Impact of the Revised WIC Food Package on Small WIC Vendors: Insight From a Four-State Evaluation

March 2011
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Impact of the Revised WIC Food Package on Small WIC Vendors: Insight From a Four-State Evaluation

March 2011

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Finally, the team would like to thank the owners and managers of the more than 200 sampled stores who allowed us to visit; inventory their foods; and, in some cases, learn from their experience implementing the WIC food package changes through interviews and surveys. Their generous contributions of time and valuable input have allowed us to create this comprehensive research report, which we hope will be a valuable resource for states in their continued implementation of the WIC food package changes.
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1. Introduction

Background

The childhood obesity epidemic is affecting millions of U.S. children, their families, the communities in which they live, and the overall health and welfare of our nation. Increased risks for diseases associated with pediatric obesity are predicted to negatively impact the life expectancy of the current generation of American children (Stewart et al., 2009). Obesity trends among young children are particularly alarming. The prevalence of obesity among 2- to 5-year-olds nearly doubled between 1970 and 2000 (Ogden et al., 2002). Currently, one-quarter of 2- to 5-year olds are overweight or obese (Ogden et al., 2010). Findings from the 2008 Pediatric Nutrition Surveillance System indicate a higher prevalence of obesity among low-income children ages 2–5 years compared to the national prevalence among children of similar ages (Ogden et al., 2008; Polhamus et al., 2009). Because the early childhood onset of obesity is a strong predictor of the persistence of obesity into adolescence and adulthood (Guo et al., 1994; Nader et al. 2006; Reilly et al., 2005), finding effective strategies to promote healthy eating among young, low-income children is critical to curbing the childhood obesity epidemic.

Food insecurity, defined as the lack of consistent access to adequate food, is more common in low-income populations and plays a role in the obesity epidemic. Food insecurity affected more than 22% of U.S. children in 2008 (Nord et al., 2009). Food insecure populations may be especially vulnerable to obesity and poor health status because of risk factors associated with poverty, such as limited access to healthy and affordable foods (Cook et al., 2004; Larson et al., 2009). Federal nutrition programs, such as the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), are well positioned to promote healthy diets among young children and their families.

Overview of WIC and Recent Food Package Changes

The WIC program provides supplemental foods, nutrition education, and health and social service referrals to eligible participants. Participation is limited to low-income pregnant, postpartum, and breastfeeding women, and infants and children up to age 5 who are at nutritional risk. In 2008, the WIC program provided nutrition assistance to 4.33 million children and 2.22 million infants (U.S. Department of Agriculture (USDA) Food and Nutrition Service (FNS), 2009) and has consistently served almost half (45%) of infants born in the United States (USDA FNS, 2010). Recent policy changes to improve the nutritional quality and variety of foods offered through the WIC program provide an opportunity to promote healthier food choices among low-income women and their children.

In 2005, the Institute of Medicine’s (IOM) Committee to Review the WIC Food Package recommended specific changes to better align nutrient intake among WIC participants with the Dietary Guidelines for Americans (Institute of Medicine, 2006). The Committee’s recommendations were intended to improve WIC participant food choices and promote...
healthy eating practices while maintaining cost neutrality within the WIC program. They focused on the need to include fruits and vegetables and to increase lower-fat and whole grain foods in WIC food packages. The potential benefits of the proposed WIC food package changes also included reductions in total and saturated fat, cholesterol, and refined grain intake in WIC participants’ diets.

The USDA responded by issuing an interim rule in 2007, which updated food packages per IOM recommendations. States were expected to begin complying with these changes by October 2009. States had considerable flexibility in determining the amount and variety of foods to include in their allowable foods lists1, which resulted in some variance in policy choices across states (differences in policy choices across study states are described in more detail in Chapter 3). Overall, changes in food package prescriptions for women and young children (Food Packages IV–VII) generally included:

- Reduced total maximum milk prescription and cheese substitution allowance;
- Increased availability of soy products;
- Disallowance of whole milk prescription for women and children over age 2;
- Addition of a cash value voucher (CVV)2 exclusively for fruit and vegetable purchases;
- Reduced maximum egg prescription;
- Allowance of whole grain bread and cereal products;
- Allowance of canned beans as replacements for dry beans and/or peanut butter; and
- Increased low-mercury (non-tuna) canned fish options.

In addition to providing more nutritious food options for WIC participants, the WIC food package changes were thought to have potential public health benefits as well. These included increased convenience and availability of healthier foods in communities serving WIC clients. For example, the increased provision of soy products, beans, and various whole grain options (e.g., whole wheat tortillas) by WIC vendors who might not have carried these items in the past might align with the cultural preferences of some populations and result in increased purchase and consumption by non-WIC households. Similarly, the new CVVs could increase access to fresh produce for other shoppers year round.

There are many factors that need to be understood and addressed if the potential benefits of the WIC food package changes are to be achieved. These include challenges faced by both WIC vendors and WIC participants. How they are addressed may ultimately determine the availability of healthier food choices, the access of participants to these products, and the acceptance of the new products by participants.

**Purpose of this WIC Food Package Evaluation**

Small store vendors may face unique challenges in complying with the new WIC food package changes. Corner or convenience stores are typically characterized by a limited availability of healthy food options (e.g., low-fat milk, fresh fruits and vegetables, whole grains) and poorer-quality foods (Andreyeva et al., 2008; Hosler et al., 2008; Laska et al., 2009). In addition to challenges associated with adding new food items to their inventory and supply chain, these stores may also experience challenges related to limited availability of shelf space and equipment to keep perishable foods fresh. Addressing these challenges may come with costs that the vendor is unwilling or unable to meet, and thus availability of the new foods could be affected. If small stores drop out of the program,

---

1 Approved or allowable foods are the types, brands, or varieties of foods that are selected and approved by each state WIC office.

2 A Cash Value Voucher (CVV) is a type of WIC benefit issued to some WIC participants for the purchase of fruits and vegetables. Unlike prescribed WIC benefits, the WIC participant may purchase any fresh fruit and vegetable product not specifically excluded and, at the option of the state agency, canned, dried and/or frozen fruits and vegetables meeting WIC nutritional guidelines.
WIC participants’ access to healthier food package choices could be limited. In both low-income rural and urban communities located a great distance from supermarkets or other grocery stores with a variety of healthy food options (Larson et al., 2009; Zenk et al., 2005), small stores are often WIC participants’ only local access point to the foods available through WIC. If small stores do not meet their challenges satisfactorily, the availability and quality of the food choices may suffer, and subsequently participants may not be exposed to or accepting of them.

To better understand the impact that the WIC food package changes had on small stores, this study aimed to:

- Describe policies adopted by four states regarding allowable foods and minimum stocking requirements as well as approaches used to train WIC vendors in preparation for the food package changes;
- Examine the extent to which small stores were able to maintain their authorization with the WIC program during the period that food package changes were implemented;
- Assess changes to the availability and quality of fresh produce and other healthy foods among small WIC stores during the same period;
- Understand the changes that small vendors had to make to comply with the revised WIC food package formulations; and
- Document related challenges and promising solutions identified by store managers.

This study was conducted under the auspices of Altarum’s Childhood Obesity Prevention Mission Project (CHOMP), a 2-year, self-funded initiative designed to catalyze systems changes that promote health and prevent obesity among young children.

**Organization of This Report**

This report details the findings from store inventories, store manager and state official interviews, and other data that provided the context for understanding the impact of the food package changes on small stores in four states. Chapter 2 describes the methodology used to conduct this study, including approaches to state and store selection and recruitment, data collection and instrumentation, and data analysis. Chapter 3 summarizes state-level findings such as policy choices adopted by each of the four states during implementation; trainings and resources provided to vendors to prepare them for the changes; and a description of each state’s vendor characteristics, including a description of the roles that small stores play in each state. Chapter 4 presents store-level findings on the availability and quality of WIC foods based on store inventories as well as challenges and promising solutions identified by store managers in implementing the changes. Chapter 5 summarizes and discusses the main conclusions that can be drawn from this study. The final chapter presents recommendations to policymakers and WIC program administrators for continued success in implementing the food package changes in small stores, along with implications of the study findings for future research in this area. A supplementary addendum, including state maps and tables, charts, and graphs of select additional data comparisons that were developed as a part of this study, is available online at www.altarum.org/obesityresources.

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3 Minimum stock requirements are the types, varieties, brands, and quantities of foods that vendor applicants and authorized vendors are required to keep in the customer area.
THANK YOU
FOR SHOPPING
HERE
YOUR BUSINESS
IS APPRECIATED

We Accept
W.I.C.
Access Card

$POPS
2. Methodology

This evaluation was exploratory in nature and used a multimethod, longitudinal design to address the specific aims of the study. Data sources included lists of WIC-authorized vendors\textsuperscript{4} gathered from state agencies before and after the food package changes were made, as well as food inventory data collected by study staff from small WIC vendors in each state. Findings from the analyses of these quantitative datasets were put into context by qualitative analysis of information gathered through interviews with a sample of store managers whose stores were inventoried.

State Selection

In April 2009, Altarum developed a list of six states to potentially participate in the study. Due to the short amount of time available to select states for inclusion in the study, this list was primarily based on Altarum’s existing relationships with state WIC programs and our knowledge of these states’ efforts to implement the revised WIC food packages.

While all six states that were approached about the study were interested in participating, two could not commit staff resources to assist with an external evaluation in the months preceding implementation of the new WIC food packages. The final group of states selected for the study included Colorado, New Hampshire, Pennsylvania, and Wisconsin.

Three of these states (New Hampshire, Pennsylvania, and Wisconsin) scheduled their food package implementation along the same timetable as most other states: between August 1 and October 1, 2009. Colorado implemented the WIC food package changes early, on June 1, 2009.

The timing of Colorado’s implementation meant that the study team had to collect data at two post-implementation time points. Despite the fact that this would complicate our efforts, Colorado was included for a number of reasons. These included the opportunity to use it as a post-implementation comparison site to help inform data analysis for the other three states, the opportunity to see how stores adjusted over time to the implementation of the food package changes, and Colorado’s choice to exclude canned fruits and vegetables as an option for CVV redemptions (the only state in the study to do so).

Store Sample Selection and Recruitment

Upon recruiting the four states, stores eligible to participate in the study were identified from authorized WIC vendor lists provided by each state. The stores in each list were stratified by number of cash registers, which was used as a proxy for store size. Stores with four or fewer cash registers were considered “small” for the purposes of the study and thus eligible for inclusion. Small stores were further classified by geography using

\textsuperscript{4} A WIC-authorized vendor is a vendor that has been authorized by the state agency to accept checks from participants and have the checks redeemed by the state agency. Vendor is used interchangeably with WIC-authorized vendor in this report.
Rural-Urban Commuting Areas (RUCAs). The RUCA taxonomy system categorizes areas as “rural” or “urban” based on the size of the town or settlement and its connectivity to nearby areas (Hart et al., 2005). This type of taxonomy is particularly sensitive to variations in rurality by differentiating “isolated,” “small rural,” and “large rural” locations. This classification was considered when selecting a rural sampling area in each state, as it allowed for the expansive rural landscape of the states to be taken into account even though sample sizes could not support analysis at the subcategory level. To this end, small stores were mapped using the four RUCA classifications, and one urban and one rural area were selected for sampling in each state. From each of these areas, a convenience sample of stores was selected for inclusion in the study, with the exception of the larger metropolitan areas sampled (Milwaukee, Wisconsin and Philadelphia, Pennsylvania). Stores from these two urban areas were selected for inventories from all ZIP codes within the city limits, in order to capture stores within all portions of these diverse metropolitan centers. The study team then traveled to all selected urban and rural areas across the four states and gathered data from the maximum number of stores that could be reached and inventoried within a 5-day time frame.

Vendors included in the initial sample drawn for each state were sent introductory letters at least 1 week prior to the inventory visits for both rounds of data collection. The letters, which described the study and encouraged their participation, were signed by the director of their state WIC program. These letters also provided store owners or managers with a phone number and email address that they could use to opt out of the study.

A subsample of store managers was also asked to participate in interviews during both data collection periods. While a convenience sample was ultimately based on the manager’s availability and willingness to participate, the study team sought to collect information from 10–15 managers per state, including stores in both rural and urban areas. Smaller stores (with one or two cash registers) were purposefully targeted for an interview because of their likelihood of facing implementation-related challenges. Some interviews were administered in Spanish if it was the preferred language of the respondent.

Data Collection and Instrumentation

The specific methods used to gather this information, and the rationale for each are provided in the following sections.

State-Level Data Collection

For the purposes of this study, it was critical to understand three contextual factors that had the potential to influence the successful implementation of the revised WIC food packages in small stores, including: key policy choices and decisions made around allowable foods and minimum stocking requirements; the provision of information and training to vendors on the revised policies; and the role small WIC stores play in each state, which could be tied to the unique geography and vendor characteristics of each state. To better understand these factors, we gathered information from several state-level data sources.

Documentation on minimum stocking requirements and allowable foods

Documentation on each state’s minimum stocking requirements and copies of their allowable food lists were obtained from state websites or requested directly from the state WIC program. Information related to WIC-allowable foods and any requirements for WIC vendors to stock minimum amounts of specific WIC food items were abstracted from these documents.
### Summary of Data Sources and Collection Methods

#### State-level data
- Documentation on minimum stocking requirements and allowable foods
- Interviews with state WIC officials
- Authorized WIC vendor lists

#### Store-level data
- Store inventories
- Interviews with store managers
- Survey of “dropouts”

### Interviews with state WIC officials

The study team conducted in-person or phone interviews with two to four representatives of each state WIC program, which usually included the state WIC director and vendor manager. These interviews were conducted within 1 month of completing post-implementation data collection at the store level. The purpose of conducting these interviews was twofold. First, the interviews provided the study team with a general understanding of each state’s process and rationale for making key policy choices and decisions related to the revised WIC food packages. Second, the interviews provided the study team with an in-depth understanding of the state’s process for providing vendors with information and training related to the revised WIC food packages, which had the potential to influence vendor ability to make necessary changes and comply with policies under the new rule.

