

# Grocery Store Beverage Choices by Participants in Federal Food Assistance and Nutrition Programs

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**Background:** Sugar-sweetened beverages are a target for reduction in the 2010 Dietary Guidelines for Americans. Concerns have been raised about sugar-sweetened beverages purchased with Supplemental Nutrition Assistance Program (SNAP) benefits.

**Purpose:** This paper describes purchases of non-alcoholic refreshment beverages among participants in the U.S. Department of Agriculture's Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and SNAP.

**Methods:** Grocery store scanner data from a regional supermarket chain were used to assess refreshment beverage purchases of 39,172 households in January–June 2011. The sample consisted of families with a history of WIC participation in 2009–2011; about half also participated in SNAP. Beverage spending and volume purchased were compared for WIC sampled households either using SNAP benefits (SNAP) or not (WIC-only). Analyses were completed in 2012.

**Results:** Refreshment beverages were a significant contributor to expenditure on groceries by SNAP and WIC households. Sugar-sweetened beverages accounted for 58% of refreshment beverage purchases made by SNAP households and 48% of purchases by WIC-only households. Soft drinks were purchased most by all households. Fruit-based beverages were mainly 100% juice for WIC-only households and sugary fruit drinks for SNAP households. SNAP benefits paid for 72% of the sugar-sweetened beverage purchases made by SNAP households. Nationwide, SNAP was estimated to pay at least \$1.7 to \$2.1 billion annually for sugar-sweetened beverages purchased in grocery stores.

**Conclusions:** Considerable amounts of sugar-sweetened beverages are purchased by households participating in WIC and SNAP. The SNAP program pays for most of the sugar-sweetened beverage purchases among SNAP households. The upcoming SNAP reauthorization could be a good time to reconsider the program priorities to align public funds with public health.

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## Introduction

Consumption of sugar-sweetened beverages among Americans increased dramatically in the 1980s and 1990s.<sup>1–3</sup> A significant source of empty calories,<sup>4,5</sup> sugar-sweetened beverages are a target for reduction in the 2010 Dietary Guidelines for Americans<sup>6</sup> because of evidence of the contribution of added sugars to a range of poor health outcomes, including obesity,<sup>7–13</sup>

diabetes,<sup>14–17</sup> metabolic syndrome,<sup>14,17</sup> vascular disease,<sup>18–20</sup> and dental caries.<sup>21,22</sup> Added sugars and sugar-sweetened beverages in particular have been shown to displace other important nutrients in the diet.<sup>23</sup> In light of the broad negative impact of added sugars, many have called for policies restricting their consumption, with a particular focus on sugar-sweetened beverages.<sup>3,24,25</sup> Across the nation, public health campaigns to reduce sugar-sweetened beverage consumption have emerged,<sup>26</sup> whereas several state and town legislatures filed bills (so far unsuccessfully) to limit sugar-sweetened beverage intake via fiscal policies, such as excise taxes on sugar-sweetened beverages.

The Supplemental Nutrition Assistance Program (SNAP) was designed to alleviate hunger and malnutrition in low-income individuals and reduce commodity

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surpluses.<sup>27</sup> In 2011, every seventh American and 21.07 million households received SNAP benefits.<sup>28</sup> Almost half of SNAP participants (47%) are children aged <18 years.<sup>29</sup> SNAP benefits can be used to buy virtually any foods and beverages, excluding alcohol, hot foods, and ready-made foods meant to be consumed within the store.<sup>30</sup> Unlike SNAP, the U.S. Department of Agriculture's Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides a prescriptive set of key nutrient-dense foods to low-income pregnant and postpartum women, and infants and children aged  $\leq 5$  years. WIC participation in 2011 was 8.96 million,<sup>31</sup> including 53% of the infants born in the U.S.<sup>32</sup>

Although SNAP has been successful in reducing hunger and food insecurity, its impact on diet quality is less clear.<sup>33</sup> Compared to eligible nonparticipants, SNAP recipients are more likely to consume nutritionally poor diets.<sup>34,35</sup> Concerns have been raised about SNAP-paid purchases of energy-dense nutrient-poor foods, particularly sugar-sweetened beverages.

