

IMPACT OF THE REVISED WIC FOOD PACKAGES ON NUTRITION OUTCOMES AND THE RETAIL FOOD ENVIRONMENT



The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) every month provides about 7 million low-income pregnant women, new mothers, infants, and young children with nutritious foods, nutrition education, and increased access to health care. The WIC food packages were revised in 2007 to align the authorized foods with the latest nutrition science and guidance. The majority of WIC participants are satisfied with the revised food packages in terms of the new foods offered and changes in the amounts of food.^{1,2,3} And, as summarized in this brief, research shows that the revised WIC food packages have favorable impacts on dietary intake, breastfeeding outcomes, and obesity rates. In addition, also as summarized in this brief, studies suggest an important role for WIC in improving neighborhood food environments, which benefits both WIC participants and non-participants.



Background of WIC

WIC provides low-income pregnant women, breastfeeding women, non-breastfeeding postpartum mothers, infants, and children up to the age of 5 with nutritious foods, nutrition education and counseling, and referrals to health care and social services.⁴ Women and children are eligible for the program if they meet the statutory income guidelines (i.e., at or below 185 percent of the federal poverty line) or are eligible based on participation in other needs-based programs, such as Medicaid, the Supplemental Nutrition Assistance Program (SNAP), or Temporary Assistance for Needy Families (TANF). In addition to being income-eligible,

applicants must be at nutritional risk (e.g., underweight, overweight, anemic, poor dietary intake) as determined through a nutrition assessment conducted by a health professional. In fiscal year 2018, WIC provided services in an average month to approximately 1.6 million women, 1.7 million infants, and 3.5 million children.⁵

Revised WIC Food Packages*

Specific WIC food packages are prescribed for different groups of participants (e.g., pregnant women, infants, young children) to supplement their diets based on their nutritional needs. The packages were revised in 2007, the first time since 1980, to align the packages with the Dietary Guidelines for Americans and infant feeding practice guidelines of the American Academy of Pediatrics.⁶ All WIC state agencies were required to implement the new food packages by

* For more information on the revised WIC food packages, visit FRAC's website at www.frac.org.

October 2009. Overall, the revised WIC food packages improve the health and nutritional quality of the foods in the program, increase participants' choices, and expand cultural food options.⁷ More specifically, the revised packages retain the basic WIC foods, including milk, cheese, eggs, fruit juice, iron-fortified cereal, beans, peanut butter, infant formula, and (for breastfeeding women) tuna. However, the amount of milk, cheese, eggs, fruit juice, and, in some cases, infant formula was reduced in the new packages. In addition, the new packages move to low-fat or non-fat milk; offer fruits, vegetables, and whole-grain bread (with the option to substitute whole-grain tortillas, pasta, rice, or other grains); and allow the substitution of soymilk, tofu, and (in 2015) yogurt for milk and cheese.

Revised WIC Food Packages and Nutrition Outcomes

Research shows that WIC is effective at reducing food insecurity, improving dietary intake, addressing obesity, and improving other health outcomes.⁸ And research published in the past several years specifically links the revised food packages with improvements in a variety of nutrition outcomes, as highlighted in the following selection of studies.

