Chapter 6
Participant Satisfaction With and Use of Prescribed Foods

State practices to reduce food package costs—by restricting brands, types, or packaging of allowed foods—limit WIC participants' food choices. One of the concerns with food-item restrictions is the possibility that choice limitation may reduce WIC participants' satisfaction with the WIC food package, their likelihood of purchasing WIC foods, or their likelihood of consuming all the prescribed foods they have selected. If such adverse effects exist, then this cost-containment practice may have an undesired impact on the WIC program's ability to improve the nutritional status of participants.

This chapter is divided into five sections. Following a discussion of research approach, the chapter presents findings about participant food preferences and the extent to which those preferences are constrained by State-imposed restrictions on foods, relative to foods allowed under Federal WIC regulations. These constraints are examined for cheese, infant cereal, juice, and cereals. The third and fourth sections provide a detailed examination of rates of satisfaction with, and purchase and consumption of, WIC-prescribed cheese and cereal, respectively; these are two food categories for which food-item restrictions appear to have had some effect on satisfaction or food use. The fifth section contains a summary of the estimated effects of food-item restrictions on satisfaction with and use of foods in all eight categories examined by this study: cheese, cereal, milk, eggs, infant cereal, single-strength adult juice, peanut butter, and dried beans or peas. Detailed findings for the latter six food categories are presented in appendix I.

Research Approach

WIC participants' satisfaction with and consumption of prescribed foods is examined, using data collected during the Survey of WIC Participants. Most of the respondents to the survey (85.8 percent) were asked the following series of questions about foods provided by WIC.[1] Did their WIC prescription include items from a specific food category (such as milk, cheese, eggs, infant cereal)? How much of the prescribed food was bought (all, some, or none)? How much of the purchased food was consumed (all, some, or none)? What was the main reason for not buying or consuming the prescribed item? For each food category, the survey also asked the type and brand of foods purchased and the types or brands respondents would have liked to buy, but could not because they were not on the State's list of approved WIC foods.

Every State imposes some restrictions on allowed foods, often to limit the number of allowed foods to a manageable size. Food-item restrictions designed primarily to reduce food package costs have been described in previous chapters. These restrictions include requirements that participants buy the least expensive brand available, limits on the allowed brands or types of food within a category (including brands for which the State receives a manufacturer's rebate), and limits on package size or form. The cost-containment restrictions vary by State and food category, as shown in table 6-1.

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[1] The remaining respondents had experience with WIC food instruments, but they had not used them during the survey reference month—the month prior to the interview. The survey did not ask these respondents questions about their purchase or consumption of WIC foods because of concerns about recall error.

Table 6-1—Major food-item restrictions imposed, by State and food category

	CA	CT	NC	OH	OK	TX
Milk	Packaging	Least expensive	Least expensive	Packaging	Least expensive, packaging	Least expensive
Eggs	Type	Least expensive, type			Least expensive, type	Type
Cheese	Type	Least expensive			Least expensive, type	
Cereal	Type				Brand, type	Packaging
Infant cereal	Rebate	Rebate				Rebate
Juice	Packaging, type	Least expensive			Brand	Brand, least expensive, packaging, type
Infant juice	Type	Type	Type			Type
Peanut butter		Least expensive				
Dried beans/ peas					Least expensive	

Blank cells indicate nonrestrictive States with respect to use of food-item restrictions.

Source: Survey of WIC Participants.

For each food category, the six case study States are identified as being either restrictive or not restrictive with respect to food-item choices, based on their WIC-approved food lists. Blank cells in table 6-1 indicate those States considered by the study to be nonrestrictive for each food category. In this chapter, patterns of satisfaction, purchase, and consumption are compared for groups of respondents in restrictive vs. nonrestrictive States. When presenting empirical results, equal weight is given to each State because the number of participants varies among States. Thus, for instance, the statement, "83.6 percent of survey respondents were 'very satisfied' with the allowed brand(s) of cheese," means the arithmetic average of the percentages in the six States was 83.6 percent.[2] To remind readers that this is not the same as saying that 83.6 percent of **all** survey respondents said they were very satisfied, the chapter often refers to a "cross-State average" where each State is weighted equally.