New York City and several states have sought, thus far unsuccessfully, a waiver from the U.S. Department of Agriculture to allow restrictions on purchases of certain foods and beverages with SNAP benefits. Such efforts have generated substantial controversy, with public health advocates championing the position and anti-hunger advocates expressing concern over restrictions placed on the use of benefits.<sup>36–38</sup> Scarcity of data on types of foods and beverages purchased with SNAP benefits has been a limitation in this debate. The current study describes supermarket purchases of non-alcoholic refreshment beverages among WIC- and SNAP-participating households, including the use of SNAP benefits in these purchases.

## Methods

### Scanner Data

The study is based on grocery store scanner data from a large supermarket chain with stores in several New England states. Typical of many chains, this grocer has a loyalty card system, which allows customers to benefit from store promotions, often available only to loyalty card users. At least 90% of transactions include the use of a loyalty card. Purchases made without the use of loyalty cards cannot be tracked over time and are not part of this analysis.

Each loyalty card is assumed to represent one household. Although some households might have multiple cards, there is no information about households to enable linking such cards. A unique feature is data on the source of funds used to pay for every purchase. This includes SNAP benefits, WIC benefits, nonfood electronic benefit transfers (EBT), and personal funds (e.g., cash),

with the majority of purchases using one method of payment (80.6%). A household's use of benefits indicates its program participation at the time of the purchase.

### Sample

The sample was conditioned on WIC participation to provide a policy-relevant subset of low-income young families. Data were collected for shoppers using WIC benefits at least once at any grocery store of the chain in January 2009–June 2011. Households with at least one WIC purchase in January 2009 were flagged as WIC and followed forward through June 2011, even if they no longer used WIC. Each month, new households were identified as WIC and carried forward, but their purchases prior to joining the sample were unavailable. No data were collected for households that never participated in WIC because of income ineligibility or self-selection into nonparticipation. About half of the sampled WIC households were also SNAP participants.

A household was defined as SNAP during a given month if at least one purchase using SNAP benefits was made during that month. Households were permitted to move in and/or out of SNAP for purposes of analysis to represent typical purchasing behavior while using SNAP. The majority of households either participated in SNAP for all months in which they provided data or did not participate at all.

The current study examines data for all grocery purchases of 39,172 households in the most recent period of January–June 2011. Each household's purchases were aggregated at the monthly level; if a household made multiple purchases that month, they were added up. The panel is unbalanced, as many households did not shop at the chain monthly. Only 11,923 households made purchases in all 6 months (regular shoppers).

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### Beverage Identification and Categorization

Each product has a unique Universal Product Code (UPC) and the store-provided product, department, category, and subcategory description. The grocery store chain product list included 392,119 UPCs in 1974 grocery subcategories, of which 142 were selected for non-alcoholic refreshment beverages (3726 UPCs). Hot tea and coffee, cocoa and milk additives, dairy beverages, baby food or formula, frozen juice pops, smoothie beverages, and alcoholic beverages were excluded.

To obtain data on each product size, nutrition facts panel, and ingredient list, the selected beverage UPCs were merged with Gladson's Nutrition Database<sup>39</sup> (Gladson; 64% match). To estimate the volume of purchased beverages, a package size was assessed for each UPC based on the size information in the product description, Gladson, or Internet searches for UPCs or brand names. For beverages for which none of these methods succeeded, prices were used to help identify a package size. For powdered drinks and 100% juice sold in a concentrated form, the volume of a drink created after adding water was used. All package size data were converted into ounces.

