



# Few Changes in Food Security and Dietary Intake From Short-term Participation in the Supplemental Nutrition Assistance Program Among Low-income Massachusetts Adults

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## ABSTRACT

**Objective:** To examine whether short-term participation in the Supplemental Nutrition Assistance Program (SNAP) affects food security and dietary quality among low-income adults recruited from a Massachusetts-wide emergency food hotline.

**Methods:** A 3-month, longitudinal study was conducted among 107 adults recruited at the time of SNAP application assistance. Outcomes included household food security (10-item US Department of Agriculture Food Security Survey Module), dietary intake (eg, grains, fruit) and diet quality (modified Alternate Healthy Eating Index). Data were analyzed using paired *t* tests and multivariable linear regression.

**Results:** Supplemental Nutrition Assistance Program participation was not associated with improved household food security over 3 months ( $P = .25$ ). Compared with non-participants, SNAP participants increased refined grain intake by 1.1 serving/d ( $P = .02$ ), from baseline to follow-up. No associations were observed with other foods, nutrients, or dietary quality.

**Conclusion and Implications:** Policies that simultaneously improve household food security and dietary quality should be implemented to support the health of low-income Americans participating in this crucial program.

**Key Words:** Supplemental Nutrition Assistance Program, food security, diet quality, Alternate Healthy Eating Index, food stamps (*J Nutr Educ Behav.* 2014;46:68-74.)

## INTRODUCTION

Food insecurity is a household-level condition of not having or not being

able to acquire “enough food to meet the needs of all their members because... of insufficient money or other resources for food.”<sup>1</sup> In 2011,

the national prevalence of food insecurity was 14.9%. The Supplemental Nutrition Assistance Program (SNAP) is the largest of 15 federal nutrition assistance programs that aims to alleviate food insecurity and improve the nutritional intake of low-income individuals. Approximately 44.7 million individuals received SNAP benefits in 2011.<sup>2</sup> These benefits can be used to purchase most foods, with the exception of alcohol, supplements, and prepared foods.

Previous studies have suggested that SNAP participation generally improves food security among its beneficiaries.<sup>3-7</sup> Other studies have also examined associations between SNAP participation and dietary intake, with mixed results. A comprehensive review of 17 studies did not support overall differences in total energy or nutrient intake between SNAP adult participants and non-participants.<sup>8</sup> These studies were primarily cross-sectional and were

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limited by the potential for unmeasured confounding and the inability to examine how SNAP participation influenced food security and dietary intake over time.

The objective of this study was to examine the longitudinal effect of SNAP participation on household food security and dietary intake of low-income Massachusetts adults over a 3-month period. In Massachusetts, the prevalence of food insecurity was 11.9%, with 813,000 individuals receiving SNAP benefits.<sup>1,9</sup> These results may help nutrition educators, researchers, and policy makers to make policy recommendations and design interventions to improve the health of program participants.

## METHODS

### Participants and Recruitment

The study protocol was approved by the Harvard School of Public Health Institutional Review Board, with expedited review. A convenience sample of Massachusetts adults was recruited from the Project Bread Food-Source Hotline by Hotline counselors. Inclusion criteria included being  $\geq 18$  years of age and English-speaking and receiving SNAP application assistance from the Hotline. If these criteria were met, callers were provided a brief study description by the Hotline counselors and asked whether they would be interested in receiving more information.

The 188 adults who expressed interest in the study then received an introductory call from the researchers in the week after their call to the Hotline. Referrals for the study were evenly spread across the weeks of the month. In the introductory call, individuals were provided details regarding the study procedures and the incentive of a \$40 grocery store gift card upon study completion and were asked to provide verbal consent to participate in the study. From the initial pool, 142 individuals consented to participate in the study (76% response rate). Data were collected from May to December, 2011.

### Data Collection and Measures

Two questionnaires and 4 24-hour dietary recalls were administered over

the telephone to study participants. One questionnaire and 2 24-hour dietary recalls<sup>10</sup> were conducted at baseline and again at follow-up 3 months later. The baseline questionnaire assessed the participant's age, gender, race/ethnicity, height, weight, household food security over the previous month,<sup>11</sup> and current participation in SNAP and the Special Supplemental Nutrition Assistance Program for Women, Infants, and Children (WIC). The follow-up questionnaire assessed the participant's household size, marital status, and educational attainment, employment of household members, household income, general health, household food security over the previous month,<sup>11</sup> and current participation in SNAP and WIC.

The researchers assessed household food security using the 10-item United States Adult Food Security Survey Module.<sup>11</sup> A food security score ranging from 0 to 10 was created, with higher scores indicating lower food security. The score was also classified as: 0–2, high food security; 3–5, marginal food security; 6–8, low food security; and 9 or 10, very low food security.

Dietary intake was assessed using the National Cancer Institute's Automated Self-Administered 24-Hour Recall (ASA24) system, a Web tool for administering dietary recalls using the Automated Multiple Pass Method.<sup>10</sup> Data from the ASA24 Individual Foods and Nutrient files were used to identify foods and nutrients of interest. For example, whole grains included any grain foods with carbohydrate to fiber ratio  $\leq 10:1$ .<sup>12</sup> For foods and food groups, servings were estimated by calculating the grams of intake and applying common serving sizes. Overall dietary quality was assessed using a modified Alternate Healthy Eating Index (mAHEI). The AHEI was developed to predict adult chronic disease risk with a maximum score of 87.5 points.<sup>13</sup> The trans fat component was excluded because data were unavailable in the ASA24 files. The mAHEI total scores were rescaled to 87.5 points for comparability with other studies.

For study participants who reported receiving SNAP benefits at follow-up, they were asked their opinions on strategies that might

help them to eat better: (1) providing incentives or more benefits for healthier foods, such as fruits and vegetables; (2) banning or restricting unhealthy foods, such as soda; and (3) providing more nutrition education classes or cooking classes.

### Data Analysis

The authors performed statistical analyses using Stata/IC 11.1 (StataCorp LP, College Station, TX, 2009). All statistical tests were 2-sided. Statistical significance was considered at  $P < .05$ . At baseline, no study participants were receiving SNAP benefits, although it was assumed that everyone had applied for SNAP. The researchers defined SNAP participants as individuals who received SNAP benefits at follow-up. Non-participants were individuals who did not receive SNAP benefits at follow-up.

Of the 142 study participants who completed the baseline survey, 108 individuals completed the baseline and follow-up questionnaires (76% retention rate). Those who were lost to follow-up ( $n = 34$ ) were excluded because their SNAP status at follow-up was unknown. They were more likely to be younger, non-white, of normal weight, of lower household food security, and with lower dietary quality scores at baseline. One participant received SNAP at baseline and was excluded from the analysis. The analytical sample consisted of 107 low-income adults.

Characteristics of study participants by SNAP participation were compared using chi-square tests. Within-group changes in food security from baseline to follow-up were evaluated using paired *t* tests and chi-square tests. To assess the effect of SNAP participation, multivariable linear regression models were fit for follow-up food security scores, adjusting for baseline food security. Multivariable models included age categories, gender, marital status, self-reported health status, body mass index categories (calculated from self-reported height and weight), and change in SNAP participation. Complete data were available for these variables.

With the exception of macronutrients, all dietary variables were adjusted for total energy using the residual method and standardized to

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