 to $37 per week, the total number of calories increase from 42,300 kilocalories to 56,500 kilocalories. In addition, the composition of the diet changes. At the lower food expenditure level the diet contains relatively less Meat and Sweets, and relatively more Dairy, Starch, Bread & Cereal, and Eggs.

These households are all eligible for food stamps, which have a primary impact of increasing income. Although the impact of the food stamp program on food expenditures is a matter of some discussion, the nature of this impact on both total consumption and the relative mix of foods can be seen in these estimates. The diet at the lower total expenditure level replaces some meat consumption with the relatively less expensive Dairy and Eggs, and relies more on the relatively inexpensive Starch and Bread & Cereal groups to provide calories. Both diets provide adequate caloric intake, although there is a much smaller margin of excess for the lower total food expenditure diet.

The effects of differences in household composition on diet are illustrated in Table 4, where consumption of the 3-person female-headed household is compared to consumption of a 4-person male and female headed household. The first household is the female-headed household previously described, with total weekly food expenditure set at the mean value, $37. The second household is obtained by adding one adult male, with a consumption equivalent of .83; for comparative purposes we have left the consumption equivalences of other family members at the levels found for the female-headed household. Expenditure for food for the 4-person household is set at the mean level for the female-headed household and at the mean level for the 4-person household. One approach to Table 4 is to view the 4-person household as an extension of the

TABLE 3. Share and Quantity of Eleven Foods for a Standard Household at Two Total Food Expenditure Levels.

	$27.5 Expenditure		$37 Expenditure	
Food	SHARE percent	QUANTITY x 1000 Kcals	SHARE percent	QUANTITY x 1000 Kcals
Dairy	16.8	5.7	16.3	7.5
Fat	3.3	4.5	3.3	6.4
Starch	6.8	6.5	6.5	8.3
Bread & Cereal	10.0	6.4	9.5	8.2
Sweets	7.4	5.7	7.7	7.9
Meat	23.6	6.9	25.2	9.9
Fish & Poultry	7.2	1.1	7.1	1.4
Eggs	3.4	1.1	3.0	1.4
Vege-tables	8.5	0.9	8.5	1.3
Fruit	7.7	1.5	7.7	2.0
Other	5.2	1.8	5.3	2.4
TOTAL		42.3 Kcals		56.5 Kcals

TABLE 4. Share and Quantity of Eleven Foods for the Standard Household and the Standard Household plus an Adult Male.

Household Composition					
children = 1.39		children=1.39		children = 1.39	
teens = .37		teens = .37		teens = .37	
women = .88		women = .88		women = .88	
men = .03		men = .83		men = .83	
total food expenditure	$37		$37		$44
	% Share	1000 Kcals	% Share	1000 Kcals	% Share	1000 Kcals
Dairy	16.3	7.5	16.0	7.3	15.8	8.6
Fat	3.3	6.4	3.5	6.8	3.5	8.1
Starch	6.5	8.3	7.5	9.6	7.3	11.1
Bread & Cereal	9.5	8.2	9.6	8.2	9.3	9.5
Sweets	7.7	7.9	7.4	7.6	7.5	9.2
Meat	25.2	9.9	26.0	10.2	26.9	12.6
Fish & Poultry	7.1	1.4	7.1	1.4	7.0	1.6
Eggs	3.0	1.4	3.6	1.6	3.4	1.8
Vege-tables	8.5	1.3	7.9	1.2	7.9	1.4
Fruit	7.7	2.0	6.6	1.7	6.7	2.0
Other	5.3	2.4	4.8	2.1	4.8	2.6
TOTAL		56.5		57.8		68.5

female-headed household where the male is added with, and without, a compensating increase in total food expenditure.

Some of the difference between the 3-person and 4-person households at a given total food expenditure level are due to decreased per capita expenditure. Comparison of dietary patterns at equivalent expenditure levels may be more appropriate, and the third column of Table 4 presents the consumption of the 4-person household at the mean level observed for that household. Total consumption is dramatically increased to 68,500 Kcals, or a weekly household increase of 12,000 Kcals associated with the .8 consuming equivalent for the adult male. Again the differences in the patterns of consumption are striking. The male and female headed household show decreased relative consumption of Dairy, Vegetables, Fruit, and Other and increased consumption of Starch, Meat, and Eggs relative to the consumption patterns of the female-headed household.

