Away-from-Home Food Consumption: Implications for Consumer Education

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Time and labor-saving products and services are increasingly in demand. In recent decades, there has been a trend toward away-from-home food consumption (Lin, Frazao, & Guthrie, 1999). With hectic lifestyles, consumers do not always have the time to prepare and eat meals at home. A number of studies have reported that Americans are eating out more often and spending more on manufactured foods (e.g., Lin, Guthrie, & Frazao, 1998; USDA Economic Research Service, 1999).

This trend has been explained in several ways. One explanation is the increase in women's labor force participation. Since 1960, the number of wives in the U. S. labor force has increased sharply. Between 1960 and 1998, the labor force participation rate among married women increased from 34.6% to 75% (Bowers, 2000). This resulted in more disposable income for two-earner families; more women in the workplace and less time for household work made meals produced away from home a popular alternative. The popularity of dining out is not just about saving time and labor. The symbolic change in eating behavior represents a new set of family codes of behavior. Food consumption has changed from being the focus of a household's everyday ritual to being an embellishment to family life (Gofton, 1995).

Researchers have suggested that increasing away-from-home food consumption may present a barrier to choosing a healthy diet (Lin et al., 1998; Lin, Guthrie, & Frazao, 1999; Jekanowski, 1999). For example, Lin and colleagues (1998) found that calories from fat in 1977 were the same in both away-from-home foods and at-home foods. However, in 1995, fat calories from away-from-home foods were higher than fat calories from at-home foods by about 10%.

Research Objectives

This study examined relationships between away-from-home food expenditure and the following selected nutrient intakes for households: total fat, saturated fat, cholesterol, sodium, fiber, calcium, and iron. Other potential predictors for selected nutrient intakes included in the analyses were the following household characteristics: location, household income, years of education of the household head, race, mother's employment status, and number of family members in various age/gender groups. The reason for including dummy variables that controlled for location (rural, West, Midwest, Northeast) was to capture price differences among different locations. Also, due to differences in cultural backgrounds and environmental conditions, food differences across regions were expected. Education was included because it may have been important in explaining dietary behavior. One's education provides resources for understanding and implementing desirable behavior.

Most studies examining food consumption have considered the demographic factor of household composition. In the current study, 14 dummy variables were used to control for the number of family members in various age/gender groups. The categories were based on dietary needs in accordance with age and gender.

Procedure

This study used the 1994-1996 Continuing Survey of Food Intakes by Individuals (CSFII) conducted by the U. S. Department of Agriculture (USDA). The CSFII surveyed 16,103 men and women from 50 states and collected food intake information for two non-consecutive days. From the 1994-1996 CSFII, we drew a sample of 1,712 households with children that provided information on food intake for the entire household. For the nutrient intake variables, average intake of two days was used. Away-from-home foods included foods eaten or purchased at restaurants, fast food establishments, cafeterias at school and

work, or vending machines. Away-from-home food expenditures as a share of total food expenditures was used for estimation. Away-from-home food expenditures ranged from 0% to 81% of total food expenditures, and the average expenditure on food away-from-home was 25.3% of total food expenditures. The average intake of unhealthy nutrients was 71.1g for total fat, 25.0g for saturated fat, 239.8mg for cholesterol, and 3065.7mg for sodium. For healthy nutrients, the average intake was 13.3g for fiber, 797.0mg for calcium, and 14.3g for iron.

To examine the factors affecting household nutrient intake, separate regressions for each nutrient were performed for the same 1,712 households. Since dependent variables can take any real value, the regressions were estimated using ordinary least squares (OLS).

Results

The results are presented in two tables. Table 1 presents the regression results for the household's average intake of "unhealthy nutrients," fat, cholesterol, and sodium. Table 2 presents the results for the household's average intake of "healthy nutrients," fiber, calcium, and iron. The R-squared values ranged from 0.08 to 0.14 for the unhealthy nutrients and from 0.08 to 0.15 for the healthy nutrients. Explanatory power seems to be low, but this was expected based on household behavior models estimated using large, cross-sectional data sets.

According to Table 1, away-from-home food consumption was positive and significant for total fat and saturated fat. As the share of away-from-home food expenditures increased by 1%, average total fat and saturated fat intake increased by 0.08g and 0.04g respectively. For average household sodium and cholesterol intakes, no significant effect of away-from-home food consumption was evident.

Looking at household composition, males tended to significantly increase the household's average intake of unhealthy nutrients. The exception was for households with male children

Table 1
OLS Regression Results for Unhealthy Nutrient Intakes (N=1,712)

