

Dietary behaviors that promote over consumption: Food insecurity is not associated with lower energy intakes

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Background

Findings from the Current Population Survey indicate that in 2006, 11% of households in the United States were food insecure (FI). Food insecurity has been associated with obesity, heart disease, diabetes, high blood pressure and food allergies. Despite this vulnerability, very little attention has been given to the diet of FI individuals. This study was undertaken to further the understanding of the dietary behaviors of FI individuals. Specifically this study determined the number of daily snacks and meals consumed by men and women in different levels of food security. In addition, the energy contribution, the energy density, and the food group sources of those snacks and meals were calculated.

Methods

National Center for Health Statistics' (NCHS) NHANES for 1999-2000 provides information about people's consumption of foods and nutrients, as well as extensive health-related data, and information about Americans' demographic and socioeconomic characteristics. The NHANES 1999-02 contains the 18-item Food Security Survey Module (FSSM), which has been shown to be a stable, robust, and reliable measurement tool. The NHANES 1999-02 Food Security data are released in four categories: Food secure (FS), marginally food secure (MFS), food insecure without hunger (FIWOH), and food insecure with hunger (FIWH). Because adults were the focus of this analysis, the adult measure rather than the household measure was used.

For the 1999-02 NHANES, individuals' dietary intakes were collected through an interviewer-administered 24-h dietary recall method. Energy intakes used for this analysis were obtained from the NHANES dataset. The number of meal occasions and snacking occasions were calculated over the entire 24-h for each individual. The energy contributions per snack and per meal, and the total energy contributions of snacks and meals, were calculated. In addition, the relative caloric contributions of food groups were calculated. Due to the differences in the treatment of beverages, it has been recommended that energy density values be calculated using only food items. Although beverages were included in all previous calculations, they were excluded from measurements of energy density. For this analysis the energy density of food items alone was calculated by dividing the total energy from foods (kcal) by the weight (g) of the foods.

The analytical sample for this work is the subset of individuals from whom the adult-level FSSM was collected. Individuals were screened into the FSSM using the USDA food adequacy indicator and/or income. Women who were pregnant and/or breastfeeding were excluded. Again adults were the focus of this research so those individuals > 18 y old were examined. To avoid including older individuals, many of whom have low energy intakes, respondents > 60 y old were excluded. Because prior research has found differences in obesity patterns among food insecure men and women, men and women were examined separately (women n=2707; men n=2933). Multivariate linear regression analyses were used to examine the relationship between food security status and dietary outcomes while controlling for age, race-ethnicity, education, and income. In all models, food secure individuals were the comparison group. To account for characteristics of the NHANES dataset, STATA (Version 10, College Station, TX) was used.

Findings/Discussion

Daily total energy intakes were not different for FI individuals however, there were considerable differences regarding their meal and snack behaviors. FIWOH and FIWH women had significantly fewer meals than FS women. The mean energy contribution of each meal and the total energy contributed from snacking were both significantly greater for FIWOH women than for FS women. Among men, the daily number of meals was significantly decreased whereas the daily number of snacks and the total energy from snacking were significantly higher for FIWOH men than for FS men. Among both men and women, the energy density of meal foods was not significantly different. Among women, the energy density of snack foods was also not different; however, among men those that were FIWOH consumed snack foods that had a significantly lower energy density than those that were FS.

The major sources of energy during meal occasions were similarly ranked for women and men. For men and women, the grain group was the predominate source, followed by meat, poultry, fish, egg and mixtures. The third largest source was the sugars, sweets and beverages group for men and women. Among women the sugars, sweets and beverages contribution ranged from 14% in both the MFS and FIWH to 16% in the FIWOH. Among men, the sugars, sweets and beverages relative contribution to meal energy was 16%, 19%, 18% and 21% for FS, MFS, FIWOH and FIWH respectively. Conversely, the major source of energy for snacking was the sugar, sweets, and beverages for both men and women. Among women sugar, sweets and beverages contributed 34%, 39%, 36% and 37% to snacking energy among FS, MFS, FIWOH and FIWH respectively. Among FIWH men, the sugar, sweets and beverages group contributed more than half their snacking energy. Grain products and dairy products are the next largest sources of energy during snacking for both men and women.

This study provides evidence that skipping meals can be associated with diets that are adequate and possibly more than adequate in energy. An increase in meal size and the energy obtained by snacking appears to compensate for a reduced meal frequency. Thus focusing solely on total energy intake would miss important consequences of food insecurity. Nutrition interventions aimed at FI audiences should target snack behaviors. For example, dairy products were a leading source of snacking energy and thus messages could emphasize the benefits of low-fat dairy products. For men, who consume a large portion of their snacking energy from sugars, messages could emphasize the sweetness of fruits.