Responses to most of the survey questions on how much of a food item was purchased or consumed have three possible responses—all, some, or none. For responses to these questions, a chi-squared test was conducted to determine whether the average distribution within States with food-item restrictions was statistically different from the average distribution within the remaining States. In a few instances, the average percentage of survey respondents answering "all" was compared for the two

[2] If equal weight is not given to the experiences in each of the six States, then overall findings will be dominated by California and Texas, the two States in the study with the greatest number of participants.

groups of States, and a *z*-test of statistical significance of the difference in means was conducted. The *z*-test was done when the survey responses did not include "some" as an allowable response (for purchase of peanut butter and dried beans/peas) and when so few respondents answered "none" to a question that a valid chi-squared test of independence could not be performed.[3] Similarly, response categories to questions about why respondents did not purchase or consume all of a prescribed food item were collapsed, when needed, to ensure the validity of the chi-squared test of independence.[4]

When examining the relationship between food-item restrictions and participants' satisfaction with and use of prescribed foods, it is important to realize that the restrictions are not necessarily "binding" on all participants. For instance, three of the case study States restricted infant cereal purchases to Gerber brand. For mothers who preferred Gerber infant cereal over other brands, this was not a binding constraint. For four of the food categories (cheese, infant cereal, juice, and cereal), the survey asked respondents whether there were any types or brands of food that they would like to buy with their WIC vouchers that were not on the State's food list.[5] If a respondent specified a type or brand of the food item that met the Federal guidelines for approved WIC foods but was not on the State's approved food list, then the State's food-item restriction was considered binding for that particular respondent.

Participant Preferences and Binding Constraints

In order to determine the extent to which WIC food-item restrictions are binding on participants, the Survey of WIC Participants asked an open-ended question designed to elicit respondents' preferences. For four of the food categories (cheese, infant cereal, juice, and cereal), survey respondents were asked, "Are there any [food items in a food category] that you would like to buy with your WIC vouchers that are not on [State's] WIC food list?" If respondents said yes, they were asked to specify their preferences. Within each of the four food categories, the participant's preferred food item was then compared to Federal regulations regarding allowed foods. If the preferred item met Federal regulations but was not on the State's list of allowed foods, then that participant faced a "binding constraint" on purchases within that food category.[6]

Table 6-2 shows the percentage of survey respondents who faced binding constraints on food choice, together with an indicator for the States treated as restrictive in this study. As displayed in that table, a cross-State average of 8.8 percent of respondents preferred a federally approved type or brand of cheese not included on their State's list of allowable WIC foods. Virtually nobody faced a binding constraint on infant cereal. A cross-State average of 6.9 percent of respondents faced a binding constraint on juice, and 10.0 percent faced a binding constraint on cereal. To the extent that respondents did not provide enough information to identify their preferred food item as not allowed in their

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[3] In general, no chi-squared test was conducted if the expected count of observations in any cell of the table was less than 2.0. The "expected count" is calculated as the sample size times the marginal row and column percentages associated with that cell.

[4] For instance, chapter 5 discussed the frequency with which survey respondents said that their WIC store ran out of an item as a reason for not buying all of a prescribed food item. Few respondents gave this as a reason, and it has been combined with other infrequently cited reasons into a response category marked "other."

[5] Similar information was not sought for the other food categories, either because brands are not well-differentiated (e.g., milk, eggs, dried beans/peas), or because the food item is prescribed for a limited number of WIC participants (e.g., infant juice).

[6] Though "binding" often means obligatory, it is used here in its sense of being confining or limiting.

State, the percentages in table 6-2 are lower-bound estimates of the prevalence of binding constraints.[7]

Table 6-2—WIC families facing binding constraints on food choices

	CA	CT	NC	OH	OK	TX	All States
				Percent			
Cheese	5.4[a]	8.8[a]	1.1	12.6	15.7[a]	9.3	8.8
Infant cereal	0.0[a]	2.1[a]	0.0	0.0	0.0	0.7[a]	0.5
Juice	13.3[a]	7.2[a]	1.0	4.7	3.1[a]	12.1[a]	6.9
Cereal	5.4[a]	15.1	12.7	5.6	19.4[a]	1.7	10.0
				Number			
Sample size	*173*	*193*	*192*	*182*	*159*	*168*	*1,064*

a Study treats State as "restrictive" with regard to food choice within this food category.

Group estimates give equal weight to each State in the group.

Source: Survey of WIC Participants.

