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RESEARCH ARTICLE

Diet Quality Over the Monthly Supplemental Nutrition Assistance Program Cycle

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Introduction: Supplemental Nutrition Assistance Program (SNAP) benefits, which are distributed monthly, help low-income families put food on their tables. Both food spending and caloric intake among recipients decrease over the month following benefit receipt. This pattern, termed the "SNAP-cycle," has serious implications for health and food security of low-income households. To understand better the SNAP-cycle, this study explored (1) differences in diet quality between SNAP and non-SNAP households and (2) the association between the SNAP-cycle and diet quality.

Methods: Multivariate linear regression with SNAP households in the U.S. Department of Agriculture's Food Acquisition and Purchase Survey to evaluate changes in diet quality as time from SNAP distribution increased. Diet quality of food purchases was measured by Healthy Eating Index–2010 total and component scores. Data were collected 2012–2013 and analyzed 2016–2017.

Results: Overall dietary quality was low throughout the SNAP-cycle (n=1,377, mean Healthy Eating Index 46.14 of 100). SNAP households had significantly lower Healthy Eating Index scores compared with eligible and ineligible nonparticipants ($p < 0.05$). After controlling for covariates, households in the final 10 days of the benefit cycle had Healthy Eating Index–2010 total scores 2.95 points lower than all other SNAP households (p=0.02). Significant declines in Healthy Eating Index fruit and vegetable scores contributed to worsening diet quality over the SNAP-cycle.

Conclusions: This study provides evidence of low dietary quality throughout the SNAP-cycle with significantly lower Healthy Eating Index scores in the final 10 days of the benefit month. This suggests less healthy purchasing occurs when resources are diminished, but overall that current SNAP levels are insufficient to consistently purchase foods according to dietary guidelines.
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INTRODUCTION

Food insecurity is a persistent problem in the U.S. that disproportionately impacts low-income, female-headed, and ethnic-minority households with children.[1] Nationally, 12.3% of households report food insecurity in the past year,[1] and despite fluctuations following the 2008 recession, this rate has shifted very little since the U.S. first measured domestic food insecurity in 1995.[2]

Food insecurity has negative dietary implications, including lower consumption of fruits and vegetables[3]; an increase in disordered eating (e.g., skipping meals)[4]; and reduced nutritional intake.[5,6] Food insecurity also has long-term health implications for mental health, cognitive development, and risk of diet-related chronic disease.[7–9]

One way the U.S. addresses food insecurity is through the Supplemental Nutrition Assistance Program (SNAP,

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formerly Food Stamps). More than 44 million people, or roughly one in seven Americans, received SNAP benefits in 2016. SNAP participants generally have lower overall diet quality compared with income-eligible and higher income nonparticipants[10]; however, national data suggest that food purchasing by SNAP households does not differ substantially from purchasing by non-SNAP households and that both groups buy foods inconsistent with the Dietary Guidelines for Americans (DGA).[11]

Although SNAP has been shown to improve very low food security by roughly one third,[12] some SNAP households still report times of food insecurity. Studies of SNAP participants showing a decrease in benefit expenditure on a monthly timescale have illustrated this periodic food insecurity.[13–16] SNAP benefits are distributed once per month, and systemwide assessments show that the majority of recipients spend most of their benefits within 2 weeks after receiving them, typically running out before the end of the month.[17] This monthly spending pattern is referred to as the "SNAP-cycle." Prior researchers have posited that increasing the frequency of SNAP benefit distribution could alleviate this cyclic spending pattern.[13,16]

The SNAP-cycle is associated with health and behavioral outcomes including hypoglycemia[18] and decreased testing scores among school-aged children.[19] The number of days since benefit distribution is also significantly negatively associated with calorie consumption, particularly among infrequent shoppers, and increases the likelihood of days without eating.[13,16,20,21] Others have found a U-shaped pattern in calorie and nutrient consumption with a dip in the middle of the SNAP-cycle, which may be attributable to the higher energy density of foods purchased when money is scarce.[22]

Despite common acknowledgment that a SNAP-cycle exists, longitudinal research exploring changes in dietary quality over this monthly timescale is limited. Among the few existing studies, results are mixed.[21,22] Additionally, limitations in the design of prior studies, such as single, 24-hour diet recall measures and small sample size, suggest that further inquiry is warranted. This study is the first to use a nationally representative data set of food purchasing to evaluate the association between the SNAP-cycle and dietary quality. The U.S. Department of Agriculture's (USDA's) National Household Food Acquisition and Purchase Survey (FoodAPS)[23] provides a full week of food purchasing data for each household, which offers a more robust measure of diet quality than prior studies.