From a nutritional viewpoint these diets are substantially different, with the diet associated with the female-headed household more nutritionally sound by most standards. Broad recommendations for most American households would be to decrease consumption of fat, switch some consumption of red meat to fish and poultry, and increase consumption of complex starches, fruits, and vegetables while decreasing consumption of processed carbohydrate foods (USDA, 1980).

In order to illustrate the effects of variation in food prices on demand a series of price simulations were run. The standard female-headed household was used with expenditure set at $35. Price variation was introduced by altering the prices of Dairy, Meat, and Fish & Poultry were singly, while the prices of Starch and Bread & Cereal were altered together as were the prices of Vegetables and Fruits.

The results of the simulation runs are presented in Table 5 The first row presents the caloric consumption of each food at the mean price level for all foods, and the last column presents the total caloric consumption at the mean price and at each of the price simulations. Thus, at mean prices, 7,100 Kcals of Dairy are consumed, and total consumption from all foods is 53,000 Kcals. For each of the five foods or food combinations a simulation was run with the price of the respective food(s) one standard deviation above the mean and one standard deviation below the mean. The consumption from each of the eleven foods is presented across the row, with the last entry being the total consumption. Thus when the price of Dairy is one standard deviation below the mean price (and all other prices constant), the Dairy consumption rises to 9,000 Kcals, the consumption of most other foods rises slightly (due to the income effect) and total weekly caloric consumption is 55,900 Kcals. When Dairy prices are set one standard deviation higher than the mean price, consumption of Dairy falls, consumption of most other foods fall, and total caloric consumption is 51,200 Kcals.

TABLE 5. Quantity of Food from Each of Eleven Foods Under Simulated Price Changes at Constant Total Expenditure.

Thousands of Kcals of Food

Total Expenditure Set at $35		Dairy	Fat	Starch	Bread& Cereal	Sweets	Meat
Mean	lo	7.1	6.7	7.7	7.6	7.4	9.3
Dairy	lo	9.0	6.2	8.0	7.8	7.4	9.3
	hi	5.9	5.8	7.6	7.3	7.4	9.2
Starches	lo	7.3	6.0	9.5	9.8	7.5	9.7
	hi	6.9	5.9	6.5	6.2	7.4	9.0
Meat	lo	7.1	6.2	8.1	7.8	7.4	10.8
	hi	7.0	5.7	7.2	7.2	7.4	7.5
Fish & Poultry	lo	7.1	6.1	7.7	7.5	7.3	9.7
	hi	7.0	5.9	7.7	7.6	7.5	9.0
Vege-tables & Fruit	lo	7.0	6.1	8.1	7.6	7.6	9.3
	hi	7.1	5.9	7.5	7.5	7.3	9.2

TABLE 5 (continued).

Total Expenditure Set at $35		Fish & Poultry	Eggs	Vege-tables	Fruit	Other	Total
Mean		1.4	1.3	1.2	2.0	2.2	53.0
Dairy	lo	1.4	1.4	1.2	2.0	2.2	55.9
	hi	1.3	1.2	1.2	2.0	2.2	51.2
Starches	lo	1.4	1.2	1.2	2.0	2.3	57.9
	hi	1.4	1.3	1.2	2.0	2.1	49.8
Meat	lo	1.5	1.4	1.2	2.0	2.3	55.8
	hi	1.2	1.2	1.2	1.9	2.1	49.6
Fish & Poultry	lo	1.6	1.3	1.3	2.0	2.2	53.8
	hi	1.2	1.3	1.2	2.0	2.2	52.4
Vege-tables & Fruit	lo	1.5	1.3	1.8	2.7	2.2	55.2
	hi	1.3	1.2	.9	1.6	2.2	51.7

The greatest effects for each simulation are the own-price effects, with the cross-price effects being much smaller in magnitude. Particularly large effects are seen for Dairy, Starch and Bread & Cereal, and Vegetables and Fruit, where a one standard deviation decrease in price leads to a 25% or greater increase in consumption.

These results suggest that there is an important impact of prices on the make up of the family food basket, and on the total calories consumed. Changes in the consumption of dairy or vegetable and fruit have marked nutritional consequences, since dairy provides about 50% of the dietary calcium in this sample and vegetables and fruit provide about 40% of the vitamin A and 70% of the vitamin C.

