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# **The Availability and Demand for Whole Wheat Bread Among WIC Households**

Hayden Stewart, USDA-Economic Research Service, [hstewart@ers.usda.gov](mailto:hstewart@ers.usda.gov)

Diansheng Dong, USDA-Economic Research Service, [ddong@ers.usda.gov](mailto:ddong@ers.usda.gov)

Jeffrey Hyman, USDA-Economic Research Service, [jhyman@ers.usda.gov](mailto:jhyman@ers.usda.gov)

Patrick McLaughlin, USDA-Economic Research Service, [patrick.mclaughlin@ers.usda.gov](mailto:patrick.mclaughlin@ers.usda.gov)

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# The Availability and Demand for Whole Wheat Bread Among WIC Households

Patrick McLaughlin, Hayden Stewart, Diansheng Dong, and Jeffrey Hyman

Poster prepared for presentation at the 2017 annual meeting of the Agricultural and Applied Economics Association, Chicago, IL, July 30 - August 1.

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Suggested layout:

Title with author names, affiliations, and disclaimer  Background section  Data section	Availability section with three figures showing market share and price estimates	Demand (Household behavior) section with descriptive statistics from FoodAPS and probit analysis
References		

## Background

In 2009, the U.S. Dept. of Agriculture (USDA) revised its food packages for the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) to include 100% whole-wheat bread:

- Women may now receive 16 ounces of 100% whole-wheat bread
- Children may now receive 32 ounces of 100% whole-wheat bread

WIC State agencies may also offer alternatives to 100% whole-wheat bread, including brown rice, whole-grain tortilla, and other types of whole-grain breads and rolls.

The addition of whole-wheat bread to WIC food packages has had a positive impact on participants' diets, increasing their purchases and consumption of whole grains. However, WIC participants may struggle to locate WIC-authorized bread at retail food stores.

## Data

USDA's Economic Research Service (ERS) has invested in several data sets to better inform policymakers about the food shopping behavior of U.S. households. In this study, we use two datasets that, together, allow us to address questions left unanswered by previous studies, including the availability of the newly added WIC foods at retail stores:

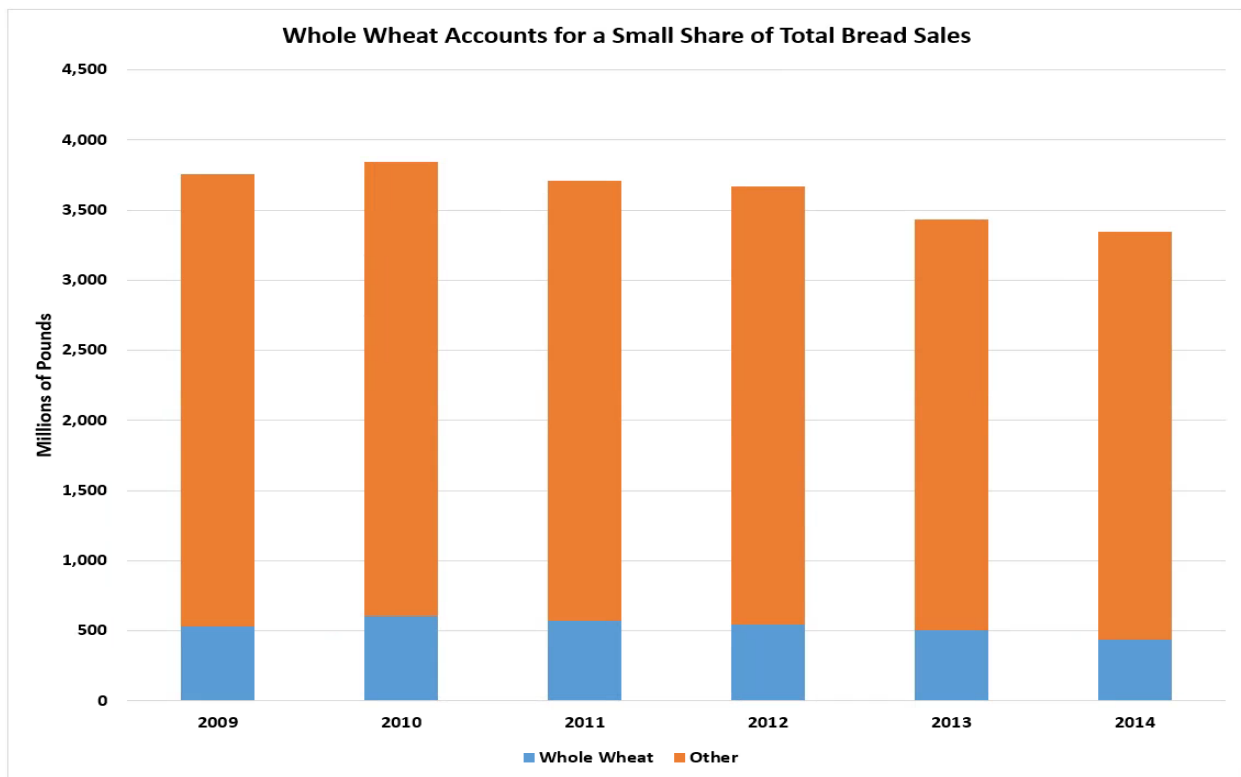
**USDA's National Household Food Acquisition and Purchase Survey (FoodAPS).** Over a 1-week period, 4,826 households recorded their food acquisitions. Detailed information was collected on the households, the types of foods acquired, the types of stores patronized, and the methods of payment used. Among all 4,826 households, 471 included a woman, infant, or child who was receiving WIC benefits. These households bought 365 bread products during their week of participation in the survey. It appears that about 18% of those purchases were paid for with WIC benefits.

