

« WIC: Latest advances »

Editorial

The United States Special Supplemental Nutrition Program for Women, Infants, and Children – WIC – is accessed nationally through 10,000 WIC clinics and serves nearly nine million mothers and young children, including 53% of all infants and 25% of children one to five years of age. Quality nutrition services are WIC's centerpiece: nutrition and breastfeeding education, nutritious foods, and improved healthcare and social service access for low and moderate income women and young children with, or at risk of developing, nutrition-related health problems, including overweight, obesity, and type-2 diabetes.

WIC foods are selected for their nutritional value to supplement the nutrients found lacking in the diets of low-income populations and include fresh, frozen, canned, and dried fruits and vegetables, prepared baby fruits, vegetables, and meats, low-fat dairy, whole grain cereals and bread, light tuna, salmon, sardines, and mackerel, canned and dried beans, peanut butter, eggs, juice, and iron-fortified infant formula.

WIC's current food package reflects 2009 revisions including healthier food choices such as fruits, vegetables, low-fat dairy, and whole grains. As a result, WIC food vendors, specifically convenience stores and groceries in low-income areas, have improved their selection of healthy foods to maintain WIC authorized vendor status. In 2015 the Institute of Medicine will re-examine the food available under WIC. While this takes place, researchers continue to evaluate the impact of the revised food package. The accompanying studies examine how WIC contributes to improving access to healthy foods, especially fruits and vegetables, in communities across the nation.



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Changes in the WIC Food Package: WIC Mothers Want The Option of Making Their Own Baby Food

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Changing the WIC package in response to changes in dietary recommendations

The Special Supplemental Nutrition Program for Women Infants and Children (WIC) was designed in the 1970s to protect the nutrition and health of low-income pregnant and postpartum women, infants and children up to age five years¹. WIC provides nutrition education, medical and social service referrals, breastfeeding promotion and support, and a supplemental food "package". The WIC food packages were designed to provide nutrients thought to be most limited in the diets of low-income women and children in the 1970s, and until recently, had not been modified in any major way. The program has effectively reduced the risk for low birth weight and iron-deficiency anemia of low-income children and currently serves over 50% of all infants born in the US²⁻⁴. However, in the more than three decades since the inception of the program, there have been significant changes in dietary recommendations and an epidemic rise in overweight and obesity, particularly among low-income and ethnic minority communities⁵⁻⁹. In 2003, the Institute of Medicine was charged with evaluating the diets of low-income women and children in the U.S. and recommending revisions to the WIC food packages. The recommended revisions were designed to reduce the prevalence of inadequate and excessive nutrient intakes among participants and to align the food packages with the current Dietary Guidelines for Americans and with accepted pediatric nutrition recommendations. In 2009 the food packages were revised program-wide¹⁰.

What the revised WIC packages mean in terms of diet quality

The revised WIC food packages represent a significant change in the resources available to improve diet quality for a large part of the low-income US population. The revised food packages provide significantly less fat, saturated fat, cholesterol and simple sugars than the previous packages, both for women and children. They also contain higher amounts of whole grains, and consequently more dietary fiber. For women and children ages 1-5, the revised packages include cash value vouchers (CVVs) for the purchase of fruits and vegetables. For infants 6-11 months old, jarred baby fruit and vegetable (F/V) are included in the revised package and CVVs are not available. Older infants (9-11 months) who are formula-fed or partially breastfed receive a monthly allotment

of jarred fruit and vegetable baby food and fully breastfed babies in the same age range receive even more jarred fruit and vegetable baby food in addition to jarred meat baby food. These jarred baby foods offer important supplemental nutrition for infants and represent a sizeable portion of the food package budget.

The 2002 Feeding Infants and Toddlers Study (FITS) found that more than 70% of infants four months and older consumed jarred baby foods¹¹⁻¹². That percentage increased to more than 87% from seven to twelve months of age. Hurley et al. reported 81% of Maryland WIC infants consumed jarred baby foods, which was associated with increased variety in fruit and vegetable intake¹³. Given such high rates of consumption of jarred baby foods, particularly among WIC infants, understanding infant feeding patterns and satisfaction with jarred baby foods is important for future revisions and policy programming of the new WIC food packages.

Evaluating the impact of the new food packages

The historic and unprecedented nature of this change in the food provision for WIC families warranted a detailed examination of the impact of the new food packages. To date, a handful of evaluations of the impact of the new food packages have been published¹⁴ but no published research to date has specifically focused on commercially prepared jarred baby food in the new WIC food package. The purpose of this study was to examine participant use and satisfaction with jarred baby F/V, assess preference for cash value vouchers (CVVs) for fruits and vegetables versus jarred baby F/V, and examine whether preferences varied among selected ethnic groups.

Two data sources were used in the study: The California Nutrition Education and Food Package Impact (NEFPI) survey and California WIC voucher redemption data. Participants reported high satisfaction with the CVV for fruits and vegetables and jarred baby foods, with statistically significant variation across ethnic groups. Our results indicated, however, that as infants get older, mothers wanted the option to choose between jarred baby foods and CVVs for fruits and vegetables. As a next step, we suggest a study to further examine redemption rates and explore the feasibility of allowing states to offer older infants the choice between CVVs for fruits and vegetables instead of jarred baby fruits and vegetables.

