Factors Affecting Food Purchase Decisions of U.S. Households with Children across Food Retail Channels over the Period 1998-2013

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Background:

Obesity is a complex problem and it is a condition resulting from having too much body fat. Causes and consequences of obesity also are complex. Genetic make-up, food eaten and physical activity levels are three major factors determining the body fat levels, hence obesity (NIH, 2014). Being obese could increase levels of diabetes, heart disease and some types of cancer (NIH, 2014). According to Smith *et al*., (2010) and Dharmasena and Capps (2012), two-thirds of adults in the United States are either overweight or obese. Ogden *et al*., (2014) and Centers for Disease Control and Prevention (CDC) (2014) shows that childhood obesity has more than doubled in children and quadrupled in adolescents in the past 30 years in the United States. As explained by Finkelstein *et al*., (2005), there are numerous economic causes and consequences of obesity among adults and children in the United States. Children and adolescents who are obese are more likely to be obese adults later in their lives, further adding to the pool of obese adults and aggravating obesity-related health and economic problems (Freedman *et a*l., 2001, 2009; Guo and Chumlea, 1999). Several studies in the extant literature have documented relationship between childhood obesity and genetic make-up (Pérusse & Bouchard, 1999; Han *et al*., 2010), food choices (Klesges et al., 1991; Clark *et al*., 2007) and physical activity levels (Epstein *et al*., 1995). However, according to most recent studies and measures, childhood obesity in the United States is still severe and prevalent.

One of the possible causes of childhood obesity in the United States is the household's consumption of so-called "unhealthy" or "calorie dense" foods over the past couple of decades

(along with changes in lifestyle; from being active to sedentary), which could be consumed at home or away from home. The food retail sector is critically important in this light, as 70% of daily calories consumed by children are purchased at a retail store, such as grocery stores, super centers, convenient stores and drug stores (others being restaurants, cafeterias, etc). That said, it would be important to investigate the purchase and consumption decisions of U.S. households with children over the past decade to better identify factors affecting purchase decisions of "calorie dense" (unhealthy) versus "non-calorie dense" (healthy) foods, delineated by income, region, race/ethnicity, and type of retail outlet. This information would be useful for food retailers as well as government policy makers to identify strategies to guide and possibly accelerate effective actions to skim or possibly to reverse the childhood obesity epidemic in the United States.

Objectives:

Over the period 1998 to 2013 for a sample of U.S. households with children, to

(1) identify driving forces behind quantities of "calorie dense" and "non-calorie dense" food types consumed, categorized by retail food channel type such as grocery stores, super centers, convenient stores and drug stores; and

(2) estimate demand elasticities for "calorie dense" and "non-calorie dense" foods delineated by income, region, and race/ethnicity.

Data and Methodology:

A nationally representative panel of approximately 2,000 U.S. households per year extracted from Nielsen Homescan data along with each household's purchase of "calorie dense" (high-fat

dairy, high-calorie beverages, frozen foods, snacks and candy, and refined grain products) and "non-calorie dense" foods (fruits, vegetables, low-fat dairy products, whole grain products, lean meat, diet beverages, and seafood) from 1998 through 2013 will be the source of information for this investigation. Currently we are in possession of this data. For each food type, quantities purchased will be expressed in ounces (liquid or solid) and prices paid will be reported in terms of dollars per ounce. A host of socio-economic-demographic characteristics along with type of retail food channel where the food is purchased will be used as factors in determining the consumption of "calorie dense" and "non-calorie dense" foods.

Trying to use a standard Heckman-type (Heckman, 1979) sample selection correction for censored panel data could induce problems with respect to calculation of the inverse mills ratio (fixed effects or random effects model inverse mills ratio) as well as for the second-stage conditional demand model (Vella, 1992; Vella, 1998; Verbeek and Nijman, 1992; Wooldridge, 2002). Therefore, using the aforementioned panel in the presence of censored observations, demand models for "calorie dense" and "non-calorie dense" foods will be estimated using a *panel tobit* specification (Wooldridge 2002) available in the Stata (Stata, 2014) statistical package.

Expected Results and Discussion:

With this study, we will be in position to address to the driving forces behind quantities of "calorie dense" and "non-calorie dense" food types consumed by U.S. households with children over the period 1998-2013, categorized by retail food channel type, such as grocery stores, super centers, convenient stores and drug stores. In addition, we will be able to estimate demand elasticities for "calorie dense" and "non-calorie dense" foods delineated by income,

race/ethnicity, and region of U.S. households with children. Results from preliminary analysis of the intake of caloric sweetened beverages are as follows. Households with children on average consumed less caloric sweetened beverages compared to those who are with no children. Households who live in the western United States consumed less high-calorie beverages compared to those live in the Midwest and east. Asian households consumed less caloric sweetened beverages vis-à-vis Whites and Blacks. Households with household heads younger than 44 years consumed more caloric beverages compared to those who are over 45 years.

This information will be useful for food retailers and government policy makers to make strategic decisions with respect to identifying factors driving childhood obesity levels and subsequently to direct appropriate policies to skim or to reverse childhood obesity in the United States.

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