**Information Resources, Inc. (IRI).** Each week, a panel of retail food stores across the United States provides IRI with their sales data. Many of the Nation's largest supercenters, club warehouses, supermarkets, and convenience stores participate. IRI's InfoScan data report sales quantities and revenue along with various characteristics of the products such as the form, package size, and relevant health characteristics. Researchers can use these data to investigate food prices and the availability of specific foods in communities across the Nation.

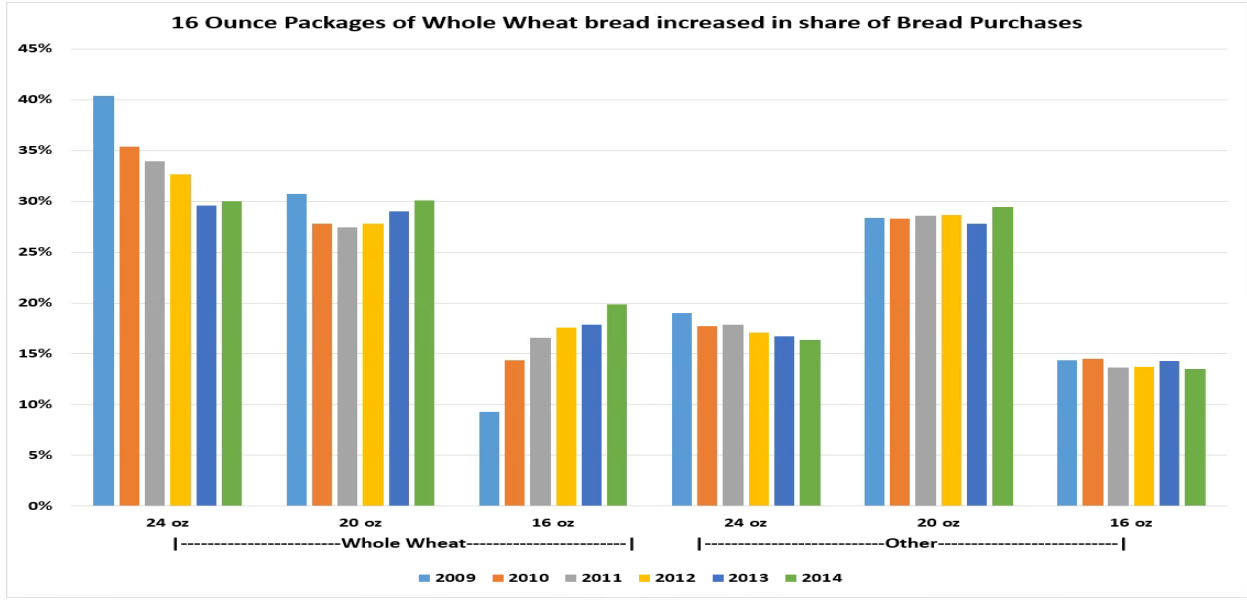
## Availability

Stores authorized to accept WIC benefits must stock a state-specific minimum quantity of WIC-allowed bread products. InfoScan data reveal that over 95% of supermarkets have sold 100% whole-wheat bread in 16-oz. packages since 2009, when USDA added it to WIC packages. To trace changes in availability over time, we look at