- Within three years of the introduction of the new WIC food packages, young children enrolled in WIC not only increased their **consumption of fruits, vegetables, and whole-grains**, but **overweight and obesity rates** also declined modestly among this group, according to a study that examined more than 3.5 million administrative records of children in the New York state WIC program.⁹
Lower-fat milk consumption and solid food introduction also improved among older children and infants, respectively.
- Additional evidence suggests that the WIC food package revisions were associated with favorable impacts on the **prevalence of obesity** among young children.^{10,11} For example, in a study using data from 2000 through 2014, obesity rates among 2-to-4-year-old WIC participants were increasing by 0.23 percentage points per year before the 2009 revisions, but obesity rates declined by 0.34 percentage points per year after the revisions.¹²
- Six months after the introduction of the new WIC food packages, **fruit, vegetable, whole-grain, and lower-fat milk consumption** improved among California WIC families, according to a study of nearly 3,000 caregivers and children.¹³ Improvements in whole-grain consumption were the most pronounced: consumption increased by 51 percent from baseline.
- Among 1,642 Native American children ages 2 to 4 years who participated in the program, **lower-fat milk, fruit, vegetable, and whole-grain intake** also increased after the introduction of the new WIC food packages.¹⁴ The children consumed a **wider variety of fruit** after the changes as well.
- Based on studies among African American and Hispanic child WIC participants in Chicago, whole milk intake significantly decreased and **lower-fat milk intake** significantly increased for both groups at 6 and 18 months after the introduction of the new WIC food packages.^{15,16} The studies also found improvements in other dietary outcomes among the children and their mothers. For instance, among Hispanic children, significant improvements were found after 18 months for **overall dietary quality** and the **intake of dietary fiber, total fat, and saturated fat**.
- Revisions to the WIC food packages were associated with higher **dietary quality** among children in WIC households, according to a study using national data on 1,197 low-income children 2 to 4 years of age.¹⁷ The greatest improvements for children in WIC households were observed for greens and beans, whole-grains, and fatty acids.

- A study of mothers and their eldest child both participating in WIC in Atlanta, Georgia, found that the percentage of children **consuming low-fat milk** significantly increased after the WIC food package revisions.¹⁸ Similarly, among WIC-participating children ages 2 to 4 in Texas, consumption of whole milk decreased and **consumption of lower-fat milk** increased following the WIC food package revisions.¹⁹
- A study of preschool children enrolled in Head Start from WIC-participating families in eight rural New Mexico communities found several positive effects on dietary intake following the WIC food package changes: increased **consumption of lower-fat milk** and reduced **consumption of saturated fat**.²⁰
- Studies of WIC participants in New York State and Los Angeles County identified improvements in **breastfeeding outcomes** after the food package revisions, including increases in breastfeeding initiation and exclusive breastfeeding at 3 and 6 months.^{21,22} In addition, more WIC mothers received the “fully breastfeeding” food package after the food package revisions, based on one study set in southern California and another 10-state study.^{23,24} (The “fully breastfeeding” food package for new mothers was revised, in part, to incentivize and support breastfeeding by increasing its economic value.) While WIC breastfeeding rates have been improving, infants in WIC are still less likely to be breastfed than non-participants.^{25,26,27}
- A number of studies have examined the impact of the revised WIC food packages on **purchases using WIC benefits and non-WIC funds**.^{28,29,30,31,32} Improvements in purchases, presumably, lead to improvements in consumption for WIC participants and even non-participating household members. Overall purchases of whole milk, WIC-eligible cheese, 100 percent juice, and white bread declined among WIC families, while purchases increased for 100 percent whole-grain bread,

brown rice, fresh fruit, and fresh and frozen vegetables.

- The **overall healthfulness of WIC participants’ food and beverage purchases** also improved after the WIC food package revisions, based on studies using point-of-sale data before and after the change.^{33,34} For example, in a study of 5,352 low-income households with preschoolers, WIC-household purchases of calories, sodium, total fat, and sugar declined, as did purchases of refined grains, grain-based desserts, and sugar-sweetened beverages.

Revised WIC Food Packages and the Retail Food Environment

The revised WIC food packages include fruits, vegetables, whole-grain products, and lower-fat milk. Research suggests that this, in turn, has increased the availability, variety, quality, and affordability of healthy foods in the food retail environment, which benefits WIC participants and non-participants. Such progress is being made not only in WIC-authorized stores, but also in non-WIC stores. The following selection of studies demonstrates these points.

- After the introduction of the new WIC food packages, **improvements in healthy food availability** were observed in WIC stores and non-WIC stores in a number of studies using composite scores of availability.^{35,36,37} For example, among 252 convenience stores and non-chain grocery stores in five Connecticut towns, access to healthy foods improved both in WIC-authorized and, to a lesser extent, in non-WIC stores.³⁸ Changes in this study were evaluated through a Healthy Food Supply Score that accounted for the availability, variety, quality, and prices of foods included in the new packages. Improvements in scores were more pronounced for WIC-authorized stores, especially those in lower-income areas, and were driven primarily by the greater availability and variety of whole-grain products.