There is considerable State-to-State variation in table 6-2, and the reasons for some of the variation seem readily apparent. For instance, at 19.4 percent, the rate of binding constraints for cereal was highest in Oklahoma—the only State in the study to exclude most nationally branded cereals from its food list.[8] Oklahoma also had the highest rate of binding restrictions on cheese (15.7 percent), for which it both limited allowed types and had a least cost brand policy.

Other rates, however, are more difficult to interpret. At 12.6 percent, Ohio participants had the second highest rate of binding restrictions on cheese, but Ohio had as many or more food choices among cheeses than the other States. In addition, the relatively high rates for breakfast cereals in Connecticut (15.1 percent) and North Carolina (12.7 percent) seem difficult to explain, because their food lists contained a variety of both national- and store-brand cereals. The next section of the chapter and Appendix I provide further detail about these binding constraints and their relationship to participant satisfaction, and to the purchase and consumption of prescribed foods.

Cheese

Connecticut and Oklahoma required WIC participants to buy the least expensive brand of cheese available. As described in previous chapters, variation also existed among States in the types of cheese WIC participants could purchase (refer to table 3-1 in chapter 3 for a complete description of

[7] Some respondents specified a food item that, as stated, was actually included in their State's list of approved foods (for instance, mozzarella cheese). It is possible that these respondents were mistaken in their understanding of which foods were allowed. It is also possible that they did not provide the interviewers enough information to assess why the foods they specified were not allowed. For instance, some respondents might have been thinking shredded mozzarella cheese, which is not allowed in any of the six States.

[8] In early 2001, when the survey data were collected, the only national cereal brands allowed in Oklahoma were Quaker and Nabisco, for hot cereals only. In July 2001, Oklahoma added four nationally branded cold cereals to its list of approved foods.

WIC-approved cheese in each State). California allowed the fewest types (four), whereas Connecticut allowed the most (eight). This study treats California, Connecticut, and Oklahoma as the restrictive group of States when examining brand satisfaction, purchase, and consumption of cheese.

All survey respondents were asked whether they were satisfied with brands of food and package sizes allowed for several different food categories, including cheese. If the food item was not currently in their food package prescription, they were asked whether they were satisfied with the item in the past.[9] The top two sections of table 6-3 present responses for satisfaction with cheese brands and package sizes, respectively. For the entire sample of States, a cross-State average of 83.6 percent of survey respondents said they were very satisfied with allowed brands of cheese,[10] and 85.2 percent said they were very satisfied with allowed package sizes.

The top panel of table 6-3 shows that restrictions on cheese were associated with lower brand satisfaction. When the average distribution of responses within States with restrictions is compared to the average distribution in States without restrictions (the "Restriction" and "No restriction" columns in the table), a chi-squared test on the difference in distributions is statistically significant at the 0.01 level; a cross-State average of 81.2 percent of respondents in California, Connecticut, and Oklahoma said they were very satisfied with allowed brands of cheese, compared to a cross-State average of 85.9 percent in States without restrictions.

No chi-squared test is performed on satisfaction with package sizes because the six States had few differences in package-size restrictions on cheese.

The central panel of table 6-3 shows that cheese was prescribed for a cross-State average of 91.5 percent of the sampled WIC families. The difference in average prescription rates between States with and without restrictions on cheese, 1.0 percent, is not statistically significant.

All respondents with prescribed cheese were asked whether they purchased "all," "some," or "none" of the cheese in the month prior to the interview. As shown in the fourth, or "Amount purchased," panel of table 6-3, a cross-State average of 95.4 percent of respondents said they purchased all of the cheese prescribed, 4.0 percent said some, and less than 1 percent said none.[11] A chi-squared test on the difference in distributions indicates no significant difference. So few participants answered "none," however, that the distribution of responses is nearly binomial ("all" versus "some"). A significance test was therefore performed for the percentage of respondents who said they purchased all the prescribed cheese; the difference between the two groups (1.3 percentage points) is not statistically significant.[12]

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[9] If the food item had never been prescribed, a response of "not applicable" was recorded.

[10] For comparison, in a nationally representative survey of people being certified for WIC, 87.5 percent of those with prior WIC experience said they were very satisfied with available brands of prescribed cheese. See Nancy Cole *et al*., *National Survey of WIC Participants: Final Report*, Nutrition Assistance Program Report Series, Food and Nutrition Service, USDA, October 2001, Exhibit 3-66.

