

The Effects of Mothers' Market Work Participation and Away-from-Home Food Consumption on Children's Selected Nutrient Intakes

Sora Kim*, Robin A. Douthitt¹

Part-time lecturer, Dept. of Consumer Studies & Resource Management, Seoul National University, Korea

¹Professor, Dept. of Consumer Sciences and Dean, School of Human Ecology, University of Wisconsin-Madison, USA

Abstract : This study examines the effect of mother's market work participation and presumably in the home, on the production of child quality, where child quality is measured by nutritional status. In general, our analysis answers how does mothers' employment affect away-from-home food consumption and their children's diet quality. The data come from the 1994-1996 Continuing Survey of Food Intakes by Individuals (CSFII) in 1998 and the sample used in this study is 1774 children that provided information on their food intake for two days from 1065 households. The direct effects and indirect effects through foods-away-from home consumption were obtained. The results suggested that although mothers' employment showed small direct effects on their children's nutrient intakes, it can have a larger effect through foods-away-from home consumption.

Key Words : Foods away from home, Children, Mothers' employment, Nutrient intakes, Healthy eating

I. Introduction

The 1990s marked a period of the biggest trend in away-from-home food consumption in the US. Consumers increasingly use foods prepared away from home such as foods that are ready-to eat in lieu of from-scratch home meal preparation. During 1977 and 1995, meals eaten away from home increased from 16% to 29%. In particular, meals and snacks eaten away from home increased from 2% to 5% for restaurant foods and 3% to 9% for fast food (Lin, Frazao, & Guthrie, 1999). This trend implies that Americans getting more nutrients from foods produced away from home. Although consumers are more sensitive to diet and health issues, the efforts and time they invest in food preparation seem to be lightened. Considering food production has been long the work of women, one of the most important

changes affecting Americans' eating pattern is the nationwide shift of women's market work participation. As women began to enter into market production out of home, their time pressure and earnings made changes in domestic labor. Child care is a best known example. Other family members' help or paying for child care was needed due to mothers' dual roles. Also, prepared foods and frequent eating out has brought out less involvement in meal preparation.

Mothers' role is greatly important for the nutritional status and health of other family members including children. Children may pick up eating style while observing their parents' food preferences. Especially, mothers' nutrient intakes are more likely to be associated with children's nutrient intakes than fathers (Oliveria, Ellison, Moore, Gillman, Garrachie, & Singer, 1992). Likewise, past studies have emphasized maternal

*Corresponding Author: Part-time lecturer, Dept. of Consumer Studies & Resource Management, Seoul National University
Tel: 82-2-880-5698 Fax: 82-2-871-2506 E-mail: sunshine@snu.ac.kr

employment in explaining children's dietary behavior (Escobar, 1999; Popkin, Entwisle, Fengying, & Guilkey, 1997). The more time mothers work outside home, the fewer time they spend preparing meals and eating away from home with children (Johnson & Birch, 1994). Similarly, it is expected that the more hours mothers work outside home, the less chance that children observe mothers eating a certain food. This may imply that mothers lose an opportunity to guide food choice and teach their children about healthy eating.

In spite of increased concern about diet and health, American children's poor diet has been reported. The recent study shows that most of children's diets need improvement or are poor (Basiotis, Carlson, Gerrior, Juan, & Lino, 2002; Lino, Gerrior, Basiotis, & Anand, 1999; Morton & Guthrie, 1998). Due to social environment stimulating overeating, children's overweight became common like adults. A number of food commercials on television imposes stimulus for children to eat more junk foods and snacks and spread to the pleasure of fast foods.

Since eating patterns built in childhood easily transfer to adulthood, children's diets has received attention from nutrition educators and policy makers. Based on the economic model of household production developed by Becker (1965), this paper examines the effect of mother's market work participation on the "production" of child quality, where child quality is measured by nutrient intakes.

The purpose of this study is to examine interrelationships between mothers' employment, away-from-home food consumption, and children's selected nutrient intakes. Women's paid work outside home has brought out increases in both time cost and household income which has encouraged use of away from home foods. Increased purchase of prepared meals, which are generally higher in fat and sodium, will make a difference in diet quality. That is, the study estimates relationships between away-from home food expenditure and children's nutrient intakes within a household production framework.

