



The Impact of the 2009 Special Supplemental Nutrition Program for Women, Infants, and Children Food Package Revisions on Participants: A Systematic Review



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ABSTRACT

For the first time since 1980, the US Department of Agriculture Food and Nutrition Service Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) food package policies were revised in 2009 to meet the Institute of Medicine's nutrition recommendations. These changes included increases in fruits, vegetables, whole grains, and low-fat dairy to improve nutrition and health of WIC participants. Our systematic review of the literature assessed the influence that the 2009 WIC food package revisions have had on dietary intake, healthy food and beverage availability, and breastfeeding participation. The systematic review followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses recommendations. Four electronic databases were searched between April 1 and 30, 2014, for peer-reviewed research. Two reviewers screened the articles, extracted the data, and established inter-rater reliability by discussing and resolving discrepancies. Twenty articles were included that met our inclusion criteria. Nine of the studies analyzed changes in dietary intake, eight examined changes in healthy food and beverage availability, and three evaluated breastfeeding participation exclusively. The review demonstrated an improved dietary intake and an increase in the availability of healthier foods and beverages in authorized WIC stores. The revised food package was also associated with improved dietary intake of WIC participants. Mixed results were demonstrated in regard to improved breastfeeding outcomes. Further research is needed to assess the influence of WIC 2009 food package revisions on breastfeeding outcomes and to make conclusions about broad nutrition-related implications.

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THE MISSION OF THE UNITED STATES DEPARTMENT of Agriculture (USDA) Food and Nutrition Service Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is to safeguard the health of low-income women, infants, and children up to age 5 years who are at risk for poor nutrition.¹ WIC, which was created as a 2-year pilot program in 1972 and made permanent in 1975, addressed the public and medical concern about malnutrition among low-income mothers and children.¹ WIC provides nutritious foods to supplement diets, nutrition education, and referrals to health care and other social services.¹ The majority of WIC participants acquire foods through retail food stores (also called vendors) authorized by WIC state agencies. Authorized vendors carry WIC-approved foods and accept WIC checks, vouchers, and/or electronic benefit transfer.¹ The focus of WIC has transitioned from preventing malnourishment to concerns of childhood obesity and excessive energy consumption combined with a low intake of fruits, vegetables, and whole grains have become the primary dietary concern of WIC participants.

The USDA Food and Nutrition Service charged a 2004 Institute of Medicine (IOM) committee with reviewing the program's current supplemental food packages and evaluating the necessity of redesigning them to improve WIC participants' diets in regard to nutrition-related diseases.² The IOM developed a report from their findings entitled, *WIC Food Packages: Time For Change*,² which recommended WIC match the current dietary guidance for infants and young children. The committee's revisions encouraged consumption of fruits and vegetables (F/V), emphasized whole grains, lower saturated fat, and food packages that appealed to diverse populations.² Informed by the IOM recommendations, the USDA published an interim rule for the food packages on December 6, 2007, that required all revisions to be implemented by October 1, 2009.³ The interim rule largely reflected the IOM recommendations.⁴ However, due to certain cost containment modifications, the interim ruling did not provide all WIC participants with a \$10 cash voucher allotment for F/V purchases as recommended by the IOM. Exclusively breastfeeding mothers were provided with a \$10 per month F/V cash value voucher and all other

women received an \$8 F/V cash value voucher. This decrease in allotment for F/V cash value vouchers was later changed to provide all WIC participants with the IOM \$10 recommendation.⁴

The final ruling on March 4, 2014, expanded whole-grain options, provided yogurt as a partial substitute, allowed parents to buy fresh F/V instead of jarred baby food, and gave states the flexibility to meet the needs and cultural preferences of their WIC participants.⁵ The final ruling still included the revisions of more fruits, vegetables, whole grains, a reduction in juice consumption, and a switch from whole milk to low-fat milk for children aged 2 years and older.⁵ The revisions also incentivized and supported breastfeeding by increasing the amount of food allotted and the length of time the exclusive breastfeeding package could be provided. In contrast, the amount of formula for women partially breastfeeding was decreased to incentivize the exclusive breastfeeding package.⁵ The 49,000 WIC-authorized retail stores were required to stock specific items such as fruits, vegetables, and whole-grain products to benefit from sales related to WIC.⁵ Overall, these revisions aimed to improve dietary intake, increase breastfeeding participation rates, and expand healthy food and beverage availability at retail stores.