The aims of this study are to assess (1) how diet quality of SNAP households compares with eligible and non-eligible households within FoodAPS, and (2) the association between the SNAP-cycle and dietary quality of food purchases. Addressing these questions may inform policy decisions regarding SNAP benefit distribution to improve the dietary quality of SNAP recipients.

METHODS

Study Sample

This study used FoodAPS to examine the relationship among SNAP recipient households between time since SNAP benefit receipt and the diet quality of food acquisitions (referred to as diet quality from this point on). FoodAPS was the first nationally representative survey of food purchasing and acquisition. Data were collected from 2012 to 2013 with a sample of 4,826 U.S. households (defined as all individuals who live together and share food, and who were present at the sampled address during the data collection week) at a range of income levels, including an oversampling of SNAP-eligible households.[23] SNAP participation was determined by self-report and administrative matching (both caseload and alert data) to confirm that households reporting being on SNAP were currently receiving benefits.

Participating households completed an initial survey and were then trained to record and scan all their food purchases and acquisitions to be consumed at home (FAH) and away from home for a 7-day period. Researchers also conducted a final household interview and collected information relevant to food purchasing behaviors including income, household composition, and demographic characteristics. Nutritional content tabulated post hoc included food group servings equivalents for each item, making the calculation of Healthy Eating Index–2010 (HEI-2010) scores possible. Analysis for this paper took place in 2016–2017 and used FAH nutrient data to evaluate the relationship between the SNAP-cycle and dietary quality.

Measures

When assessing mean HEI-2010 total and component scores, SNAP households were compared with eligible households not participating in SNAP (n=1,117) and non-eligible households (n=2,128). Non-eligible households were further divided for this analysis by (1) those households with income ≥185% of Federal Poverty Guidelines (FPL; n=1,792) and (2) those households with average income <185% FPL (n=336). SNAP eligibility was determined by using the indicator simulated in FoodAPS (Model Run 4) based on income, assets, and state-level eligibility guidelines.[23]

The primary predictor variable was the number of days since SNAP benefits were distributed (DSS), which was defined as the number of days between date of last reported SNAP disbursement and the last day of the data collection week (Figure 1). Therefore, households with DSS of 0–6 received their SNAP benefits during the data collection week, whereas a household with DSS=8 received their benefits 2 days prior to the start of their data collection week. For those households nearing the end of the benefit cycle at the time of the initial survey, it was assumed that they received their benefits on the same day the next month; therefore, their benefits would be renewed during the data collection week.

Primary outcome variables included diet quality of foods purchased, as measured by HEI-2010 scores applied to the full week of household purchases, total energy per person, as measured by total kilocalories/100 g, and total spending in dollars. The HEI-2010 was developed by