While a number of studies examined the effects of mothers on children's food consumption, no approach has focused on the direct and indirect effects of mothers' employment on both away-from home food consumption and children's nutrient intakes. Does a mother's employment increase the chances of dining-out? If so, how this affects children's nutrient intakes? Because of nutritional differences in away-from-home foods and home-made foods, mothers' employment might affect differently on nutrients that need to be recommended met moderation level like sodium and saturated fat, and nutrients that need to be met recommended adequacy level such as calcium and fiber. The significance of this study is that it examines casual relationships between mothers' employment and away-from home food consumption, and children's nutrient intakes. Moreover, different effects on both nutrients for moderation and nutrients for adequacy are examined. The outcome from analysis is expected to provide important implications about children's eating decision and diet quality.

II. Review of Literature

1. Mothers' employment and children's dietary behavior

Over the past three decades, there has been a dramatic increase in the labor force participation rates of women. Especially, dual earner families, in which both the husband and wife participate in paid work force, are in growing in number. By contrast, the number of traditional families couples, in which the husband works outside home and wife stayed at home has dropped. In 1999, 64.1% of married couple with children was dual worker families whereas the proportion of traditional families was 29.1%. This shows that more mothers are entering paid labor indicating 72% of mothers were presented in the labor force in 1999 (USDAL, 2000).

Even with women's dual roles, mothers generally take the primary responsibility for child care and indoor

works such as meal preparation. Previous research on this issue has examined the effects of mothers' employment on children. Effect of mothers' employment on child quality has been negative rather than positive. For example, Stafford (1987) found a negative effect of mothers' employment on children's cognitive ability and Fleisher (1977) found that mothers' home time have a positive effect on high school IQ. Similarly, Krein and Beller (1988) showed that maternal employment is negatively associated with boys' educational attainments.

In terms of children's diet quality, effect of mothers' employment is unclear. Variyam, Blaylock, Lin, Ralston, and Smallwood (1999) indicated that full-time employed mothers are related to school children's high intakes of fat and saturated fat but not for preschool children, while Johnson, Crouter, and Smiciklas-Wright (1993) found no effect of maternal employment on children's dietary status. Popkin and colleagues (1997) compared dietary difference by mothers' work pattern. They found that children of dual-jobbers, who have a paid job and work in agriculture or sideline field and also participate in household work, have better diets compared to full time household worker and paid worker with no other job.

More disposable household income due to market work changes time allocation and consumption pattern. Faced with new budget constraint and time constraint, the household tends to substitute household work with market products and service. The recent study performed by the USDA reported that people are more likely to trade off other attributes for conveniences when choosing foods (USDA, 2006). This implies changes in household consumption including family meals. Thus, increased use of food-away-from-home would be explained by household response to new resource constraints. In this context, maternal employment is expected to affect meal preparation and food consumption. In addition to increases in time cost and income, mothers' dual jobs and hectic work lighten their involvement with children's eating habits. Considering mothers' food preference contributes to forming children's eating style (Oliveria *et al.*, 1992), maternal employment means that

children have less opportunity to learn from their mothers by eating together. Maternal employment was anticipated to affect her children's dietary behavior but dairy products, however, were not affected by mothers' paid labor participation (Kim & Douthitt, 2003). Instead, mothers' awareness of diet and health relationships increased their teen children's dairy consumption, although mothers' health awareness did not affect dairy product consumption for preschool children and primary school children.

As Tarone indicated (1999), being "food is a key part of a loving home," plays a major role in children's healthy eating. Moreover, Emotional, cognitive and social growth helps children's healthy diets (Tarone, 1999). Food consumption is not just every day ritual but is the highly valued forms of sociability (Gofton, 1995). Making family meal time pleasant with conversation may help children have healthful eating habits and right attitudes.

2. Away-from-home food consumption and children's diets

More than three decades, Americans have made significant progress in understanding the links between health and meeting the dietary recommendation. Past results, however, supported the claim that increased away from home food may be an obstacle to Americans' healthy eating. Assessing the effects of away from home food expenditure on household nutrient intakes implied that people are demanding more convenience while ignoring the importance of healthy diet (Kim & Douthitt, 2003). Unlike adults, previous studies showed that most of American children need dietary improvement (Lin, Guthrie, & Blaylock, 1999; Lino, Gerrior, Basiotis, & Anand, 1999; Morton & Guthrie, 1998). Morton and Guthrie (1998) reported that there was an increase in children's fat intake between 1989-91 and 1994-95. The average calories from fat were 34% for total fat and 13% for saturated fat, which exceed recommendation levels, 30% and 10%. Children's high fat intake was associated with increased away-from-home consumption. Higher

level of fat was more found in away-from home food than home foods eaten by children (Lin, Guthrie, & Frazao, 1999). Also, children underconsumed sodium and fiber and female teens, especially, showed high fat and sodium intake but low intake of calcium, fiber and iron. As shown in the US, Korean middle school children's intakes of iron and calcium were below the recommended levels (Yoo, 2004).