- Another study set in 45 corner stores in Hartford, Connecticut, found that WIC-certified stores offered more **varieties of fresh fruit**, a greater **proportion of lower-fat milk**, and greater **availability of whole-grain products** after the introduction of the new WIC food packages, compared to those stores without WIC authorization.³⁹
- Among 27 small WIC stores in New Orleans, the **availability of whole-wheat bread and brown rice**, and the **variety of fresh fruit** significantly increased after the introduction of the new WIC food packages.⁴⁰ Fresh fruit and brown rice availability also both significantly increased among 66 small, non-WIC stores after the WIC packages were revised. WIC stores, on average, had larger improvements in the number of fresh fruit varieties as well as in shelf space dedicated to vegetables compared to non-WIC stores.
- In a study of 105 WIC-approved stores in Texas, researchers observed an increase in **shelf space availability for most key healthy food options** (e.g., fruit, vegetables, and cereal) and **greater visibility of fresh juices** after the WIC food package revisions.⁴¹ The study also found improvements in **WIC labeling visibility** for fruits, WIC-approved cereal, and whole-grain or whole-wheat bread.
- According to a study of 118 food stores in Baltimore, Maryland, **healthy food availability** (e.g., fruit, vegetables) improved significantly between 2006 and 2012. These impacts were most pronounced in corner stores and predominantly Black census tracts.⁴²
- In a study examining **fruit and vegetable prices** in more than 300 stores, overall prices fell for canned vegetables and frozen vegetables after the WIC food package revisions across WIC-authorized stores in seven Illinois counties, possibly from greater demand and economies of scale.⁴³ The largest price reductions were observed for canned fruit and frozen vegetables in small stores, and frozen vegetables in non-chain supermarkets. Chain supermarkets also had modest reductions in the prices of fresh vegetables and frozen fruit. According to another study using the same sample of Illinois stores, the overall availability improved in stores for commonly consumed fresh fruits and vegetables, fresh fruits and vegetables commonly consumed by African American families, canned low-sodium vegetables, and frozen fruits and vegetables.⁴⁴
- WIC-authorized food retailers across the nation report increased **demand for and sales of healthy foods** included in the new WIC food packages, especially fresh produce, whole-grain products, and lower-fat milk.^{45,46,47} Many also conclude that the introduction of the new food packages has improved their stores, and increased their customers and profits.

As the research here suggests, the revised WIC food packages have favorable impacts on dietary intake, breastfeeding outcomes, and obesity rates as well as on the retail food environment, especially in low-income communities. The WIC program continues to play a vital role in improving the health and well-being of vulnerable Americans.

This brief was originally prepared in September 2014 and updated in May 2019 by FRAC's Heather Hartline-Grafton, DrPH, RD, Senior Nutrition Policy and Research Analyst. Research assistance for the update was provided by Olivia Dean during a student internship. FRAC wishes to thank the Robert Wood Johnson Foundation for their generous support of this research brief.