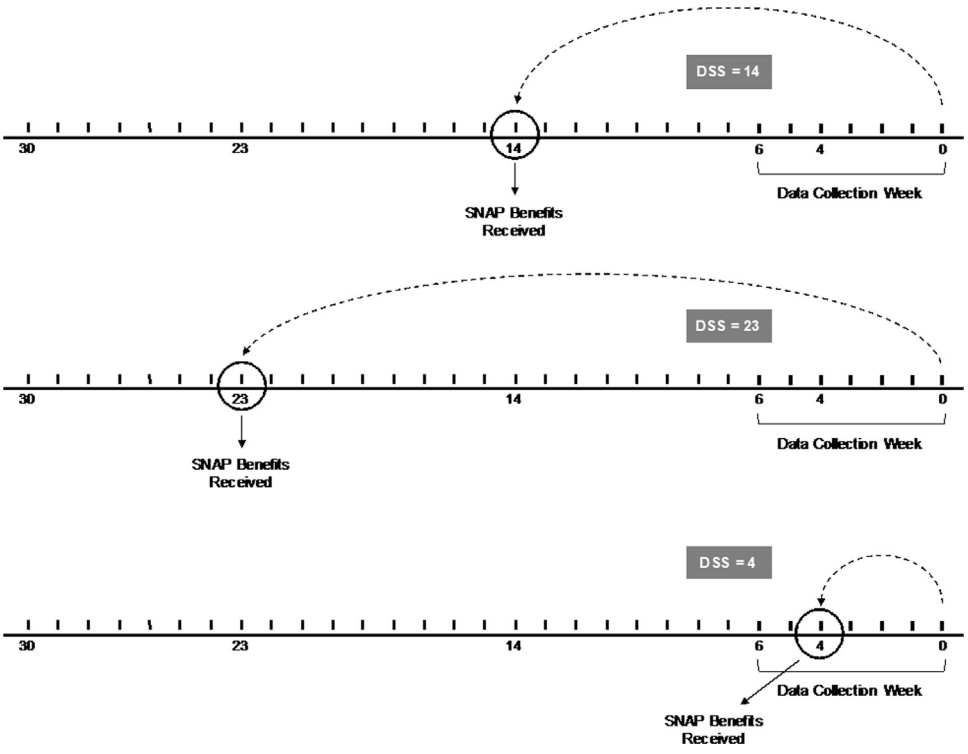

Figure 1. Construction of the days since SNAP variable.
SNAP, Supplemental Nutrition Assistance Program; DSS, days since SNAP until the final day of data collection week.

the National Cancer Institute and USDA to measure how American diets compare with the DGA.[24] The HEI-2010 total score is composed of 12 components—nine measured for adequacy (i.e., sufficient consumption for a person's age and sex) and three for moderation. Because the index uses a density measure and follows a universal set of standards, it can be applied to measure and compare the nutritional quality of foods at various scales, including individual consumption or purchasing, restaurants, and the broader food environment.[25]

Statistical Analysis

Analysis was conducted using Stata, version 14.2, software. To properly account for the complex sampling design of FoodAPS, sampling weights were applied, and variance was estimated using the Jackknife Repeated Replication technique. Univariate and multivariate linear regression were used to determine changes in dietary quality as DSS increased. Univariate models where $p < 0.25$ were admitted into the full model. The DSS was run first as a continuous measure, with values 0–30 for the actual number of days since benefit receipt until the final day of a given household's data collection week. Then, using visual inspection of the mean distribution of FAH purchases over the SNAP-cycle, the DSS variable was divided into time brackets to account for disproportionate food spending early in the benefit month. This bracketing was also informed by USDA program evaluations showing that most SNAP households go shopping within 1 day of receiving benefits and spend an average of 21.40% of their benefits on this first food shopping trip.[17] Within this sample, the majority of food acquisitions occurred at the beginning of the SNAP-cycle (directly after receipt of benefits); therefore, time brackets of ≤ 2, 3–9, 10–20, and >20 days were used. Other time brackets, including Models 1 (≤ 2, 3–5, 6–19, >19), 2 (≤ 6, 7–13, 14–20, >20), and 3 (≤ 6, 7–13, 14–20, 21–27, >27) were also tested.

The DSS was also tested as a dichotomous variable for both (1) households receiving benefits during the data collection week versus all other households and (2) households in the final 10 days of the SNAP-cycle during the data collection week versus all other households. Sensitivity analysis was performed to determine whether different time bracketing substantively changed the outcomes. These analyses showed similar magnitudes of effect on total HEI-2010 scores, with slight variations in statistical significance above and below the $p < 0.05$ level.

Potential covariates were selected based on past SNAP food spending literature. Correlational tests were performed for race/ethnicity, gender, education level, age of primary respondent, household income, household size, whether the household had a child, and residence in a metropolitan or nonmetropolitan county. Other potential covariates, including physical access to food retail, household food insecurity status, and use of other food assistance programs (including the Special Supplemental Nutrition Program for Women, Infants, and Children [WIC] and USDA school lunch), were evaluated to ensure they did not influence the main research question. A robustness check was run using all potential covariates (showing similar magnitude and significance) and final regression models controlled for those variables that were significantly associated with outcomes.