Female adolescents had the largest portion of away-from-home foods. Lino and colleagues (1999) found that both preschool children and adolescents did not meet the recommendations in fruits and vegetable group, and dairy group. Along with their unbalanced nutrient intakes, child obesity became important in the American health perspective. Overweight is becoming common in Korean children. One study showed that pizza & drinks and shellfish & processed meats products were positively associated with children's body fat (Li, 2005). The serious problem in children's diets is that children's unhealthy food habits might prevent them from forming good eating habits and childhood eating patterns carry into adulthood. Moreover, children who grow up with fatty deposits have higher risks of heart disease and cancers as adults.

These findings raised some important issues related eating out and prepared food consumption. In general, foods prepared outside home are higher in fat and sodium and lower in calcium and fiber. According to Lin and colleagues (1996), higher levels of fat and lower levels of fiber, calcium and iron were consumed by children through away-from-home foods compared to home-prepared foods. US food service industry has provided all kinds of foods at any time and this worked against preparing meals at home. A study looking at the nutrient intakes of children aged 2 to 19 (Lin *et al.* 1999) showed that children gain more fat calories from restaurant and fast foods and less fiber and calcium than from at-home foods. For children, taste tends to be predominate factor when they choose foods (Cotugna & Vickery, 2004). Children might rate better away-from home foods than home-made foods in term of taste.

Popularity of away-home food may lead consumers to overlook importance of diet when eating meals and snacks. First, consumers are less likely to participate in food shopping and meal preparation. This translates into children have fewer chances to help their parents with shopping and preparing and to learn healthful eating. Second, most of prepared foods have no nutritional labels. People cannot identify serving size and contained nutrients and this makes consumers fail to monitor their nutrient intakes.

III. Method

1. Sample

The objective of this study is to examine and compare the role of mothers' work and food-away-from home consumption in their school children's nutrition intakes. The data are from the 1994-1996 Continuing Survey of Food Intakes by Individuals (CSFII) in 1998 conducted by the U.S. Department of Agriculture (USDA). The CSFII is a nationwide food intake survey of randomly selected US households and this is 10th survey (USDA, 1998). During 1994 and 1996, the CSFII collected food intake information for two nonconsecutive days from 16,103 men and women. Child data were obtained through proxy interview and the data set contains personal and household demographic information. The sample used in this study is 1774 children that provided information on their food intake for two days from 1065 households. Children's nutrient intakes are examined in two age groups: 890 primary school children (aged 6-11) and 884 adolescents (aged 12-17). The age of 1065 mothers ranged from 19 to 90 with average of about 40 years. Average nutrient intake of two days is used for analyses.

2. Statistical model

To find the effects of mothers' paid work partici-

pation, the original variable used was mothers' working during the reference week. In this study, away-home food is defined according to where the food is prepared, not where the food is eaten. Away-from-home foods includes foods that are eaten or purchased at restaurants, fast food places, cafeterias at school and work or purchased from vending machine. For the analysis, three variables--mothers' working hours, household income, and total away from home consumption--were modified as monthly term. Selected six nutrients examined were total fat, saturated fat, sodium, fiber, calcium, and iron. Total fat and saturated fat were measured in percentage of calories, fiber was measured in grams, and sodium, calcium and iron in milligrams were examined.