Although evidence exists about dietary intake, healthy food and beverage availability, and breastfeeding participation of the 2009 WIC food package revisions, to our knowledge, no systematic review exists that assesses the overall influence of the 2009 WIC food package revisions. Therefore, the objective of this review was to assess the effects of the 2009 food package revisions on healthy food and beverage availability, breastfeeding outcomes, and dietary intake of WIC program participants 5 years later using only peer-reviewed research.

METHODS

Articles included in this review were extracted from CINAHL, Cochrane Database, Web of Knowledge, and PubMed through a systematic review of literature utilizing the Preferred Reporting Items for Systematic Reviews and Meta-Analyses format.⁶ The authors tested potential key words related to WIC packages and revisions found in the Medical Subject Headings Library (<http://www.nlm.nih.gov/mesh/>) through mock searches to ensure that the final list of terms captured relevant articles that met inclusion and exclusion criteria. Final terms used in this search included a combination of the following words: *WIC; The Special Supplemental Nutrition Program for Women, Infants, and Children; food package; and 2009 revisions*. Reference lists of primary studies were scanned for additional citations. Inclusion criteria for manuscripts were peer-reviewed, English language, and United States. Meeting abstracts were excluded due to limited information provided. Articles were added to the initial review in cases where the title, abstract, or key words indicated that the study analyzed the implications of the 2009 WIC food package revisions, measured availability of healthy food and beverages at WIC retail locations, breastfeeding participation, and dietary intake, and were published before the peer-reviewed study was started April 1, 2014, and ended April 30, 2014. Articles were excluded if published before the 2009 WIC revisions occurred, did not analyze changes due to 2009 WIC revisions, or focused on other federal food and nutrition assistance programs.

Two coders (D. J. S. and C. B. S.) independently extracted and then compared data to resolve any discrepancies through consensus. Both coders extracted information into a standardized form from selected articles and eligibility criteria into a table to note author, year published, research design, participants, location, data collection, study description, and results (see [Table 1](#)). Risk of bias was noted by assessing publication and funding mechanisms, experimental design (eg, whether there was a control group), sample size, follow-up measures, validity and reliability of the data collection instrument, and reporting. Where quantitative results existed, no summary measures were addressed due to inconsistent measurement methods across studies.

In total, 28 articles were identified in the initial review. Full articles were read for inclusion in the study. Two articles were excluded because they did not assess the 2009 WIC revisions and six articles were excluded because they were conference abstracts (see the [Figure](#)). This study was exempt from institutional review board review because there was no interaction with human subjects.

RESULTS

Twenty articles met the aforementioned study criteria (see the [Figure](#)). The following sections summarize changes in dietary intake, availability of healthy foods and beverages, and breastfeeding outcomes. Eight of the studies examined changes in the availability of healthy foods and beverages, nine analyzed changes in dietary intake, and three evaluated an increase in breastfeeding participation. The articles reported a variety of quantitative and qualitative research methods, including cross-sectional surveys, secondary data analysis, inventories, and interview methodology.

Dietary Intake

Dietary changes after the 2009 WIC food package revisions were observed among WIC participants across several food groups.⁷⁻¹⁵ Households enrolled in WIC purchased more whole-grain breads and brown rice.⁷ Retail scanner data demonstrated that WIC households also decreased purchases of juice.⁸ Native-American children participating in WIC reported increased consumption of whole-wheat bread at rates of four to seven times per week and two or more times per day and decreased consumption of white bread in an interview setting.⁹

Significant changes were observed in dietary intake in another study, with increased fruit consumption by 0.33 servings (one fruit serving is equivalent to 1 medium fruit, whereas $\frac{1}{4}$ cup dried fruit is equivalent to $\frac{1}{2}$ cup fresh, frozen, or canned fruit based on the 2005 Dietary Guidelines for Americans [DGA]) per day among Hispanic mothers enrolled in WIC.¹⁰ In the same study, low-fat dairy intake increased by 0.21 servings (one milk serving is equivalent to 1 cup milk, 1 cup yogurt, and 1.5-oz cheese based on the 2005 DGA) per day among Hispanic WIC-enrolled mothers, 0.34 servings per day among Hispanic WIC-enrolled children, and 0.24 servings per day for African-American WIC-enrolled children.¹⁰ Native-American WIC-enrolled children consuming F/V four or more times per day increased from 7.0% and 3.9%, respectively, to 11.5% and 8.0% after the 2009 WIC food package revisions.⁹ Saturated fat intake decreased as the purchase of milk and cheese declined by 85 g/month

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