The “State Administrator Interview Guide” was designed to elicit the following information:

- Vendor management structure, including communication, monitoring, and authorization practices that the state maintains;
- Policy choices made around the revision of the food packages and concerns about small store compliance that shaped these policies;
- Vendor training approach, provision of resources by each state to vendors, and perceived success of this assistance to vendors;
- Perceived impact of the changes on small stores, including the knowledge of any departures from the program as a result of these changes; and
- Lessons learned from working with retailers in making these changes.

### Authorized WIC vendor lists

A list of vendors who were authorized to serve WIC participants at 6 months pre- and 6 months post-implementation were collected from each state. These lists included basic information on each vendor, including vendor name, address, and number of registers. The primary purpose of examining these lists was to understand the unique geography and vendor characteristics of each state. More specifically, we used these lists to determine the number of small stores in relation to all stores in each state as well as to map their specific locations using ESRI ArcGIS Desktop version 10 software. Once stores were mapped and characterized, these lists were used to select the rural and urban clusters that would be the focus of further data gathering efforts in each state.
Store-Level Data Collection

Data were collected at the store-level from three sources (store inventories, store manager interviews, and vendor dropout interviews) in order to better understand the impact of the revised food packages on the availability of healthy foods in small WIC-authorized stores, determine whether stores were able to maintain their authorized vendor status after changes were implemented, and characterize store manager experiences implementing the revised food packages.

Store inventories

We sought to conduct an empirical assessment of a number of dimensions of food availability before and after the new food packages were introduced. A store inventory tool was designed to measure the availability, quality, and price of healthy WIC foods by direct observation in small stores. This tool was adapted from an instrument developed by researchers at Yale Rudd Center for Food Policy & Obesity, which is based on the validated Nutrition Environment Measures Survey in Stores (NEMS-S) (Glanz et al., 2007). Rudd Center researchers modified the original NEMS-S by excluding food categories that are generally not allowed for purchase with a WIC check or voucher (e.g., ground beef, frozen dinners, soda, baked goods, chips); these categories were also excluded from the instrument used in this study. A healthy WIC food availability and quality index (WFAQI) score was calculated for each store, following a similar scoring scheme to that of the NEMS-S. Like the original NEMS-S, the availability score of the WFAQI ranges from 0 to 27 points and the quality score ranges from 0 to 6 points, with a higher score indicating a greater availability of healthy foods and higher quality of fresh fruit and produce. Produce quality was visually assessed by raters, and produce was deemed as being “acceptable” or “unacceptable” based on the majority available at the store at the time of each visit. Criteria to make this determination are consistent with those used in the NEMS-S instrument.

Table 1 provides an overview of the scoring system for each food category assessed through the modified tool. The definition of what constituted a “good” score was never established for this study and thus was not used to categorize stores in this way. For the purposes of this study, WFAQI scores were used for relative comparisons only.

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5 A WIC check or voucher is a negotiable instrument distributed by local WIC agencies on behalf of the state agency for use by a participant to purchase approved foods.
Table 1. Scoring Scheme for Healthy WIC Food Availability and Quality Index (WFAQI), Adapted From the NEMS-S

<table>
<thead>
<tr>
<th>Food Groups</th>
<th>Availability Scores</th>
<th>Quality Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>2 pts if low-fat/skim available, and 1 pt if soy available</td>
<td>n/a</td>
</tr>
<tr>
<td>Tofu</td>
<td>2 pts if available</td>
<td>n/a</td>
</tr>
<tr>
<td>Fresh Fruit</td>
<td>1 pt if 1–5 varieties available, or 2 pts if 6–10 varieties available, or 3 pts if more than 10 varieties available</td>
<td>1 pt if 25–49% acceptable quality, or 2 pts if 50–74% acceptable quality, or 3 pts if 75% or more acceptable quality</td>
</tr>
<tr>
<td>Fresh Vegetables</td>
<td>1 pt if 1–5 varieties available, or 2 pts if 6–10 varieties available, or 3 pts if more than 10 varieties available</td>
<td>1 pt if 25–49% acceptable quality, or 2 pts if 50–74% acceptable quality, or 3 pts if 75% or more acceptable quality</td>
</tr>
<tr>
<td>Frozen Fruit</td>
<td>2 pts if available, and 1 pt if more than 3 varieties available</td>
<td>n/a</td>
</tr>
<tr>
<td>Frozen Vegetables</td>
<td>2 pts if available, and 1 pt if more than 3 varieties available</td>
<td>n/a</td>
</tr>
<tr>
<td>Whole Wheat Bread</td>
<td>2 pts if whole wheat bread available, and 1 pt if more than 3 whole wheat bread varieties available</td>
<td>n/a</td>
</tr>
<tr>
<td>Whole Grain Tortillas</td>
<td>2 pts if whole grain tortillas available, and 1 pt if more than 3 whole grain tortilla varieties available</td>
<td>n/a</td>
</tr>
<tr>
<td>Rice</td>
<td>2 pts if available</td>
<td>n/a</td>
</tr>
<tr>
<td>Cereal</td>
<td>2 pts if available</td>
<td>n/a</td>
</tr>
</tbody>
</table>

**Total Points Possible:**

- Availability Scores: 0–27 points
- Quality Scores: 0–6 points

Raters (study staff that conducted inventories in the field) were trained by a certified NEMS-S rater to administer our modified NEMS-S tool in a 1-day training that took place prior to each of the two data collection periods. The training included a full presentation of the tool and hands-on practice in the field where raters received feedback on their performance. In addition to learning how to complete a store inventory using the NEMS-S tool, raters were trained in how to approach store managers in the field. When visiting stores, raters were instructed to first confirm the store owner or manager’s WIC vendor authorization status and willingness to allow the store to be inventoried; this procedure was followed at both data collection points. Raters were also asked to categorize the stores that they visited by type, which are defined in the box on page 10. References made to the store type of sample stores throughout this report are based on raters’ assessments.
Store Types and Definitions*

**Convenience store:** establishment primarily engaged in the retail sale of a medium variety of canned goods, dairy products, prepackaged meats, and other grocery items in limited amounts.

**Food mart/gas station:** similar to a convenience store in terms of the size and variety of items that it sells, but associated with a gas station.

**Corner store:** non-chain store that sells food. Corner stores are often “mom and pop” grocery stores, bodegas, and older markets and typically have a greater supply of foods than convenience stores and mini-marts but offer less food availability compared to supermarkets and chain grocery stores.

**Grocery store:** chain or non-chain store that sells food and is larger than a convenience or corner store but smaller than a supermarket. It offers a wide assortment of raw ingredients and other grocery items for purchase.

*These definitions were derived from the NEMS-S Rater Training Manual.

Raters administered the store inventory tool at two key points in time: approximately 1–3 months prior to implementation (baseline) and approximately 9–12 months post-implementation. Baseline food environment data was not collected in Colorado, because the Colorado WIC Program implemented the WIC food package changes in June 1, 2009, before the study began. In that state, there were two post-implementation data collection periods. Stores that were no longer WIC-authorized vendors at the post-implementation data collection period were not inventoried. The specific timeline for store-level data collection in each state is presented in Table 2.

<table>
<thead>
<tr>
<th>State</th>
<th>Implementation of the WIC food packages</th>
<th>Baseline data collection period (# months prior to implementation)</th>
<th>Post-implementation data collection period (# months post implementation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
<td>June 1, 2009</td>
<td>NA</td>
<td>September 2009 (4 months) May 2010 (12 months)</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>October 1, 2009</td>
<td>July 2009 (3 months)</td>
<td>March–April 2010 (6 months)</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>October 1, 2009</td>
<td>August 2009 (2 months)</td>
<td>April 2010 (7 months)</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>August 1, 2009</td>
<td>July 2009 (1 month)</td>
<td>May 2010 (10 months)</td>
</tr>
</tbody>
</table>
**Store manager interview**

As noted above, up to 15 store managers per state were selected to participate in interviews based on their availability and willingness. Data collectors asked managers to participate in an in-depth interview at the time of the study team’s first store visit and offered to conduct the interview in-person or by telephone within one week of the inventory. Store managers were informed of the purpose of the interview and offered a $25 gift card as compensation for participating. Store managers were eligible to participate in a pre-implementation interview if they were familiar with how WIC foods are supplied to their store. Familiarity was assessed by data collectors and based on the store manager’s response to a few supply-related questions prior to the start of the interview.

During post-implementation inventory visits, store managers who completed a pre-implementation interview were recruited for a second interview. Again, store managers were informed of the purpose of the interview and offered a $25 gift card as compensation for participating. If the store manager who completed the pre-implementation interview was not available, another manager from the same store was asked to participate if they met the following additional criteria:

- Managed the store since the initial date of their state’s food package implementation (see Table 2 above) and
- Were familiar with the food package changes.

The store manager interview guide was designed to capture information on small store preparedness for and implementation of the food package changes. Interview guide questions were tailored to reflect policy choices specific to each state and modified for use between pre- and post-implementation data collection periods to focus on implementation issues. The interview guides addressed the following topics:

- Store manager attitudes toward the changes and policies shaping implementation (e.g., allowed foods, minimum stocking requirements, transaction methods);
- Anticipated and actual changes in store inventory and infrastructure;
- Supply channels by which store managers receive food and ways in which these may have changed in response to the food package changes;
- Customer preferences and purchasing in response to the new foods;
- Accessibility and utility of the training that store managers received from the state WIC program related to the food package changes; and
- Resources or other support store managers found helpful in preparing for the food package changes.

**Vendor dropout interview**

If vendors were found to have left the WIC program between the pre- and post-implementation data collection periods, a brief interview was conducted by data collectors at the time of their post-implementation visit or by telephone within 1 week of the visit. The interview focused on store managers’ reasons for departure as well as any changes in WIC sales volume they might have experienced after implementation of the new WIC food packages.
Data Analysis

Analyses of WIC-authorized vendor lists and store inventory data were conducted using SAS software (SAS Institute, Inc., Cary, North Carolina). The distribution of authorized vendor characteristics, including store size (number of registers) and geographic location (rural or urban), was determined for each state at 6 months pre-policy and 6 months post-policy. Differences in state-level vendor characteristics at these key points in time were assessed by examining the net change in the total numbers of vendors authorized, small vendors authorized, and small vendors authorized in rural and urban areas.

The primary goals of the analysis of store inventory data were to assess the overall availability of the new WIC foods following implementation of the new food packages, changes in food availability over time, and how the availability of foods and food categories differed over time by store size and by state. The analysis focused on looking at increases of foods that were newly allowable, decreases when foods were newly restricted, and whether policy choices meant to enable stores to meet client preferences resulted in greater variety of foods available. Analysis of inventory data was limited to stores included in the final sample (i.e., stores that had inventory data from two time points). As an indicator of overall availability of healthy food, paired t-tests were used to evaluate changes in mean WFAQI scores over time. Changes in availability of specific foods were examined overall and by store size and state using paired t-test of proportions. Pre- to post-implementation comparisons were limited to stores in New Hampshire, Pennsylvania, and Wisconsin. Shifts in availability of WIC food items between two post-implementation data collection periods (4 months and 12 months post-policy) were examined in Colorado.

Multivariate statistics were also examined, but due to small sample sizes and thus limited relevance, are not presented in this report. Both store type (grocery versus non-grocery) and number of registers were examined as indicators of store size. Because type of store (grocery versus non-grocery) was strongly correlated with number of registers (R = 0.72), and because number of registers is a less subjective measure than store type, number of registers was selected as the primary covariate of interest.

Closed-ended responses in the store manager interview guide were entered into a Microsoft Excel database for data cleaning and analysis. Excel formulas were used to generate descriptive statistics on this interview data. Responses to open-ended questions in the store manager interviews were coded in QSR International NVivo version 8. Responses to the state administrator interviews were compiled by question into a master document in Microsoft Word. Study staff trained in qualitative analysis techniques then identified themes and analyzed the responses in accordance with these themes.

This chapter presents information on the policies adopted by each state regarding allowable foods, minimum stocking requirements, and approaches used to train WIC vendors in preparation for the food package changes, based on review of published state information plus interviews conducted with WIC program staff. These contextual factors are important to understanding the implications of the WIC food package changes on small WIC vendors which are described in the next chapter (Chapter 4). The number of stores before and after food package changes is presented, classified by urban or rural location and store size, based on WIC authorization lists provided by each state.

Allowable Foods and Minimum Stocking Requirements

While the 2007 Interim Final Rule provided clear guidelines and rules for implementing the food package changes by October 1, 2009, individual states still had considerable flexibility in determining which foods to include on their state allowable food list. The four states selected to participate in the study demonstrated this flexibility through the diversity of policy decisions they made, varying with respect to allowable foods (see Table 3) and stocking requirements described in more detail below.

Table 3. Allowable Foods in New WIC Food Packages, by State

<table>
<thead>
<tr>
<th>State</th>
<th>Milk*</th>
<th>Fruits and Vegetables</th>
<th>Whole Grains</th>
<th>Tofu</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low-fat, skim</td>
<td>Reduced-fat</td>
<td>Soy</td>
<td>Fresh, frozen</td>
</tr>
<tr>
<td>Colorado</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

*For participants aged 2 years and older.

Milk

Unlike the addition of fruits and vegetables or whole grains to the food packages, milk, a previously allowed food, was further limited by the Interim Final Rule. Prior to the changes, all WIC participants could purchase milk of any fat content, but the rule limited milk options to reduced-fat (2%), low-fat (1%), or skim milk for participants aged 2 and
States could opt to limit milk choices further, and two of the states in the study chose to do so; New Hampshire and Wisconsin did not allow reduced-fat milk in their new food packages.

**Fruit and Vegetables**

With the addition of the fruit and vegetable CVVs, states were given the opportunity to allow fresh, frozen, and canned fruits and vegetables or to limit these choices to one or more types. Three of the four states chose to allow all three types of fruits and vegetables, while Colorado limited fruit and vegetable choices to fresh and frozen.

Minimum stocking requirements for fruits and vegetables were also set by each state to ensure availability of WIC foods for participants. Colorado, New Hampshire, and Pennsylvania each required at least two varieties of fruits and vegetables to be available at all times, while Wisconsin required five varieties of each. In addition, Wisconsin was the only state to set a minimum requirement for fresh fruits and vegetables (two varieties each). While New Hampshire only required two varieties of fruits and vegetables (of any type), the minimum retail value of fruits and vegetables required was set at $50 ($25 each). In comparison, Wisconsin set a minimum retail value of $28 combined, and Pennsylvania set a minimum value of $15 combined.