Endnotes

- ¹ Ritchie, L. D., Whaley, S. E., & Crocker, N. J. (2014). Satisfaction of California WIC participants with food package changes. *Journal of Nutrition Education and Behavior*, 46(3 Suppl), S71-S78.
- ² Gleason, S., & Pooler, J. (2011). *The Effects of Changes in WIC Food Packages on Redemptions*. Alexandria, VA: Altarum Institute.
- ³ Kim, L. P., Whaley, S. E., Gradziel, P. H., Crocker, N. J., Ritchie, L. D., & Harrison, G. G. (2013). 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. *Journal of Nutrition Education and Behavior*, 45(6), 723-727.
- ⁴ USDA Food and Nutrition Service. (2018). *Frequently Asked Questions about WIC*. Available at: <https://www.fns.usda.gov/wic/frequently-asked-questions-about-wic>. Accessed on April 30, 2019.
- ⁵ U.S. Department of Agriculture. (2019). *WIC Data Tables: Monthly Data - National Level*. (FY 2012 through February 2019). Available at: <https://www.fns.usda.gov/pd/wic-program>. Accessed on May 15, 2019.
- ⁶ USDA Food and Nutrition Service. (2014). *Background: Revisions to the WIC Food Package*. Available at: <https://www.fns.usda.gov/wic/background-revisions-wic-food-package>. Accessed on April 30, 2019.
- ⁷ Food Research and Action Center. (n.d.) *Time for a Change Guide: Maximizing the Benefits of the New WIC Foods*. Available at: <http://www.frac.org/research/resource-library/time-change-guide-maximizing-benefits-new-wic-foods>. Accessed on April 30, 2019.
- ⁸ Hartline-Grafton, H. (2019). *WIC is a Critical Economic, Nutrition, and Health Support for Children and Families*. Washington, DC: Food Research & Action Center.
- ⁹ Chiasson, M. A., Findley, S. E., Sekhobo, J. P., Scheinmann, R., Edmunds, L. S., Faly, A. S., & McLeod, N. J. (2013). Changing WIC changes what children eat. *Obesity*, 21(7), 1423-1429.
- ¹⁰ Chaparro, M. P., Anderson, C. E., Crespi, C. M., Whaley, S. E., & Wang, M. C. (2019). The effect of the 2009 WIC food package change on childhood obesity varies by gender and initial weight status in Los Angeles County. *Pediatric Obesity*, published online ahead of print.
- ¹¹ Chaparro, M. P., Crespi, C. M., Anderson, C. E., Wang, M. C., & Whaley, S. E. (2019). The 2009 Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) food package change and children's growth trajectories and obesity in Los Angeles County. *American Journal of Clinical Nutrition*, published online ahead of print.
- ¹² Daepf, M. I. G., Gortmaker, S. L., Wang, Y. C., Long, M. W., & Kenney, E. L. (2019). WIC food package changes: trends in childhood obesity prevalence. *Pediatrics*, published online ahead of print.
- ¹³ Whaley, S. E., Ritchie, L. D., Spector, P., & Gomez, J. (2012). Revised WIC food package improves diets of WIC families. *Journal of Nutrition Education and Behavior*, 44(3), 204-209.
- ¹⁴ Ishdorj, A., & Capps, Jr., O. (2013). The effect of revised WIC food packages on Native American children. *American Journal of Agricultural Economics*, 95(5), 1266-1272.
- ¹⁵ Kong, A., Odoms-Young, A., Schiffer, L. A., Kim, Y., Berbaum, M. L., Porter, S. J., Blumstein, L. B., Bess, S. L., & Fitzgibbon, M. L. (2014). The 18-month impact of Special Supplemental Nutrition Program for Women, Infants, and Children food package revisions on diets of recipient families. *American Journal of Preventive Medicine*, 46(6), 543-551.
- ¹⁶ Odoms-Young, A. M., Kong, A., Schiffer, L. A., Porter, S. J., Blumstein, L., Bess, S. Berbaum, M. L., & Fitzgibbon, J. L. (2013). Evaluating the initial impact of the revised Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) food packages on dietary intake and home food availability in African-American and Hispanic families. *Public Health Nutrition*, 17(1), 83-93.
- ¹⁷ Tester, J. M., Leung, C. W., & Crawford, P. B. (2016). Revised WIC food package and children's diet quality. *Pediatrics*, 137(5), e20153557.
- ¹⁸ Meiqari, L., Torre, L., & Gazmararian, J. A. (2015). Exploring the impact of the new WIC food package on low-fat milk consumption among WIC recipients: a pilot study. *Journal of Health Care for the Poor and Underserved*, 26(3), 712-725.
- ¹⁹ Ishdorj, A., & Capps, Jr., O. (2017). The impact of policy changes on milk and beverage consumption of Texas WIC children. *Agricultural and Resource Economics Review*, 46(3), 421-442.
- ²⁰ Morshed, A. B., Davis, S. M., Greig, E. A., Myers, O. B., & Cruz, T. H. (2015). Effect of WIC food package changes on dietary intake of preschool children in New Mexico. *Health Behavior and Policy Review*, 2(1), 3-12.
- ²¹ Langellier, B. A., Chaparro, M. P., Wang, M. C., Koleilat, M., & Whaley, S. E. (2014). The new food package and breastfeeding outcomes among women, infants, and children participants in Los Angeles County. *American Journal of Public Health*, 104(Suppl 1), S112-S118.
- ²² Chiasson, M. A., Findley, S. E., Sekhobo, J. P., Scheinmann, R., Edmunds, L. S., Faly, A. S., & McLeod, N. J. (2013). Changing WIC changes what children eat. *Obesity*, 21(7), 1423-1429.
- ²³ Whaley, S. E., Koleilat, M., Whaley, M., Gomez, J., Meehan, K., & Saluja, K. (2012). Impact of policy changes on infant feeding decisions among low-income women participating in the Special Supplemental Nutrition Program for Women, Infants, and Children. *American Journal of Public Health*, 102, 2269-2273.
- ²⁴ Wilde, P., Wolf, A., Fernandes, M., & Collins, A. (2012). Food-package assignments and breastfeeding initiation before and after a change in the Special Supplemental Nutrition Program for Women, Infants, and Children. *American Journal of Clinical Nutrition*, 96(3), 560-566.