This research suggests that both income and prices will affect the composition of the diet for low-income households. Moreover, the nature of the effect and thus nutritional consequences will depend on the composition of the household. Most interesting in this research is the impact that food prices have on the composition of the diet. This suggests that government policy and regulation that have an impact on food prices may have nutritional consequences not usually considered when making policy. National nutrition policy will be affected by price policy.

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DISCUSSION: DEMAND ANALYSIS FOR FOOD

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ABSTRACT

The three studies discussed are based on large scale data sets which have both strengths and limitations. The models employed gave little attention to the possibility of interaction between household composition and income. In the development of demand analysis research, attention should be given to developing projects with clear implications for consumer education and consumer policy.

THE DATA SETS

The three studies presented all are based on large-scale data sets. The Tufts-Gerner-Haas paper is based on data from the 1977-78 U.S.D.A. Nationwide Food Consumption Survey as is the Eastwood-Terry-Brooker paper. The Kolodinsky paper is based on data from the 1980-81 B.L.S. Consumer Expenditures Survey. The diverse topics of the three papers suggest the interesting possibilities of such data sets. We also need to be aware of some of their limitations.

The B.L.S. and U.S.D.A. data sets contain no information on the context of the choices made. There is no information on local prices or market structure. (This information can perhaps be constructed from other sources and added if the respondent's location can be identified). While there is some demographic information included, some variables of interest may not be. Income information is available, but data on financial assets, home ownership and household equipment owned is limited, at best.

And, of course, there is no information on attitudes or beliefs. We have no idea what particular goals were driving the respondent's choices. These limitations circumscribe the possibilities of these data sets. The Nationwide Food Consumption Survey, in particular, is a compromise between the needs of nutritionists, economists and marketers and may, in the end, not serve the needs of any of these three groups very well.

As a result of the nature of these data sets, economists who use them are likely to do demand analyses. (There isn't much else they can do with them.) The creativity arises in selecting and overcoming the limitations of the data. The papers today demonstrate several of the most creative techniques currently available.

MODEL SPECIFICATION ISSUES

It appears useful to comment on some issues of model and variable specification which arise in the three papers. All three papers pay close attention to the effects of household composition. Dummy variables are used to take account of its effects in both the Kolodinsky and Eastwood-Terry-Brooker paper. Tufts-Gerner-Haas uses another approach, weighted age-sex categories.

The use of dummy variables to deal with household composition assumes their effect is on the level of spending or use. It is implicitly assumed that they have no effect on response to income change. There is, I believe, reason to question this simplifying assumption. There is evidence that the effect of income on food expenditure (and, presumably also use) differs among household types [1]. This study found that the effect of income on expenditures for food-at-home were clearly different between one and two person households and larger households. The smaller households were much less responsive than the larger ones. This analysis was based on data which now would be regarded as semi-antique--the 1955 Household Food Consumption Survey. I think it is not unreasonable to suggest that the same type of interactions between household size and income which existed in 1955 still exist. Patterns in consumer behavior often persist, even if the specific numbers change.

Two of the studies took region and/or urbanization into account. Tufts, Gerner and Haas did not. This is, of course, important if we expect prices to differ between locales or expect access to particular items to differ (e.g., if we expect access to food-away-from-home to differ between urban and rural areas). Kolodinsky has, in Model I, used regional Consumer Price Index values to control for inter-regional price variation. The use of the CPI in this way is not appropriate, however. The CPI measures changes from historical base levels, not relative price levels.

Prices are a key component of Almost-Ideal-Demand-Systems estimations, such as that done by Tufts-Gerner and Haas. Their paper relies on an index of prices paid to control variation in prices paid between households and in determining real income. AIDS analyses using time-series data use the CPI to do this. With the CPI, quality is strictly controlled; price differences do not contain quality differences. It is unclear to what extent the prices variables used by Tufts, Gerner and Haas include quality differences.

IMPLICATIONS FOR CONSUMER POLICY AND EDUCATION

It is, also, useful to consider the utility of demand analyses such as those we are hearing today for consumer policy and consumer education. Do demand analyses have applications in these two areas? Too often they don't.

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The Tufts, Gerner and Haas paper has the clearest policy implications. We can see the potential effect of price and income manipulation on the behavior of low-income households. The large own-price elasticities for dairy, for starch-bread-cereals and for vegetables-fruit are of particular interest. They suggest, for example, that if we wished to improve the nutritional quality of the diets of the poor we might do well to limit food stamp coverage to these items.