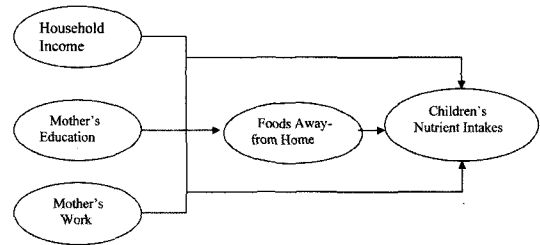
Consumption model explaining mothers' influence, away-from home food consumption and children's nutrient intakes was described in <Figure 1>. Basic estimation models can be specified as

$$FAFH = \alpha_0 + \alpha_1 MW + \alpha_2 ME + \alpha_3 HINC + \alpha_4 Z_1 + e_1 \quad (1)$$

$$N_k = \gamma_0 + \gamma_1 MW + \gamma_2 ME + \gamma_3 FAFH + \gamma_4 HINC + \gamma_5 Z_2 + e_{2k} \quad k=1, 2, \dots, 6 \quad (2)$$

Where MW and ME represent mothers' market work participation, and mothers' schooling years, respectively, and HINC indicates household monthly income, and Z denotes full set of exogenous variables. FAFH and N_k correspond to food-away-from consumption per month and kth nutrient consumed by a child, and e is a random error term. To control price variation, location and year dummy variables were included.

Equations (1) and (2) were estimated by Ordinary Least Square. To look at these interrelationships, the total causal effects of three exogenous variables, MW, ME and HINC can be decomposed into direct effect and indirect effect. From equation (2), a weighted regression coefficient showing the direct effect of an exogenous variable on nutrient intakes is obtained. Indirect effect through away-from-food consumption was the standar-



<Figure 1> Model of relationships between family variables, food-away-from-home consumption and children's nutrient intakes.

dized coefficient of away-from-home consumption on nutrient intakes multiplied by direct effect coefficients. These effects are equivalent to path coefficients of causal effects. As suggested in <Figure 1>, current analysis assumed that three family variables (household income, mothers' education, and mothers' employment) can affect simultaneously away-from-home food consumption and children's nutrient intakes. Also, the indirect effects of mothers' employment through away-from-home-food consumption on children's intakes might change in terms of direction or magnitude. The path analysis could be appropriate to explain these relationships between variables. Path analysis should focus on determining whether two models confirm to the underlying casual relationships between variables.

IV. Results

1. Variable characteristics

Descriptive statistics for socio-economic characteristics, survey year and nutrient intakes are presented in <Table 1>. While there is no noticeable difference between two age groups in socio-economic status, average nutrient intakes were higher for teenage children except for saturated fat. Dividing sample into two age groups was based on previous studies on mothers' effects on children's food intakes. The role of mothers differed in primary school children and high school children in terms of direction and size (Kim and Douthitt, 2003; Lin

<Table 1> Variable description and descriptive statistics

Variable	Description	Mean (S.D.), frequency(%) for dummy variable	
		Age 6-11 (N = 890)	Age 12-17 (N = 884)
AGE	Age in years	8.55(1.73)	14.44(1.63)
MALE*	Male child	454(50.)	442(50.0)
BLACK*	Black male household head	153(17.2)	141(16.0)
HHSIZEa	Household size	4.67(1.41)	4.52(1.44)
HINC	Monthly household income (\$)	3331.46(2286.78)	3513.17(2323.33)
ME	Mothers' schooling years	12.86(2.91)	12.92(2.81)
MW	Mothers' working hours per month	85.63(87.18)	100.33(90.41)
MIDWEST*	Midwest region	196(22.0)	222(25.1)
NEAST*	Northeast region	167(18.8)	142(16.1)
WEST*	West region	229(25.7)	211(23.9)
RURAL*	Non-MSA ¹	206(23.1)	248(28.1)
YEAR94*a	Year 1994	306(34.4)	323(36.5)
YEAR96*a	Year 1996	330(37.1)	311(35.2)
FAFH	Away-from-home food expenditure per month	149.92(133.966)	173.60(159.99)
CALTFAT	% of calories from total fat	32.60(5.58)	33.14(6.38)
CALSFAT	% of calories from saturated fat	11.96(2.62)	11.71(2.91)
SODIUM	Sodium intake (mg)	2857.08(1026.54)	3591.00(1626.45)
FIBER	Fiber intake (g)	12.45(5.50)	14.54(7.55)
CALCIUM	Calcium intake (mg)	873.29(374.35)	937.61(534.64)
IRON	Iron intake (mg)	14.24 (7.00)	16.03(8.62)

* denotes binary variable

a. included in FAFH model

1. Metropolitan Statistical Area

et al., 1996). Also, Food Guide Pyramid for Young Children in 1999 indicated appropriate serving sizes with respect to age groups (Tarone, 1999). Mothers especially tend to be the primary meal planners for primary school children compared to high school children who benefit from food service. The average calories from fat were about 33% and 12% for total fat and saturated fat, respectively regardless of age groups. Sodium intakes were very high considering recommendation moderation level for adults is 2400mg. Also, school aged children showed low level of calcium and fiber intakes confirming previous report (Lin *et al.*, 1996).