Nutrient	(1)Total Fat (g)		(2)Sat. Fat (g)		(3)Cholesterol(mg)		(4)Sodium (mg)	
Variable	Coefficient	t	Coefficient	t	Coefficient	t	Coefficient	t
Constant	70.08**	16.16	24.91**	15.50	262.89**	12.07	2889.18**	16.15
AFH[a]	0.08*	2.10	0.04*	2.41	-.34	-1.72	1.34	0.84
Demogr[b]								
M≤5	-4.62**	-4.66	-0.94*	-2.57	-10.13*	-2.04	-227.69**	-5.57
F≤5	-3.81**	-3.71	-0.98*	-2.57	-13.13*	-2.55	-257.58**	-6.09
6≤M≤11	-0.19	-0.19	0.10	0.26	-7.91	-1.56	-22.98	-0.55
6≤F≤11	-1.49	-1.46	-0.30	-0.79	-9.22	-1.80	-67.37	-1.60
12≤M≤17	7.68**	7.52	2.67**	7.05	23.21**	4.53	314.51**	7.47
12≤F≤17	-2.06	-1.90	-0.78	-1.93	-7.84	-1.44	-26.32	-0.59
18≤M≤25	5.36**	3.19	1.38*	0.21	28.80**	3.41	280.32**	4.05
18≤F≤25	1.28	-0.84	-0.42	-0.75	3.60	0.47	-39.92	-0.64
26≤M≤49	5.58**	4.24	1.71**	0.49	21.95**	3.32	258.65**	4.77
26≤F≤49	-2.47	-1.92	-1.36**	-2.86	6.89	1.07	-127.44*	-2.41
50≤M≤64	7.46**	3.57	2.11**	2.73	49.08**	4.68	272.98**	3.17
50≤F≤64	-5.00*	-2.22	-1.72*	2.06	-0.48	-0.04	-223.85*	-2.41
M≥65	0.92	0.23	-0.10	-0.06	34.70	1.70	90.75	0.54
F≥65	-10.80**	-2.96	-3.90**	-2.88	-19.70	-1.07	-333.97*	-2.22
ME	-0.48	-0.40	-0.29	-0.65	-0.32	-0.05	10.40	0.21
BLACK	-0.43	-0.25	-0.67	-1.09	11.54	1.40	-101.40	-1.49
HISPAN	-3.93*	-2.38	-1.69**	-2.77	15.91	1.92	-131.34	-1.93
EDU	-0.295	-1.27	-0.12	-1.35	-3.93**	-3.38	4.92	0.52
Econ[c]								
INC 1	0.82	0.43	0.14	0.20	18.68	1.95	68.88	0.88
INC 2	1.99	1.34	0.52	0.94	17.40*	2.32	10.60	0.17
INC 4	-2.04	-1.28	-0.94	-1.60	-8.08	-1.01	-12.71	-0.19
Price Var[d]								5.40
MIDWST	7.25**	5.03	2.89**	5.40	9.22	1.27	321.03**	
N. EAST	1.81	1.14	1.40*	2.39	-1.15	-0.14	64.84	0.99
WEST	1.58	1.04	0.62	1.11	0.79	0.10	30.48	0.49
RURAL	4.03**	3.08	1.37	2.84	18.14**	2.76	91.66	1.70
F-statistics	9.79**		7.89**		6.65**		11.74**	
Adj. R-sq.	0.12		0.09		0.08		0.14	

Notes. [a]*AFH* refers to away-from-home food expenditures. [b]*Demogr* refers to demographic factors that include household composition variables (family member age/gender groups). M denotes "male" and F denotes "female"; ME refers to the mother's employment status (dummy variable); two race variables, BLACK and HISPANIC (dummy variables); and EDU refers to the average years of schooling of household heads. [c]*Econ* refers to economic factors. Income variables are dummy variables based on four groups. INC 1, INC 2, and INC 4 denote annual household income below <$15,000, $15,000-$35,000, and ≥$65,000, respectively. [d]*Price var* refers to price variations represented by location variables, all four of which are dummy variables. RURAL refers to households in non-Metropolitan Statistical Areas (MSAs).

* $p \leq 0.05$

** $p \leq 0.01$

aged 6 to 11 years and men aged 65 years or older. Generally, children aged 0-11 years and female household members tended to reduce the household's average intake of unhealthy nutrients. However, male adults aged 12-64 years tended to increase average household cholesterol intake. It is suspected that they may have underestimated their chronic disease risk. Average year of schooling for household heads (EDU) was found to be negatively associated with the household's average intake of unhealthy nutrients. EDU was significant for cholesterol intake, but not for total fat and saturated fat intake. In this analysis, household income was not a good predictor of the household's average intake of unhealthy nutrients.

The regression results for the household's intake of healthy nutrients are presented in Table 2. A negative relationship was found between away-from-home food consumption and both fiber and iron. Thus, increased intake of away-from-home food- was associated with reduced consumption of these two healthy nutrients. As away-from-home food expenditure shares increased by 1%, average fiber and iron intakes were reduced by 0.04g and 0.02mg, respectively.

Male household members, except male children aged 0-5 years, tended to increase the average household intake of healthy nutrients, while female household members reduced average household intake of healthy nutrients. For example, the addition of one primary school or adolescent male child increased average household calcium intake by 28 mg and 77 mg, respectively. By contrast, women over 26 and female adolescents reduced average household calcium intake. Considering that adequate calcium is needed for healthy growth and prevention of osteoporosis, it is noteworthy that these population groups brought about reductions in average household calcium intake.

Male household members aged 12-64 years positively affected average household fiber intake. In particular, the presence of a male household member aged 50-64 years showed the highest coefficient for fiber intake among all age groups.

