Differences in Dietary Intake and Meal Patterns in U.S. Children by Food Security Status

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Abstract

Information about differences in dietary intakes and daily meal patterns by household food security status in US children ages 2 to 18 years old is valuable for developing adequate nutrition interventions. Using 1999-2002 National Health and Nutrient Examination Survey (NHANES) data (n=7,265) significant differences were found in breakfast and snack consumption by household food security status. Children in fully food secure households were least likely to miss breakfast (15.4%), and their food choices were higher in fiber and contributed more nutrients when compared to children in food insecure households. On the other hand, children in food insecure households with hunger showed the highest risk of missing breakfast (25.5%). Furthermore, their food choices for breakfast were marked by higher consumption of saturated fat and meat products.

Objectives

1. Identify differences in dietary intake of macro nutrients and micronutrients in U.S. children by meal and household food security status.
2. Identify differences in dietary intake of food groups or foods in U.S. children from meals by household food security status.

Materials and Methods

Dietary intake information from the 24-hour recall in 1999-2002 NHANES dataset and household food security information was merged and analyzed to reveal the association between dietary intake and dietary quality in U.S. children (ages 2-18 years at time of interview) from different household food security status. SPSS Complex Samples was used for statistical analyses due to the complex sampling design (stratification and clustering) and to account for specific population oversampling.

Key Variables
- Food Security Status (fully food secure, marginally food secure, food insecure without hunger, food insecure with hunger)
- My Pyramid Food Servings (USDA/ARS My Pyramid Equivalents Database)
- Nutrient Intake (USDA Food and Nutrient Database)
- Meals (Breakfast, Lunch, Snack, Supper)
- Proportion of meal consumption for food groups and nutrient intakes was calculated using this formula: (Xtotal food group servings or nutrient intakes from meal) / (Xtotal food group or nutrient intakes from meal)
- Food servings and nutrient intakes were adjusted to 1000 kilocalories according to this formula: (Xtotal food group or nutrient intakes from meal x 1000 kilocalories) / (energy intake from meal)

Analysis of Data
- Frequency analyses were utilized to examine the relationship between meal pattern, energy intake and household food security status.
- A one-way ANOVA was performed in order to determine the relationship between household food security and dietary intake and nutrient intakes.
- Significance level of a test (α) less or equal to 0.05 was used to identify differences in the dietary and nutrient intake consumption among children in different food security status.

Introduction

Food insecurity is the limited or uncertain availability of nutritionally and adequate safe foods.1

Food Insecurity and Overweight in U.S. Children

Figure 1 Household Food Security Status in U.S. Children from 1999 to 2002

Figure 2 Proportion of overweight children by household food security status.

The attitudes and eating behavior associated with food deprivation during childhood are a possible mechanism for explaining the association between childhood poverty and adult obesity.3 An understanding of eating patterns of children who lived in these households are important tools to develop targeted nutrition interventions.

In this study we identified differences in the dietary intake and daily meal patterns in U.S. children living in households with different food security status. The National Health and Nutrition Examination Survey (NHANES) 1999-2002 data sets were analyzed to reveal food intake and dietary quality of U.S. children (ages 2-18 years) by household food security status.

Results

Daily Meal Patterns of U.S. Children by household food security status

Figure 3 Proportion of children missing any meal by household food security status.

Figure 4 Proportion of energy intake from different meals by household food security status.

Mean Differences in Adjusted Potato and Carbohydrate Intakes in U.S. Children

Figure 5 Statistically significant differences in mean adjusted potato intake for 1000 calories by meal and household food security status.

Figure 6 Statistically significant differences in mean total carbohydrate for snack by household food security status

Conclusions

- Children living in households that are not fully food secure have meal patterns and dietary intakes of nutrients and foods that might make them more vulnerable to overweight.
- Children need to be especially targeted for nutritional interventions focusing on several aspects:
  - improving food security status by reducing the frequency of meal skipping
  - ensuring breakfast participation and increasing the quality of breakfast
  - reducing added sugar consumption and increasing the nutritional value of the snacks

References