As policy inputs, one of the limitations of demand analyses is that they do not really deal with policy manipulable variables. (While prices and incomes can be manipulated for small groups, they can't easily be manipulated for the population as a whole). One reason the Tufts, Gerner and Haas study is useful is that it is for a sub-group for whom price and income can, perhaps, be manipulated.

For consumer education, it can be argued that we need more studies of the market, or of consumers' interaction with the market and fewer studies of samples of consumers. Studies of consumers' behavior in the marketplace can, for example, answer questions about how effectively consumers are functioning in the current market environment.

There is a role for demand analyses, too, but not the usual one. I feel it would be useful to provide consumers information which can help them form expectations about the effect of a change in their personal situations. We could, for instance, answer such questions as:

- what is likely to happen to our food bills as our children get older?
- what is likely to happen to our food bills if we move to Houston?
- and, what is likely to happen to our food bills if my wife gets a job outside the home?

These are, of course, not exactly the kind of questions demand analyses usually set out to answer.

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CONSUMER REPORTERS ON TELEVISION: A PROFILE

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ABSTRACT

Consumer reporters on television can play beneficial educational and advocacy functions by presenting their viewers with current consumer problems and issues. Based on findings from 110 surveys, education-oriented reporters stressed current consumer issues in their stories while intervention-oriented reporters' stories were more involved with perennial consumer problems. Fifty percent of the education-oriented reporters indicated that they used professional consumer educators as a resource, but few considered them their consistently best source. As most consumer reporters come from broadcast journalism backgrounds, they may find the expertise of consumer educators a valuable resource. Consumer educators however have done little to avail themselves of the opportunity to interact with reporters to enable them to present accurate information.

INTRODUCTION

Consumer interest segments are popular features on many televised news programs. These segments are typically delivered by news-station personnel, often identified as "consumer reporters," who present viewers with information on a wide range of consumer topics. These program segments reach a large cross-section of the U.S. population by virtue of the fact that most Americans watch TV. A beneficial educational function is being performed by these consumer reporters by helping viewers to become more familiar with current consumer issues and problems, albeit perhaps to a limited extent. Hayes and AlYasiri (1985) raised questions about consumer reporters in a discussion on mass media and consumer information. They asked: should consumer reporters receive special training; can consumer reporters function independently of management/advertiser constraints; can issues be adequately covered in limited time; and how can consumer educators add their expertise to this system?

The purpose of this study was to find out who these consumer reporters are, what resources they typically rely upon, their educational and experiential backgrounds, and the issues they have recently addressed. Our goal is to develop a working profile of electronic media consumer reporting and reporters in order to more fully understand the potential and constraints of this channel of consumer information, and to elucidate the degree to which these informal educators/advocates utilize professional consumer educators.

A search of the relevant literature identified no previous studies addressing televised consumer reporting. Kuester (1978) surveyed newspaper consumer reporters to determine their perceptions of current consumer concerns, of developing trends in the consumer movement, and to more fully understand the status of consumerism in the newspaper establishment. According to Kuester, consumer reporters might be perceived as leaders in communicating consumer issues largely because they are in direct touch with the concerns and interests of their local constituents. Topics most frequently covered by these reporters included energy issues, government regulation, money management, conservation/environment and credit.

Mass media in general and its relationship with the consumer movement has been dealt with in several studies. Consumer affairs professionals, consumer activists, and the general public were asked in a Louis Harris and Associates (1977) poll "How good a job has television done in protecting the interests of consumers?" Television was rated "only fair" or "poor" by 61% of the general public and by 89% of the responding consumer activists. In 1977, based on this study, the message was that television had room for improvement in protecting the consumer interest.

More recently, AlYasiri, Hayes, and Stampfl (1986) identified the media as an important source of information, especially on technical advances in consumer products and services. They also found that media respondents considered themselves the best source of consumer information. They indicated that media in general, and television in particular, may assume an important role in the future of the consumer movement.