Based on : Kim LP, Whaley SE, Gradziel PH, Crocker NJ, Ritchie LD, Harrison GG. Mothers prefer fresh fruits and vegetables over jarred baby fruits and vegetables in the new Special Supplemental Nutrition Program for Women, Infants, and Children food package. *J Nutr Educ Behav.* 2013 Nov-Dec;45(6):723-7.

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Children Increase Fruit and Vegetable Consumption Following 2009 Changes to the WIC Food Package in New York State

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Changing the WIC Food Package in Response to the US Childhood Obesity Epidemic

Childhood overweight is highly prevalent in the United States with more than one quarter (26.7%) of children as young as 2-5-years-old already overweight or obese (BMI >85th percentile)¹. In 2005, in response to the childhood obesity epidemic, the Institute of Medicine (IOM) report *WIC Food Packages: Time for a Change* recommended a change to the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), which reaches nearly half of all infants born in the United States and serves approximately nine million low-income pregnant and postpartum women, infants, and children below age five per months². The change was to reduce the elements of the food package that contribute to overweight and obesity without compromising key nutrients/micronutrients often absent in the diet³. In response, the US Department of Agriculture (USDA) mandated changes to WIC food packages in all states. WIC programs also were encouraged to offer educational programs focused on increasing physical activity and reducing screen time for children and their families in addition to WIC's core nutrition education function.

Adding Fruits, Vegetables, and Whole Grains to the WIC Food Package

On 5 January 2009, New York (NYS) was the first state to implement these revisions. For the first time, food packages were required to include fruits, vegetables, and whole grains. Children were eligible for modest \$6 fruit/vegetable vouchers/month. For children 2-4 years of age, low non-fat milk (1%) replaced whole milk. At the same time, NYS introduced the WIC Healthy Lifestyle Initiative. This multi-faceted, comprehensive program incorporated breastfeeding peer counseling and client-centered counseling which provide education to WIC participants on how to help their families eat healthier, increase physical activity, and reduce screen time from birth. The Healthy Lifestyle Initiative grew out of programs that have been progressively implemented by NYS WIC since 1997 as part of the statewide initiative for childhood obesity prevention^{4,5}.

Using the Automated New York State WIC Database to Compare Fruit and Vegetable Consumption and Weight Before and After Before and After Changing the Food Package

This study was undertaken as part of a comprehensive evaluation of the innovative NYS WIC program obesity prevention policies and implementation of the new WIC food package. Using cross-sectional data abstracted from the NYS WIC administrative data system (WICSIS), more than 3.5

million records were analyzed at six month intervals from July-December 2008 (pre-implementation of the new WIC food package) through July-December 2011. Behavioral data in WICSIS were obtained from parent interview by WIC staff at mandatory certification and recertification visits. Approximately 500,000 infants and children through age four years were enrolled in the program in each six month interval. Prevalence proportions for behaviors and BMI were calculated. Statistical tests were not calculated because biannual WIC data represented a census of all children who participated in WIC. The objective of the study was to examine trends over time in prevalence of: infant feeding practices; daily consumption of fruits, vegetables, whole grains, and low-/non-fat milk; screen time; and obesity in children 1-4 years of age.

Increases in Healthy Eating Behaviors Including Fruit, Vegetable and Whole Grain Consumption and Decreases in Weight Following Changes to the WIC Food Package

Comparing July-December in 2008 and 2011, increases in prevalence proportions were observed in: daily fruit (87.0 to 91.6%), vegetable (78.1 to 80.8%), and whole grain consumption (59.0 to 64.4%) by children aged 1-4 years; breastfeeding initiation (72.2 to 77.5%); delaying introduction of solid foods until after four months of age (90.1 to 93.8%); and switches from whole milk to low-/non-fat milk by children aged 2-4 years (66.4 to 69.4%). In one year old children, the proportion > 95th percentile weight-for-recumbent length decreased from 15.1 to 14.2%; the proportion of children 2-4-years-old with BMI > 95th percentile decreased from 14.6 to 14.2%.

Making Small, Revenue Neutral Changes to a Program that Reaches Nearly Half of All Infants in the US May Have a Measurable Impact on Behavior

These findings demonstrate that, within the context of the NYS Healthy Lifestyle Initiative, positive changes in dietary intake and reductions in obesity followed implementation of the USDA mandated revisions to the WIC food package for the hundreds of thousands of young children participating in the NYS WIC program. While our findings are limited to NYS, they suggest that WIC has enormous potential to positively influence nutrition and diet, both now and in the future⁶, through revenue neutral changes to a nutritional program that reaches one-half of all children born in the U.S. A national focus on evidence-based, population-level obesity prevention programs such as WIC that target children from the earliest ages may be key to combating the obesity epidemic in the US⁷.