RESULTS

Of the full sample, 1,581 households received SNAP. After removing observations where households were missing data for date of SNAP distribution (n=16); had

Table 1. Description of the Sample

Characteristics	*n* (%)
Total	1,377 (100.00)
Age of primary respondent, years	
16–30	351 (25.49)
31–45	447 (32.46)
46–60	394 (28.61)
>60	185 (13.44)
Gender of primary respondent	
Male	276 (20.04)
Female	1,101 (79.96)
Married	391 (28.40)
Child in home	851 (61.80)
Non-metro county	128 (9.30)
Race of primary respondent	
White	889 (64.56)
Black/African American	274 (19.90)
Multiple/other	213 (15.47)
Hispanic	349 (25.34)
Education level	
Less than high school	375 (27.23)
High school or GED	452 (32.82)
Some college	438 (31.81)
College graduate	111 (8.06)
Annual household income	
<$15,000	534 (38.78)
$15,000–$24,999	346 (25.13)
$25,000–$34,999	211 (15.32)
$35,000–$49,999	145 (10.53)
$50,000–$74,999	141 (10.24)

GED, General Educational Development test.

no FAH purchases (n=182); or data-entry errors occurred in either macronutrient or household income values (n=6), 1,377 SNAP households remained. Most primary respondents were female (80.00%) and white (64.56%). Seventy-nine percent of households reported annual income <$35,000, and nearly 62% had at least one child living in the home (Table 1).

Overall, the mean HEI-2010 of foods acquired by SNAP households was 46.14 of 100 (Table 2). Among the sample, HEI-2010 component scores were relatively low; mean scores for total fruit, whole fruit, total vegetables, dairy, fatty acids, and empty calories were <50% of the maximum score for each category, meaning the quality of the mix of household food purchases was well below what is recommended by the DGA-2010. Scores for greens and beans and whole grains were on average <20% of the maximum possible score.

After removing observations among non-SNAP households without any FAH purchases (n=325) and where there were extreme outliers in macronutrients (n=9), there were 992 eligible nonparticipating households; 303 lower-income ineligible households (income <185% FPL); and 1,616 ineligible households with income ≥185% FPL. Compared with both eligible and non-eligible households, SNAP households had significantly lower total HEI-2010 scores ($p<0.05$) (Table 2). Higher-income ineligible households (≥185% FPL) had, on average, a 7.36-point greater total HEI score ($p<0.001$). Eligible nonparticipants had significantly better scores in several components, including total and whole fruits, total vegetables, whole grains, and empty calories. There were no significant differences among any of the sample groups for total protein, fatty acids, sodium, or refined grains.

Among SNAP households, unadjusted mean HEI decreased by 0.11 points for every additional day since benefit distribution (95% CI= –0.24, 0.02). When DSS was run as a dichotomous measure, HEI-2010 was 2.89 points lower among households in the final 10 days of the SNAP-cycle compared with all other SNAP households (95% CI= –5.39, –0.39). As a sensitivity analysis, when households with no FAH purchases were included and assigned an HEI score of zero, unadjusted mean HEI decreased by 0.23 points for each additional DSS (95% CI= –0.44, –0.02) and 4.63 points for households in the final 10 days of the SNAP-cycle (95% CI= –8.74, –0.51).

After controlling for significant covariates in the prediction model (race/ethnicity, income, age, college degree, marital status, metropolitan area), the mean HEI-2010 total score was 39.01 (95% CI=32.80, 45.22) for households who received their benefits on the final day of the data collection week (DSS=0; Table 3). For each 1-day increase in DSS, total HEI-2010 decreased by 0.12 points (95% CI= –0.25, 0.00, p=0.053); however, although the full model was significant at the $p<0.05$ level, DSS was not a significant predictor of diet quality when run as a continuous measure. With DSS as a dichotomous measure, households in the final 10 days of the SNAP-cycle had on average an HEI-2010 total score 2.95 points lower than those households within the first 20 days of the SNAP-cycle (95% CI= –5.31, –0.58, p=0.02). Among covariates, living in a metropolitan area and having a college degree were significantly positively associated with dietary quality. Total vegetables was the only component score in the full model with a significant negative association with DSS (continuous; Table 3). For those households in the final 10 days of the SNAP month, there were significant decreases in whole fruit and total vegetable scores. Sodium was the only component score to significantly improve in the final 10 days of the SNAP-cycle, indicating reduced acquisition of high-sodium foods.