sales of various types of bread in various package sizes between 2009 and 2014. Over the period, we find that 100% whole-wheat products have continued to account for about 15% of all bread product sales. In 2009, 16-oz loaves—the size specified for WIC—represented about 9% of all whole-wheat packages sold. That share increased to about 20% by 2014. While product availability has increased, however, it is not surprising that some WIC participants may still have difficulty locating WIC-eligible breads in stores: Even in 2014, 16-oz loaves of 100% whole-wheat bread represented only about 3% of all bread product sales (i.e., 20% of 15%).

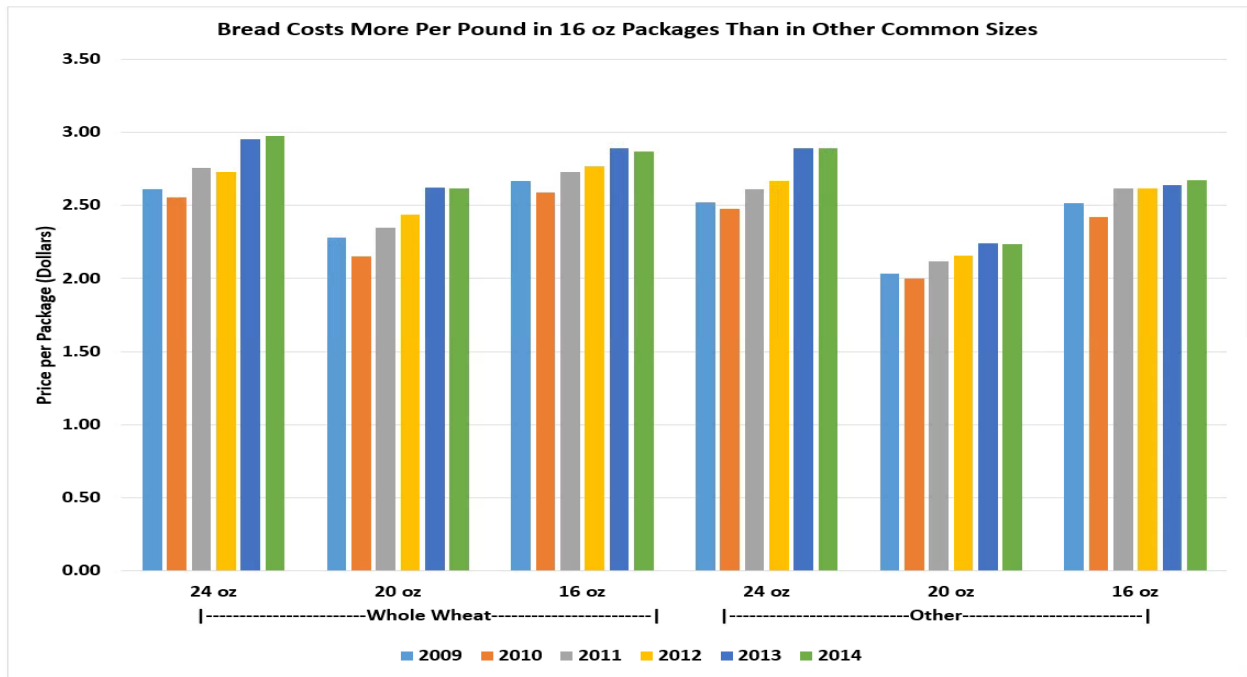
Price may explain why 16-oz. loaves account for a small share of the overall market for 100% whole-wheat bread. InfoScan data reveal that these loaves are not the least expensive way to buy this type of bread. Indeed, they can cost more than a 20-oz. loaf.