[11] Nationally, 98.7 percent of WIC participants say they usually purchase all their prescribed cheese (*National Surveyof WIC Participants: Final Report*, Exhibit 3-69).

[12] Significance tests were not conducted for differences in the average percentage of respondents saying they purchased "some" or "none" of the prescribed cheese. Because such tests would not be independent (of each other or the test on "all"), stricter conditions for evaluating statistical significance would have to be used. The report instead uses the usual criteria for evaluating the statistical significance of differences in the "all" category. This approach is used throughout the rest of the chapter.

Table 6-3—Satisfaction with, purchase, and consumption of cheese

	Individual States						State groups			
	CA	CT	NC	OH	OK	TX	All States	No restric-tions	Restric-tion	Group differ-ence
						Percent				
Satisfaction with brands[a]										
Very satisfied	88.6	78.2	86.6	85.5	78.9	85.6	83.6	85.9	81.2	-4.7
Somewhat satisfied	13.4	15.8	12.8	13.1	18.5	13.5	14.5	13.2	15.9	
Not satisfied	0.0	6.0	0.6	1.4	2.7	0.9	1.9	1.0	2.9	
Sample size (number)	*204*	*225*	*220*	*213*	*198*	*195*	*1,255*	*628*	*627*	
Satisfaction with package sizes										
Very satisfied	90.5	83.6	86.5	88.9	79.5	82.3	85.2			
Somewhat satisfied	9.4	13.4	11.8	9.0	18.9	13.8	12.7			
Not satisfied	0.0	3.1	1.6	2.0	1.7	3.9	2.1			
Sample size (number)	*204*	*225*	*220*	*212*	*201*	*195*	*1,257*			
Percent with prescription	91.8	93.4	89.8	96.3	90.6	86.9	91.5	91.0	92.0	1.0
Sample size (number)	*178*	*198*	*195*	*191*	*168*	*171*	*1,101*	*557*	*544*	
Amount purchased[b]										
All	99.4	94.5	92.3	97.1	94.5	94.8	95.4	94.8	96.1	-1.3
Some	0.6	5.5	7.4	2.9	3.9	3.4	4.0	4.6	3.3	
None	0.0	0.0	0.3	0.0	1.6	1.8	0.6	0.7	0.5	
Sample size (number)	*164*	*184*	*175*	*181*	*150*	*150*	*1,004*	*406*	*498*	
Amount consumed[a]										
All	87.8	71.0	78.2	79.5	72.3	84.1	78.8	80.6	77.1	-3.5
Some	11.3	27.0	21.5	19.8	26.8	15.9	20.4	19.1	21.7	
None	0.9	2.0	0.3	0.7	0.9	0.0	0.8	0.3	1.2	
Sample size (number)	*164*	*184*	*175*	*181*	*148*	*148*	*1,000*	*504*	*496*	

a A chi-square test on the difference in distribution between States with and without restrictions was statistically significant at the 0.01 level.

b A chi-square test on the difference in distribution between States with and without restrictions was not statistically significant.

Weighted estimates for States were obtained with SUDAAN software. Group estimates give equal weight to each State in the group. Totals may not sum to 100 due to rounding.

Significant differences in means and proportions between State groups are noted by * (0.05 level), ** (0.01 level).

Connecticut and Oklahoma required purchase of least expensive brand of cheese. California limited allowed types of cheese.

Source: Survey of WIC Participants.

All respondents who purchased at least some of the prescribed cheese were asked whether the WIC participants in the family ate "all," "some," or "none" of the cheese they purchased; responses are shown at the bottom of table 6-3. Respondents in States without restrictions were more likely to eat all the cheese purchased (80.6 percent) than respondents in States with restrictions (77.1 percent). The two distributions are significantly different at the 0.01 level.[13]

The direction of the difference in amount consumed is consistent with a hypothesis that food-item restrictions would reduce consumption of WIC-prescribed foods. Examination of respondents' reasons for not consuming all their purchased cheese, however, suggests that the difference in consumption was not related to the presence or absence of food-item restrictions. Table 6-4 shows the percentage of respondents giving different reasons for not purchasing or consuming all of their prescribed cheese. With only 49 respondents saying they did not purchase all of their prescribed cheese, sample sizes are too small to present State-specific results. The two group distributions in the table, however, are not significantly different from one another. The most common reason given for not purchasing cheese was that too much cheese was prescribed (64.2 percent in the restrictive States and 31.4 percent in the nonrestrictive group). Very few respondents said they did not like the prescribed cheese, and the 3.3 percentage-point difference in this response between the two groups of States (6.0 percent vs. 9.3 percent) is not statistically significant.