Variables used for analysis and their descriptive statistics are presented in <Table 1>. Nutrient needs vary by age and gender. Males need more caloric intakes than females do. As children grow, they need more nutrient intakes for healthy growth. Socio-demographic conditions and health conditions beyond the individual's or

household's control may affect households' access to food and the way to use it. For example, education is important in explaining dietary behavior. In general, one's education provides resources for understanding and processing most types of information. Education may encourage diet-health information acquisition and people with high education levels are more likely to recognize potential risks and health benefits from dietary behavior (Moorman & Matulich, 1993). Hence, it is expected that highly educated people were found to have better diet quality than people with lower education levels. Women's employment is important in explaining their food consumption. Market work participation leads to increase in both household income and time cost, which reduces home meal production. Anthropomorphic characteristics are commonly employed in food demand model. Previous studies indicate that African Americans have been reported to have poor diet quality (Basiotis,

Lino, & Anand, 1998; Bowman, Lino, Gerrior, & Basiotis, 1998). This might be related to their high meat consumption and low consumption in fruits and vegetables. Although these sociodemographic factors are expected to influence food consumption, the direction and significance may vary across sample and empirical specification.

Household income may change consumer food demand in quality and convenience. Given income constraint, the conditions for maximization of utility suggest the nutrient demand equation as a function of prices, household income, and personal and household demographic characteristics. The reason for using year and location dummy variables-rural, West, Midwest, and Northeast-is to capture price differences among different locations and years. Also, due to differences in cultural backgrounds, environmental conditions, and main industries, food differences across regions are expected. Income provides financial resource to purchase foods and female head of household's market work participation reflects the time resource to produce meals. Real income and limited time constrain one's ability to increase welfare and the responses to these given constraints differ across households. Besides income and market work participation, most studies examining food consumption have considered demographic factors such as household size. Also, education is important in explaining dietary behavior because one's education provides resources for understanding and implementing desirable behavior.

2. Effects on away-from home food consumption and children's nutrient intakes

<Table 2> and <Table 3> contain the effects of maternal factors and household income on children's nutrient intakes. Analysis was conducted to look at the direct and indirect effects of explanatory variables taken as causes of away-from home food consumption taken as effects. As indicated in <Table 2> and <Table 3>,

greater food-away-from home consumption was related with higher intakes of unhealthy nutrients and lower intakes of healthy nutrients. Household income had negative direct effects on three unhealthy nutrients except for sodium intakes of adolescents. The role of income in healthy diets was found in healthy nutrients <Table 3>. The effects were relatively small compared to fat and saturated fat but household income increased intakes of healthy nutrients. Because of its financial ability to purchase foods, higher income encouraged dining out and thus, indirect effects indicated that higher income lead to unhealthy diet behavior across nutrients. In general, total effects of income still showed the association between higher income and healthy diets for four nutrients. However, indirect effect of higher income through food-away-from home ultimately resulted in low calcium intakes for children aged 6-11.

Formal schooling may help understand and process most types of information and lead desirable behavior (Moorman & Matulich, 1993). Mothers' education may encourage their children's healthy dietary choices. As shown in <Table 2> and <Table 3>, mothers' schooling had positive relationship between children's healthy dietary behavior except for iron intakes of younger children. The indirect effects, however, were not clear across nutrients and age groups.

For young children, mothers' education had negative indirect effects on unhealthy nutrients, while for mothers who have children aged 12-17, there was positive relationship between mothers' schooling and away-from home consumption leading higher intakes of fat <Table 2>. In our analysis, mothers' education played a role for opposite direction in decision of away-from home consumption for primary school children and teenager children. This means that mothers' education lead healthy dietary behavior through foods-away-from home consumption for primary school children, but, it was associated with unhealthy dietary behavior of teenagers through away-from-home foods.

