



**2021**



**NOPREN**

Nutrition & Obesity  
POLICY RESEARCH & EVALUATION NETWORK

**SPECIAL COLLECTION**

# About the 2021 NOPREN Special Collection

The NOPREN Special Collection features peer-reviewed publications authored by NOPREN members in 2021. This curated collection showcases the impact of NOPREN's collaborative research and evaluation activities and spotlights the many ways in which NOPREN researchers have partnered to improve the nation's nutrition policy research capacity and brought about awareness of policies and practices that work to catalyze national, state and local actions. Included in the collection are articles on early childhood and breastfeeding, drinking water access, healthy food retail, federal nutrition assistance programs (including school meals, SNAP, and WIC), and the effects of the pandemic on food and nutrition security.

## Article Key Words

*COVID-19 Food & Nutrition*



*Drinking Water & Healthy Beverages*



*Early Childhood*



*Food Security*



*Healthy Food Retail*



*Rural Food Access*



*School Wellness*



# Articles

## 1. A QUALITATIVE EVALUATION OF DOUBLE UP FOOD BUCKS FARMERS MARKET INCENTIVE PROGRAM ACCESS

Garner, J. A., Coombs, C., Savoie-Roskos, M. R., Durward, C., & Seguin-Fowler, R. A. (2021). A qualitative evaluation of Double Up Food Bucks farmers' market incentive program access. *Journal of Nutrition Education and Behavior*, 52(7), 705–712. <https://doi.org/10.1016/j.jneb.2019.11.010>

### Abstract:

**Objective:** Explore factors affecting access to and use of Double Up Food Bucks (DUFB), a farmers' market program that doubles Supplemental Nutrition Assistance Program benefits for use toward the purchase of fruits and vegetables (FV).

**Design:** Focus groups.

**Setting:** Metro and nonmetro counties in Utah and western Upstate New York.

**Participants:** Nine groups composed of 62 low-income adults (3-9/group).

**Phenomena of interest:** Satisfaction with, barriers to, and facilitators of program use; suggestions for improvement.

**Analysis:** Transcribed verbatim and coded thematically in NVivo 11 software according to template analysis.

**Results:** Program satisfaction was high and driven by FV affordability, perceived support of local farmers, positive market experiences, and high-quality FV. Primary barriers to using DUFB were lack of program information and inconvenient accessibility. Insufficient program communication was a consistent problem that elicited numerous suggestions regarding expansion of program marketing. Emergent topics included issues related to the token-based administration of DUFB and debate regarding stigma experienced during DUFB participation.

**Conclusions and implications:** Results suggest that although DUFB elicits many points of satisfaction among users, program reach may be limited owing to insufficient program marketing. Even among satisfied users, discussion of barriers was extensive, indicating that program reach and impact may be bolstered by efforts to improve program accessibility.

## 2. EVALUATING THE IMPLEMENTATION AND IMPACT OF A HEALTHIER CHECKOUT PROGRAMME AT A REGIONAL CONVENIENCE STORE CHAIN

Baquero, B., Anderson Steeves, E., Polacsek, M., De Marco, M., Chapman, L., Leone, L. A., & Simon, C. (2021). Evaluating the implementation and impact of a healthier checkout programme at a regional convenience store chain. *Public Health Nutrition*, 24(11), 3520–3529. <https://doi.org/10.1017/S1368980021001488>

### Abstract:

**Objective:** To test the feasibility of implementing and evaluating a healthier checkout pilot study in a convenience store chain.

**Design:** A quasi-experimental study was conducted comparing a 3-month 'healthier checkouts' intervention in ten convenience stores which stocked eight healthier items in the checkout space and ten comparison stores assigned to continue stocking their current checkout space product mix. All aspects of the intervention were implemented by the retailer. The research team conducted in-person fidelity checks to assess implementation. Sales data were collected from the retailer in order to compare mean baseline to intervention sales of the eight healthier items in intervention and comparison groups while controlling for overall store sales.

**Setting:** Convenience store chain.

**Participants:** Twenty convenience stores in New Hampshire.

**Results:** The increases in sales of healthier items between the baseline and intervention periods among the intervention and comparison stores were not statistically significant; however, the overall pattern of the results showed promising changes that should be expanded on in future studies. Intervention fidelity checks indicated that results may have been attenuated by variability in intervention implementation.