All types of non-alcoholic, refreshment beverages in the U.S. market were included: carbonated soft drinks, bottled water, 100% juice, fruit drinks, energy drinks and shots, sports drinks, ready-to-drink tea, flavored/enhanced water, ready-to-drink coffee, and powdered non-alcoholic drinks. Beverage type for each UPC was

identified using the UPC description and subcategory description. Beverages were categorized also by type of sweetener (or lack of one). The nutritional label from Gladson, product description and manufacturers' websites were used to categorize beverages as sugar-sweetened, diet, unsweetened, and less sweeteners added. Detailed information about beverage classification by type and sweetener is in Appendix A (available online at [www.ajpmonline.org](http://www.ajpmonline.org)). Two coders independently performed cross-verification of all beverage UPCs.

**Outcomes**

The volume purchased was assessed by beverage type and type of sweetener. Ounces purchased were aggregated at the transaction level; all household purchases within each month were then summed to construct a measure of beverage volume purchased every month that a household shopped at the grocery store chain. With the same approach, beverage spending and the proportion of beverage spending in total grocery expenditure were calculated. For each transaction, the percentage of groceries paid by SNAP, WIC, and personal funds was calculated.

For households using SNAP, the proportion of beverage and total grocery spending paid by the program was calculated. If the program paid for the entire purchase, all beverage spending in that transaction was used to calculate SNAP-paid beverage purchases. If beverages were purchased using only personal funds, SNAP spending on beverages was zero. For purchases with mixed methods of payment (e.g., program benefits and cash), the weighted average percentage of SNAP-eligible grocery items paid by the program was estimated. For example, if 50% of expenditure on food and beverages came from program benefits and the rest from personal funds, 50% of beverage spending in this transaction was assumed to be paid by SNAP.

**Data Analysis**

For each month of January–June 2011, the mean beverage volume and spending were calculated for households using SNAP (referred to as SNAP households) and not using SNAP benefits that month (referred to as WIC-only households). All households in the sample were WIC beneficiaries at some point in January 2009–June 2011; about half of them also participated in SNAP at some point during the analysis. As beverage purchases were assessed for January–June 2011, SNAP status during these 6 months (rather than in previous years) was used to measure the effect of SNAP benefits use, assessed each month.

Six monthly means were used to calculate the unweighted mean for the entire study, which is reported. This approach is preferred to calculating the mean of all household-month observations. Households shopping more months also purchased more beverages, so using the mean across household-months and weighing such households more heavily would bias the results.

Analyses were completed for all households and for households shopping every month (regular shoppers). Regression analyses estimated the proportion of refreshment beverage spending in total grocery expenditure and the share of refreshment beverage volume by type using a generalized linear model from the binomial family with a logit link function. The model and estimation results are presented in Appendix B (available online at [www.ajpmonline.org](http://www.ajpmonline.org)). All analyses were carried out using Stata, version 11.2, in 2012.

A back-of-the-envelope estimation was used to calculate SNAP spending on sugar-sweetened beverages among all SNAP households in the U.S. Two assumptions were made that are likely to produce conservative estimates. First, SNAP households with young children in New England were assumed to be representative of all SNAP households in the U.S. and to mirror beverage purchases at grocery store chains elsewhere. Another conservative assumption was that the first 6 months of refreshment beverage purchases represented the entire year (the highest refreshment beverage sales are usually in July and August).<sup>40</sup> The average monthly SNAP-funded spending on sugar-sweetened beverages for each SNAP household in the sample was estimated along with bootstrapped SEs in order to calculate bias-corrected CIs, account-

**Table 1.** Descriptive statistics of sample (N=39,172 households; 150,694 observation months), % unless otherwise noted

