

# The Supplemental Nutrition Assistance Program and Dietary Quality Among US Adults: Findings From a Nationally Representative Survey

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## Abstract

**Objective:** To examine the association of the Supplemental Nutrition Assistance Program (SNAP) and diet quality among low-income adults.

**Patients and Methods:** We examined US nationally representative data from the National Health and Nutrition Examination Surveys 2003-2004, 2005-2006, 2007-2008, and 2009-2010. The data were analyzed from October 7, 2013, to March 1, 2014. The analytic sample consisted of 4211 low-income adults aged 20 to 64 years, of whom 1830 participate in SNAP. We adhered to the National Cancer Institute method in calculating the Healthy Eating Index 2010 and other dietary indicators, such as empty calorie intake. Bivariate and multivariable regression was used to compare SNAP participants and income-eligible nonparticipants among the full sample and subsamples of age, sex, race/ethnicity, and food insecurity.

**Results:** Compared with low-income nonparticipants, adjusted analyses reveal that SNAP participants had lower dietary quality scores overall (42.58 vs 44.36,  $P \leq .0001$ ) and lower scores for fruits and vegetables, seafood and plant proteins (1.55 vs 1.77,  $P \leq .0022$ ), and empty calories (9.03 vs 9.90,  $P \leq .0001$ ), but they exhibited comparable scores on whole grain, refined grain, total dairy, total protein, fatty acid, and sodium intakes. The association between SNAP participation and lower dietary quality was statistically significant among women, Hispanics, young adults, and individuals who were food secure.

**Conclusion:** Our analyses suggest that SNAP participants have lower dietary quality than their income-eligible nonparticipant counterparts. Although SNAP has an important role in providing nutrition assistance to eligible low-income individuals, interventions are warranted to improve the dietary quality of participants.

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The Supplemental Nutrition Assistance Program (SNAP) is one of the largest government nutrition-assistance programs in the United States. In 2013, approximately 47.6 million individuals participated in the program, approximately 1 in 7 Americans.<sup>1</sup> Although SNAP aims to help families “put food on the table” and prevent food insecurity,<sup>2</sup> some studies have found that SNAP participation is also linked to increased likelihood of weight gain and obesity, particularly among women.<sup>3,4</sup> This may stem from the fact that SNAP benefits do not restrict the purchase of food and beverages that are unhealthful and not nutritious, such as sugar-sweetened beverages (SSBs). Subsequently, New York State and 9 other states have requested more flexibility from the US Department of Agriculture (USDA) to set standards for what cannot be purchased with

SNAP benefits; however, these requests have been unsuccessful to date.<sup>5</sup>

SNAP aims to provide low-income households with the resources to obtain a nutritionally adequate diet,<sup>6</sup> yet the association of SNAP participation and dietary quality is not conclusive.<sup>7,8</sup> Some studies suggest that participating in SNAP is associated with enhanced nutrient intake,<sup>9,10</sup> whereas others have found that SNAP participants have a lower dietary quality than nonparticipants who are income eligible (household income  $\leq 130\%$  of the federal poverty level).<sup>7,8</sup> Moreover, previous studies have compared SNAP participants and income-eligible nonparticipants using the Healthy Eating Index (HEI) 2005, which differs from the HEI-2010 in several aspects.<sup>11</sup> Specifically, the HEI-2010 has placed an increased emphasis on seafood and plant proteins, whole grains, empty

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calorie, and solid fat intake, following recommendations of the 2010 Dietary Guidelines for Americans.<sup>12</sup> This new emphasis necessitates additional research to identify the changes in dietary quality among SNAP recipients.

Building on previous literature, we examine the association between dietary quality (using the HEI-2010) and participation in SNAP by comparing the dietary quality of participants and income-eligible nonparticipants among a nationally representative sample of US adults. To our knowledge, this is the first attempt using HEI-2010 to determine dietary quality. Furthermore, we supplement previous research by assessing the effects of the SNAP program on solid fat and empty calorie consumption, which not only displaces other nutrient-dense foods but also increases the risk of chronic morbidity, mortality, and some cancers.<sup>13-23</sup>

## METHODS

### Participants

Data were obtained from 4 waves of the National Health and Nutrition Examination Surveys (NHANES): 2003-2004, 2005-2006, 2007-2008, and 2009-2010. The data were analyzed from October 7, 2013, to March 1, 2014. NHANES is a nationally representative ongoing survey of the civilian, noninstitutionalized US population to assess their health and nutritional status.<sup>24</sup> A complete description of the survey design, participant selection, and collection procedures are provided elsewhere.<sup>25</sup> In the current study, adults aged 20 to 64 years with complete dietary survey data and who are income eligible for SNAP were included in the analytic data set. This comprised 4211 individuals, of whom 1830 were SNAP participants and 2381 who were income eligible but nonparticipants.

### SNAP Eligibility

In general, eligibility for SNAP is determined by household assets, gross household income ( $\leq 130\%$  of the federal poverty level or \$2422 per month for a family of 4 in fiscal year 2012),<sup>2</sup> immigration status, and employment status.<sup>26</sup> However, because the NHANES data do not include all these factors, we determined the eligibility for the program via the poverty-income ratio (PIR). Specifically, if household income was equal to or less than 130% of the federal poverty level, adults in the household

were considered eligible for SNAP. SNAP recipients were determined by an affirmative response to the question, "In the last 12 months, did [you, or any member of your household] receive food stamp benefits?"<sup>25</sup> Consequently, our sample was divided into 2 groups: adults with SNAP benefits and adults who were income eligible but did not participate in the program.

### Dietary Intake

Information on consumption was determined on the basis of the NHANES dietary recall data, for which respondents reported on all food and beverages consumed in the past 24 hours. The individual-level dietary data (day 1) were collected by a trained interviewer with the use of the USDA's Automated Multiple Pass Method in a mobile examination center (MEC).<sup>27</sup>

### Dietary Quality

Overall dietary quality was determined by using the HEI-2010, which was developed by the USDA Center for Nutrition Policy and Promotion as a tool to measure adherence with the key diet-related recommendations from the 2010 Dietary Guidelines for Americans.<sup>28</sup> The HEI-2010 has 12 components, each of which contribute to total diet quality: total fruits, whole fruits, total vegetables, greens and beans, whole grains, dairy (all milk products and soy beverages), total protein foods, seafood and plant proteins, fatty acids (ratio of polyunsaturated and monounsaturated fat to saturated fat), refined grains, sodium, and empty calories (all calories from solid fats and added sugars plus calories from alcohol beyond a moderate level). Details of the measurements and the differences between HEI-2010 and the previous index (HEI-2005) appear elsewhere.<sup>28</sup>

The HEI-2010 component and total scores were calculated on the basis of NHANES individual dietary data; the MyPyramid Equivalents Database for USDA Survey Food Codes, version 2.0; the CNPP MyPyramid Equivalents Database for Whole Fruit and Fruit Juice; and the CNPP Addendum to the MyPyramid Equivalents Database, version 2.0B.<sup>11</sup> The scale of HEI-2010 is 0 to 100, with a higher score indicating a more healthful diet. In addition, our calculations were made on the basis of individuals' dietary intake instead of the simulated population ratio method, which generally generates higher scores.<sup>28,29</sup>

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