Table 2
OLS Regression Results for Healthy Nutrient Intakes (N=1,712)

Nutrient	(1)Fiber (g)		(2)Calcium (mg)		(3)Iron(g)	
Variable	Coefficient	t	Coefficient	t	Coefficient	t
Constant	11.70**	12.06	675.95**	12.314	13.42**	13.46
AFH[a]	−0.04**	−4.91	−0.22	−0.44	−0.02**	−2.70
Demographic[b]						
M≤5	−1.09**	−4.94	−6.85	−0.55	−0.45*	−1.98
F≤5	−1.52**	−6.62	−7.07	−0.55	−0.81**	−3.43
6≤M≤11	0.61E-02	0.03	28.22*	2.20	0.15	0.66
6≤F≤11	−0.45	−1.95	0.19	0.02	−0.57*	−2.42
12≤M≤17	0.50*	2.20	76.95**	5.96	0.96**	4.08
12≤F≤17	−0.37	−1.54	−37.97**	−2.77	−0.46	−1.85
18≤M≤25	1.93**	5.12	22.01	1.04	0.90*	2.33
18≤F≤25	−0.12	−0.36	−16.65	−0.86	0.05	0.15
26≤M≤49	1.62**	5.50	17.046	1.02	0.77*	2.54
26≤F≤49	−0.27	−0.93	−63.51**	−3.91	−0.76**	−2.58
50≤M≤64	1.67**	3.58	5.61	0.21	1.05*	2.18
50≤F≤64	−0.42	−0.84	−74.20**	−2.60	−1.83**	−3.53
M≥65	0.21	0.23	−15.14	−0.29	0.59	0.63
F≥65	−0.58	−0.71	−97.33*	−2.11	−1.17	−1.40
ME	0.23	0.85	0.09	0.01	0.03	0.10
BLACK	−1.43**	−3.88	−153.48**	−7.34	−0.92*	−2.42
HISPANIC	1.44**	3.91	−31.76	−1.52	−0.46	−1.22
EDU	0.15**	2.85	10.94**	3.73	0.11*	1.98
Economic Var[c]						
INCOME 1	−0. 28	−0.66	−15.31	−0.64	−0.25	−0.56
INCOME 2	−0.45	−1.35	−12.58	−0.67	−0.03	−0.09
INCOME 4	0.91*	2.55	−0.28	−0.01	0.73*	1.99
Price Variation[d]						
MIDWEST	0.91**	2.81	89.88**	4.92	1.35**	4.07
N. EAST	0.10	0.29	66.88**	3.33	1.57**	4.31
WEST	1.62**	4.77	79.29**	4.14	1.00**	2.89
RURAL	−0.71*	−2.44	−18.63	−1.13	−0.81**	− 2.71
F-statistics	12.74**		9.49**		6.50**	
Adj. R-sq.	0.16		0.11		0.08	

Notes. [a]*AFH* refers to away-from-home food expenditures. [b]*Demographic* factors include household composition variables (family member age/gender groups); M = "male;" F = "female"; ME = mother's employment status (dummy variable); two race variables, BLACK and HISPANIC (dummy variables); and EDU = average years of schooling of household heads. [c]Economic variables are dummy variables based on four income groups. INCOME 1, INCOME 2, and INCOME 4 denote annual household income <$15,000, $15,000-$35,000, and ≥$65,000, respectively. [d]*Price variations* include four location variables (all dummy variables). RURAL refers to households in non-MSAs.

*$p \leq 0.05$

** $p \leq 0.01$

Education was a good predictor of healthy eating behaviors. A significant effect for education level was observed for the three healthy nutrient intakes. As expected, additional years of schooling for household heads resulted in higher intakes of healthy nutrients. Households in the South had the lowest intake for each of the three healthy nutrients. There were positive associations for households in both the West and Midwest. Rural households had lower fiber and iron intakes compared with urban households. Restricted access to various food stores may have prompted less healthy eating decisions for rural consumers.

Discussion

Has the increase in away-from-home food consumption prevented American families from making healthy eating decisions? Multiple regression analyses produced fairly consistent findings across nutrient intake levels supporting the claim that increased away-from-home food consumption may present an obstacle to healthy eating. Choosing more foods that are prepared outside of the home does not necessarily have to be a barrier to healthy diets. Wise decision-making is needed when eating out. Consumer educators should consider focusing more of their educational programming on away-from-home food consumption. More point-of-choice information should be available for those eating foods prepared outside the home. Education provided within everyday settings such as restaurants might be effective. Whether families eat at home or away from home, foods should contribute to households' healthy diets.

The current study suggested that education should be tailored more specifically to some demographic groups. For example, consumer educators should focus on teenaged boys, who tend to have higher intakes of fat and sodium, so that they can learn to choose moderation when exposed to advertisements for fast foods with messages emphasizing "super sizing." Also, for teenaged girls who decreased the household's intake of calcium, consumer education could include information on the important

role that calcium plays with respect to growth. Ultimately, the goal of nutrition education for consumers is to help people who are at greatest risk for poor nutrition; therefore, at-risk groups should have easy access to nutrition information.

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