Household variables	Monthly M		
	WIC-only	SNAP	
<b>Spending (\$)</b>			
Personal funds	114.39	60.05	
WIC	11.79	15.26	
SNAP	—	120.28	
Cash assistance (nonfood EBT)	0.71	4.61	
Total grocery	126.90	200.20	
<b>Transactions using WIC, January–June 2011</b>	26.2	32.4	
<b>Transactions using cash assistance, January–June 2011</b>	0.6	8.2	
Sociodemographics of households	Store-level		National-level <sup>a</sup>
	WIC-only	SNAP	
Median income (\$)	60,343	54,085	51,914
Have 4-year bachelor's degree	16.9	14.9	17.6
English not spoken in home	15.3	18.4	20.1
Unemployment	7.5	8.5	7.9
Using SNAP	9.1	12.4	9.3
In poverty	7.1	9.4	10.1
White, non-Hispanic	83.3	80.0	64.7

Note: 46% of households were WIC-only; 54% were SNAP households (SNAP only or SNAP and WIC combined). Monthly means represent the average monthly value over the 6 months, January–June 2011. Store-level sociodemographics represent the census tract-level demographics of the store locations where households shop.

<sup>a</sup>Source: U.S. Census Bureau, 2006–2010 American Community Survey. Data are 5-year estimates for 2010.

SNAP, Supplemental Nutrition Assistance Program; WIC, U.S. Department of Agriculture's Special Supplemental Nutrition Program for Women, Infants, and Children

ing for the skewed expenditure distribution. The estimated mean (\$6.77 for all households and \$8.11 for regular shoppers) was then extrapolated to 21.07 million households that received SNAP benefits in 2011 nationwide.<sup>28</sup>

## Results

Table 1 provides descriptive statistics of the sample characteristics for SNAP- and WIC-only households. SNAP households had on average 57% higher monthly expenditure on groceries than WIC-only households, with two thirds of their total grocery spending paid by SNAP. Sociodemographic characteristics of the areas where households shopped were less favorable for SNAP- than WIC-only households, which may mirror household-level sociodemographics such as lower income of SNAP participants. As expected in the New England states, average sociodemographic conditions in the sampled areas were generally somewhat more beneficial than nationwide.

On average, SNAP households purchased 689 oz of refreshment beverages per month, including 399 oz of sugar-sweetened beverages or 58% of beverage volume (Table 2). WIC-only households purchased less of all refreshment beverages (352 oz) and fewer sugar-sweetened beverages: 169 oz or 48% of beverage volume. The two groups were similar in purchasing carbonated soft drinks more than other refreshment beverages (about one third of the beverage volume).

The proportion of bottled water and smaller beverage categories, such as sports drinks, ready-to-drink tea/coffee, and flavored waters was virtually identical for SNAP- and WIC-only households. The choice of fruit-based beverages was, however, different: almost half of fruit-based beverages purchased by SNAP households were less-

**Table 2.** Average monthly volume of beverages purchased by WIC-only and SNAP households, January–June 2011

Beverage product	Mean ounces purchased per month (% of all beverages)			
	All households <sup>a</sup> (N=39,172)		Regular shoppers <sup>b</sup> (n=11,923)	
	WIC-only	SNAP	WIC-only	SNAP
<b>Beverage type</b>				
Carbonated soft drink	114 (33)	231 (34)	154 (33)	285 (34)
Bottled water	54 (15)	95 (14)	73 (15)	116 (14)
100% juice	64 (18)	101 (15)	84 (18)	123 (15)
Fruit drinks	35 (10)	92 (13)	47 (10)	113 (13)
Energy drinks	1 (0)	3 (0)	1 (0)	4 (1)
Sports drinks	23 (7)	39 (6)	30 (6)	48 (6)
Ready-to-drink tea	17 (5)	30 (4)	23 (5)	36 (4)
Ready-to-drink coffee	0 (0)	0 (0)	0 (0)	1 (0)
Flavored water	8 (2)	14 (2)	12 (3)	17 (2)
Powdered drinks	35 (10)	83 (12)	48 (10)	100 (11)
<b>Sweetener type</b>				
Sugar-sweetened beverages	169 (48)	399 (58)	224 (47)	488 (58)
Diet beverages	57 (16)	81 (12)	80 (17)	100 (12)
Unsweetened beverages	121 (34)	200 (29)	160 (34)	244 (29)
Less-sweetened beverages	6 (2)	9 (1)	8 (2)	11 (1)
<b>All beverages</b>	<b>352 (100)</b>	<b>689 (100)</b>	<b>472 (100)</b>	<b>843 (100)</b>