**Whole Grains**

Whole grains were another new addition to WIC food packages. In addition to whole wheat bread, states could select whether to allow soft corn tortillas, whole wheat tortillas, brown rice, and/or oatmeal under this food package provision. All four states allowed whole grain breads, soft corn tortillas, and brown rice as whole grain options. Three states also allowed whole wheat tortillas (New Hampshire, Pennsylvania, and Wisconsin), and two states also allowed oatmeal or oats as whole grain options (New Hampshire and Pennsylvania). Only two states (New Hampshire and Pennsylvania) had requirements that WIC vendors stock at least two of the varieties allowed. These two states plus Wisconsin required minimum stocking of whole grains, ranging from two to nine products total (the total number of packages across all whole grain types allowed by the state).

**Tofu**

Tofu was newly allowed in three of the study states but not in Wisconsin. None of the states required stores to carry a minimum stock of this item.

**Vendor Training and Other Resources**

In order to inform vendors of revisions to the allowed foods list, minimum stocking requirements, or other program changes that influence their operation as an authorized WIC retailer, states routinely provide trainings as well as print and online resources. Routine vendor training is a requirement of the WIC program that is typically offered as a mandatory component of the vendor authorization and reauthorization process. Federal law requires that states offer interactive training to authorized vendors at least once every 3 years (USDA FNS, 2005). Training and resources for authorized WIC vendors are crucial to ensuring their effective adoption of program policies and procedures in order to serve WIC participants.

Prior to the implementation of the new food packages, trainings and resources were provided above and beyond states’ standard education and communication practices, in order to fully inform all authorized vendors of the comprehensive changes that were made to the food packages. The following section highlights feedback from WIC state officials on the various training approaches and resources provided over the course of implementation. Store managers’ feedback on the training and materials that they
received and their perceptions of how prepared they were for implementation of the new food packages are provided in Chapter 4.

**Format, Content, and Accessibility of Trainings**

States offered multiple forms of training to inform vendors of the changes, including group trainings, in-store trainings, conference calls, and some combination of the three. At a minimum, most states required vendors to attend in-person group trainings on the food package changes, which were held at multiple locations around the state. Trainings covering the food package changes were either combined with the vendors’ mandatory annual training or offered separately prior to implementation. Presentations given at trainings were typically interactive (with a Q&A session) and highlighted general topics such as history of the food package changes, new food categories, major changes within food categories, items that can be purchased with the CVV, and other transaction information for cashiers.

States tried to make trainings easily accessible to vendors by holding them at various locations across the state within reasonable travel distances. New Hampshire, for example, conducted 28 in-person trainings for vendors around the state who were allowed to attend up to three trainings. In planning these trainings, state officials reported trying to limit drive time to no more than 45 minutes. Pennsylvania selected seven different training locations around the state and offered two to three trainings at each location for vendors. In Philadelphia alone, more than two trainings were offered because of the large number of stores (more than 500) in this area. In Colorado, vendors were not required to attend a group training administered by the state agency due to the long distances that would need to be travelled to attend an in-person, group training. As an alternative, Local Agency Retailer Coordinators were tasked with training individual stores and had to provide the state with a plan on how they would accomplish this.

Conference calls were also offered by states as a means to tell vendors and other members of the retail community about the changes early on. In Wisconsin, a series of conference calls were offered to vendors 2 months prior to implementation, before in-person trainings took place. In Colorado, calls were available to a broader audience of stakeholders including not only authorized retailers but chain retail representatives and manufacturers. Since group trainings were not mandatory in Colorado, vendors were required to have a representative on one of these conference calls and calls were available at different times to accommodate participants’ schedules.

**Additional Resources**

In addition to trainings, states provided vendors with necessary updates or changes to the program through supplemental materials to educate vendors on the new food packages. A variety of print or online resources (e.g., flyers, DVDs, newsletters) are typically available to participating vendors, so the added provision information on the food package changes required only modification or expansion of the states’ standard communication practices with vendors. Additionally, most states offered phone support to vendors in the event that they had additional questions or needed assistance in making the changes on their own.
State-Level Vendor Characteristics and the Role of Small WIC Stores

The number of all WIC stores authorized before the food package changes and their distribution by size and location are presented in this section along with views of state WIC officials regarding the role small stores play in their state.

Store Size and Location

Based on an analysis of authorized vendor lists provided by each state’s WIC agency, at approximately 6 months prior to implementation, 83% of all WIC stores in Pennsylvania were located in urban areas, compared to 70% or less in Colorado, New Hampshire, and Wisconsin. Furthermore, 42% or more of all WIC stores in New Hampshire, Pennsylvania, and Wisconsin were small (fewer than five registers), compared to only 14% in Colorado (Table 4).

Table 4. Summary of WIC Store Size and Location by State 6 Months Pre-implementation

<table>
<thead>
<tr>
<th></th>
<th>New Hampshire* N (%)</th>
<th>Pennsylvania N (%)</th>
<th>Wisconsin N (%)</th>
<th>Colorado N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total WIC Vendors</td>
<td>219 (100.0)</td>
<td>1,710 (100.0)</td>
<td>941 (100.0)</td>
<td>421 (100.0)</td>
</tr>
<tr>
<td>By Vendor Size</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5 registers</td>
<td>93 (42.5)</td>
<td>800 (46.8)</td>
<td>481 (51.1)</td>
<td>59 (14.0)</td>
</tr>
<tr>
<td>5+ registers</td>
<td>125 (57.1)</td>
<td>910 (53.2)</td>
<td>460 (48.9)</td>
<td>362 (86.0)</td>
</tr>
<tr>
<td>By Geography</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>125 (57.1)</td>
<td>1,411 (82.5)</td>
<td>626 (66.5)</td>
<td>294 (69.8)</td>
</tr>
<tr>
<td>Rural</td>
<td>94 (42.9)</td>
<td>299 (17.5)</td>
<td>315 (33.5)</td>
<td>127 (30.2)</td>
</tr>
</tbody>
</table>

*Missing information on the number of registers for one vendor.

Of the small stores in these states, one-register stores made up the greatest proportion—at least one-quarter of all WIC stores—in each of these states, as depicted in Figure 1. In contrast, less than 1% of WIC stores in Colorado had only one register.

Figure 1. Distribution of WIC Stores by Number of Registers 6 Months Pre-Implementation
Figure 2. Map of Small and Large WIC Vendors Authorized in Colorado

- **WIC Vendor Size**
  - ▲ Small, Inventoried
  - ▲ Small, Not Inventoried
  - ● Large, Not Inventoried

- **RUCA Classification**
  - ■ Isolated
  - ■ Small & Large Rural
  - ■ Urban
Figure 3. Map of Small and Large WIC Vendors Authorized in Wisconsin

**WIC Vendor Size**
- ▲ Small, Inventoried
- ▲ Small, Not Inventoried
- ● Large, Not Inventoried

**RUCA Classification**
- □ Isolated
- □ Small & Large Rural
- □ Urban
The distribution of small WIC stores across states varied. For instance, among the nearly 70% of stores located in urban Colorado, very few were small stores. As depicted in Figure 2, some of the smallest stores in Colorado are located in isolated rural areas and are not in close proximity to any other authorized WIC stores. Unlike Colorado, more than one third (71%) of small WIC vendors in Wisconsin are located in urban areas, particularly Milwaukee, the state’s major metropolitan center (Figure 3). A similar trend in the location of small stores was observed in Pennsylvania where 89% of small stores are located in urban areas (primarily the Philadelphia area). In New Hampshire, the majority of small stores (59%) were located in urban areas throughout the state (primarily Manchester and Nashua). See the online report Addendum, located at http://www.altarum.org/obesityresources, for detailed maps of all four study states and tables depicting the statewide vendor characteristics (including vendor size and geography).

**State Perceptions on the Role of Small WIC Stores**

Perceptions of the role of small stores in providing access to healthier WIC food package items varied among WIC officials from the four states. Some state officials saw the new food packages as an opportunity to introduce fresh fruits and vegetables into WIC stores that might not have otherwise carried these items. Some officials recognized that smaller vendors play a key role in serving the isolated rural areas of their state. In contrast, some state officials felt that small vendors are not as critical to serving the eligible participants in their state, because they are primarily located in urban areas, and the majority of WIC clients live in rural areas. Specifically, some acknowledged the presence of a large number of WIC authorized small stores in their urban regions and indicated that, even with a reduced number of small stores, they would still be able to adequately serve program participants located in these areas. Therefore, the prospect of small retailers dropping out as a result of the food package changes did not have the same negative implications for their program as it might in another state.

Despite the variance in opinion on the role that small stores play in their respective states, all state officials reported consciously considering the ability of small vendors to incorporate the food package changes in their stores when developing their revised food lists and minimum stocking requirements. For instance, the Wisconsin WIC program relaxed their minimum stock to only $10 for fresh fruits and vegetables due to concerns about the limited availability of fresh produce in gas stations and other small stores. In contrast, Pennsylvania officials felt that not placing a minimum stock requirement for fresh fruits or vegetables would best support small stores’ continued participation in the program. Colorado did not require vendors to stock a 16-ounce loaf of bread as one of their whole grain options to allow them flexibility to procure whole grains from other states or regions.
4. Store-Level Findings: Implications for Small Vendors

This chapter presents results of inventories and interviews from small WIC stores in each state, including reflections from managers of stores that were no longer authorized to sell WIC foods at the time of the second visit.

Participating Store Characteristics

Final Inventory Sample

Initial inventories were completed at 275 stores. Twenty-seven stores were not inventoried during the second round of data collection, leaving a final sample of 248 stores with inventories completed at both periods (see Table 5). Twenty-one of the 27 stores (78%) that were lost to follow-up were stores with one register, and 22 (81 percent) were located in urban areas. The number of stores included in the final analysis ranged from 37 in Colorado to 93 in Pennsylvania. The inventoried stores represent 50% of all small vendors in New Hampshire and 65% of those in Colorado but only 15% or less in Wisconsin and Pennsylvania.

Table 5. Reasons That Small WIC Vendors in the First Round of Inventories Were Lost to Follow-up

<table>
<thead>
<tr>
<th>Reason</th>
<th>New Hampshire</th>
<th>Pennsylvania</th>
<th>Wisconsin</th>
<th>Colorado</th>
</tr>
</thead>
<tbody>
<tr>
<td>First round of inventories</td>
<td>55 (14.5)</td>
<td>103 (6.8)</td>
<td>77 (3.9)</td>
<td>40 (2.5)</td>
</tr>
<tr>
<td>No longer WIC authorized</td>
<td>8 (14.5)</td>
<td>7 (6.8)</td>
<td>3 (3.9)</td>
<td>1 (2.5)</td>
</tr>
<tr>
<td>Out of business</td>
<td>1 (1.8)</td>
<td>2 (1.9)</td>
<td>0 (0)</td>
<td>1 (2.5)</td>
</tr>
<tr>
<td>Denied entry</td>
<td>0 (0)</td>
<td>1 (1.0)</td>
<td>1 (1.3)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Not open at time of visit</td>
<td>1 (1.8)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (2.5)</td>
</tr>
<tr>
<td>Final sample</td>
<td>45 (81.8)</td>
<td>93 (90.3)</td>
<td>73 (94.8)</td>
<td>37 (92.5)</td>
</tr>
</tbody>
</table>

The characteristics of WIC stores included in the inventory sample vary by state but largely reflect the distribution of WIC stores in each state. Table 6 presents characteristics of the stores inventoried in our study compared to the distribution of small WIC vendors in each state during the post-implementation inventory period. Between 51% and 75% of stores included in the New Hampshire, Pennsylvania, and Wisconsin samples have one register, compared to only 5% of stores sampled from Colorado. While most stores (81%) in the Colorado sample are located in rural areas, most stores in Pennsylvania (75%) and Wisconsin (66%) are located in urban areas. The final sample of inventoried stores ultimately reflects how many inventories could be completed by the study team in the 5-day periods in which they traveled to each state. As discussed above, analysis of data from this final sample was limited to stores that had inventory data from both time points.
Table 6. Characteristics of Small WIC Vendors at 6 Months Post-Implementation and Final Study Sample in Selected States

<table>
<thead>
<tr>
<th></th>
<th>New Hampshire</th>
<th>Pennsylvania</th>
<th>Wisconsin</th>
<th>Colorado</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N in state (%)</td>
<td>N in sample (%)</td>
<td>N in state (%)</td>
<td>N in sample (%)</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td>45</td>
<td>849</td>
<td>93</td>
</tr>
<tr>
<td><strong>Store Size</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 register</td>
<td>47 (59.5)</td>
<td>23 (51.1)</td>
<td>582 (75.3)</td>
<td>70 (51.0)</td>
</tr>
<tr>
<td></td>
<td>(21.5)</td>
<td>(26.7)</td>
<td>(15.3)</td>
<td>(19.4)</td>
</tr>
<tr>
<td>2 registers</td>
<td>17 (21.5)</td>
<td>12 (26.7)</td>
<td>130 (15.3)</td>
<td>18 (25.8)</td>
</tr>
<tr>
<td></td>
<td>(10.1)</td>
<td>(15.6)</td>
<td>(6.9)</td>
<td>(1.1)</td>
</tr>
<tr>
<td>3 registers</td>
<td>8 (10.1)</td>
<td>7 (15.6)</td>
<td>59 (6.9)</td>
<td>1 (1.1)</td>
</tr>
<tr>
<td></td>
<td>(8.9)</td>
<td>(6.7)</td>
<td>(9.2)</td>
<td>(4.3)</td>
</tr>
<tr>
<td>4 registers</td>
<td>7 (8.9)</td>
<td>3 (6.7)</td>
<td>78 (9.2)</td>
<td>4 (4.3)</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>43 (45.6)</td>
<td>20 (44.4)</td>
<td>758 (87.1)</td>
<td>81 (72.3)</td>
</tr>
<tr>
<td></td>
<td>(54.4)</td>
<td>(55.6)</td>
<td>(10.7)</td>
<td>(12.9)</td>
</tr>
<tr>
<td>Rural</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Vendor Interview Sample

In three states, 35 store managers completed pre-implementation interviews and 33 completed post-implementation interviews (see Table 7). Ten interviews were completed in Colorado as post-implementation interviews in the first round of data collection (4 month post-implementation). The rate of matched interviews (i.e., when pre- and post-implementation interviews were done with the same individual) was highest in New Hampshire (91%) and lowest in Pennsylvania (47%). Of interviewed store managers, the majority (86% pre-policy; 100% post-policy) owned or managed one- or two-register stores. Store managers from 17% of the stores included in our final sample completed post-implementation interviews.

