

Recent news on the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)



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The Rev. Douglas A. Greenaway has been the President / CEO of the National WIC Association (NWA) for 31 years, the voice of education and advocacy for the more than 6.2 million mothers and young children participating in WIC - the first public health nutrition program in the United States for women, infants and children - and the 12,000 WIC provider agencies. He also represents the WIC community's interests to the White House, Congress, the US Department of Agriculture, and other federal agencies and departments.

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Along with the global community, the United States (US) continues to grapple with the myriad challenges presented by the COVID-19 pandemic. Among the programs that provide steadfast support and operate as a safety net for US families is the nation's premier public health nutrition program – the **Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)**.

WIC has provided **healthy food**, breastfeeding support, referrals to health and social services, and nutrition education to **income qualified families with nutritional needs** for almost **50 years**. Administered by the United States Department of Agriculture (USDA), WIC serves over **6.3 million low-income women, infants, and children between the ages of 1 and 5**.

WIC agencies nationwide labored throughout the pandemic to implement **program flexibilities** including food package substitutions and a tripling of the value of the **cash-value benefit (CVB)** spent exclusively on **vegetables and fruits**, usually allotted \$9 per child and \$11 for pregnant, postpartum, and breastfeeding women, to **\$35 per person per month**. The National WIC Association (NWA) played a critical role in leading advocacy efforts for these flexibilities. This dramatic win for the program creates an opportunity to permanently increase the CVB and double down on WIC's healthy food offerings.

As the non-profit education arm and advocacy voice of the WIC program for both the mothers and young children served by WIC, and the **12,000 service provider Agencies** who are the front lines of WIC's public health nutrition services, NWA works to assure and support policies that mandate a healthy, science-based, culturally sensitive food package.

We are pleased to share with you three articles that further demonstrate the importance of research as a tool to continuously reflect on how WIC participants use their WIC food benefits:

- The article of Ronit Ridberg aimed to determine the impact of the additional voucher on food insecurity and dietary intake.
- The study of Lauren Au assessed the alignment of the recommended NASEM* revisions of the WIC child food package with the views of WIC participants and to compare satisfaction by race/ethnicity.
- The systematic review of Qi Zhang and Mohammed Alsuliman examined the factors associated with WIC participants' fruit and vegetables **consumption or purchases** after the implementation of the 2009 WIC food package revision.

*National Academies of Science, Engineering, and Medicine

Fruit and vegetables vouchers during pregnancy: What impact on dietary intake and food security?

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Pregnancy is a critical period to address food insecurity and maternal nutrition and health because of long-term potential impacts on the developing fetus (Carmichael-Jensen, 2007; Cook, 2008). Due to potential complex interactions between economic, physiologic, mental health and behavioral factors, women living in food insecure households are less likely to have a healthy diet than women living in food secure households (Weiser, 2015). Studies also show that mothers living in food insecure households have sharp reductions in their calorie, carbohydrate, vitamin B6 and fruit and vegetables intake at the end of the month when food budgets are more likely to be exhausted (Tarasuk, 2007). In a 2011 dietary practices survey, more than half of low-income women reported eating less than 5 servings of fruit and vegetables daily, and 12% reported eating none at all. One of the primary reasons was that they were “too expensive” (California Dietary Practices Survey, 2011). Thus, financial incentives have been tested as a strategy to reduce financial barriers to fruit and vegetables intake. Since the 1970s, the US government has provided the Special Supplemental Nutrition Program of Women, Infants and Children (WIC). The standard WIC package for pregnant women includes a voucher of 11\$/month for fruit and vegetables.

In this study carried out in San Francisco, pregnant women received additional 40\$/month for fruit and vegetables. Thus, the aim is to determine the impact of this additional voucher on food insecurity and dietary intake. As an exploratory outcome, we examined whether the vouchers were associated with reduced preterm birth rates compared to a historical control group of WIC participants.

Increasing the value of fruit and vegetable voucher significantly improved food security

At baseline, 53 % of the intervention group who received the additional voucher of fruit and vegetable were food insecure versus 38 % from the comparison group. At follow up, among food insecure women at baseline, a significantly greater proportion of the intervention group (23%) were food secure, compared to the comparison group (14%). Also, the mean food insecurity raw score for women in the intervention group decreased from 3.32 (at baseline) to 2.32 (at follow up) showing that they became more food secure, compared to women in the comparison group (from 2.5 to 2.4).

A small improvement in dietary intake was also noted when increasing the value of the voucher

Pregnant women who received additional 40\$/month for fruit and vegetables had an increased improvement of their dietary intake. Indeed, compared to the control group, they had a larger change in mean intake frequency of total vegetables (0.59 times/day), combined fruit and vegetables (0.73 times/day), salad (0.23 times/day), non-fried potatoes (0.19 times/day) and fruit juice (0.27 times/day), indicating greater consumption of these food items (Figure 1).