Table 2. HEI-2010 Scores by SNAP Eligibility and Participation

HEI-2010 score	Maximum score[a]	SNAP participants, M (SE) (*n*=1,377)	Not SNAP eligible		
			Eligible, non-participants, M (SE) (*n*=992)	<185 FPL, M (SE) (*n*=303)	≥185 FPL, M (SE) (*n*=1,616)
Adequacy					
Total fruit	5	1.80 (0.09)	**2.40*** ** (0.10)	**2.28** ** (0.12)	**2.59*** ** (0.08)
Whole fruit	5	1.95 (0.12)	**2.75*** ** (0.11)	**2.52** ** (0.15)	**2.81*** ** (0.09)
Total vegetables	5	2.24 (0.09)	**2.82*** ** (0.09)	2.51 (0.14)	**2.84*** ** (0.05)
Greens and beans	5	0.86 (0.08)	**1.59*** ** (0.11)	1.16 (0.13)	**1.62*** ** (0.07)
Whole grains	10	1.73 (0.11)	**2.13*** (0.16)	2.05 (0.28)	**2.73*** ** (0.12)
Total dairy	10	4.64 (0.12)	4.91 (0.20)	4.40 (0.24)	**5.23*** ** (0.10)
Total protein foods	5	3.46 (0.08)	3.26 (0.08)	3.61 (0.16)	3.35 (0.06)
Seafood and plant proteins	5	1.49 (0.10)	**1.83*** (0.08)	1.76 (0.15)	**2.03*** ** (0.09)
Fatty acids	10	4.86 (0.17)	4.96 (0.24)	5.15 (0.27)	4.80 (0.11)
Moderation					
Refined grains	10	6.68 (0.16)	6.85 (0.16)	7.40 (0.33)	6.94 (0.14)
Sodium	10	6.47 (0.16)	6.51 (0.26)	6.91 (0.37)	6.97 (0.14)
Empty calories	20	9.98 (0.20)	**11.57*** ** (0.27)	10.72 (0.67)	**11.58** ** (0.31)
Total score	100	46.14 (0.56)	**51.57*** ** (0.60)	**50.49*** (1.32)	**53.50*** ** (0.60)

Note: Adjusted Wald tests, all compared to SNAP participants. Boldface indicates statistical significance (*$p<0.05$; **$p<0.01$; ***$p<0.001$).
[a]Scores based on adherence to recommendations from the Dietary Guidelines for Americans. Higher scores equate to better diet quality.
FPL, Federal Poverty Level; HEI-2010, Health Eating Index 2010; SNAP, Supplemental Nutrition Assistance Program.

Mean household spending for the data collection week was $107 and energy per person was 17,226 (kilocalories/100 g). After controlling for significant covariates, for each additional DSS, spending decreased $3.82 (95% CI= −4.56, −3.08, $p<0.001$) and calorie acquisition per person decreased 652 (kilocalories/100 g) (95% CI= −824.01, −478.29, $p<0.001$). Households in the final 10 days of the SNAP-cycle spent, on average, $43.86 less (95% CI= −56.18, −31.54, $p<0.001$) and acquired 7,702 fewer calories per person (95% CI= −10,233.45, −5,170.06, $p<0.001$) compared with households at all other points of the SNAP-cycle.

DISCUSSION

To the authors' knowledge, this is the first study to use a nationally representative sample of household food purchasing to assess dietary patterns during the SNAP-cycle. Use of the HEI-2010, an extensively validated tool, provides a robust measure of dietary quality. Overall diet quality among the sample was low compared with the FoodAPS national average, which itself is only 51.95 of the total possible score of 100 reflecting perfect adherence to the DGA. SNAP-household component scores reflect proportionally low acquisition of whole grains, seafood, fruits, and vegetables and high acquisition of empty calories, including sugar-sweetened beverages.