Hayes and AlYasiri (1985) identified some potential problems which might arise by using mass media to disseminate consumer information. These problems are typically institutional barriers to, and filters of, consumer information, and the "information gatekeeper" role of the consumer reporter. Institutional barriers in TV consumer reporting include time constraints and the format of most newscasts: many consumer issues are too complex to adequately cover in a limited time slot, and consumer stories are often bumped from the news line-up in favor of segments with more greater visual appeal or dramatic impact. Filters of consumer information include other editorial and management priorities, potential for liability questions, and possible conflicts arising from the interests of the station owners.

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While local markets may serve to keep reporters "in touch," more broadly-based consumer issues may be recognized through nationwide channels. Haefner and Permut (1975) indexed frequent consumer complaints based upon a content analysis of fourteen national-circulation magazines sampled over a twelve month period. Complaints about energy matters and about the government's inability to deal with major problems, especially economic ones, were the most frequently mentioned. Whether or not these issues would remain as important to consumers could only be determined through longitudinal surveying. Haefner and Permut concluded that business could take a more active role in eliminating consumer's problems, thus reducing the need for government intervention.

The literature reveals a paucity of information on media reporters as disseminators of consumer information. Kuester (1978) found that newspaper consumer reporters rated consumer leaders and educators "mediocre to poor" as reliable sources of consumer information, while rating themselves and consumer publications as the most reliable sources. Do television consumer reporters feel the same? A fuller understanding is needed by consumer professionals of television consumer reporters. What issues are covered by these broadcasters of consumer information? What information sources do they frequently use? What are their backgrounds and orientations?

METHOD

The population of television consumer reporters was not easily identified. At present, there exists no general listing of television consumer reporters, nor is there a nationwide professional organization of TV consumer reporters. In absence of such information, a more circuitous route to the nation's TV consumer reporters was required. The Broadcasting-Cablecasting Yearbook, 1986 (BCY86) was used as the comprehensive sourcebook of television stations in the United States. The population of eligible stations was determined by including those BCY86 stations having a named news director on their personnel lists. Excluded were secondary members or "partner" stations: those stations having a single staff, yet operating under different channels and call letters.

A target of 500 stations was selected to ensure a sufficient response to preserve statistical power. With the use of a random numbers table, 397 stations were selected from the identified population. The balance of 103 stations were selected as a canvass of the top 51 Area of Dominant Influence (ADI) cities, hereafter referred to as "major markets". The major market cities ranged in size from New York (1) to greater Greensboro, NC (51). Thus, each station in the top 51 markets with a BCY86 listed news director received a survey. Combined, these top 51 markets reach almost 57 million TV households. A total of 210 stations surveyed were in major markets: 107 chosen at random from the population, and 103 designated in the canvass. The remaining 290 stations represented smaller markets.

Survey materials were addressed to the news directors of each station, with instructions in the cover letter to pass the questionnaire along to the station's consumer reporter. If the station had no consumer reporter, the news director was instructed to check the corresponding box on the cover of the questionnaire and return it. Each survey packet mailed out contained 1) a cover letter stating the purpose and goals of the study, along with an invitation to receive a copy of the results; 2) the questionnaire; 3) a postage-paid, preaddressed return envelope; and 4) the token complimentary gift of a ballpoint pen.

RESULTS

Of the 500 surveys sent, 222 (44.4%) were returned. Stations doing no consumer reporting accounted for 112 responses (50.5% of the returns) while 110 stations completed the questionnaire (49.5% of the returns). Of the 110 responses from stations involved in consumer reporting, 48.6% were from the major markets. A note of caution regarding those major market responses: the response rate for the top 10 major markets was extremely low--only 8 stations out of 59 returned completed questionnaires.

The television consumer reporters were 54% male, 46% female, and the majority (51.6%) were between 26 and 35 years old. The majority (61.2%) of respondents listed a bachelor's degree as their highest level of education (Table 1). Broadcasting was the prevalent academic major reported (51.6%), with journalism a distant second (18.3%) followed by liberal arts (15.1%).

The responding television consumer reporters brought a fair amount of broadcast experience to their positions. Almost half (48.6%) had been in broadcasting ten years or more. However, 57.8% had been a consumer reporter for 2 years or less, and 32.5% had been consumer reporters for less than a year. When asked how they came to the position of consumer reporter, 31.5% responded they were hired specifically for the position, 41.6% were assigned to be the consumer reporter, and 13.5% volunteered for the position. Thirty-two percent of the respondents indicated they were the only person who regularly worked on consumer stories, while 46.2% reported having one- or two-person staffs. The respondents had been employed by their current station for relatively short periods of time: 39.8% had been there two years or less (Table 1). These relatively short job tenures are perhaps characteristic of broadcast journalism -- when asked about their career goals, the most popular response among these consumer reporters was moving to a larger market (23.9% of respondents).