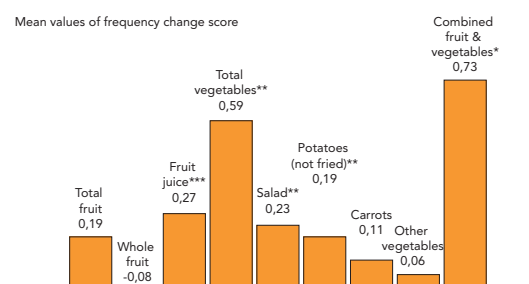


Figure 1: Frequency change score of daily intake of key screener items. Difference in Differences Analyses were conducted with t tests of frequency change scores, by treatment group. Mean values were significantly different from those of the comparison group or between groups:

*P < 0.05, **P < 0.01, ***P < 0.001 (in orange).

Vouchers may have meaningfully impact birth outcomes

When examining the preterm birth (exploratory outcome), the intervention group had 37% lower odds of a preterm delivery compared to births in a separate, historical comparison group of WIC clients. Even if improvements in dietary intake were not sufficient on their own to reduce preterm birth rates, the combined effect of improved dietary intake and food security may have been sufficient.

KEY MESSAGES

- Significant improvements in **food security** and in **fruit and vegetables intake** were observed in low-income pregnant women receiving fruit and vegetable vouchers.
- Financial support for fruit and vegetable purchases may support **healthier dietary habits** and reduce pressure on the household **food budget**.
- Financial incentives for fruit and vegetables during pregnancy may meaningfully contribute to reduce disparities in **preterm birth**.

METHODOLOGY

- Pre-/post- changes in food security and dietary intake outcomes were compared between two groups:
 - Comparison group: 108 non-pregnant WIC participants (postpartum or breastfeeding women, or women with infants or children up to age 5) received the standard WIC package (11\$/month).
 - Intervention group: 592 pregnant women received additional 40\$/month for fruit and vegetables.
- Dietary intake was assessed using the validated National Youth Risk Behavior Survey (YRBS). Questions asked about daily consumption frequency (Never, 1-3 times/week, 4-6 times/week, 1 time/day, 2 times/day, ≥ 3 times/day) over the last week respectively of 100% fruit juice, whole fruit, salad, non-fried potatoes, carrots, and other vegetables.
- Preterm birth rate is defined as <37 weeks gestational age.

Based on: Ronit A. Ridberg, et al. Fruit and Vegetable Vouchers in Pregnancy: Preliminary Impact on Diet & Food Security, Journal of Hunger & Environmental Nutrition. 2020; 16(2): 149-163.

The authors have just completed data collection for a follow-up to this pilot study that includes a new group of pregnant WIC clients in San Francisco who receive \$40 vouchers, and a contemporaneous control group of pregnant WIC clients in two neighboring counties who did not receive vouchers.

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WIC Food Package Revision: Participants Request More Fruit and Vegetables

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In 2017, the National Academies of Science, Engineering, and Medicine (NASEM) released comprehensive recommendations to update the WIC food packages to align with the 2015–2020 Dietary Guidelines for Americans (DGA). Among their recommendations, providing supplemental amount of most food groups, supplying at least 50% of most priority nutrients and maximize responsiveness to diverse cultural preferences across the US were suggested (NASEM, 2017). Increasing the cash value voucher for the purchase of fruit and vegetables for children while decreasing the amount of some foods offered to maintain cost neutrality was one of the recommended changes.

Thus, the current study aims to assess the alignment of the recommended NASEM revisions of the WIC child food package with the views of WIC participants with children aged 1–4 years and to compare satisfaction by race/ethnicity.

56.1% of families wanted to increase cash value voucher for the purchase of fruit and vegetables

WIC participants requested most commonly changes related to fruit and vegetables. About 56% of WIC families wanted an increase in the \$9 cash value voucher to purchase fruit and vegetables. Although many WIC participants (69.6%)

reported that the amount of juice offered was just right, when asked whether they would prefer to receive more fruit and vegetables instead of juice, the majority (91%) wanted to substitute their juice benefit for more fruit and vegetables.

Concerning the other groups of food, 64.3% of families were also interested in adding canned fish to their child's WIC food package. However, the majority of WIC participants were satisfied with the amount of beans (78.4%), peanut butter (78.7%) and milk (88.3%).