- ²⁵ Guthrie, J. F., Catellier, D. J., Jacquier, E. F., Eldridge, A. L., Johnson, W. L., Lutes, A. C., Anater, A. S., & Quann E. E. (2018). WIC and non-WIC infants and children differ in usage of some WIC-provided foods. *Journal of Nutrition*, 148(Supplement 3), 1547S-1556S.
- ²⁶ Centers for Disease Control and Prevention (2018). *Nationwide Breastfeeding Goals*. Available at: <https://www.cdc.gov/breastfeeding/data/facts.html>. Accessed on April 30, 2019.
- ²⁷ Zhang, Q., Lamichhane, R., Wright, M., McLaughlin, P. W., & Stacy, B. (2019). Trends in breastfeeding disparities in US infants by WIC eligibility and participation. *Journal of Nutrition Education and Behavior*, 51(2), 182-189.
- ²⁸ Andreyeva, T., Luedicke, J., Tripp, A. S., & Henderson, K. E. (2013). Effects of reduced juice allowances in food packages for the women, infants, and children program. *Pediatrics*, 131(5), 919-927.
- ²⁹ Andreyeva, T., Luedicke, J., Henderson, K. E., & Schwartz, M. B. (2014). The positive effects of the revised milk and cheese allowances in the Special Supplemental Nutrition Program for Women, Infants, and Children. *Journal of the Academy of Nutrition and Dietetics*, 144, 622-630.
- ³⁰ Andreyeva, T., & Luedicke, J. (2013). Federal food package revisions: effects on purchases of whole-grain products. *American Journal of Preventive Medicine*, 45(4), 422-429.
- ³¹ Andreyeva, T., & Luedicke, J. (2015). Incentivizing fruit and vegetable purchases among participants in the Special Supplemental Nutrition Program for Women, Infants, and Children. *Public Health Nutrition*, 18(1), 33-41.
- ³² Oh, M., Jensen, H. H., & Rahkovsky, I. (2016). Did revisions to the WIC program affect household expenditures on whole grains? *Applied Economic Perspectives and Policy*, 38(4), 578-598.
- ³³ Andreyeva, T., & Tripp, A. S. (2016). The healthfulness of food and beverage purchases after the federal food package revisions: the case of two New England states. *Preventive Medicine*, 91, 204-210.
- ³⁴ Ng, S. W., Hollingsworth, B. A., Busey, E. A., Wandell, J. L., Miles, D. R., & Poti, J. M. (2018). Federal nutrition program revisions impact low-income households' food purchases. *American Journal of Preventive Medicine*, 54(3), 403-412.
- ³⁵ Hillier, A., McLaughlin, J., Cannuscio, C. C., Chilton, M., Krasny, S., & Karpyn, A. (2012). The impact of WIC food package changes on access to healthful food in 2 low-income urban neighborhoods. *Journal of Nutrition Education and Behavior*, 44(3), 210-216.
- ³⁶ O'Malley, K., Luckett, B. G., Dunaway, L. F., Bodor, J. N., & Rose, D. (2015). Use of a new availability index to evaluate the effect of policy changes to the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) on the food environment in New Orleans. *Public Health Nutrition*, 18(1), 25-32.
- ³⁷ Gleason, S., Morgan, R., Bell, L., & Pooler, J. (2011). *Impact of the Revised WIC Food Package on Small WIC Vendors: Insight from a Four-State Evaluation*. Alexandria, VA: Altarum Institute.