**Conclusions:** This study advances the evidence for effective promotion of healthier food purchases in the convenience store chain setting and adds to the current literature on retail checkout space interventions. Additional research is needed to confirm and expand these results.



### 3. FOOD-SEEKING BEHAVIORS AND FOOD INSECURITY RISK AMONG NEW YORK STATE RESIDENTS DURING THE CORONAVIRUS (COVID-19) PANDEMIC

Lewis, E. C., Colón-Ramos, U., Gittelsohn, J., & Clay, L. (2021). Food-seeking behaviors and food insecurity risk during the coronavirus (COVID-2019) pandemic. *Journal of Nutrition Education and Behavior*, 54(2), 159–171. <https://doi.org/10.1016/j.jneb.2021.05.002>

#### Abstract:

**Objective:** Food insecurity risk increases among disaster-struck individuals. The authors employed the social determinants of health framework to (1) describe the characteristics and food-seeking behaviors of individuals coping with the coronavirus disease 2019 pandemic and (2) evaluate the relationship between these factors and food insecurity risk.

**Design:** A cross-sectional Qualtrics survey was administered May 14-June 8, 2020.

**Participants:** Adults living in New York were recruited online (n = 410).

**Main outcome measure:** Food insecurity risk.

**Analysis:** Logistic regression analyses were conducted using a model-building approach.

**Results:** A total of 38.5% of the sample was considered food insecure after the coronavirus disease 2019 outbreak. The final model revealed that not knowing where to find help to acquire food, reporting that more food assistance program benefits would be helpful, being an essential worker, having general anxiety, and being a college student were risk factors for food insecurity regardless of demographic characteristics.

**Conclusions and implications:** With more individuals experiencing food insecurity for the first time, there is a need for enhanced outreach and support. The findings complement emerging research on food insecurity risk during and after the pandemic and can help to inform food assistance programs and policies.

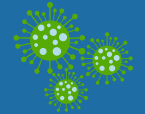
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### 4. FRUIT AND VEGETABLE INTAKE ASSESSED BY REPEAT 24-HR RECALLS, BUT NOT BY A DIETARY SCREENER, IS ASSOCIATED WITH SKIN CAROTENOID MEASUREMENTS IN CHILDREN

Seguin-Fowler, R. A., Hanson, K. L., Marshall, G. A., Belarmino, E. H., Jilcott Pitts, S. B., Kolodinsky, J., Sitaker, M., & Ammerman, A. (2021). Fruit and vegetable intake assessed by repeat 24-hr recalls, but not by a dietary screener, is associated with skin carotenoid measurements in children. *Nutrients*, 13(3), 980. <https://doi.org/10.3390/nu13030980>

#### Abstract:

Accurate measurement of fruit and vegetable (FV) intake is important for nutrition surveillance and evaluation of dietary interventions. We compared two tools for reporting FV intake to objective measurement of skin carotenoids among children. FV cups/day was assessed by repeated 24 h dietary recalls (24H FV) and the National Cancer Institute's All-Day Fruit and Vegetable Screener (NCI FV). Skin carotenoids were measured by repeated resonance Raman spectroscopy (RRS) of the palm. FV cups were regressed on RRS scores in unadjusted, field-based, and research-setting models with covariates feasible in each scenario. Data were baseline values from children aged 2–12 years in low-income households enrolled in a healthy eating randomized trial in four U.S. states (n = 177). Twenty-four-hour FV cups were associated with skin carotenoids in all models (p < 0.001) but NCI FV cups were not. Predicted RRS scores for discrete 24H FV cups provide a guide to interpretation of RRS in children (2 cups FV intake ~36,000 RRS units), with the research-setting scenario generally providing the narrowest prediction range (+/-1924). When self-reported data are required, 24 h recalls are more accurate than NCI FV screener data; and, when limited time, resources, or literacy must be considered, RRS scores can be quickly obtained and easily interpreted.