Source: U.S. Dept. of Agriculture, Economic Research Service (ERS) analysis of InfoScan data.



Source: U.S. Dept. of Agriculture, Economic Research Service (ERS) analysis of InfoScan data.



U.S. Dept. of Agriculture, Economic Research Service (ERS) analysis of InfoScan data.

# Demand

## WIC Household Behavior

Data from USDA's FoodAPS were analyzed to understand how often households buy bread and what types of bread they choose, including WIC households when they have benefits and when they rely exclusively on other financial resources. To conduct formal hypothesis tests, we estimate a 2-equation probit model with sample selection (Van de Ven and Van Praag, 1981):

$$(1) \text{ Probability Household Bought Bread} = \Phi(\beta X)$$

and

$$(2) \text{ Probability Household Chose Whole Wheat} = \Phi(\alpha Z)$$

where  $X$  and  $Z$  are vectors of explanatory variables.  $\alpha$  and  $\beta$  are parameters to be estimated. For example, we include explanatory variables for WIC status and whether a WIC household actually used its benefits to buy food during the survey week.  $\Phi(\beta X)$  and  $\Phi(\alpha Z)$  denote the standard normal CDF evaluated at  $\beta X$  and  $\alpha Z$ , respectively.

Results show that only about half of all FoodAPS households bought bread during their survey week. Many households may abstain from buying bread in a given week if they already have a stock at home. However, participation in food assistance programs also plays a role. Results show that WIC participants may wait to buy bread until they have a coupon (WIC benefit) in hand. Alternatively, WIC households may stock up on bread when they have a coupon, reducing the need to shop for bread in other weeks.

USDA's success at improving the diets of WIC participants also depends on these households' food choices when they use their own money. It might be hoped that, after talking with nutrition counselors about the benefits of eating more whole grains and trying whole-grain bread through the program, WIC participants would show an increased proclivity to buy products with whole grains at their regular store when using their own money. However, we find no evidence of such behavior. Controlling for WIC coupon use, we find that WIC participants are less likely to choose a bread containing whole grains than other households.

**USDA's FoodAPS includes WIC households who used benefits to buy bread and WIC households who used own money to buy a variety of bread types**

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Number of households who participated in FoodAPS	4,826
Purchased bread during their week of participation in the survey	2,172
-Bought 100% whole-wheat bread	299
-Bought other bread containing whole grains (excluding 100% whole wheat)	234
-Bought refined-grain bread	1,807
Number of WIC households who participated in FoodAPS	471
Used WIC benefits to buy any food during their survey period	162
Used WIC benefits to buy bread	50
Used own money to buy bread	181
-Choose 100% whole-wheat bread	18
-Choose bread with whole grains (including 100% whole wheat)	10
-Choose refined-grain bread	158

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U.S. Dept. of Agriculture, Economic Research Service (ERS) analysis of FoodAPS data.



**Results for two-equation probit model for whether a household buys bread in a given week and, conditional on buying bread, chooses a whole-grain product, marginal effects<sup>1</sup>**

	Probability household bought bread (n=4,826)		Conditional Probability household chooses a whole-grain product	
	Marginal Effect	Std. Err.	Marginal Effect	Std. Err.
Income as percentage of poverty level	0.001  >	0.001  >	0.001  >	0.001  >
WIC household	-0.12**	0.036	-0.066	0.031
Used WIC benefits	0.186**	0.045	0.458**	0.065
SNAP household	-0.156**	0.023		
Used SNAP benefits	0.233**	0.021		
Meal planner is white, non-Hispanic	0.13**	0.02		
Household size	0.051**	0.006	-0.003	0.005
Meal planner uses nutrition facts panel			0.07**	0.014
Meal planner aware of Myplate			0.046**	0.022
Meal planner graduated college			0.097**	0.017

Note: \*\* = statistically significant at the 5% level; \* = statistically significant at the 10% level.

<sup>1</sup>Probit analysis results.

Source: U.S. Dept. of Agriculture, Economic Research Service (ERS) analysis of FoodAPS data.

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