Note: SNAP households are those that participate in either SNAP only or in both WIC and SNAP on the month of analysis. WIC-only refers to households not using SNAP benefits on the month of analysis, and using WIC benefits at some point during January 2009–June 2011.

<sup>a</sup>Includes households regardless of the frequency shopped at the grocery store chain

<sup>b</sup>Includes households that shopped at the grocery store chain every month between January and June 2011

SNAP, Supplemental Nutrition Assistance Program; WIC, U.S. Department of Agriculture's Special Supplemental Nutrition Program for Women, Infants, and Children

nutritious fruit drinks, whereas WIC-only households prioritized 100% juice (two thirds of the fruit beverage volume). Regular shoppers purchased more of all refreshment beverages than all households, yet the composition of beverage choices was the same.

Mirroring their higher grocery expenditure, SNAP households had higher monthly spending on refreshment beverages than WIC-only households (\$17 vs \$9; Table 3). The share of all refreshment beverages in total grocery spending was correspondingly 9% and 7%. Spending patterns by beverage type mirrored volume results, with carbonated soft drinks as the leading beverage and similar distribution by type, with the exception of fruit drinks. SNAP households devoted 5% of total grocery expenditure to sugar-sweetened beverages, whereas WIC-only

**Table 3.** Average monthly expenditures by WIC-only and SNAP households, January–June 2011

Beverage product	Mean monthly expenditure, \$ (% of all groceries)					
	All households <sup>a</sup> (N=39,172)			Regular shoppers <sup>b</sup> (n=11,923)		
	WIC-only	SNAP	% paid by SNAP	WIC-only	SNAP	% paid by SNAP
<b>Beverage type</b>						
Carbonated soft drink	2.56 (2.0)	5.41 (2.7)	68	3.45 (2.1)	6.65 (2.7)	67
Bottled water	0.72 (0.6)	1.25 (0.6)	70	0.96 (0.6)	1.52 (0.6)	69
100% juice	2.79 (2.2)	4.48 (2.2)	54	3.63 (2.2)	5.43 (2.2)	54
Fruit drinks	1.18 (0.9)	2.91 (1.5)	75	1.61 (1.0)	3.58 (1.5)	73
Energy drinks	0.15 (0.1)	0.49 (0.2)	79	0.21 (0.1)	0.61 (0.3)	80
Sports drinks	0.39 (0.3)	0.70 (0.4)	72	0.55 (0.3)	0.85 (0.4)	71
Ready-to-drink tea	0.43 (0.3)	0.78 (0.4)	70	0.57 (0.3)	0.95 (0.4)	68
Ready-to-drink coffee	0.02 (0.0)	0.07 (0.0)	85	0.02 (0.0)	0.08 (0.0)	83
Flavored water	0.31 (0.2)	0.55 (0.3)	69	0.45 (0.3)	0.66 (0.3)	68
Powdered drinks	0.31 (0.2)	0.73 (0.4)	75	0.42 (0.3)	0.88 (0.4)	73
<b>Sweetener type</b>						
Sugar-sweetened beverages	3.79 (3.0)	9.34 (4.7)	72	5.09 (3.0)	11.44 (4.7)	71
Diet beverages	1.25 (1.0)	1.74 (0.9)	65	1.76 (1.0)	2.15 (0.9)	62
Unsweetened beverages	3.65 (2.9)	6.00 (3.0)	59	4.78 (2.8)	7.27 (3.0)	58
Less-sweetened beverages	0.18 (0.1)	0.29 (0.1)	69	0.25 (0.2)	0.35 (0.1)	67
<b>All beverages</b>	<b>8.87 (7.0)</b>	<b>17.37 (8.7)</b>	<b>67</b>	<b>11.88 (7.1)</b>	<b>21.21 (8.7)</b>	<b>66</b>
<b>All groceries</b>	<b>126.91</b>	<b>200.20</b>	<b>63</b>	<b>167.82</b>	<b>242.49</b>	<b>62</b>