## 5. HOME FOOD PROCUREMENT IMPACTS FOOD SECURITY AND DIET QUALITY DURING COVID-19

Niles, M. T., Wirkkala, K. B., Belarmino, E. H., & Bertmann, F. (2021). Home food procurement impacts food security and diet quality during COVID-19. *BMC Public Health*, 21(1), 945. <https://doi.org/10.1186/s12889-021-10960-0>

### Abstract:

**Background:** Home food procurement (HFP) (i.e. gardening, fishing, foraging, hunting, backyard livestock and canning) have historically been important ways that people obtain food. Recently, some HFP activities have grown (e.g. gardening), while other activities (e.g. hunting) have become less common in the United States. Anecdotally, COVID-19 has sparked an increase in HFP evidenced by increased hunting licenses and shortages in seeds and canning supplies. HFP may have positive benefits for food security and diet quality, though research beyond gardening is especially limited in high-income countries.

**Methods:** We examine HFP activities since the COVID-19 pandemic began, and their relationship to food security and dietary quality using multivariable logit models and matching analysis with a statewide representative survey (n = 600) of residents of Vermont, United States.

**Results:** We find 29% of respondent households classified as food insecure since COVID-19, and higher prevalence of food insecurity among those experiencing a negative job change since COVID-19, households earning less than \$50,000 annually, Hispanic and multi-race respondents. Nearly 35% of respondents engaged in HFP activities since the COVID-19 pandemic began; the majority of those gardened, and more than half pursued HFP activities more intensely than before the pandemic or for the first time. Food insecure households were more likely to pursue HFP more intensely, including more gardening, fishing, foraging, and hunting. Respondents who were food insecure, Black, Indigenous, People of Color, those with a negative job disruption, and larger households all had greater odds of increased intensity of HFP during the COVID-19 pandemic. HFP was significantly associated with eating greater amounts of fruits and vegetables; however, this effect was only significant for food secure households.

**Conclusion:** Overall, these results suggest that HFP activities have increased since the start of the COVID-19 pandemic, and may be an important safety net for food insecure households. However, HFP for food insecure households does not translate into the same higher fruit and vegetable intake as found among food secure HFP households, suggesting this population may be trying to maintain intake, or that they may have potential important resource or technical assistance needs. Long-term, HFP activities may have important food security and diet quality impacts, as well as conservation implications, which should be more thoroughly explored. Regardless, the increased interest and intensity of HFP demonstrates opportunities for educational and outreach efforts.

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## 6. RESTAURANT KIDS' MEAL BEVERAGE OFFERINGS BEFORE AND AFTER IMPLEMENTATION OF HEALTHY DEFAULT BEVERAGE POLICY STATEWIDE IN CALIFORNIA COMPARED WITH CITYWIDE IN WILMINGTON, DELAWARE

Ritchie, L. D., Lessard, L., Harpainter, P., Tsai, M. M., Woodward-Lopez, G., Tracy, T., Gosliner, W., McCallops, K., Thompson, I., & Karpyn, A. (2021). Restaurant kids' meal beverage offerings before and after implementation of healthy default beverage policy statewide in California compared with citywide in Wilmington, Delaware. *Public Health Nutrition*, 25(3), 1-23. <https://doi.org/10.1017/S1368980021001245>

### Abstract:

**Objective:** In 2019, California and Wilmington, Delaware' implemented policies requiring healthier default beverages with restaurant kids' meals. The current study assessed restaurant beverage offerings and manager perceptions.

**Design:** Pre-post menu observations were conducted in California and Wilmington. Observations of cashiers/servers during orders were conducted pre-post implementation in California and post-implementation in Wilmington. Changes in California were compared using multilevel logistic regression and paired t tests. Post-implementation, managers were interviewed.

**Setting:** Inside and drive-through ordering venues in a sample of quick-service restaurants in low-income California communities and all restaurants in Wilmington subject to the policy, the month before and 7-12 months after policy implementation.

**Participants:** Restaurant observations (California n 110; Wilmington n 14); managers (California n 75; Wilmington n 15).

**Results:** Pre-implementation, the most common kids' meal beverages on California menus were unflavoured milk and water (78.8 %, 52.0 %); in Wilmington, juice, milk and sugar-sweetened beverages were most common (81.8 %, 66.7 % and 46.2 %). Post-implementation, menus including only policy-consistent beverages significantly increased in California (9.7 % to 66.1 %,  $P < 0.0001$ ), but remained constant in Wilmington (30.8 %). During orders, cashiers/servers offering only policy-consistent beverages significantly decreased post-implementation in California (5.0 % to 1.0 %,  $P = 0.002$ ). Few managers (California 29.3 %; Wilmington 0 %) reported policy knowledge, although most expressed support. Most managers wanted additional information for customers and staff.