- ³⁸ Andreyeva, T., Luedicke, J., Middleton, A. E., Long, M. W., & Schwartz, M. B. (2012). Positive influence of the revised Special Supplemental Nutrition Program for Women, Infants, and Children food packages on access to healthy foods. *Journal of the Academy of Nutrition and Dietetics*, 112(6), 850-858.
- ³⁹ Havens, E. K., Martin, K. S., Yan, J., Dauser-Forrest, D., & Ferris, A. M. (2012). Food nutrition program changes and healthy food availability. *American Journal of Preventive Medicine*, 43(4) 419-422.
- ⁴⁰ Rose, D., O'Malley, K., Dunaway, L. F., & Bodor, J. N. (2014). The influence of the WIC food package changes on the retail food environment in New Orleans. *Journal of Nutrition Education and Behavior*, 46, S38-S44.
- ⁴¹ Lu, W., McKyer, McKyer, E. L. J., Dowdy, D., Evans, A., Ory, M., Hoelscher, D. M., Wang, S., & Miao, J. (2016). Evaluating the influence of the revised Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) food allocation package on healthy food availability, accessibility, and affordability in Texas. *Journal of the Academy of Nutrition and Dietetics*, 116(2), 292-301.
- ⁴² Cobb, L. K., Anderson, C. A., Appel, L., Jones-Smith, J., Bilal, U., Gittelsohn, J., & Franco, M. (2015). Baltimore City stores increased the availability of healthy food after WIC policy change. *Health Affairs*, 34(11), 1849-1857.
- ⁴³ Zenk, S. N., Powell, L. M., Odoms-Young, A. M., Krauss, R., Fitzgibbon, M. L., Block, D., & Campbell, R. T. (2014). Impact of the revised Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) food package policy on fruit and vegetable prices. *Journal of the Academy of Nutrition and Dietetics*, 114(2), 288-296.
- ⁴⁴ Zenk, S. N., Odoms-Young, A., Powell, L. M., Campbell, R. T., Block, D., Chavez, N., Krauss, R. C., Strode, S., & Armbruster, J. (2012). Fruit and vegetable availability and selection: federal food package revisions, 2009. *American Journal of Preventive Medicine*, 43(4), 423-428.
- ⁴⁵ Andreyeva, T., Middleton, A. E., Long, M. W., Luedicke, J., & Schwartz, M. B. (2011). Food retailer practices, attitudes and beliefs about the supply of healthy foods. *Public Health Nutrition*, 14(6), 1024-1032.
- ⁴⁶ Ayala, G. X., Laska, M. N., Zenk, S. N., Tester, J., Rose, D., Odoms-Young, A., McCoy, T., Gittelsohn, J., Foster, G. D., & Andreyeva, T. A. (2012). Stocking characteristics and perceived increases in sales among small food store managers/owners associated with the introduction of new food products approved by the Special Supplemental Nutrition Program for Women, Infants, and Children. *Public Health Nutrition*, 15(9), 1771-1779.
- ⁴⁷ Gittelsohn, J., Laska, M. N., Andreyeva, T., Foster, G., Rose, D., Tester, J., Lee, S. H., Zenk, S. N., Odoms-Young, A., & Ayala, G. X. (2012). Small retail perspectives of the 2009 Women, Infants, and Children program food package changes. *American Journal of Health Behavior*, 36(5), 655-665.