The lower diet quality of SNAP households compared with eligible nonparticipants and higher-income ineligible households is consistent with prior literature, and further highlights the degree to which SNAP households are struggling to meet dietary guidelines.[10] The nutritional disparity exists not just for overall diet quality, where the average SNAP household HEI score was more than 7 points lower than for higher-income non-eligible households, but also for HEI components. The proportion of food purchasing composed of total and whole fruits was significantly lower for SNAP households than for all non-SNAP households, regardless of eligibility. Among eligible nonparticipants—those closest resembling SNAP households in terms of income and assets—fruit and vegetable component scores were more than 25% higher than among SNAP households ($p<0.001$). These disparities may be explained, at least in part, by the relatively higher disadvantage that has been shown among income-eligible households who choose to participate in SNAP.[26]

Aligned with prior SNAP-cycle literature, food spending and calorie acquisition among the sample decreased significantly as time from benefit distribution increased.[13,16,21] A key finding from this study, however, is that dietary quality was low throughout the entire SNAP-cycle. There was a small, but significant 2.95-point decrease in HEI-2010 for households in the final 10 days of the SNAP-cycle compared

Table 3. Adjusted Regression Models of Days Since SNAP on HEI-2010 Total Score

	Continuous measure						Dichotomous measure (DSS > 20)					
	Total score		Total vegetables		Whole fruits		Total score		Total vegetables		Whole fruits	
Variable	**Coef. (95% CI)**	$p>\|t\|$	**Coef. (95% CI)**	$p>\|t\|$	**Coef. (95% CI)**	$p>\|t\|$	**Coef. (95% CI)**	$p>\|t\|$	**Coef. (95% CI)**	$p>\|t\|$	**Coef. (95% CI)**	$p>\|t\|$
HEI-2010 total score	−0.12 (−0.25, 0.00)	0.05	**−0.01*** (−0.25, −0.00)	**0.04**	−0.03 (−0.06, 0.00)	0.09	**−2.95*** (−5.32, −0.58)	**0.02**	**−0.45** (−0.75, −0.16)**	**0.00**	**−0.64*** (−1.20, −0.08)	**0.03**
Race												
White	ref		ref		ref		ref		ref		ref	
Black/AA	−1.17 (−4.32, 1.98)	0.45	−0.33 (−0.78, 0.12)	0.14	−0.26 (−0.80, 0.27)	0.32	−0.99 (−4.01, 2.03)	0.51	−0.31 (−0.74, 0.13)	0.16	−0.22 (−0.73, 0.28)	0.38
Other/ multiple	1.71 (−2.24, 5.66)	0.38	0.17 (−0.59, 0.25)	0.40	**0.43*** (0.02, 0.84)	**0.04**	1.68 (−2.27, 5.62)	0.40	−0.17 (−0.58, 0.24)	0.40	**0.42*** (0.03, 0.82)	**0.04**
Monthly income (hundreds)	0.01 (−0.04, 0.07)	0.65	0.00 (−0.01, 0.01)	0.71	0.01 (−0.00, 0.01)	0.11	0.01 (−0.05, 0.07)	0.69	0.00 (−0.01, 0.01)	0.77	0.01 (−0.00, 0.01)	0.15
Age	0.08 (−0.01, 0.17)	0.08	0.11 (−0.00, 0.02)	0.06	**0.02** (0.01, 0.03)**	**0.01**	0.08 (−0.01, 0.17)	0.09	0.01 (−0.00, 0.02)	0.07	**0.02*** (0.00, 0.03)	**0.01**
Married	1.28 (−1.68, 4.23)	0.38	0.15 (−0.20, 0.49)	0.40	−0.15 (−0.44, 0.15)	0.31	1.24 (−1.72, 4.21)	0.40	0.14 (−0.20, 0.48)	0.40	−0.16 (−0.45, 0.13)	0.28
Non-metro area	**−4.68**** (−7.73, −1.62)	**0.00**	**−0.57*** (−1.13, −0.02)	**0.04**	−0.25 (−0.87, 0.37)	0.41	**−4.74**** (−7.83, −1.66)	**0.00**	**−0.58*** (−1.14, −0.03)	**0.04**	−0.27 (0.89, 0.36)	0.39
College degree	**4.63*** (0.32, 8.93)	**0.04**	0.10 (−0.46, 0.66)	0.72	0.54 (−0.12, 1.21)	0.10	**4.73*** (0.44, 9.03)	**0.03**	0.11 (−0.45, 0.66)	0.69	0.56 (−0.10, 1.23)	0.09
Hispanic	0.94 (−3.53, 5.41)	0.70	0.17 (−0.26, 0.61)	0.42	**0.59**** (0.18, 1.01)	**0.01**	1.00 (−3.44, 5.43)	0.65	0.18 (−0.25, 0.61)	0.39	**0.61**** (0.19, 1.02)	**0.01**