For all six nutrients, the direct effects of mothers' working hours were weak, which is lower by more than

<Table 2> Effects on nutrients that need to be met recommended moderation level

	Total Fat			Saturated Fat			Sodium		
	Direct effect	Indirect effect	Total effect	Direct effect	Indirect effect	Total effect	Direct effect	Indirect effect	Total effect
Children aged 6-11									
Household monthly income (0.448)	-.198	.031	-.167	-.179	.022	-.157	-.024	.016	-.008
Mothers' education (0.099)	-.040	-.007	-.047	-.008	-.005	-.013	-.025	-.003	-.028
Mothers' monthly working hours (0.061)	.009	.004	.013	.017	.003	.020	-.011	.002	-.009
Foods- Away- from Home	.069		.069	.048		.048	.035		.035
Adj. R ²		0.068			0.027			0.085	
Adj. R ² for Foods-Away from Home					0.189				
Children aged 12-17									
Household monthly income (0.361)	-.056	.012	-.044	-.037	.003	-.034	.021	.006	.027
Mothers' education	-.113	.001	-.112	-.097	.000	-.097	-.010	.000	-.010
Mothers' monthly working hours (0.026)	-.018	.003	-.015	-.012	.001	-.011	.006	.002	.008
Foods- Away- from Home	.032		.032	.007		.007	.017		.017
Adj. R ²		0.072			0.036			0.184	
Adj. R ² for Foods-Away from Home					0.199				

Notes. 1. For sodium model, dependent variable was transformed in logarithms.

2. The weighted coefficients on food-away-from home consumption were presented in parentheses.

3. Age for children, gender, race (black), regional variables (Midwest, Northeast, West, Rural area) were included in the regression for control.

10% compared to household income. The direction of effects was also unclear across nutrients and age groups. For total fat and saturated fat, mothers' work had positive direct effects for primary school children but negative effects for teenagers. For children aged 6-11, sodium intake reduced with mothers' increasing working hours, but teen children increased their sodium intake as their mothers work more hours. Difference between younger children and older children was found in healthy nutrients. Mothers' work increased intakes of fiber and iron for primary school children but decreased those for adolescents. In contrast, calcium intakes declined with more mothers' working hours for younger children but increased with increasing working hours for teen children. Expectedly, mothers' market work was positively associated with food-away-from home consu-

mption because they might choose more dining out in order to save time for meal production. Hence, it is obvious that indirect effects of mothers' market work were against children's healthier dietary behavior. The signs of total effects followed those of direct effects, but indirect effects through food-away-from consumption halted the maternal influence on healthy diets. Given inconsistent direct effect, the indirect effect through food-away-from home consumption can be more substantial in the case of maternal employment.

Summarizing the effects of controlling variables, rural household's high intake of fat and cholesterol was expected based on previous findings (Bowman, Lino, Gerrior, and Basiotis 1998; Putler and Frazao 1994). Also, Midwest households' high fat and sodium intakes are consistent with results from past studies (Jensen,

<Table 3> Effects on nutrient that need to be met recommended adequacy level

	Fiber			Calcium			Iron		
	Direct effect	Indirect effect	Total effect	Direct effect	Indirect effect	Total effect	Direct effect	Indirect effect	Total effect
Children aged 6-11									
Household monthly income (0.448)	.094	-.019	.075	.003	-.008	-.005	.080	-.025	.055
Mothers' education (0.099)	.023	.004	.027	.086	.002	.088	-.033	.006	-.027
Mothers' monthly working hours (0.061)	.018	-.003	.015	-.004	-.001	-.005	.007	-.003	.004
Foods- Away- from Home	-.042		-.042	-.017		-.017	-.056		-.056
Adj. R ²		0.083			0.077			0.099	
Adj. R ² for Foods-Away from Home					0.189				
Children aged 12-17									
Household monthly income (0.361)	.084	-.017	.067	.031	-.013	.018	.079	-.007	.072
Mothers' education (0.026)	.056	-.001	.054	-.044	-.001	.043	.016	-.001	.025
Mothers' monthly working hours (0.099)	-.016	-.005	-.021	.012	-.004	.008	-.026	-.002	-.028
Foods- Away- from Home	-.047		-.047	-.037		-.037	-.020		.017
Adj. R ²		0.131			0.188			0.174	
Adj. R ² for Foods-Away from Home					0.199				

Notes. 1. The dependant variables were transformed to logarithms. 2. The weighted coefficients on food-away-from home consumption were presented in parentheses. 3. Age for children, gender, race (black), regional variables (Midwest, North-east, West, Rural area) were included in the regression for control.