**Conclusions:** While the proportion of menus offering only policy-consistent kids' meal default beverages increased in California, offerings did not change in Wilmington. In both jurisdictions, managers lacked policy knowledge, and few cashiers/servers offered only policy-consistent beverages. Additional efforts are needed to strengthen implementation of kids' meal beverage policies.



## 7. SHIFTS IN SOURCES OF FOOD BUT STABLE NUTRITIONAL OUTCOMES AMONG CHILDREN IN THE EARLY MONTHS OF THE COVID-19 PANDEMIC

Borger, C., Paolicelli, C., Ritchie, L., Whaley, S. E., DeMatteis, J., Sun, B., Zimmerman, T. P., Reat, A., & Dixit-Joshi, S. (2021). Shifts in sources of food but stable nutritional outcomes among children in the early months of the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 18(23), 12626. <https://doi.org/10.3390/ijerph182312626>

### Abstract:

Early in the COVID-19 pandemic, the U.S. Department of Agriculture (USDA), State governments, and school districts took unprecedented steps to mitigate the pandemic's impact on students' nutrition. To examine the effect of emergency responses on 6-year-old children's nutritional outcomes, this study analyzed longitudinal data from a national study of children's feeding practices, the Special Supplemental Nutrition Program for Women, Infants, and Children—Infant and Toddler Feeding Practices Study-2 (WIC ITFPS-2). Findings include no differences in food insecurity prevalence; however, there were shifts in sources of food, with children in the post-COVID-emergency-declaration (post-ED) group consuming more dietary energy from stores and community food programs and less from restaurants and schools than children in the pre-COVID-emergency-declaration (pre-ED) group ( $p < 0.01$  for all comparisons). Examination of within-person mean differences in 2015 Healthy Eating Index scores and nutrient intakes between ages 5 and 6 years revealed few statistically significant differences between the two groups: children in the post-ED group consumed slightly fewer vegetables ( $p = 0.02$ ) and less sodium ( $p = 0.01$ ) than their pre-ED peers. Findings suggest emergency efforts to maintain children's nutrition were largely successful in the early months of the pandemic. Research is needed to understand the mechanisms by which emergency efforts contributed to these findings.



## 8. THE FOOD BANK AND FOOD PANTRIES HELP FOOD INSECURE PARTICIPANTS MAINTAIN FRUIT AND VEGETABLE INTAKE DURING COVID-19

Bertmann, F., Rogomentich, K., Belarmino, E. H., & Niles, M. T. (2021). The food bank and food pantries help food insecure participants maintain fruit and vegetable intake during COVID-19. *Frontiers in Nutrition*, 8, 673158. <https://doi.org/10.3389/fnut.2021.673158>

### Abstract:

Charitable food services, including food banks and pantries, support individual and households' food access, potentially maintaining food security and diet quality during emergencies. During the COVID-19 pandemic, the use of food banks and pantries has increased in the US. Here we examine perceptions of food banks and food pantries and their relationship to food security and fruit and vegetable (FV) intake during the first 6 months of the COVID-19 pandemic, using a statewide representative survey ( $n = 600$ ) of residents of Vermont. The utilization of food pantries was more common among food insecure households and households with children. Among food insecure respondents, those who did not use a food pantry were significantly more likely to report consuming less FV during the pandemic. Further, we find respondents who are food insecure and using a food pantry report consuming more FV since the onset of the COVID-19 pandemic. We found that respondents who were both food insecure and reported not using a food pantry were significantly more likely to report both a reduction in fruit consumption ( $b = -0.58$ ;  $p = 0.001$ ) and a reduction in vegetable consumption ( $b = -0.415$ ;  $p = 0.012$ ). These results indicate that these services may support food access and one important dimension of diet quality (FV intake) for at-risk populations during emergencies.