When asked if they felt their education had prepared them to address consumer topics, the majority (58.2%) agreed. However, when asked whether their education, own experiences, or on-the-job training had been most helpful in addressing consumer problems/issues, 37.8% stated that their on-the job training had been most

helpful while 34.7% indicated their own experiences were most helpful. Only 2% stated that their formal education was most helpful in addressing consumer problems/issues.

The television consumer reporters were asked to characterize their reports as being primarily education-oriented or intervention-oriented. This distinguishes the practice of providing people with information so they may be more informed consumers (education) from that of assisting people in resolving consumer problems (intervention). Of those responding, 35.8% of the consumer reporters dealt with both intervention and education, while 53.2% were exclusively education-oriented, and 11% were exclusively intervention-oriented.

Those involved in educational consumer reporting were asked what sources of information they typically used when researching a consumer topic, and which of those were consistently their best source (Table 2). The most frequent sources included state or local consumer affairs agencies (acknowledged by 82.5% of the respondents), consumer-oriented publications such as Consumer Reports (78.4%), and the attorney general or district attorney (63.9%). Consumer educators were acknowledged by 50.5% of the respondents as being a typically used source, while academic journals were noted least often (13.4%). The most frequently mentioned "best source" was state or local consumer affairs agencies (29.8%) followed by consumer-oriented publications, 26.2%. Consumer educators were rated "best source" by only 8.3% of the TV consumer reporters.

Of those television consumer reporters involved in an intervention approach, 56.8% reported that they mediate or arbitrate disputes between consumers and businesses. The majority (91.5%) of those involved in intervention televise follow-up reports pertaining to actions they have taken on behalf of consumers. Over half (54.3%) of those responding reported a 75-100% success rate for gaining satisfaction for the consumer.

Both education- and intervention-oriented respondents were presented with lists of common consumer problems/issues and asked to check those they had dealt with on the air in the last three months (Table 3). The most frequently handled topics among the education-model reporters were 1) banking and new financial services - 79.4%, 2) housing - 74.2%, 3) automotive - 73.2%, 4) gasoline prices - 69.1%, and 5) desceptive business practices - 68.0%. Intervention-model television consumer reporters dealt most frequently with 1) vacations and tours - 66.0%, 2) mail and telephone orders - 63.8%, 3) landlord-tenant issues - 59.6%, 4) credit - 57.4%, and 5) automobile repair - 51.1%.

In summary, TV consumer reporters appear to be trained as broadcast journalists who learn about consumer issues and problems as they do their jobs. Their most frequent and best sources of information are consumer affairs agencies and the popular consumer publications. These consumer reporters handle a wide variety of topics, and these topics differ depending upon whether the approach is education or intervention.

DISCUSSION AND CONCLUSIONS

This study has explored television consumer reporting and described the backgrounds, orientations, and experience of the reporters as well as issues and sources of information used by them. These reporters can have tremendous impact on their audiences. Kuester (1978) observed, with regard to newspaper consumer reporters, that they are in direct touch with the pulse of local consumer interests and issues. This may even be more true of television consumer reporters.

The education/intervention typology used to describe the different approaches to consumer reporting may be a very important differentiation. Our evidence suggests these to be two different tasks, and it appears that two different approaches to consumer reporting emerge. Furthermore, two different types of consumer problems/issues are covered. The stories could be subject to differing sets of barriers and filters as suggested by Hayes and AlYasiri (1985). The demands placed on each type of consumer reporter may also be quite different, and these may impact the types of consumer stories that are covered.

AlYasiri et al. (1986) asked if consumer topics could be adequately covered by TV consumer reporters. According to the results of this study, the education-oriented reporters are addressing topics on specific types of information where up-dates of new aspects would be invaluable to their viewers. Therefore, they are in need of readily available resources regarding new consumer issues and problems. In contrast, the intervention-oriented reporters appear to be addressing perennial problem areas. They are working with an investigative reporting model, a particular journalistic style. They are also adopting a more active, advocacy role on the part of the consumer. Their needs for information sources are somewhat different than their education-oriented counterparts.