Note: SNAP households are those that participate in either SNAP only or in both WIC and SNAP on the month of analysis. WIC-only refers to households not using SNAP benefits on the month of analysis, and using WIC benefits at some point during January 2009–June 2011.

<sup>a</sup>Includes households regardless of the frequency shopped at the grocery store chain

<sup>b</sup>Households that shopped at the grocery store chain every month between January and June 2011

SNAP, Supplemental Nutrition Assistance Program; WIC, U.S. Department of Agriculture's Special Supplemental Nutrition Program for Women, Infants, and Children

households spent more on diet and unsweetened beverages (4%) than on sugar-sweetened beverages (3%). Limiting the sample to regular shoppers had no qualitative effect on the results.

Percentage of refreshment beverage spending paid by SNAP varied by beverage type from 54% for juice to 85% for ready-to-drink coffee, with the mean for all beverages at 67% (Table 3). Overall, SNAP benefits paid for 63% of all grocery expenditures at the chain among households using SNAP benefits. Total grocery expenditures (\$200/month) included all groceries, but the share of SNAP-ineligible items was small. SNAP benefits were used to pay for 72% of sugar-sweetened beverage purchases by SNAP households—a higher percentage than for all groceries (63%), diet (65%), and unsweetened beverages (59%).

Spending of WIC benefits on 100% juice explains lower SNAP spending on juice and unsweetened beverages than on other beverages. For example, WIC paid for about 50% of juice purchased by households using SNAP and WIC benefits. Regular shoppers using SNAP benefits had a slightly lower percentage of beverages paid by SNAP (66% for all beverages and 71% for sugar-sweetened beverages). Using data on purchases of all SNAP households, the SNAP program was estimated to spend annually \$1.713 billion (bootstrapped 95% CI=1.689, 1.733) on sugar-sweetened beverage purchases at grocery store chains nationwide. Focusing on regular shoppers that may better represent total grocery store purchases among SNAP participants, this estimate was \$2.050 billion (95% CI=2.017, 2.084). The total

SNAP spending on sugar-sweetened beverages is likely to be considerably higher after adding all retail channels where SNAP participants could use their benefits to purchase sugar-sweetened beverages (e.g., convenience stores, large retailers such as Wal-Mart).

## Discussion

The current analysis shows that refreshment beverages are a large contributor to total grocery expenditure of SNAP- and WIC-only households, and many of these beverages contain empty calories and are sugar-sweetened. Despite all the evidence on health risks linked to their consumption, sugar-sweetened beverages account for almost 60% of beverage purchases among SNAP households and about one half of beverages purchased by WIC-only households. The dominant role of sugar-sweetened beverages in refreshment beverage purchases of low-income households suggests the need for policy interventions that encourage a shift from sugar-sweetened beverages to lower-calorie beverages. The two commonly cited determinants of poor nutrition, such as limited availability and high cost, do not explain these results, as all varieties of beverages were available at the grocery store, and bottled water and diet beverages were not more expensive than sugar-sweetened beverages.