Based on : Chiasson MA, Findley SE, Sekhobo JP, Scheinmann R, Edmunds LS, Faly AS, McLeod NJ. Changing WIC changes what children eat. *Obesity* (Silver Spring). 2013 Jul;21(7):1423-9. doi: 10.1002/oby.20295. Epub 2013 May 22. PMID: 23703806

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Impact of Personal Preference and Motivation on Fruit and Vegetable Consumption of WIC Participating Mothers and Children in Atlanta

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The primary objective of the present study was to examine the relationship between psychosocial factors (personal preferences and motivation for healthy eating habits) and the consumption of fruit and vegetables (F&V) among mothers and children participating in the WIC program in the metro-Atlanta area. Socio-demographic factors were also examined as possible confounders of the relationship with F&V consumption. Understanding personal preferences and motivation would allow the WIC program to improve the effectiveness of its nutrition education efforts to increase F&V consumption.

Participants were selected from two metro-Atlanta WIC agencies and interviewed between April and October, 2009. All 249 participants of the study met the following inclusion criteria:

- at least 18 years of age,
- English as the primary language;
- received WIC coupons or vouchers at the WIC clinic;
- had at least one child receiving WIC vouchers between the age of 1 and < 5 years; and
- received WIC vouchers on date of interview.

Measure of F&V consumption and psychosocial and sociodemographic factors

The baseline survey asked six questions pertaining to F&V intake for the mother and the oldest child receiving the food voucher. The questions asked about the daily or weekly consumption of six different categories of F&V: fruit juice, fruit, green salad, potatoes (not including french fries), carrots, other vegetables.

The psychosocial factors included in this study focused on personal preference and motivation factors of F&V consumption for participants. A total of eight subtopics of personal preference and motivation were asked (Table 1) with three response options: "Disagree," "Agree," and "Neutral." Seven sociodemographic variables were identified (Table 1).

Table 1: Parameters for likelihood of WIC Mothers Consuming F&V (n=249)

Psychosocial factors	Sociodemographic variables
Did not grow up eating many F&V	Age
Do not like the taste of F&V	Race
Already eat plenty of F&V	Marital status
Do not know when F&V in season	Education
Difficult to store fresh F&V	Children in household
F&V often spoil before I eat them	Adults in households
Do not know how to prepare most	Concerns about money
Fresh F&V cost too much	

Fruit juice and fruits consumption were the highest category of F&V intake

For both mother and child, fruit juice and fruit had the highest average intake. Carrots, potatoes, and green salad had the lowest average daily

consumption for both mother and child (Table 2).

Table 2: WIC Mothers and Their Oldest Child's Average F&V consumption by categories (n=249)

F&V consumption categories, mean	Mother	Oldest Child
Average fruit juice intake	1.12	1.94
Average fruit intake	1.08	1.39
Average green salad intake	0.36	0.26
Average potato intake	0.24	0.32
Average carrot intake	0.23	0.28
Average other vegetable intake	0.98	1.05

Categorical breakdown for F&V consumption is important for development of new WIC initiatives focused on F&V. Fresh fruits and green leafy vegetables are highly recommended for a healthy diet². Fruit juice consumption has been criticized for high sugar content, often with sparse nutritional benefits^{3,4}. Further examination of knowledge of F&V consumption will be beneficial in developing education programs and tailoring new WIC initiatives toward healthier diets.

Only 28% of mothers and 44 % of their oldest children consumed more than five servings of F&V daily

The average total daily intake of F&V among mothers was 3.92 servings, and 5.25 for the oldest child.

The analysis of perception of F&V intake showed that the majority of mothers in this study believe they "already consume plenty of F&V." However, only 28% of mothers (and 44 % of oldest children) met the suggested daily intake of five servings of F&V a day.

Not knowing how to prepare F&V and spoilage of F&V before eating them were significantly related to F&V consumption of mothers

The demographic characteristics did not differ significantly by whether the F&V criterion was met. However, those who did not meet the criterion showed a higher percentage of being concerned about not having enough money.

Of the 15 independent variables, only three showed a significant difference between mothers who met criteria and those who did not: "Already eat plenty of F&V" (P =0.04); "Fruits and vegetables often spoil before I eat them" (P=0.02); and "Do not know how to prepare most F&V" (P =0.04). This last item is consistent with findings from a previous study in which WIC recipients claimed to spend little time cooking each day, rarely used recipes, and prepared larger meals only on weekends⁵.

For children, only two variables had a significant different in outcome of child's F&V intake: "Already eat plenty of F&V" (P=0.04); and "Concerned about money" (P=0.02).

Food storage and preparation resulted in significant differences in meeting criteria for F&V consumption. Future education and research initiatives should offer cooking classes and focus on teaching participants how to use recipe books.

Based on : Chen DY, Gazmararian JA. Impact of Personal Preference and Motivation on Fruit and Vegetable Consumption of WIC-Participating Mothers and Children in Atlanta, GA. J Nutr Educ Behav. 2014 Jan;46(1):62-7. doi: 10.1016/j.jneb.2013.03.001. Epub 2013 Nov 13.

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