Table 7. Number of WIC Store Owners or Managers Interviewed Before and After Implementation

<table>
<thead>
<tr>
<th>State</th>
<th>Pre (N)</th>
<th>Post (N)</th>
<th>Matched Interviews (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado*</td>
<td></td>
<td>10</td>
<td>—</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>11</td>
<td>10</td>
<td>91%</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>15</td>
<td>14</td>
<td>47%</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>9</td>
<td>9</td>
<td>67%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>35</td>
<td>43</td>
<td>—</td>
</tr>
</tbody>
</table>

* Interviews were completed only in the first post-implementation period.

Ability and Desire of Small WIC Stores to Remain Authorized

One means of assessing whether or not small WIC stores were able to and interested in maintaining their WIC authorization status through the transition to the new WIC food packages is to examine the number and percentage of small WIC stores that were authorized pre- and post-policy. Based on an analysis of each state’s authorized vendor lists at approximately 6 months pre- and post-implementation of food package changes, the findings do vary by state (see Table 8).
Table 8. Changes in WIC Vendor Characteristics between 6-Months Pre- and Post-Implementation, by State

<table>
<thead>
<tr>
<th></th>
<th>New Hampshire</th>
<th>Pennsylvania</th>
<th>Wisconsin</th>
<th>Colorado</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total WIC Vendors</strong></td>
<td>-17 (↓7.3%)</td>
<td>+55 (↑3.2%)</td>
<td>-2 (↓0.2%)</td>
<td>-2 (↓0.5%)</td>
</tr>
<tr>
<td><strong>By Vendor Size</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 register</td>
<td>-13 (↓21.7%)</td>
<td>+36 (↑16.6%)</td>
<td>+10 (↑14.2%)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>2 registers</td>
<td>0 (0)</td>
<td>+9 (↑17.4%)</td>
<td>-1 (↓0.8%)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>3 registers</td>
<td>-1 (↓11.1%)</td>
<td>+2 (↑3.5%)</td>
<td>-5 (↓3.4%)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>4 registers</td>
<td>0 (0)</td>
<td>+2 (↑2.6%)</td>
<td>-1 (↓1.5%)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>5+ registers</td>
<td>-2 (↓1.6%)</td>
<td>+6 (↑10.7%)</td>
<td>-5 (↓1.1%)</td>
<td>-2 (↓0.6%)</td>
</tr>
<tr>
<td><strong>By Geography</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>-13 (↓10.4%)</td>
<td>+54 (↑3.8%)</td>
<td>+3 (↑0.5%)</td>
<td>-3 (↓1.0%)</td>
</tr>
<tr>
<td>Rural</td>
<td>-4 (↓4.3%)</td>
<td>+1 (↑0.3%)</td>
<td>-5 (↓1.6%)</td>
<td>+1 (↑0.8%)</td>
</tr>
</tbody>
</table>

*Missing vendor size for one store in New Hampshire

Overall, New Hampshire experienced a 7% decline in the total number of vendors authorized between pre- and post-implementation. One-register stores saw the greatest change, with approximately one in five stores leaving the program during this period. Interestingly, all of these stores were in urban areas. Unlike New Hampshire, Wisconsin and Colorado experienced virtually no net change in the number of vendors authorized statewide. However, there were 10 more one-register stores in Wisconsin post-implementation than there were pre-implementation of WIC food package changes—an approximate 4% increase. Pennsylvania experienced a 3% increase in the total number of stores authorized statewide. Interestingly, a majority of this increase is accounted for by urban stores with one or two registers: 82% (45 out of 55 stores). Overall, the number of stores in Pennsylvania with one or two registers increased by almost 7% between pre-policy and post-policy.

In addition to examining vendor authorization statewide, we also looked at any changes in authorization status among stores in our inventory sample. A total of 18 stores in our pre-implementation sample (which excludes stores in Colorado) were no longer authorized at the time of follow-up (see Table 5 above). To gain insight into the reasons vendors were no longer authorized post-policy, we conducted brief interviews with owners or managers of these stores who were available at the time of follow-up (n = 15).

Four of the managers of the 15 stores—three from New Hampshire and one from Pennsylvania—reported that they voluntarily dropped their WIC authorization because of the WIC food package policy changes. Three of them managed stores with only one register. They explained that although they had made the necessary changes and stocked the new foods, these foods were not selling or were expiring before they could be sold. Two of these store managers also reported that it was difficult to stock all of the required items in a store of their size. The fourth store had two registers, and the store manager did not provide a specific reason for being dissatisfied with the changes. That manager indicated that the store’s WIC sales were low compared to their non-WIC sales and that their WIC sales did not improve after implementing the revised food packages. When probed further, these store managers reported that they were still seeing approximately the same number of WIC participants as had shopped there prior to the food package changes, but the vouchers that WIC participants were using in their stores did not have many foods items on them; the newly allowable food items and cereals were frequently absent from the vouchers.

Interestingly, when this phenomenon was described to the New Hampshire WIC program, they described a new practice that they had implemented in line with the rollout of the revised food packages that could very well explain the decline in business that some small stores were experiencing. New Hampshire officials explained that their food
packages were redesigned to provide participants with multiple vouchers per month to better allow them to shop at multiple stores. Essentially, they were operating under the assumption that some vouchers might be used at a large store while only a few items might be purchased at a smaller store. As a result, two vouchers contained a majority of the food prescription for the month (assuming larger store purchases) while the third voucher could be used at a small store to purchase “convenience” items. Therefore, the third voucher typically only includes two or three food types, most commonly milk and juice. This redesign of the food package vouchers was done to encourage participants through nutrition education to be economical in their shopping and to tell them that the best value (and thus the lower cost to the state) is available at larger stores.

The remaining 11 store managers reported that their stores were not authorized post-policy for a variety of reasons. Most (n = 9) had recently experienced a change in ownership and were in the process of reapplying for authorization, one had violated WIC program rules or program rules for the Supplemental Nutrition Assistance Program (formerly known as the Food Stamp Program) and thus was disqualified from participating in either program, and one did not provide a reason for their non-WIC status.

Availability of New, Healthy WIC Foods

Analyses of inventory data were completed overall and by state and store size. The data comparisons included in this section highlight key findings related to observed differences in the availability and quality of newly allowed WIC foods over time. A comprehensive set of tables and charts summarizing the extensive data that were collected and analyzed are provided in an online report Addendum located at www.altarum.org/obesityresources.

It is important to note that the store inventories conducted as part of this study did not attempt to measure or determine whether the minimum stocking requirements of the food items were being met. Rather, the inventory assessed whether or not a particular food item was available at the time of data collection. Sample stores in Colorado are excluded from analyses of availability changes between pre-implementation to post-implementation data collection periods. However, where appropriate, findings related to changes in the availability of these foods in Colorado stores between the two post-implementation data collection periods (4 months and 12 months) will be reported, as they may contribute to the discussion of whether or not these new WIC foods become more available over time, perhaps as participants and WIC stores adapt to the changes.

WIC Food Availability and Quality Index (WFAQI)

Overall, mean WFAQI scores—which serve as a composite measure of WIC food availability and quality—increased by an average of 2.9 points after WIC food packages changes were implemented (p < 0.0001), as demonstrated in Table 9. When examined by state, stores in all three study states saw significant increases in mean WFAQIs after implementing new WIC food packages. However, stores in New Hampshire and Wisconsin experienced comparable and much larger increases in mean WFAQI scores during the study period (+4.5 and +3.8, respectively; p < 0.0001) than did stores in Pennsylvania (+1.3; p < 0.05). Stores in Colorado did not experience an increase in mean WFAQI scores between 4 and 12 months post-policy.

WFAQI scores were strongly and positively correlated with store size (r = 0.75), and changes in small store WFAQI scores were significant in a number of ways. Mean WFAQI scores in stores with one register were lower than stores with two to four registers pre- and post-implementation, but one-register stores experienced the largest increase in WFAQI scores during the study period (+3.5; p < 0.0001). Stores with two registers also saw a marked increase between pre- and post-policy (+2.7; p < 0.0001).
Table 9. Mean WFAQI Scores and Mean Change Pre- to Post-implementation

<table>
<thead>
<tr>
<th></th>
<th>Mean (SD)</th>
<th>Change</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>Overall</td>
<td>211</td>
<td>14.5 (8.1)</td>
<td>17.4 (6.8)</td>
</tr>
<tr>
<td>By state</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Hampshire</td>
<td>45</td>
<td>16.4 (8.9)</td>
<td>20.9 (6.3)</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>93</td>
<td>13.5 (7.2)</td>
<td>14.8 (6.2)</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>73</td>
<td>14.6 (8.5)</td>
<td>18.4 (6.6)</td>
</tr>
<tr>
<td>By number of registers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 register</td>
<td>141</td>
<td>10.6 (5.1)</td>
<td>14.1 (4.8)</td>
</tr>
<tr>
<td>2 registers</td>
<td>40</td>
<td>19.0 (7.2)</td>
<td>21.7 (5.7)</td>
</tr>
<tr>
<td>3 registers</td>
<td>19</td>
<td>26.1 (3.2)</td>
<td>26.3 (1.3)</td>
</tr>
<tr>
<td>4 registers</td>
<td>11</td>
<td>28.1 (4.0)</td>
<td>28.1 (1.9)</td>
</tr>
</tbody>
</table>

WIC Food Availability and Quality by Food Type

To better understand what specific inventory changes contributed to the observed increases in WFAQI scores, data were analyzed and are presented in this section by food type. Table 10 provides a summary of observed differences in the availability of WIC foods by state. Additional charts and detailed descriptions of these differences by state and store size are provided in subsequent food category sections.

Table 10. Differences in Percentage of Small Stores Carrying Various Food Items Between First and Second Data Collection Time Points, by State

<table>
<thead>
<tr>
<th></th>
<th>New Hampshire (n = 45)</th>
<th>Pennsylvania (n = 93)</th>
<th>Wisconsin (n = 73)</th>
<th>Total (n = 211)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% diff</td>
<td>% diff</td>
<td>% diff</td>
<td>% diff</td>
</tr>
<tr>
<td><strong>Milk</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skim</td>
<td>2.2</td>
<td>-3.2</td>
<td>0.0</td>
<td>-0.9</td>
</tr>
<tr>
<td>Low-fat (1%)</td>
<td>17.8*</td>
<td>4.3</td>
<td>31.5‡</td>
<td>16.6‡</td>
</tr>
<tr>
<td>Reduced-fat (2%)</td>
<td>-4.4*</td>
<td>-2.2</td>
<td>-1.4</td>
<td>-2.4</td>
</tr>
<tr>
<td>Soy</td>
<td>15.6*</td>
<td>11.8*</td>
<td>8.2*</td>
<td>11.4‡</td>
</tr>
<tr>
<td><strong>Fruit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh</td>
<td>13.3*</td>
<td>12.9*</td>
<td>12.3*</td>
<td>12.8‡</td>
</tr>
<tr>
<td>Canned</td>
<td>2.2</td>
<td>1.2</td>
<td>8.2*</td>
<td>3.8*</td>
</tr>
<tr>
<td>Frozen</td>
<td>11.1</td>
<td>4.3</td>
<td>15.1*</td>
<td>9.5*</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh</td>
<td>8.9*</td>
<td>3.2</td>
<td>5.6</td>
<td>5.2*</td>
</tr>
<tr>
<td>Canned</td>
<td>0.0</td>
<td>0.0</td>
<td>-1.4</td>
<td>-0.5</td>
</tr>
<tr>
<td>Frozen</td>
<td>4.4</td>
<td>8.6*</td>
<td>8.2</td>
<td>7.6*</td>
</tr>
<tr>
<td><strong>Grains</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole wheat bread, any size</td>
<td>24.4*</td>
<td>14.0*</td>
<td>49.3‡</td>
<td>28.4‡</td>
</tr>
<tr>
<td>Whole wheat tortilla</td>
<td>37.8‡</td>
<td>8.6*</td>
<td>21.9‡</td>
<td>19.4‡</td>
</tr>
<tr>
<td>Corn tortillas</td>
<td>13.3</td>
<td>11.8*</td>
<td>4.1</td>
<td>9.4*</td>
</tr>
<tr>
<td>Brown rice</td>
<td>51.2‡</td>
<td>16.1*</td>
<td>50.7‡</td>
<td>35.3‡</td>
</tr>
<tr>
<td>Tofu</td>
<td>9.1</td>
<td>1.1</td>
<td>-6.9</td>
<td>0.0</td>
</tr>
</tbody>
</table>

*p < 0.05  †p < 0.001  ‡p < 0.0001
Milk

Cow's milk. As was summarized above in Table 3, two of the four selected states (Pennsylvania and Colorado) allowed participants two or more years of age to purchase reduced-fat (2%) milk, consistent with the requirements of the new rule, while the other two selected states (New Hampshire and Wisconsin) allowed these participants to purchase only skim or low-fat milk with their WIC checks. Regardless of these variations in policy, the availability of 2% milk was very high; even at baseline, more than 94% of small WIC stores carried 2% milk. Two percent milk remained the most readily available non-whole milk option post-implementation in three of the four states: Colorado, Pennsylvania, and Wisconsin. However, at the time of post-implementation data collection, every New Hampshire store included in the sample carried 1% milk, making it the most readily available option there.

As presented in Figure 4, a significant increase in the availability of 1% milk was observed in the two states that restricted WIC participants to skim and 1% milk. Between pre- and post-policy implementation, availability of low-fat milk in New Hampshire increased 17.8% ($p < 0.001$), and increases were even higher in Wisconsin (31.5%, $p < 0.0001$). Across the three states in which we collected pre- and post-implementation data, significant increases in 1% milk availability (22.7%, $p < 0.0001$) were observed among the smallest stores (i.e., those with only one register).