Haefner and Permut (1975) attempted to identify the universe of consumer topics and index their relative importance. While there may actually be a fairly constant set of topics covered by the education-oriented TV reporters, their relative importance appears to be constantly shifting. For example, Haefner and Permut found energy to be the number one topic in the early 1970's. In this study, banking and new financial services was number one. However, if this survey had been done in the early fall of 1986, it is highly likely that credit and automotive topics would have led the list due to reduced interest rate the sales incentives of all the major automakers.

Some major implications for this study are related to the potential role consumer educators and consumer professionals may have in terms of outreach to consumer reporters. In other studies (e.g., Kuester, 1976) reporters have considered themselves to be good sources of consumer

information. However, TV consumer reporters are not specially trained in consumer studies, but come from broadcast and journalism backgrounds. Neither is their professional orientation specifically related to remaining a consumer reporter (many listed their career goal as moving to a larger market or into management positions). However, they are sufficiently interested in consumer issues and problems to function effectively in their positions although they pull from their own experiences and rely on on-the job training to become informal educator/advocates. Consumer education professionals should become more active and be available as resources for these reporters to ensure the quality and accuracy of the information transmitted. Given their small staff size, consumer reporters may welcome an additional resource if consumer educators and advocates can prove to be easily available and reliable. Other forms of outreach for these television consumer reporters may include encouraging their involvement in consumer-oriented professional organizations such as ACCI and SOCAP, providing valuable networking with a variety of consumer professionals to be called upon as resources. In educational settings, more effort should be made to include consumer courses as electives for broadcast and journalism majors.

In conclusion, TV consumer reporters are using an readily accessible medium to impart information to, and intervene for, consumers. The fact that consumer educators are not considered to be an important source of information by the education-oriented reporters points to a missed opportunity. In simple terms, consumer educators have information and expertise to offer TV consumer reporters while TV consumer reporters have an audience to offer consumer educators. TV consumer reporters are not actively seeking out consumer educators, nor are consumer educators actively seeking TV consumer reporters to offer their expertise. Given that many stations still highly value the public service component of broadcasting and perceive their use of the airwaves and a public trust, they may welcome the opportunity to share this responsibility with consumer educators.

TABLE 1. A Profile of TV Consumer Reporters

Education		
Highest level attained		
Vocational school or associate degree		1.9%
Some college		10.7%
Completed college (BA/BS)		61.2%
Some graduate study		7.8%
Graduate degree		18.4%
Academic Major		
Broadcasting	51.6%	
Journalism	18.3%	
Liberal Arts	15.1%	
Social Sciences	6.5%	
Business	5.4%	
Consumer Studies	0	
Experience		
Years in Broadcasting		
0-2 years	5.6%	
3-5 years	21.5%	
6-10 years	24.3%	
10 or more years	48.6%	
Years at Current Station		
0-2 years	39.8%	
3-5 years	28.7%	
6-10 years	17.6%	
10 or more years	13.9%	
Years as a Consumer Reporter		
less than 1 year	32.5%	
1-2 years	25.3%	
3-5 years	21.7%	
6 or more years	20.5%	
Career Goals		
Move to larger market station		23.9%
Anchor newscast		19.7%
Move to management position		14.1%
"Success"		12.7%
Remain in same position		11.3%
News director position		7.0%
Do other type of reporting		5.6%
Production		4.2%

TABLE 2. Sources of Information Used by Education-Oriented Reporters

	Used	Best Source
State/local consumer affairs agencies	82.5%	29.8%
Consumer publications	78.4%	26.2%
Attorney general/district attorney	63.9%	15.5%
Consumer educators	50.5%	8.3%
Government publications	48.5%	0
Attorneys	45.5%	1.2%
Academic journals	13.4%	1.2%

TABLE 3. Topics Covered By TV Consumer Reporters During Last Three Months (Percent indicating that topic)

Education-Oriented	%
Banking and new financial services	79.4
Housing	74.2
Automotive	73.2
Gasoline prices	69.1
Deceptive business practices	68.0
Fraud	67.0
Credit	66.0
Insurance	63.9
Getting more for your money	52.6
Health care costs	51.5
New Products	43.3
Money management	42.3
Energy conservation	40.2
Environmental issues	39.2
Know your rights	39.2
Government regularion	37.1
Repair services	35.1
Intervention-Oriented	
Vacations and tours	66.0
Mail/telephone orders	63.8
Landlord/tenant	59.6
Credit	57.4
Automotive repairs	51.1
Health care	46.8
Automotive sales	46.8
Charities	36.2
Appliance repair	36.2
Work-at-home ventures	29.8
Appliance sales	17.0

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DOES WORD-OF-AUTHOR ADVERTISING POSE A PROBLEM FOR CONSUMERS?