Preferences differed according to race/ethnicity and language of participants

The examination of the findings by race/ethnicity and language of WIC participants showed notable difference in preferences. Hispanics, particularly Spanish-speaking Hispanics, tended to report the highest levels of satisfaction with the options currently provided by WIC. For example, Spanish-speaking Hispanics were more likely to report that the current voucher for fruit and vegetables was just right (55.2%). However, they were more likely (92.5%) to request to substitute WIC vouchers for more fruits and vegetables than Hispanic English-speaking (92.3%), non-Hispanic black (89.7%), Asians (89.3%), and non-Hispanic white (86.1%).

These differences by race/ethnicity reinforce the need to maximize the flexibility allowed in the WIC child food package.



KEY MESSAGES

- Preferences of WIC participants are **highly aligned** with the 2017 NASEM WIC food package recommendations for **increasing the fruit and vegetable voucher**.
- Findings suggests that increasing the cash value for fruits and vegetables would resonate among all racial/ethnic subgroups in California.
- Differences by **race/ethnicity** support the need for more **flexibility** in the WIC child food package

METHODOLOGY

- The current study was a cross-sectional examination of survey responses collected between January and May 2019 from 2,993 California WIC families with children aged 1–4 years.
- Surveys were administered over the phone in English or Spanish using a computer-assisted telephone interview system.
- Each respondent was mailed a \$10 gift card after completing the survey.
- The study was reviewed and approved by the California Department of Public Health Institutional Review Board.

Based on: Lauren E. Au, et al. Alignment of California WIC Participant Preferences with Proposed WIC Food Package Recommendations. *J Nutr Educ Behav.* 2021; 53(1):60-66.

References:

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- Daepf MIG, et al. WIC food package changes: trends in childhood obesity prevalence. *Pediatrics.* 2019;143:e20182841.
- National Academies of Sciences, Engineering, and Medicine. Review of WIC Food Packages: Improving Balance and Choice: Final Report. Washington, DC: The National Academies Press; 2017.

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WIC Participants' Fruit and Vegetable Purchases and Consumption after the 2009 WIC Food Package Revision

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One of the most notable changes in the 2009 WIC food package revision was the addition of cash value vouchers (CVV), later called cash value benefits (CVB), for participants to redeem for fruits and vegetables (USDA, 2007). The first monthly benefit was \$6 for children and \$10 for women; the amount was later increased to \$9 for children and \$11 for women (USDA, 2014; USDA, 2015). Although the CVV/CVB was an important change in the WIC food benefits, few studies have systematically examined the factors related to fruit and vegetable intake after the 2009 WIC revision (The National Academies of Sciences, Engineering and Medicine, 2017).

We conducted a systematic review to examine the factors associated with WIC participants' fruit and vegetables consumption or purchases after the implementation of the 2009 WIC food package revision. The results can

support policy makers to improve CVB redemptions among WIC participants. The review included 39 studies from which seven main themes emerged: the 2009 WIC revision, WIC participation, individual factors (characteristics of WIC participants), farmers' market, store- and clinic-level factors, program intervention, and fruit and vegetables prices.

Fruit and vegetables consumption was positively associated with WIC food package revision

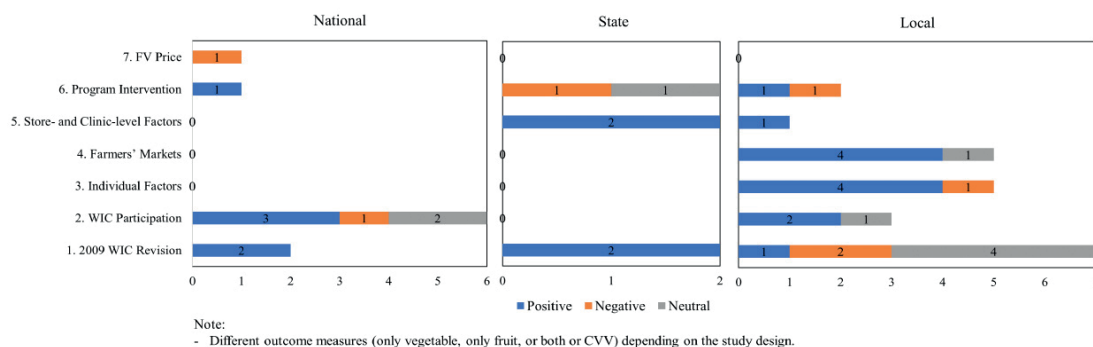
The review showed that the 2009 food package revision had a positive association with fruit and vegetables consumption or purchase among WIC participants in national- or state-level studies (Figure 1). For example, a study suggested that the proportion of WIC women eating more vegetables increased by 7.2% after the 2009 revision (Whaley, 2012).

In local studies, results were mixed with no consistent positive relation between the 2009 WIC revisions and fruit and vegetables consumption and/or purchase.