Figure 4. Percentage of Small WIC Stores Carrying 1% Milk, Pre- and Post-Implementation

Quantities of milk in gallon and half gallon package sizes were also examined by milk type. Consistent with the significant increases in 1% milk availability among Wisconsin stores (present versus not), the quantity of skim or 1% milk significantly increased by an average of 2.8 gallons ($p = 0.05$). Likewise, the quantity of 2% or whole milk in a half-gallon size decreased by an average of 1.8 half-gallons ($p = 0.05$). Interestingly, when milk quantities were examined by store size, only stores with three registers saw a significant increase in the quantity of skim or 1% milk gallons (mean change = 4.1, $p < 0.05$).

The availability of whole milk was also examined. Nearly 100% of stores stocked whole milk pre-implementation, and there was no change in the availability of whole milk between pre- and post-implementation.

Soy milk. Three states (Colorado, New Hampshire, and Pennsylvania) allowed their WIC participants to purchase soy milk as part of the new food packages. Despite the fact that Wisconsin did not make this allowance, the availability of soy milk significantly increased among stores of all sizes in all three states in which we gathered pre- and post-implementation inventory data (Figure 5). After policy implementation, soy milk was
most readily available in stores with two registers (47.5%) and stores with three to four registers (96.7%).

**Figure 5. Percentage of Small WIC Stores Carrying Soy Milk Pre- and Post-Implementation, by Store Size**

<table>
<thead>
<tr>
<th>Store Size</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>20.4%</td>
<td>31.8%</td>
</tr>
<tr>
<td>1 register</td>
<td>5.7%</td>
<td>13.5%</td>
</tr>
<tr>
<td>2 registers</td>
<td>27.5%</td>
<td>47.5%</td>
</tr>
<tr>
<td>3–4 registers</td>
<td>80.0%</td>
<td>96.7%</td>
</tr>
</tbody>
</table>

*p < 0.0001  †p < 0.001  ‡p < 0.05

**Fruit**

All four states allowed participants to purchase fresh and frozen fruits with their CVVs, but only Colorado restricted participants from purchasing canned fruits. Overall, there was a statistically significant increase in the availability of fresh (*p < 0.001*), frozen (*p < 0.05*), and canned fruit (*p < 0.05*) across all three states in which pre- and post-implementation data were collected. While canned fruit varieties were the most readily available in both periods (93.4% and 97.2%, respectively), the increase in fresh fruit availability was the largest. The percentage of small stores carrying fresh fruit increased across the three states in which pre- and post-implementation data were collected (Figure 6). Frozen fruit, which was available in 40.3% of small stores post-implementation, also experienced a sizable increase in availability during this period.

**Figure 6. Percentage of Small WIC Stores With Fruit Available Pre- and Post-Implementation, by Type (n = 211)**

<table>
<thead>
<tr>
<th>Fruit Type</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh</td>
<td>59.7%</td>
<td>72.5%</td>
</tr>
<tr>
<td>Canned</td>
<td>93.4%</td>
<td>97.2%</td>
</tr>
<tr>
<td>Frozen</td>
<td>30.8%</td>
<td>40.3%</td>
</tr>
</tbody>
</table>

*p < 0.0001  †p < 0.001  ‡p < 0.05
**Fresh.** One hundred percent of stores with three and four registers stocked fresh fruit prior to implementation of the revised food packages, leaving no room for improvement. However, statistically significant increases in the availability of fresh fruit were found among stores with one or two registers (15.6% and 12.5%; \( p < 0.05 \) and \( p < 0.001 \), respectively). Statistically significant increases in the availability of fresh fruit were also observed in each state (Figure 7). Wisconsin was the only state of the four to require stores to carry at least two varieties of fresh fruit. However, at the time of post-implementation data collection, 19% of stores did not have any fresh fruit in stock.

**Figure 7. Percentage of Small WIC Stores With Fresh Fruit Available Pre- and Post-Implementation, by State**

In addition to looking at shifts in the availability of fresh fruit, the quality of the fresh fruit available in these small stores was also examined. Stores in New Hampshire saw the greatest gains in terms of improved quality of fresh fruit; at least 75% of the fresh fruit stocked in more than 73% of stores at post-implementation was of acceptable quality, compared to less than 45% at pre-implementation. Small, but insignificant increases in fresh fruit quality were also observed in Pennsylvania and Wisconsin (Figure 8).

**Figure 8. Percentage of Small WIC Stores With at Least 75% of Fresh Fruit of Acceptable Quality at Pre- and Post-Implementation, by State**
**Canned.** When stores were examine by size, the availability of canned fruits increased modestly among stores with one register. Every store in the sample with two to four registers stocked canned fruit prior to implementing the new policies, again leaving no room for improvement among stores of this size. When examined by state, statistically significant increases in canned fruit availability was observed among stores in Wisconsin. There, 97.3% of stores carried this item after implementing food package changes, compared to 89.0% observed in the first round of data collection.

Canned fruit is allowed for purchase with the WIC CVV only if it does not contain any added sugar or is packaged in 100% fruit juice. The availability of canned fruits with no sugar added was observed only during the second round of data collection. Overall, these varieties of canned fruit were much less readily available, with only 70.6% of stores in the sample carrying this item after the food package changes went into effect. These results varied substantially by state, with more than 86% of stores in the new Hampshire and Wisconsin samples and fewer than 52% of stores in the Pennsylvania sample stocking at least one canned fruit variety with no sugar added. One-register stores were least likely to have this item available (60.8%) and three- or four-register stores were the most likely (85.7%) when examined across all states.

**Frozen.** Similarly, statistically significant changes in the availability of frozen fruit from pre- to post-implementation time periods were limited to stores with one register. At the time of the second round of data collection, only 19.9% of all stores with one register carried frozen fruit. This rate was higher (67.5%–100%) in stores with two, three, or four registers. While each state saw increases in the availability of frozen fruit, only stores in Wisconsin experienced a statistically significant increase from pre- to post-policy ($p = 0.007$).

In addition to examining the availability of each fruit type—fresh, frozen, and canned—the extent to which stores offered multiple fruit types was also explored. In the three states in which we collected pre- and post-implementation data, the number of small WIC stores carrying multiple fruit types (i.e., two or more) increased after food package changes were made. In New Hampshire, 60% of stores post-implementation carried all three fruit types, up from 51%. In Wisconsin, there was a 14% increase in stores carrying all three types. Although the number of stores carrying all three types of fruits was still somewhat limited in Pennsylvania post-implementation, the number of stores carrying only canned fruit decreased by more than 15%. The number of stores carrying two types (canned and fresh fruit) increased by 13% (Figure 9).

**Figure 9. Types of Fruit Offered by Small WIC Stores in Pennsylvania at Pre- and Post-Implementation**

*Percentages may not add up to 100% due to rounding.*
Vegetables

All four states allowed participants to purchase fresh and frozen vegetables with their CVVs, but only Colorado restricted participants from purchasing canned vegetables. Overall, there was a statistically significant increase in the availability of fresh (5.2%; \( p < 0.05 \)) and frozen (7.6%; \( p < 0.05 \)) vegetables after states implemented changes to their WIC food packages. At the time of follow-up data collection, 85.3% of stores carried fresh and 79.6% of stores carried frozen vegetables. Prior to implementing the new WIC food packages, 100% of sampled stores in New Hampshire, Pennsylvania, and Wisconsin already carried canned vegetables, making them the most readily available type of vegetable (Figure 10).

**Figure 10. Percentage of Small WIC Stores With Vegetables Available Pre- and Post-implementation, by Type of Vegetable (n = 211)**

<table>
<thead>
<tr>
<th>Type of Vegetable</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh†</td>
<td>80.5</td>
<td>85.3</td>
</tr>
<tr>
<td>Canned</td>
<td>100</td>
<td>99.5</td>
</tr>
<tr>
<td>Frozen †</td>
<td>72.0</td>
<td>79.6</td>
</tr>
</tbody>
</table>

* †p < 0.0001 ††p < 0.001 †‡p < 0.05

**Fresh.** When examined by store size, increases in the availability of fresh vegetables were significant among stores with one register. Because these items were largely already available in stores with two to four registers, little or no change was observed between pre- and post-implementation. When examined by state, statistically significant increases in the availability of fresh vegetables (\( p < .05 \)) were observed in New Hampshire.

The quality of fresh vegetables in these small stores was also examined. As with fresh fruit, stores in New Hampshire saw the greatest gains in the quality of fresh vegetables. In that state, at least 75% of the fresh vegetables stocked in almost 76% of stores were of acceptable quality after WIC changes were implemented. Less than 56% of stores had that same level of fresh vegetable quality prior to changes being implemented. Insignificant decreases in fresh vegetable quality were observed in Pennsylvania and Wisconsin (Figure 11).
Frozen. As with fresh vegetables, when examined by store size, increases in the availability of frozen vegetables were significant among stores with one register. When examined by state, statistically significant increases in the availability of frozen vegetables were observed in Pennsylvania (p < 0.05).

As with fresh fruit, the extent to which stores offered multiple vegetable types (frozen, fresh, or canned) was also explored. In general, small stores were more likely to carry all three vegetable types than they were to carry all three fruit types, which is consistent with the fact that vegetables were generally more available than fruit in sampled stores. Approximately 10% more stores were carrying all three vegetable types in Wisconsin after implementing WIC changes (Figure 12). In New Hampshire and Pennsylvania, modest increases were observed in the number of stores carrying all three types (7% and 2%, respectively). Similar to the findings related to fruit, 13.7% of stores in Wisconsin did not have any fresh vegetables in stock after WIC changes went into effect, despite the state’s requirement that they carry at least two varieties of fresh vegetables at all times.

Figure 12. Types of Vegetables Offered by Small WIC Stores in Wisconsin at Pre- and Post-Implementation.
Grains

The states in our study varied in how they expanded the whole grain offerings of their WIC food packages (Table 3). All four states allowed participants to purchase bread, corn tortillas, and brown rice. Only Colorado did not also allow for the purchase of whole wheat tortillas. New Hampshire and Pennsylvania also allowed oatmeal and oats to be purchased as a whole grain option.

Whole wheat bread. In the three states where we collected pre- and post-implementation data, the availability of whole wheat bread (in any size package) increased from 58.3% to 86.7%. Statistically significant increases in the availability of whole wheat bread were observed in stores with one, two, and three or four registers and in each of these states. However, the availability of whole wheat bread (of any size package) post-implementation did vary by store size. Although stores with one register were the least likely to have whole wheat bread available after the WIC changes went into effect (82.3%), more than 30% of one-register stores added this item to their inventory during the study period. This helped to close the availability gap between what was inventoried in these small stores and stores with two (92.5%) and three or four registers (100%) (Figure 13).

Figure 13. Percentage of Small WIC Stores with Whole Grain Bread Available Pre- and Post-Implementation, by Store Size (n = 211)

The availability of whole wheat bread in a 16-ounce package was examined only post-implementation, because bread manufacturers did not generally make loaves of bread in this size of package prior to this item being added to the WIC food packages. However, after WIC food packages went into effect, only 57.4% of stores in the sample carried at least one variety of whole wheat bread in a 16-ounce package. These results varied substantially by state, with almost 78% of stores in New Hampshire and fewer than 40% of stores in Pennsylvania stocking 16-ounce packages of whole wheat bread. Again, one-register stores were least likely to have this item available (48.2%) and three- or four-register stores were the most likely (90.0%) when examined across states. Although sample sizes were small, the availability of 16-ounce whole wheat bread was examined by state and store size, revealing that in some states, one-register stores were as likely as or even more likely than stores with three or four registers to carry this item.

In Colorado, whole grain bread in a 16-ounce package was the only WIC food item that significantly increased in availability between the two post-implementation data collection periods (p < 0.0001), providing some indication that the availability of this item could increase as suppliers and stores adjust to this change (Figure 14).
Tortillas. Statistically significant increases in the availability of whole wheat ($p < 0.0001$) and soft corn tortillas ($p < 0.05$) were observed during this study. However, these items were still relatively limited post-implementation (24.6% and 41.2%, respectively) compared to other WIC allowable foods and less healthy alternatives like white flour tortillas (48%). One-register stores were the least likely to carry whole wheat and soft corn tortillas post-implementation (12.1% and 37.6%, respectively) and three- or four-register stores were most likely (63.3% and 60.0%, respectively) to carry these items.

There was also some cross-state variation in the availability of these items. More than 44% of stores in New Hampshire carried whole wheat tortillas after the changes to the WIC food packages were implemented (Figure 15). Only 15% of stores in Pennsylvania carried them after that state’s changes went into effect. Likewise, more than 53% of stores in Wisconsin carried soft corn tortillas, compared to only 30.1% of stores in Pennsylvania.
Brown rice. Over the course of this study, the availability of brown rice increased more than any other newly allowable WIC food, with 35.3% of all stores adding this item to their inventory. Overall, nearly 83% of stores stocked brown rice post-implementation. Although brown rice was most available in three- to four-register stores (100%), nearly 40% of one-register stores and 34% of two-register stores added brown rice to their inventory, making it much more readily available in stores of these sizes as well (78.0% and 87.5%, respectively) (Figure 16).

Figure 16. Percentage of Small WIC Stores With Brown Rice Available Pre- and Post-Implementation, by State

<table>
<thead>
<tr>
<th>State</th>
<th>Percent of Small WIC Stores Pre</th>
<th>Percent of Small WIC Stores Post</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Hampshire</td>
<td>41.9</td>
<td>93.3</td>
<td>*p &lt; 0.001</td>
</tr>
<tr>
<td>(n=45)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>61.3</td>
<td>77.4</td>
<td>†p &lt; 0.001</td>
</tr>
<tr>
<td>(n=93)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wisconsin</td>
<td>33.8</td>
<td>83.6</td>
<td>‡p &lt; 0.05</td>
</tr>
<tr>
<td>(n=73)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tofu

Among our selected states, only Wisconsin did not expand its food packages to allow for tofu to be purchased. Approximately 9% of stores in the sample carried tofu both before and after WIC changes were implemented. No significant increases in the availability of tofu were observed for any subgroup within the study period.
Insight From and Perceptions of Small Store Managers on the Transition to the New WIC Food Packages

In making the transition to the new food packages, each store manager had to assess the availability of foods in their store and determine whether inventory and infrastructure changes were necessary. Given the limited availability of shelf space and fresh, healthy foods in many small stores, it was anticipated that implementation of these changes (and subsequent adherence to revised food lists and minimum stocking requirements) would be challenging. To obtain the new WIC items for their stores, it was expected that small stores would have to modify their approach to navigating local and familiar supply channels. The following section highlights store manager perceptions of the changes, common inventory and infrastructure changes that interviewed store managers identified as necessary for their small store to undergo, challenges that they encountered in working with suppliers and in making changes, and strategies that they employed to overcome these challenges. These findings are derived from interviews with store managers conducted before and after the implementation of WIC food package changes.