Note: Boldface indicates statistical significance (*$p<0.05$; **$p<0.01$; ***$p<0.001$).
AA, African American; Coef., coefficient; DSS, days since SNAP; HEI-2010, Healthy Eating Index 2010; SNAP, Supplemental Nutrition Assistance Program.

with those households who were within 3 weeks of receiving SNAP. This decline in diet quality was largely attributable to decreased density among food acquisitions of fruits and vegetables. Households in the final 10 days of the SNAP-cycle had a 21% lower total vegetable score compared with all other SNAP households. Declines in diet quality at the end of the SNAP-cycle may be explained by depletion of resources with which to purchase more expensive, nutrient-dense foods such as fruits and vegetables.[27,28] As diet quality in this sample was notably low throughout the SNAP-cycle, not just in the final week, this suggests current benefit levels are insufficient to purchase foods in accordance with the DGA. Although previous SNAP-cycle literature has hypothesized that changing the benefit distribution cycle may help with present-biased spending of benefits early in the month,[16] the findings from this study suggest that more frequent benefit disbursements are unlikely to significantly impact diet quality.

The modest changes in both total and component HEI scores should not be discounted, especially given the proportionally large declines in purchasing of certain foods. Low fruit and vegetable scores throughout the SNAP-cycle, and particularly at the end of the month, are concerning as fruit and vegetable consumption is an important protective factor against chronic disease.[29] Studies have shown that individuals who most closely follow the DGA have an 11%–28% reduced risk of all-cause, cardiovascular disease and cancer mortality, and 16% and 18% lower major chronic disease and diabetes risk, respectively.[30–33] These findings are particularly important in the context of this study, where the decline in diet quality at the end of the SNAP-cycle suggests the nutritional gap between SNAP households and the general population grows even larger during periods of the month. Addressing disparities in diet quality between SNAP participants and nonparticipants is a critically important step in reducing the higher rates of mortality among SNAP participants from diet-related diseases, including cardiovascular disease and diabetes.[34]

Limitations

Study limitations relating largely to the FoodAPS data set, discussed elsewhere,[23,35,36] include lack of full-month purchasing data, reporting error in the date of SNAP receipt, and lack of food consumption data. The limitation of having only one week of purchasing data means that this study compares households at different points in the SNAP-cycle with each other, rather than evaluating changes during the SNAP-cycle within each household. Additionally, households without any FAH purchases were omitted, as it was not possible to calculate an accurate HEI score for them. Lack of consumption data limits interpretation of the HEI scores, as the possibility cannot be ruled out that higher diet quality purchases made early in the month are stored and consumed later in the SNAP-cycle.

Future research should employ longitudinal methods and further explore the complex factors influencing food purchasing during the SNAP-cycle, including diet quality of restaurant and other away-from-home food purchases, as well as how SNAP interacts with other food assistance programs, such as WIC.

CONCLUSIONS

One of the most important contributions of this study is the finding that although SNAP beneficiaries experienced extremely low diet quality throughout the month, as measured using the HEI-2010, there was a significant drop in diet quality in the final 10 days of the benefit cycle, suggesting that insufficient benefits lead to poorer quality food purchases later in the month. These critically important social benefits define and constrain the food choices available to low-income Americans and therefore prove centrally important in determining the health of the population.

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