Sugar-sweetened beverage purchases made by WIC-only households were similar to the beverage choice patterns in the general U.S. population. Using the beverage industry data, sugar-sweetened beverages were estimated to account for 48% of total U.S. beverage consumption in 2009.<sup>41</sup> However, SNAP households appeared to consume substantially more sugar-sweetened beverages than WIC-only households or the general population. This finding supports earlier reports that SNAP participants obtained a higher percentage of total energy from added sugars than income-eligible nonparticipants and higher-income individuals and were more likely to choose sugar-sweetened soda and less often diet beverages than higher-income nonparticipants.<sup>42</sup>

As SNAP pays for most of the empty-calorie sugar-sweetened beverage purchases made by participating households (72% estimated in the present study), high consumption of sugar-sweetened beverages among program participants and its funding by billions of taxpayer dollars is a major public health concern. The current study estimated at least \$1.7 to \$2.1 billion went to paying for sugar-sweetened beverage purchases made by SNAP households in 1 year. This is a conservative estimate as only purchases in grocery stores are assessed and extrapolations are based on data for young families participating in the program in

New England. The U.S. Department of Agriculture should consider conducting studies to evaluate whether limiting the use of SNAP benefits to purchase sugar-sweetened beverages could improve the nutritional quality of food and beverage purchases among program participants.

All households in the WIC-conditioned sample had young children or babies, and their exposure to substantial amounts of sugar-sweetened beverages is particularly concerning. The sweet taste of sugar-sweetened beverages makes them more palatable than water, and children tend to prefer sweet foods. Regular sugar-sweetened beverage consumption can alter children's taste sensitivity and make them even more interested in sugar and averse to less-sweet foods.<sup>43</sup> Bottled water could be a convenient alternative to sugar-sweetened beverages, but its purchases in the sample were considerably lower than the 31% share of bottled water in the U.S. beverage market in 2011.<sup>44</sup>

More work is necessary to educate parents about healthy beverage options for their children. Public health messages about sugar-sweetened beverage consumption face considerable competition from beverage companies marketing their products as fun and desirable. The beverage companies spent \$948 million marketing sugar-sweetened beverages in 2010, and children and teenagers saw 277 and 406 sugar-sweetened beverage advertisements per year.<sup>45</sup> Of note, the share of diet carbonated soft drinks has stayed virtually flat at about 30% over recent years,<sup>46</sup> despite the increased media focus on obesity and the role of sugar-sweetened beverages in weight gain.

The study has a number of strengths. It used unique data on grocery purchases of thousands of low-income families with young children. The source of payment for groceries was available to examine the use of SNAP and/or WIC benefits. SNAP households spent an important share of their SNAP benefits at the grocery store chain that provided data for the present study. For example, average monthly SNAP spending among regular shoppers was \$242, whereas average monthly benefits per SNAP household in the area ranged from \$240 to \$260 in 2011.<sup>47</sup>

The analysis also was subject to limitations. Data were for WIC and SNAP recipients from several New England states, which may differ in beverage purchase patterns from other regions. For example, per capita carbonated soft drink consumption in the South and in the West Central U.S. is more than twofold that in the Pacific area.<sup>46</sup> The Northeast, with consumption just below the national average, can provide a reasonable conservative estimate of national beverage consumption patterns. Another limitation was a restriction of SNAP households

with a history of recent WIC participation. Future studies should provide data on beverage purchases of all SNAP participants.

## Conclusion

Sugar-sweetened beverage purchases are particularly high among SNAP households, and the majority are bought using program benefits. At least \$1.7 to \$2.1 billion is spent in national SNAP funds annually to pay for beverages with no nutritional value. SNAP is the largest federally funded food assistance program serving millions of low-income families, including a high proportion of food-insecure households. SNAP benefits are extremely important in helping these families put food on the table, and every effort should be made to maintain the generous level of federal food assistance via SNAP. At the same time, allowing annual use of multibillions in SNAP benefits to purchase products that are at the core of public health concerns about obesity and chronic illnesses appears misaligned with the goals of helping low-income families live active, healthy lives. The upcoming SNAP reauthorization in 2012 could be a good time to reconsider the program priorities to align use of public funds with fostering public health.

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## Appendix

### Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.amepre.2012.06.015>

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