General Perceptions of the Food Package Changes and State-Specific Policies

Prior to the implementation of the WIC food package changes, some store managers expressed concerns about carrying fresh produce and the revised minimum stocking requirements, which may require them to carry greater quantities than they have demand for. After the changes were implemented, nearly all the store managers interviewed from Colorado, Pennsylvania, and Wisconsin reported feeling positively about the changes to the new food packages. Generally, they thought more highly of the program because of the healthy changes that were made. However, store managers in New Hampshire responded less favorably. Some felt that the regulations were not beneficial for small stores and, in some cases, that their business had declined as a result of carrying the new WIC foods.

Store managers in the majority that responded positively to the policy changes noted the importance of these changes in helping their customers eat more healthfully, and they appreciated being able to offer a wider variety of foods that offer customers more choices. Some reported being optimistic that carrying the newly added foods (e.g., fruits and vegetables) would help them compete with other stores in their area. Store managers also mentioned positive changes in supplier offerings, noting the availability of healthy WIC foods from suppliers had increased as a result of greater demand for these products from WIC vendors.

Perceptions Surrounding the Transition to the New WIC Food Packages

Prior to implementation of the new food packages, we asked store managers what they anticipated in terms of the ease of the transition. Most expected that it would be easy to accommodate the changes in their store; however, some seemed unsure of how difficult the transition would be, because they had not begun making changes yet. In Wisconsin, for instance, where store managers were interviewed less than 2 weeks prior to the implementation date, only half (50%; n = 4) of store managers said that they had begun making the changes to their inventory. Similar trends were reported in the pre-implementation interviews with store managers in other states who said they would wait until a few days or weeks prior to implementation to contact their suppliers and purchase the new foods.

“I have increased my supply of healthy product options. I have noticed a major culture change with food eating behavior. Even I have begun to eat more healthy because of the products that I supply and offer.”
—Pennsylvania store manager

“[The program] is better, because they offer more variety and families can have healthier foods.... Before, nobody turned around to look at the fruit.”
—Wisconsin store manager
After making the WIC food package changes, the vast majority of store managers (85%, \( n = 28 \)) reported that they felt well prepared for the changes prescribed by the states and that making the adjustments necessary to implement the new food packages were not difficult. When probed during interviews about any difficulties that occurred during implementation of the food package changes, some store managers reported having experienced initial difficulties obtaining the new foods; however, these difficulties seemed to dissipate with time and as products became more readily available throughout the implementation period.

**Customer Acceptance of the New Foods**

Prior to implementation of the food package changes, some interviewed store managers expressed concerns that their customers might not respond well to the changes because previous attempts to sell healthier foods (e.g., low-fat milk, produce, wheat bread) in their store(s) had failed. Many store managers perceived that their customers do not like healthier items and that in order to effectively sell healthier foods, they would need to “change their customers.” Some store managers recognized the challenges associated with changing eating behaviors and that it will take time for customers to get used to modifications to previously allowed foods and newly added foods; however, they were also concerned that their sales would decline while customers adapted. Many WIC participants enhance their business by purchasing other non-WIC items when they redeem their vouchers so a loss in WIC sales could negatively affect their other sales.

Throughout the implementation period, some of the anticipated issues with customer demand for the new WIC items were realized by store managers, most notably with the switch to lower-fat milk. Store managers reported that some participants did not easily accept the change to low-fat or reduced-fat milk, because they or their child did not like the taste or because they thought that their child needed whole milk to maintain a healthy weight. In talking to their customers, some store managers discovered that if they did not like certain items customers did not use their check at all.

**Customer Redemption and Store Handling of the CVV**

All store managers interviewed reported that participants have redeemed CVVs at their store; however, the frequency with which they receive CVVs varied. Some reported receiving checks very infrequently (e.g., only one or two in the months since implementation), while others reported receiving CVVs much more frequently (e.g., 10–20 per month). Most store managers that did not receive checks at their stores on a regular basis speculated that participants redeemed their CVV at local supermarkets or larger grocery stores. When we asked store managers what WIC customers were purchasing with their CVVs, the majority (55%; \( n = 23 \)) reported that fresh fruit and vegetables were preferred over frozen or canned. Some store managers indicated that participants frequenting their store purchased a mix of fresh, canned, and/or frozen fruit and vegetables with their CVV.

Store managers like the way in which CVVs are designed to be transacted in that participants can purchase fruits and/or vegetables based on a cash value rather than an amount defined by quantity or weight. However, some felt that it was challenging for customers to use the maximum value of the CVV and still stay within the allotted dollar amount. This occurs because produce is frequently priced by weight or quantity, and the CVVs are allocated in dollars. In Colorado, New Hampshire, and Pennsylvania, where participants were not allowed to purchase more than the amount on the check (i.e., to pay the difference between the value of the CVV and the price of the produce they are purchasing in another tender), some store managers encountered difficulties working with customers purchasing items worth more than the prescribed dollar amount.
Summary of Changes That Small Store Managers Had to Make to Their Inventory and Infrastructure

During the post-implementation period, 91% (n = 39) of store managers reported making some changes to their inventory or other changes to their store to accommodate the new WIC food packages. The remaining store managers did not report needing to make changes, because they already carried all of the new foods prior to the food package changes. Some of the common inventory and infrastructure changes that store managers reported making to their stores included:

- Adding new food items that they did not previously carry;
- Finding different sizes of items that they already carried;
- Increasing or decreasing the quantity of the items that they already carried;
- Expanding shelf-space to accommodate inventory changes; and
- Adding equipment such as refrigeration and scales for weighing produce.

With regard to the newly added foods that stores are not required to stock (e.g., tofu, soy milk), some store managers reportedly tried to add them prior to or at the beginning of implementation but discontinued carrying them because participants did not use any vouchers to purchase these foods.

Challenges Reported by Small Stores in Accommodating Inventory and Infrastructure Changes

Limited refrigeration equipment and ability to keep food fresh

Prior to implementation, many store managers expressed concerns about their ability to carry fresh produce, citing limited equipment, space, demand, and other issues related to maintaining the quality and freshness of produce. Before the food package changes took effect, about one-quarter (26%; n = 9) of interviewed store managers anticipated needing more refrigeration or freezer equipment to begin carrying or to expand their stock of fresh or frozen fruits and vegetables and low-fat milk. However, many of these store managers noted that any equipment purchases would be contingent upon adequate revenue from sales of the new foods. At 6–10 months post-implementation, fewer store managers reported having added refrigeration equipment than was anticipated prior to the food package changes. Despite expressing a strong desire for more refrigeration or freezer equipment, some store managers said that they simply did not have the space available to add the needed equipment.

Some small stores with limited refrigeration space were further challenged by a lack of air conditioning, which made it difficult to carry produce during the hot summer months because it often spoiled before it would sell. Also, store managers frequently complained about receiving poor-quality or damaged produce in their shipments from distributors, which further limited their time frame to carry and sell fresh, high-quality products before having to supply more. In addition to produce, store managers had difficulty maintaining the freshness of other foods, including whole wheat bread and tortillas, baby food, and milk. Whole wheat bread, for example, expires on the shelf within approximately 1 week’s time. Some store managers reported that if they go a few days without a WIC customer visiting their store, they are often forced to throw out their entire stock of bread.

Lack of supplier awareness of the changes

In order to obtain the newly allowed foods, store managers worked with their suppliers to ensure that they were selecting allowed foods in the appropriate brands and sizes. However, some store managers found that their suppliers were not aware of the changes or were not prepared to meet the demand when the state policies went into effect.

“We had another produce case [but] it was too small and too hot. There’s a heater nearby that makes it hotter and worse. I am thinking about that for the future. If there are more opportunities to sell produce I may need a larger produce case.”

—Pennsylvania store manager
Store managers also encountered situations where they interpreted the allowed foods list and minimum stocking requirements differently than their suppliers. For example, in states such as Wisconsin, where several grain options (whole wheat bread, whole wheat or corn tortillas, or brown rice) were allowed for purchase under the new food packages, differences in interpretation arose regarding whether all or some options had to be offered by store managers. In these and similar instances, store managers became responsible for obtaining information about the changes and educating their suppliers. In order to obtain this information, store managers often sought additional assistance from WIC program staff to clarify state policies and reported this information back to their suppliers to ensure that they could obtain what they needed.

**Availability of the new foods in allowable form**

Some of the food items that store managers reported most difficulty finding in any form post-implementation included tofu, baby food, fresh fruits and vegetables, and whole wheat tortillas. Other foods, such as juice, brown rice, and whole wheat bread were commonly available through suppliers but not in approved brands and/or sizes. The unavailability of bread in approved sizes was a significant issue that store managers across all states in the study encountered at the time of implementation. In some cases, store managers continued to have difficulty for months after implementation. From the store managers’ perspective, suppliers were reportedly unprepared to offer the 16-ounce size of whole wheat bread largely because the bread manufacturers did not already produce loaves in this size and therefore needed to reconfigure their manufacturing and packaging processes (to downsize packages in most cases). One Wisconsin store manager describes how their supplier made approved packaging available the same week the policy went into effect:

“[The bread supplier] had to change their packaging because they didn’t have the 16-ounce package. We had the 20 oz bread but not the 16-ounce. [We] did not have to look for a different bread supplier. They changed the packaging so it is the 16-ounce. now. Otherwise, I was kind of worried about that. The first week of August is when the packaging came out.”

The limited availability of WIC-approved whole wheat bread was also reported to have negatively affected vendors’ ability to make a profit. Several store managers remarked that approved brands of whole wheat bread in the 16-ounce size were more expensive than unapproved brands in larger package sizes.

In addition, some vendors located in remote areas cited difficulties obtaining the new WIC foods from suppliers. In Colorado and Wisconsin, in particular, the rural geography of the state provided an additional challenge. Store managers reported that it takes time for items to be delivered from suppliers that are located great distances from their stores. As a result, the process to make the necessary changes in obtaining foods for the store may have been lengthier in these states compared to others that we sampled. Also, some store managers reported that suppliers refused to deliver to them because of their remote location or that when they did receive foods via delivery, they were near expiration.
Increased need to self-supply

As a result of difficulties finding or obtaining certain WIC allowable foods from their standard suppliers, many vendors resorted to self-supplying the foods that they needed, which could be both time consuming and costly, especially if vendors had to visit multiple stores. Many vendors chose to self-supply from nearby grocery stores, supermarkets, wholesalers, or some combination of these different retailers.

This practice was commonly reported with regard to supplying whole wheat bread in order to minimize or eliminate dependence on unaccommodating bread suppliers. More specifically, some store managers reported that suppliers delivering to their store refused to abide by their standard practice of taking back stale loaves that were not sold, after the store was repeatedly unable to sell this food item. Similarly, if the store’s bread went stale before being purchased some suppliers refused to leave the minimum number of loaves that authorized vendors are required to carry (typically six) for WIC.

Store managers described the need to self-supply as an approach necessary not only to obtain the WIC foods but also to minimize general costs associated with purchasing in bulk. This is reportedly a characteristic challenge for small stores, because many suppliers that offer delivery services set a minimum order criterion (in dollars or number of cases) or charge a delivery fee to stores who would like to use these services. Store managers frequently noted that these minimums are too high or not cost-effective for them when ordering small amounts for their store. Although this challenge may not be specific to the food package changes, it is important to consider because it may have been exacerbated by the changes. One Wisconsin store manager describes his rationale and need to self-supply food for his store:

“Yes [wholesalers] require more cases. That’s why we have to go pick up the stuff. It costs me more, plus stuff doesn’t sell. Why would I buy a case and then throw away half of it? So I buy half a case. I would be losing money if I bought the whole case and then they start charging a service charge and it’s going to be expensive for the customer because they pay the difference. We’d rather go pick it up, save money for the customer, and get the sales.”

[The] requirement is six loaves and he’s not going to leave that many. It’s expensive, and all six won’t sell before they go stale. [The bread supplier] is running his own business, and if it doesn’t sell and he has to take it out, he’s lost money.

—New Hampshire store manager
Promising Solutions Identified by Small Store Managers

Making room for the new foods

The smallest stores are extremely limited in terms of the amount of items that they can carry on their shelves and in their refrigerators or freezers. In adding fresh fruits and vegetables to their store, a number of store managers recognized the importance of keeping produce cool to maintain freshness, but this addition often put a higher premium on their already limited refrigerator space. To accommodate the addition of produce and additional types of milk, the reorganization of existing refrigerator space was a common approach among vendors. Additionally, some stores freed up needed fridge space for additional milk types by not having their less popular types of milk “faced” (in the refrigerators on the store floor where customers have access to them). Others made room for the newly allowed milk types (skim and 1%) by carrying less of other milk types, including 2% (reported in New Hampshire) or whole milk (reported in Pennsylvania). In order to make room for shelf-stable items (such as canned fruits and vegetables, bread, and baby food), vendors also reorganized or made additions to their existing shelf space. In the process of reorganizing, some had to eliminate certain products from their store altogether to accommodate the new additions.

Stocking the store based on customer demand and preferences

In compensating for a perceived or realized low demand or the additional costs of selling some of the new foods, some vendors reportedly went to grocery stores or produce markets every other day and bought enough food to last them only 2–3 days. Others said they waited to purchase certain (specialty or less-frequently purchased) items until their WIC customers specifically requested them; this was a common practice with items such as baby formula or soy milk. In states where vendors are not required to carry certain items that easily spoil, such as fresh produce, they often tried to time their purchases to coincide with when WIC clients redeem their checks and also relied on their WIC customers calling ahead of their arrival to the store.