## 9. QUALITATIVE PERSPECTIVES OF THE NORTH CAROLINA HEALTHY FOOD SMALL RETAILER PROGRAM AMONG CUSTOMERS IN PARTICIPATING STORES LOCATED IN FOOD DESERTS

Haynes-Maslow, L., Jilcott Pitts, S. B., Boys, K. A., McGuirt, J. T., Fleischhacker, S., Ammerman, A. S., Johnson, N., Kelley, C., Donadio, V. E., Bell, R. A., & Laska, M. N. (2021). Qualitative perspectives of the North Carolina healthy food small retailer program among customers in participating stores located in food deserts. *BMC Public Health, 21(1)*, 1459. <https://doi.org/10.1186/s12889-021-11509-x>

### Abstract:

**Background:** The North Carolina Healthy Food Small Retailer Program (NC HFSRP) was established through a policy passed by the state legislature to provide funding for small food retailers located in food deserts with the goal of increasing access to and sales of healthy foods and beverages among local residents. The purpose of this study was to qualitatively examine perceptions of the NC HFSRP among store customers.

**Methods:** Qualitative interviews were conducted with 29 customers from five NC HFSRP stores in food deserts across eastern NC. Interview questions were related to shoppers' food and beverage purchases at NC HFSRP stores, whether they had noticed any in-store efforts to promote healthier foods and beverages, their suggestions for promoting healthier foods and beverages, their familiarity with and support of the NC HFSRP, and how their shopping and consumption habits had changed since implementation of the NC HFSRP. A codebook was developed based on deductive (from the interview guide questions) and inductive (emerged from the data) codes and operational definitions. Verbatim transcripts were double-coded and a thematic analysis was conducted based on code frequency, and depth of participant responses for each code.

**Results:** Although very few participants were aware of the NC HFSRP legislation, they recognized changes within the store. Customers noted that the provision of healthier foods and beverages in the store had encouraged them to make healthier purchase and consumption choices. When a description of the NC HFSRP was provided to them, all participants were supportive of the state-funded program. Participants discussed program benefits including improving food access in low-income and/or rural areas and making healthy choices easier for youth and for those most at risk of diet-related chronic diseases.

**Conclusions:** Findings can inform future healthy corner store initiatives in terms of framing a rationale for funding or policies by focusing on increased food access among vulnerable populations.

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## 10. USDA SPECIAL SUPPLEMENTAL NUTRITION PROGRAM FOR WOMEN, INFANTS AND CHILDREN (WIC) VENDOR CRITERIA: AN EXAMINATION OF US ADMINISTRATIVE AGENCY VARIATIONS

Landry, M. J., Phan, K., McGuirt, J. T., Ostrander, A., Ademu, L., Seibold, M., McCallops, K., Tracy, T., Fleischhacker, S. E., & Karpyn, A. (2021). USDA Special Supplemental Nutrition Program for Women, Infants and Children (WIC) vendor criteria: An examination of US administrative agency variations. *International Journal of Environmental Research and Public Health*, 18(7), 3545. <https://doi.org/10.3390/ijerph18073545>

### Abstract:

The food retail environment has been directly linked to disparities in dietary behaviors and may in part explain racial and ethnic disparities in pregnancy-related deaths. The Special Supplemental Nutrition Program for Women, Infants and Children (WIC), administered by the United States Department of Agriculture, is associated with improved healthy food and beverage access due to its requirement for minimum stock of healthy foods and beverages in WIC-eligible stores. The selection and authorization criteria used to authorize WIC vendors varies widely from state to state with little known about the specific variations. This paper reviews and summarizes the differences across 16 of these criteria enacted by 89 WIC administrative agencies: the 50 states, the District of Columbia, five US Territories, and 33 Indian Tribal Organizations. Vendor selection and authorization criteria varied across WIC agencies without any consistent pattern. The wide variations in criteria and policies raise questions about the rationale for inconsistency. Some of these variations, in combination, may result in reduced access to WIC-approved foods and beverages by WIC participants. For example, minimum square footage and/or number of cash register criteria may limit vendors to larger retail operations that are not typically located in high-risk, under-resourced communities where WIC vendors are most needed. Results highlight an opportunity to convene WIC stakeholders to review variations, their rationale, and implications thereof especially as this process could result in improved policies to ensure and improve healthy food and beverage access by WIC participants. More work remains to better understand the value of state WIC vendor authorization authority, particularly in states that have provided stronger monitoring requirements. This work might also examine if and how streamlining WIC vendor criteria (or at least certain components of them) across regional areas or across the country could provide an opportunity to advance interstate commerce and promote an equitable supply of food across the food system, while ensuring the protection for local, community-oriented WIC vendors.



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