Various specific factors are related to WIC participants' fruit and vegetables purchases or consumption

Individual factors such as race/ethnicity, immigration status, and birth places were associated with fruit and vegetables consumption or purchase. Findings also showed a positive relationship between farmer-to-consumer sales and fruit and vegetables consumption or purchase. Finally, limited evidence showed that stores' minimum stocking policy and increasing fruit and vegetables' visibility, nutrition education, or economic incentives could increase CVV redemption or fruit and vegetables consumption (figure 1).

Figure 1: Summary results of factors related to fruit and vegetable consumption and purchase among WIC participant based on national, state, and local level.



Note:
- Different outcome measures (only vegetable, only fruit, or both or CVV) depending on the study design.

KEY MESSAGES

- In this systematic review, national and state-level studies showed a consistently **positive relation** between the 2009 revision and fruit and vegetables purchases and/or consumption.
- There were **substantial variations** among the studies concerning study settings and design, data collection and analysis, and outcome measures of fruit and vegetables, which made it difficult to generalize the results.
- Due to the studies' non-experimental design, **few causal inferences** can be drawn about the cash value benefits and changes in fruit and vegetables purchases or consumption.
- Further research at the state agency level is needed to determine the specific impact of cash value vouchers on fruit and vegetables consumption and purchases among WIC participants.

METHODOLOGY

- In this systematic review, PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Cochrane Central Register of Controlled Trials, and Web of Science were used with key search terms.
- Included studies were published from January 1, 2007, through February 28, 2019, since an interim rule for the WIC food package revision was issued in 2007.
- Thirty-nine articles met the inclusion criteria and were grouped in seven main themes.

Based on: Zhang Q, et al. Fruit and Vegetable Purchases and Consumption among WIC Participants after the 2009 WIC Food Package Revision: A Systematic Review. *Adv Nutr.* 2020;11(6):1646-1662.

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- Whaley SE, et al. Revised WIC food package improves diets of WIC families. *J Nutr Educ Behav.* 2012;44(3):204-9.



Effectiveness of workplace wellness programmes for dietary habits, overweight, and cardiometabolic health: a systematic review and meta-analysis.

A systematic literature review including more than 10,000 publications assessed the effectiveness of workplace wellness programmes. These programmes aim to improve dietary habits and cardiometabolic health. According to this review, workplace wellness programmes improved fruit and vegetable consumption, anthropometric and cardiometabolic risk indicators. They should be considered as prevention strategies in terms of public health.

Peñalvo JL et al. *Lancet Public Health*. 2021;6(9):e648-e660.



Increasing Fruit and Vegetable Variety over Time Is Associated with Lower 15-Year Healthcare Costs: Results from the Australian Longitudinal Study on Women's Health.

A team of Australian researchers examined the association between fruit and vegetable variety and healthcare costs. More than 15,000 women were included in the present longitudinal study conducted over 15 years. Findings show that a higher fruit and vegetable variety over time is associated with lower healthcare costs.

Baldwin JN et al. *Nutrients*. 2021;13(8):2829.



More Frequent Food Shopping May Promote Fruit and Vegetable Intake: A Systematic Review

A systematic literature review of 24 scientific publications examined the relationship between frequency of food shopping and fruit and vegetable consumption. This work seems to indicate that fruit and vegetable consumption increases with the frequency of food shopping.

Fultz AK et al. *J Nutr Educ Behav*. 2021;S1499-4046(21)00753-3.



Evaluation of Dietary Patterns and All-Cause Mortality: A Systematic Review

The 2020 Dietary Guidelines Advisory Committee conducted a systematic literature review to identify eventual links between dietary habits and all-cause mortality. This work included 150 studies from 28 countries conducted on adults aged 17-84 years. Findings suggest that healthy dietary habits involving higher consumption of vegetables, fruits, legumes, nuts, wholegrains, unsaturated vegetable oils, fish, and lean meat or poultry (when meat was included) were associated with decreased risk of all-cause mortality.

English LK et al. *JAMA Netw Open*. 2021;4(8):e2122277.



Fruits and their impact on the gut microbiota, gut motility and constipation

A team of English researchers explored the mechanisms of action and effectiveness of fruits and fruit products on the gut microbiota, gut motility and constipation, on the basis of *in vitro* studies (animal and human). Various fruits and fruit products have been shown to modify the microbiota including blueberry powder (lactobacili, bifidobacteria), prunes (bifidobacteria), kiwi fruit (Bacteroides, *Faecalibacterium prausnitzii*) and raisins (*Ruminococcus*, *F. prausnitzii*).

Katsirma Z et al. *Food Funct*. 2021; 12(19):8850-8866.