Many vendors in states that have multiple options for stocking items of certain food groups (e.g., states allow various combinations of whole wheat bread, whole wheat or corn tortillas, and brown rice) paid attention to the options that were preferred most by customers and began carrying more of these options. Similarly, some vendors offered a selection of produce that appeals to specific cultural groups (e.g., Hispanic) frequenting their store.

In-store promotion of the new foods and attempts to make them more convenient

Some vendors reportedly made extra efforts to promote the new foods and encourage their WIC customers to try the foods that they were hesitant to buy. At one store, a member of the store staff accompanied WIC customers as they shopped, in order to point out and promote the new WIC foods that they have available. Store managers also spent time educating their customers about the newly allowable foods on their checks, because they recognized confusion among their customers or their customers specifically asked for some explanation of policies.

Vendors also promoted the new foods in their store by making them more visible and accessible to their customers. Some examples include filling a shelf or basket with produce near the front counter or stocking small amounts in the front portion of the deli case or refrigerator. In addition, some vendors pre-priced their produce by package (instead of by pound) so that customers could more easily estimate the amount of their CVV purchases before arriving at the cash register.
Store Manager Input on Training and Resources

As mentioned previously, states went to great lengths to ensure that trainings on the food package changes were easily accessible to their vendors. When we asked store managers whether they had enough notice from the state about the training and whether it was easily accessible to them, all said that they were given enough advance notice to make time to attend the training. Store managers also felt that they had plenty of sessions to choose from and that session locations were nearby or easy to travel to. They appreciated receiving advance notice about the changes in multiple formats from the state (e.g., conference calls, newsletters, mailings), which enabled them to prepare and consider modifications to their stock prior to attending the training itself.

Overall, interviewed store managers who attended a pre-implementation training reported that it and the additional resources that they received provided them with enough information to prepare for the food package changes. As mentioned previously, the types of food package trainings offered to vendors varied across the four states in this study but were generally offered in an in-person or conference call format. Many store managers prefer the in-person training format, because they value the discussion (or Q&A) sessions, which enable them to ask specific questions about their store. In Colorado, however, where trainings were primarily held via conference call, some store managers did not like this format because they did not have many opportunities to ask questions. Additionally, in states such as Pennsylvania, where trainings are offered in multiple languages (English and Spanish), store managers felt that this was very beneficial to them or store staff who attended the training.

When we asked store managers what they disliked about the trainings, some felt the trainings included a lot of information that they already knew and would rather hear more information on topics that would help them best adapt to program changes and prevent challenges such as how to find suppliers for new foods, produce handling, and food marketing and merchandising. With trainings that included both large and small stores, some small store managers felt overwhelmed by the amount of information that they received that did not apply to them.

In addition to trainings, other resources and materials were provided by states to inform vendors of the food package changes. DVDs, which were provided by some states in the absence of or in addition to in-person training, were very helpful for informing both managers and their employees about the changes. DVDs also served as a useful resource for store staff to refer back to if they had forgotten something they had learned. Many interviewed store managers also expressed a strong appreciation for the immediate availability of WIC staff to answer their questions by phone, and many seemed to use this resource as the first stop to obtain needed information. When we asked store managers how they would recommend improving materials offered by the state, some said it would be easier for them to understand and interpret changes to the program if materials were in Spanish.

“Before the training, they sent information out in the mail to warn you about the changes, and then they had a phone conference. You could ask questions and hear what they had to say, so I think we were actually better prepared when we did go to the training. I think they did a good job.”

—Wisconsin store manager
5. Conclusions and Discussion

Implementing the WIC Food Package Interim Final Rule at the state and local levels was an enormous, unprecedented undertaking that cross-cut all aspects of the WIC program. To successfully implement the changes, each state had to carefully consider how the changes would affect their operation of the program and provision of benefits and services to WIC participants. Small vendors can play an important role in the WIC program, offering access to WIC foods in areas often underserved by larger grocery stores and supermarkets (Morland et al., 2002; Zenk et al., 2005). As the food package changes were implemented, there was some question about the impact that the changes would have on small vendors and the participants whom they serve. The addition of healthy food items (e.g., fruit and vegetables, low-fat milk, a variety of whole grain options) to the WIC food packages, and therefore into these types of stores, has the potential to positively affect the food environment of the communities in which WIC participants reside. But the role that small vendors can and will play will be affected by the policies of states in which they reside, their ability to maintain authorization and meet program requirements, the quality and quantity of the foods provided, and the choices made by WIC participants regarding where they will shop.

Understanding how the revised WIC food packages have affected small WIC vendors was the primary focus of this exploratory study. After 1 year of implementing the rule, the emerging evidence presented in this and other evaluations (Andreyeva et al., 2010; Hillier et al., 2010) suggests that some positive changes in the availability and quality of the healthier foods that are now part of WIC food packages are being realized, yet challenges still remain. This chapter provides a summary and discussion of the key findings from this study. Recommendations for program implementation and future research are provided in Chapter 6.
**Key Findings**

- Most small WIC stores were able to maintain their authorization status.
- Small stores appear to have added healthy foods to their inventory in response to the WIC food package changes.
- Many stores with only one or two registers had to make multiple changes in order to meet new WIC food package requirements.
- Despite a seemingly successful transition to the revised food package, some challenges still remain, including
  - Vendor ability to maintain food freshness and
  - Availability of products in allowable form.
- Adequate vendor preparation likely factored into the overall success of implementation, but there is a need for ongoing engagement of these and other WIC stakeholders through
  - Continued and expanded training of vendors,
  - Ongoing engagement of food suppliers, and
  - Continued nutrition education for WIC participants.

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**Most Small WIC Stores Were Able to Maintain Their Authorization Status**

Review of state-authorized vendor lists at two key points in time allowed us to assess statewide shifts in vendor demographics, namely the number and percent of small stores authorized pre- and post-implementation. The results of our analysis were mixed. Two of the four states involved in the study, Pennsylvania and Wisconsin, saw an increase in the number of very small (one-register) stores authorized by the WIC program, while one state, New Hampshire, saw a decline. The decline in stores in New Hampshire could easily have been an artifact related to a temporary moratorium on new store authorizations during the period examined. The decline might also be explained, in part, by the voucher redesign implemented by this state. This revised voucher system, which redistributed the foods across multiple vouchers, was intended to encourage WIC participants to be more economical in their shopping and may have resulted in more participants choosing to purchase WIC foods at larger grocery stores. This shift may have reduced WIC business for smaller stores and could have led to their departure from the program.

When stores included in our sample left the program, attempts were made to determine the store owners’ rationale for withdrawing from the program. In some cases, store managers reported leaving the program because the new WIC foods were not selling well; but in most cases, stores that were not authorized at the time of our second visits were in the process of reapplying, because the store had a recent change in ownership.

It was outside the scope of this study to assess what motivated stores to seek authorization around the time of implementation. However, the influx of one-register stores into the Pennsylvania and Wisconsin WIC programs suggests that small stores in these states might have viewed the food package changes as an opportunity for the potential increased demand for foods like fruits, vegetables, and whole grains. At the very least, it seems accurate to conclude that the transition to the revised WIC food packages in these states did not deter small stores from seeking or maintaining authorization with the WIC program.

It is important to note that the increases and decreases in small store participation do not necessarily translate into meaningful changes, positive or negative, in participants’
Small Stores Appear to Have Added Healthy Foods to Their Inventory in Response to the WIC Food Package Changes

Results from an analysis of inventory data indicate that most of the newly allowable foods were more readily available post-implementation than they were previously. In New Hampshire, Pennsylvania, and Wisconsin, significant increases in availability were seen for soy milk, whole wheat bread, whole wheat tortillas, and brown rice. Significant increases in the availability of low-fat milk were observed as well, but only in stores in New Hampshire and Wisconsin, the two states that did not allow participants to buy reduced-fat milk. While fresh fruit availability increased in all three study states, Wisconsin was the only state to see significant increases in all three types of fruit: fresh, frozen, and canned. Some significant increases in the availability of vegetables were also observed. However, vegetables were generally more available than fruit at baseline, leaving less room for improvement.

The general trend of increased availability of these healthy WIC foods is important for two reasons. First, it suggests that small WIC stores that maintained their authorization status through the transition to the revised food packages were able to accommodate the changes required of them per the new rule. More importantly, it ensures that WIC participants who depend on them would generally be able to continue accessing the new healthy foods at these stores.

Second, small stores’ ability to adjust and adapt to the changes when faced with a less desirable alternative—losing the WIC business that they have previously enjoyed—suggests that policies implemented on a large-scale through federal food assistance and nutrition programs may be an effective strategy for increasing healthy food offerings in communities with small, local retailers, where larger grocery stores do not exist. This approach may be effective in improving the food environment of communities often left without alternatives for healthy food purchasing.

What remains to be seen is whether the levels of healthy food availability that were observed 6–12 post-implementation are sustainable. Clearly, small stores made changes to their stock of healthy foods in response to the WIC food package changes and, more specifically, to meet their states’ minimum stocking requirements. Although the increase in the availability of healthier foods in small WIC stores may be largely or partially explained by the WIC food package changes, other factors not accounted for in this study also may have affected the availability of healthier foods in small stores. For example, in Wisconsin, availability of soy milk increased in small stores over the study
period despite soy milk not being part of the state’s new WIC food packages. Despite the reasons for the increased availability of healthier foods, continued or even increased demand for these products may be required to ensure that small stores can maintain current or required stocking levels without loss of profit due to products expiring or going stale before they are sold. This issue of supply and demand is one that may need to play out over a longer period and will need to be monitored.

**Many Stores With Only One or Two Registers Had to Make Multiple Changes in Order to Meet Revised WIC Food Package Requirements**

Based on both inventory data and interviews with store owners, it appears that stores with three or four registers already carried most of the newly required foods before the policy change and thus were better positioned to meet the new requirements. Their WFAQI scores showed greater availability of healthy foods before the policy change compared with the smallest stores. Conversely, stores with one to two registers did not score as high and had to make more changes to increase their inventories. These smaller stores increased availability of the new WIC food items and had significant increases in WFAQI scores between pre- and post-implementation.

To support these inventory changes, many smaller stores needed to simultaneously make infrastructure and operational changes to adjust their existing supply channels. Common infrastructure and operational changes included: reorganizing refrigeration or freezer equipment and/or shelf space as well as modifying in-store promotion strategies. Stores with limited space adopted creative ways for adding the new WIC foods by having only their popular milk types “faced” (in refrigerators on the store floor where customers have access to them) or by purchasing certain perishable items with perceived or realized low demand in small quantities or at times when they knew WIC clients would be redeeming their checks. In order to promote the new foods and encourage their customers to try new foods, some store managers placed the new foods in visible areas (e.g. near the register, front of the refrigerator or deli case) or pointed out the new foods in their store. They also pre-priced produce by the package so customers could easily estimate their CVV purchases prior to arriving at the cash register.

In addition, the food package changes seemed to exacerbate vendors’ need to self-supply from larger grocery stores (a common practice among small stores to avoid making bulk purchases) because they could not find the very specific allowable brand or size through their current suppliers or because suppliers delivering to their store refused to leave the minimum stock of certain perishable foods (e.g., whole wheat bread). One positive outcome of the shift in vendor supply methods was that certain wholesalers and distributors began carrying healthier products (e.g., fresh fruits and vegetables) to accommodate increased demand.

Overall, vendors’ continued participation in the program and the observed additions to their inventories are evidence that they were able to make the changes. The food packages may have improved not only the availability of healthy food in small stores but also the infrastructure and ability of small stores to carry fresh, healthy foods—a necessary factor for sustaining the food package changes in the long term.
Despite a Seemingly Successful Transition to the Revised Food Packages, Some Challenges Still Remain

While the overall results of the revised WIC food package implementation are encouraging for small vendors’ continued participation in WIC and the increased healthy food offering, there remain a few challenges that should continue to be examined. These challenges are described below, and some specific recommendations related to these challenges are provided in the final chapter.

Vendor Ability to Maintain Food Freshness

Small corner and convenience stores typically carry limited quantities of fresh produce or do not sell it for a variety of reasons and for many store managers we interviewed, the addition of produce and effort required to maintain its freshness was a new challenge to address in transitioning to the new food package. Limited refrigeration equipment and lack of air conditioning in the summer months were cited as some of the primary barriers to keeping produce fresh. However, many small store managers who reported needing or wanting refrigeration or freezer equipment prior to implementation had not acquired any by 6–10 months post-implementation. This is likely the result of vendors weighing their availability of space with their need for equipment and their potential profitability from the fresh WIC items that would be stored in refrigeration or freezer units. This finding may also be the result of stores receiving fewer sales from fruits and vegetables or other fresh foods than was needed to support the purchase of new equipment or the repair of broken equipment.

Given the lack of necessary equipment and concurrent increases in produce availability, one might expect the quality of produce to have declined during this period. Contrary to this assumption, findings from the store inventories indicate that the percentage of fresh produce deemed to be of acceptable quality was consistent or even increased between pre- and post-implementation. However, it is important to note that this observed change could be related to seasonal differences between the two data collection periods. Pre-implementation data collection took place during the summer months, when maintaining produce freshness would have been most challenging for small stores, especially those without cooling equipment, while post-implementation data collection took place in the spring when spoilage due to excessive heat would have been less of an issue. Regardless of this observed change or lack thereof, fresh fruit and vegetable quality in small stores was still somewhat limited. For example, less than 50% of small stores in Pennsylvania had at least 75% of fresh fruit of acceptable quality. Similar levels of quality were observed for fresh vegetables and in the other study states.

Interestingly, even though challenges related to freshness were primarily related to fresh produce, store managers experienced challenges keeping other food items (e.g., whole wheat bread and tortillas, baby food, milk) fresh as well. To ensure the continued participation of small stores and accessibility of the WIC foods to program participants, it is important to (1) consider these challenges and how they might be related to minimum stocking requirements and (2) identify policy changes or innovative strategies for alleviating the financial strain caused by the spoilage or expiration of produce and other allowable WIC food items.