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ABSTRACT

The term "word-of-author advertising" has been used to refer to the fact that popular writers are using brand names in the texts of their works. The study draws upon data from 265 Consumer Reports tests conducted from 1950-1979 to determine the quality of the products associated with brands which are frequently used in this way. The results indicate that in a majority of the tests, product quality was higher for the frequently used brand names in word-of-author advertising, but a substantial minority of test reports proved to be exceptions to this general finding.

In a recent series of articles, Friedman (1985a, 1985b, 1986a, 1986b) identified a relatively new publishing practice which he called "word-of-author advertising." The term was used to refer to the fact that writers of screenplays, television dramas, novels, and other popular cultural products are using brand names in the texts of their works. An illustration of the practice is Don McLean's taking his "Chevy to the levee" in the hit song American Pie.

Word-of-author advertising can be expected to prompt concern on the part of consumer advocates, many of whom would no doubt see consumer recipients as unduly vulnerable to the influence of such messages. Advocates are especially likely to be concerned if the brand names used in word-of-author advertising are those associated with products of low quality. For, in such instances, the suspension of critical faculties on the part of consumer recipients of the messages could lead to undue influence in the direction of poor consumer choices.

This study attempts to determine the level of product quality associated with brands varying in frequency of use in word-of-author advertising. The study addresses this question by first identifying those brands that are high on this dimension (relative to their competitors), and than determining how they rate on quality (again, relative to their competitors).

PROCEDURES

Brand name frequencies were examined for a research collection of 315 popular American novels, plays and songs all of which were published in the years 1950-1979. Since literally hundreds of different brand names were found in this collection, it was decided to limit attention to those brand names associated with products for which objective quality information was available over the 30-year period of study. Consumer Reports magazine, which was published continuously over this 30-year period, was selected as our arbiter of product quality, and brand names associated with products not tested in Consumer Reports were eliminated from our pool of candidates.

Next we looked for brands in the remaining pool (we call them "tested brands") which had scored high on frequency of usage. Once we found these brands, we looked among them for instances in which a tested brand's competitors had not scored high on frequency of usage over the 30-year period of study. The objective here was to compare the product quality of brands high on frequency of usage of word-of-author advertising with the product quality of competing brands which were low on this measure. Six of the tested brand names met this criterion and we refer to them as "Word-of-Author Brands." Included here are A & P, Buick, Cadillac, Kleenex, Levis and Sears.

Close examination of the product tests for the Word-of-Author Brands revealed the repeated presence of certain competitors of these brands for the 1950-79 period ("Leading Competitor Brands"). To determine how the Word-of-Author Brands compared on product quality with all of their competitors ("All Competing Brands") and the Leading Competitor Brands, the total set of Consumer Reports tests was identified for the 1950-79 period which provided overall evaluations of the Word-of-Author Brands and all of their Leading Competitor Brands.

The individual product brands and models evaluated in each test report were then assigned rank values according to their overall evaluations in Consumer Reports. Some brands were represented by more than one model in a single test report; in such instances, it was decided to opt for the rank value of the highest quality model to represent the brand in the data analysis. In effect, then, the study findings compare the highest quality representatives of the brands included in a test report, e.g., how the highest ranked Sears model compares with the highest ranked model of J.C. Penney, and the highest ranked model of Wards, etc.

RESULTS

The highest ranked models of the Word-of-Author Brands tended to outperform the highest ranked models of All Competing Brands. Overall, a slight majority of the tests showed this effect. And the same pattern emerged consistently across all six Word-of-Author Brands, a result which is statistically significant.

Moreover, we find a similar dominance of the Word-of-Author Brands over the Leading Competitor Brands, in that the highest ranked models of the Word-of-Author Brands tended to outperform the highest ranked models of the Leading Competitor Brands. And once again, the tendency was evident

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