Kesavan, and Johnson 1992; Variyam, Blaylock, Smallwood, and Basiotis 1998). Ethnic background, food characteristics, and weather conditions could explain this result. The coefficient on the variable representing the percentage of Black households was negative and statistically significant in total fat and saturated fat intake. For all three models on nutrients that need adequacy, the coefficient on the variable representing the percentage of African-American households was negative and statistically significant. This might be associated with African Americans' low intake of fresh vegetables and fruits and dairy products (Bowman *et al.*, 1998). It has often been reported that African-Americans do not have healthy eating patterns. All three variables on region implied that households in the South have the lowest intake of these healthy nutrients. Midwestern and

Western households were significant and positive for all three nutrients. As expected, rural households have lower fiber and iron intake compared to urban household. Restricted access to various food stores seems to be not helpful for healthy eating decisions.

V. Conclusion and Discussion

The purpose of the present study was to examine maternal influence on children's nutrient intakes in terms of food-away-from home consumption. Current approach presents the simultaneous relationships among the set of variables. In general, mothers' education level and market work participation had no clear implications. Since education and income provide resources to

implement healthy behavior, these factors were expected to influence children's dairy consumption. Maternal employment was anticipated to affect her children's dietary behavior based on conventional arguments and past research. Although mothers' paid work increased children's away-from-home foods, this does not directly influence nutrient intake as expected direction.

Given the same positive effects of mothers' working hours on fat, saturated fat, fiber, and iron, young children's overintakes of nutrients might bring out regardless of types of nutrients when their mothers work outside home. Their total effects increased by adding indirect effects through away-from home food consumption. More interestingly, the analysis implied that teenagers might be risk at underconsumption of each nutrient as their mothers work outside home. Away-from home consumption also, reduced the intakes of nutrients need adequacy. Teenagers should consider health concern rather than weight concern when they eat. Further inquiry regarding school meal programs provide a good opportunity to explain children's dietary behavior and thus, development of new meal program is anticipated to promote school children's healthy diets. Furthermore, this may be effective for developing nutrition education targeting both children and their parents to improve children's diets.

General findings suggested that household income led children's healthy dietary behavior but the effects may be reduced through foods-away-from-home consumption. Moreover, considering small direct effects of mothers' work on their children's diets, maternal employment is expected to have a larger effect on nutrient intake through food-away-from home consumption. Mothers' education played a different role in foods-away-from-home consumption for primary school children and older children. Although mothers' schooling helped their children choose healthy diets, this effect declined for teenagers because higher education level led more foods-away-from-home consumption.

This study also implied that foods-away-from-home does not necessarily have to be unhealthful for children

by treating away-from-home food consumption as endogenous. Although these foods are expected to contain more fat and sodium, and less fiber and calcium, children's wise food choice and dietary control can be achieved by maternal factors and family environment when eating away-home foods. Rather than foods-away-from home itself, parents' lack of knowledge may be an obstacle to children's diets. This study did not consider important factors other than family factors. Food programs, however, may have a substantial effect on children's diet quality. These programs can be applied for all environments of the child including home, school, and community. Moreover, food programs have potential benefits in nutrition education for both parents and children. Nutrition education goals should be geared specifically for away-from-home food consumption so that nutrition knowledge can be utilized to help parents and children's healthy diet. Also, education programs should be applied for all environments of the child including home, school, and community through various sources like TV.

The current study suggested that basic information that mothers' paid work increases away-from home foods consumption but is not an obstacle to their children's healthy eating for American nutrition educators and parents. In Korea, expenditures on dining-out have been increased for last 30 years (Kim, 2006). Given increased overweight and unbalanced nutrient intakes among Korean children, Korean mothers and educators should focus on teaching young children good eating habits wherever they eat. Also, teenagers who most need adequate and balanced meals should learn how can choose moderation when watching massive advertisements for fast foods. Especially for teenaged girls tend to be engaged in weight concern, adequate nutrient intakes should be emphasized. Further, school lunch programs might help Korean children learn about healthy eating. Ultimately, the goal of nutrition education is to help children's healthy growth through balanced nutrient intakes; therefore, children should have easy access to nutrition information when they eat outside home.

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