Availability of Products in Allowable Form

One of the biggest challenges faced by all store managers was obtaining some of the new WIC foods in approved brands and/or appropriate sizes. The most prevalent example of this was the inability of vendors to obtain whole wheat bread in a 16-ounce size. Prior to the implementation of the revised WIC food packages, the 16-ounce size loaf of whole wheat bread was produced by very few bread manufacturers. The
significant demand brought about by the WIC program’s decision to approve this size resulted in limited supplies among those manufacturers that did produce it, while some other producers had to reconfigure their sizing and packing practices to accommodate the approved size. As a result, many WIC-authorized stores encountered problems obtaining bread in the proper size. Also, findings from the two post-implementation data collection periods in Colorado suggest that stores were still adjusting to this change months after implementation. State officials may need to consider providing some sort of ongoing support to these vendors and their suppliers to ensure that they have access to the proper size of bread.

**Adequate Vendor Preparation Likely Factored Into the Overall Success of Implementation, but There Is a Need for Ongoing Engagement of These and Other WIC Stakeholders**

*Continued and Expanded Training of Vendors*

The provision of training and resources to authorized WIC vendors by state officials was widely appreciated by store managers and helped to ensure their effective adoption of the revised food package policies. The variety of resources and training provided seemed to have been sufficient for store managers; however, communication in a variety forms and the provision of multiple opportunities for vendors to learn about programmatic changes seemed to be especially important. Store managers feel that they are sometimes put into the position of being “educators” of WIC participants, in terms of both encouraging WIC participants to purchase healthier foods and educating participants on program rules. Some store managers expressed interest in additional training to support them in these roles. Store managers were also interested in learning more about better business practices (e.g., produce handling, working with suppliers, in-store food marketing) that may help them more effectively obtain and sell the newly allowed foods.

Continued provision of resources (in many forms and multiple languages) and tailoring of trainings and resources to the needs of small stores will ensure continued success in implementation and the continuation of small stores as WIC vendors. Additionally, ongoing training and support will be important for both new vendors as well as for those who continue to encounter challenges with making the new foods accessible.

*Ongoing Engagement of Food Suppliers*

Some vendors experienced difficulties in working with their food suppliers to obtain the new WIC foods because suppliers were not sufficiently aware of the revised foods list or minimum stocking requirements and/or some simply did not update their inventories to include the new foods in adequate amounts to meet retailer demand. This issue seemed to be most prominent in the initial months of implementation, but will likely persist as state policies (e.g., allowable brands) continue to be modified. States should continue to communicate with suppliers and manufacturers on behalf of all WIC vendors when changes are made to the allowed foods list or minimum stocking requirements. Outreach efforts should include not only major statewide distributors and manufacturers but also regional and local distributors and other suppliers, which are the main sources that small stores use to obtain products. An individual small vendor lacks the purchasing power to influence distribution systems; however, state WIC agencies can be a powerful force in influencing food suppliers and manufacturers to help and support all WIC vendors.
Continued Nutrition Education for WIC Participants

As emphasized by store managers, state and local WIC agencies should continue to ensure that participants are fully educated about the food packages and the importance of the changes to their diet and overall health. Local WIC agencies play a critical role in educating participants about both the nutritional value of the WIC foods as well as the importance of purchasing all of the correct foods. It is important that a feedback loop be created between those responsible for vendor management and those providing participant education to ensure that participants understand the importance of purchasing the correct foods. Local WIC agencies can learn about challenges and issues related to food purchasing from WIC vendors in their community. States may want to consider creating such feedback loops to support ongoing participant education.

Study Limitations

This study was designed to explore the impact of the revised WIC food packages on small WIC stores in four states. It is important to note that the small WIC stores included in the study were not selected at random, and although we feel the store samples reflect the characteristics of small WIC stores in each state, these data cannot be used to draw definitive conclusions about the entire population of small WIC stores. Further, the one-group pre-test and post-test design or the lack of a control group limits our ability to say with certainty that the observed changes in small store inventories are directly related to the implementation of the revised WIC food packages.

For the purposes of this study, stores with one to four registers were categorized as “small.” Because other investigators conducting similar research have defined “small” in other ways, it may not be appropriate to directly compare the findings of this study to other such studies. It is possible that factors such as store type, square footage, and geographic location influence the impact that policy implementation, such as the WIC food package change, has on small stores. However, some of these factors were not readily available for use in this study, and/or the study samples were not large enough to allow for stratification by multiple factors. Ultimately, number of registers was the trait most readily available, as it is systematically collected by all WIC agencies.

In addition, conducting a third data collection period at 18 months post-implementation would have been ideal and likely would have contributed to understanding the long-term impacts of the WIC food package changes. However, the study was limited by time and available resources. The collection and analysis of inventory data at two points post-implementation—at 4 and 12 months—in Colorado did yield some findings related to longer-term impacts, but data from Colorado alone could not accomplish this aim because we did not obtain pre-implementation data from there and the sample of stores in Colorado was very different from the samples drawn for New Hampshire, Pennsylvania, and Wisconsin.

Another limitation of the study is related to the instrument used to collect inventory data. The instrument was designed to measure general shifts in the availability of healthy foods, not to assess whether the observed shifts met or exceeded the states’ minimum stocking requirements. Furthermore, the instrument was not designed to assess only those brands and package sizes allowed by each WIC program, so shifts in observed availability might not necessary reflect shifts in approved WIC foods. To this end, it was not within the scope of the study to assess (1) the extent to which small stores were in compliance with the new program rules, which could have implications on their ability to remain authorized, or (2) whether the quantities of available food items were sufficient to meet demand beyond that of WIC program participants and thus had a substantial effect on the greater food environment.
6. Recommendations for Program Implementation and Future Research

This four-state evaluation of the impacts of the WIC food package changes on small stores and other initial assessments and evaluations of the new WIC food packages should be viewed in the context of an ongoing nationwide assessment. The impact of the recent changes to this important program on the availability of healthy foods to low-income individuals will not be completely understood for some time and should be considered in broader terms. For example, this study was funded by Altarum because of the Institute’s commitment to examining models of systems change that have the potential to positively influence current childhood obesity trends; the recent changes to the WIC food packages were seen as one such model. With some 9 million WIC participants now receiving prescriptions for healthy foods, the potential for the program to influence consumer demand is great. Increased consumer demand could be the economic opportunity small stores need to justify the addition of healthy foods to their inventory. More importantly, local access to healthy foods is seen as a factor that could impact child nutrition behaviors and ultimately body mass index. However, other evaluations have and will continue to assess the WIC program changes with different goals and models of systems change in mind. As the results from various evaluations are summarized over time, a more complete understanding of both the specific and more far-reaching impacts of the WIC food package changes will emerge.

From our research, we have found that both WIC participants and grocers are enthusiastic about the changes to the WIC food packages and that implementation was generally a success. However, some challenges and opportunities for continued investigation were also identified. Recommendations and suggestions for future research have been provided below in hopes that policymakers and WIC program administrators will continue to improve aspects of food package implementation to ensure the changes to the food packages are as impactful and far-reaching as possible.

State WIC Data Could Be Better Used for Internal Program Management and Policymaking, Including Ongoing Monitoring of Small Store Participation in the WIC Program

Long-term impacts on small store participation in the WIC program should continue to be examined. Within the first 6–10 months of implementation, small WIC stores were generally able to remain on the program and adapt to the changes. However, some evidence from this study suggests that longer-term impacts may vary. Some small stores are still trying to gauge how supply and demand for the new healthy WIC foods will play out and assessing whether their participation in the WIC program makes good business sense. Because the data are readily available, states could use methods similar to those employed for this study, comparing characteristics of their authorized vendors at
regular intervals over time. However, states could also be proactive and use state data to monitor shifts in redemption trends that could negatively affect small stores’ continued participation in the program (e.g., limited or decreased redemption of CVVs in small stores, overall reductions in small stores’ volume of WIC business). As part of this study, Alarum attempted to acquire and analyze store-level redemption data for the stores in our sample. However, states either had rules in place that did not allow researchers to access the data, did not have time to make it available, or had very old vendor redemption systems where data could not be easily accessed in any electronic format. Even when we asked for higher-level data aggregated by store type, it was difficult for states to pull from their WIC Management Information System (MIS). Fortunately, many states are in the process of upgrading their MIS or plan to in the near future using American Recovery and Reinvestment Act Federal Stimulus Funds that are available for this purpose. These upgrades represent a prime opportunity for states to make changes that would enhance access to and the usefulness of redemption data.

There is a Need to Examine the Impact of Specific Minimum Stocking Requirements on Small Store Participation, Food Availability, and Food Quality

State policies around minimum stocking requirements varied substantially among the states in this study. Some states took an approach of only requiring small stores to carry a very minimum selection of food products, while other states required more variety (e.g., requiring fresh produce in addition to canned and frozen, requiring only one grain option but not necessarily whole wheat bread). Furthermore, some states required higher quantities of a particular item to be in stock at all times, whereas some states set these minimums quite low. It was outside the scope of this study to fully explore the impact of specific minimum stocking requirements on small store participation, healthy food availability, or even healthy food quality and freshness. However, it became evident through interviews with store managers that some minimum stocking requirements were of particular concern. Some small store managers did report that they could not turn the minimum stock of a certain product over fast enough to avoid losing profit due to spoilage or product expiration. Because this could both discourage continued vendor compliance with minimum stocking requirements and participation in the program, additional studies need to examine this issue more thoroughly. Ideally, this study would result in the issuance of some best practice guidelines for setting minimum stocking requirements, taking into consideration the need to balance product availability with vendor compliance and participation to ensure that WIC participants have optimal access to their food package benefit.

Ongoing Quality Assessments of WIC Foods in Small Stores Need to Be Incorporated Into Vendor Management Practices Through the Use of New or Revised Monitoring Tools

States are required to monitor their WIC vendors to ensure compliance with program requirements. As part of this monitoring, states check not only the availability of allowable WIC foods to confirm that minimum stocking requirements are being met, but also the freshness of WIC foods that a store carries. Freshness is typically assessed by examining a product’s expiration date. However, with the addition of fresh fruits and vegetables as an allowable WIC item, it should or will be necessary to consider an alternate means of assessing the freshness of produce during these types of monitoring visits. For this and
many other studies of the new WIC food packages, a modified form of the NEMS-S tool was used to assess availability and quality of the new WIC foods, including fresh fruits and vegetables. While the NEMS-S tool was not necessarily designed to monitor WIC stores, it could serve as a model for the development of a quality assessment tool that states could incorporate into their monitoring worksheets.

Support Vendors by Expanding Annual Trainings and Providing More Opportunities for Education and Engagement

Annual WIC-authorized vendor trainings provide an ideal opportunity for routinely engaging store managers about program policies and practices; however, these trainings typically offer no or little information about sustainable business practices related to working with suppliers, handling and maintaining fresh produce, and marketing and merchandising foods. To ensure continued success in implementation of the food package changes among small stores, it will be important for states to offer, or to connect vendors to, technical assistance and other resources that will help them address their challenges and improve their business practices. Trainings or technical assistance of this nature that are tailored to the needs of small stores are increasingly being offered by nonprofits and other organizations seeking to develop partnerships with small stores in order to build their capacity and ultimately make healthier choices more readily available in underserved communities. For example, the Minnesota Department of Health partnered with the Institute of Agriculture and Trade Policy, to assist WIC-authorized corner stores in meeting revised minimum stocking requirements for fresh fruits and vegetables and developed a promotional campaign of posters and point-of-sale materials for enrolled vendors (Centers for Disease Control and Prevention, 2010). Other programs, such as the Philadelphia Food Trust’s Healthy Corner Store Initiative, provide ongoing assistance to corner stores through trainings and consulting services and help stores make layout changes in order to increase shelf space for healthy foods. Stores participating in the initiative also receive small refrigeration units to stock and display fresh fruit (The Food Trust, 2010).

If state WIC agencies do not have the capacity to offer this type of assistance to stores through their annual training or other assistance efforts, they should seek to connect those small vendors who need assistance to other capacity-building opportunities being offered in their community. Linking WIC vendors to these efforts may not only help improve the capacity of small stores to carry the healthy WIC foods but also reduce the burden on states in providing assistance and support to vendors who may be struggling.

Studies of Participant Food Choices and Store Selection Can Be an Important Tool for State Policy Development

In addition to monitoring vendors, states have an interest both in understanding why participants choose particular types of stores for shopping and why they make decisions to purchase or not purchase certain WIC foods. For participants using small vendors, understanding why they chose these vendors can be an important factor in making state policies that could affect the participants’ ability to access healthy foods (such as the New Hampshire voucher modifications). Additionally, examination of participant reasons for not purchasing certain foods, such as preference factors or lack of availability, can be valuable in adapting nutrition education efforts or revising vendor stocking policies. States should continue to engage in research and evaluation focused on participant food choices, store selection, and factors influencing each to ensure their state policies
A Strong Process Evaluation of the New WIC Food Package Implementation Could Serve as a Roadmap to Help the USDA Make Major Changes in Other Child Nutrition Programs

The success of the WIC food package implementation can serve as a model for the USDA when it comes to making changes to other child nutrition programs. FNS has declared a commitment to fighting childhood obesity and ending childhood hunger and is considering a number of changes to food assistance programs over the next several years to accomplish this commitment. For example, in late 2010, the Institute of Medicine made recommendations for changes to the Child and Adult Care Food Program (CACFP). Presuming the USDA will respond to the Institute’s recommendations with programmatic changes, the lessons learned from WIC food package evaluations might help identify strategies for the CACFP program changes too.

Provide Forums for Policymakers, Program Administrators, and Researchers to Share Findings and Best Practices and to Foster Collaboration

The recent WIC Food Package Evaluation Symposium held in Washington, DC, in November 2010 (also funded by Altarum through CHOMP, event proceedings and video available at www.altarum.org/obesityresources) provided a forum for those conducting initial research to present findings of studies and recommendations for future research. These types of symposia can serve as a basis for framing an overall process evaluation; proceedings can be used for policy briefs, study designs, and prioritization of future research. Results from these types of symposia, as well as ongoing opportunities for collaborations around research findings, can play an important role in helping policymakers and program administrators understand the dynamics of what worked well in implementing such a widespread policy change and what might be improved upon in future policy development and implementation. To advance our collective knowledge, evaluation methods, and strategic planning around WIC and other programs, the organization of future events of this kind should be considered by those working in the field.
References


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