Recall from table 6-2 that, among all six States, an average of 8.8 percent of respondents said they preferred a federally approved type or brand of cheese that was not on their State's list of approved foods. The highest rates of binding constraints were in Oklahoma (15.7 percent) and Ohio (12.6 percent). Although the high rate in Oklahoma is consistent with that State's requirement that participants buy the least cost brand of cheese, only 5 of the 26 survey respondents in Oklahoma with a binding constraint said that they preferred a brand not on the State's list of approved cheeses. Twelve respondents in Oklahoma said they preferred a nonallowed type of cheese (especially Colby-jack), and seven indicated a preference for sliced cheese or individually wrapped cheese.

Indeed, a preference for wrapped slices of cheese was indicated by respondents with binding constraints in all States except North Carolina—the only State in the group to allow purchase of prewrapped slices. Of the 71 respondents in the six States facing a binding constraint, 23 said they wanted to buy wrapped cheese and 11 wanted to buy sliced cheese. An additional 22 preferred cheese types that were not allowed in their State, with Colby-jack being the most commonly preferred type. Only 12 respondents preferred a brand that was not allowed or not least cost. Thus, it was not the least expensive brand policies in Connecticut and Oklahoma that created binding constraints, but rather packaging restrictions and limits on the types of cheese that could be purchased.

[13] Note that these responses are conditional on at least some of the prescribed cheese being purchased. If one wanted to know the percentage of all respondents who said they both purchased and ate all their prescribed cheese, the "all" percentages in the panel on "amount consumed" would need to be multiplied by the "all" percentages in the panel on "amount purchased". In California, for example, 87.3 percent of respondents ate all the cheese that was prescribed (that is, 87.8 percent of the 99.4 percent who bought all their prescribed cheese).

Table 6-4—Reasons for not purchasing or consuming prescribed cheese

	All States[a]	No restrictions	Restriction	Group difference
		Percent		
Reasons for not purchasing some or all of prescribed item[b]				
Don't like	7.6	9.3	6.0	–3.3
Voucher expired or lost	13.6	9.0	18.2	
Too much	48.1	32.0	64.2	
Can't get to store	16.8	31.4	2.3	
Other	13.8	18.4	9.2	
Sample size (number)	*49*	*27*	*22*	
Reasons for not eating some or all of prescribed item[b]				
Don't like	20.2	22.5	17.9	–4.6
Too much	41.4	41.1	41.6	
Don't normally eat	5.9	10.8	0.9	
Consumed by others	20.9	12.9	29.0	
Other	11.7	12.7	10.6	
Sample size (number)	*197*	*97*	*100*	

a Results presented for the six States in the study. Due to small sample sizes, State-specific results are not reported.

b A chi-square test on the difference in distribution between States with and without restrictions was not statistically significant.

Weighted estimates for States were obtained with SUDAAN software. Group estimates give equal weight to each State in the group. Totals may not sum to 100 due to rounding.

Significant differences in means and proportions between State groups are noted by * (0.05 level), ** (0.01 level).

Connecticut and Oklahoma required purchase of least expensive brand of cheese. California limited allowed types of cheese.

Source: Survey of WIC Participants.

Do respondents facing binding constraints behave differently in their purchase or consumption of prescribed cheese? Table 6-5 shows the relationships between binding constraints, brand satisfaction, and the amount of cheese purchased and consumed. Compared to survey respondents who did not indicate a preferred type or brand of cheese that was restricted by the State, respondents with a binding constraint were significantly less likely to purchase their prescribed cheese. Based on the group distributions shown in the table, they also may have been less satisfied with brand choice and less likely to eat the cheese that was purchased, but the relatively small number of respondents with binding constraints causes these distributions to be not significantly different from one another.

Table 6-5—Binding constraints and participant satisfaction with and use of prescribed cheese

	Binding	Not binding
	Percent	
Satisfaction with allowed brands or types		
Very satisfied	77.1	85.7
Somewhat satisfied	15.9	12.9
Not satisfied	7.0	1.4
Sample size (number)	*71*	*931*
Amount purchased[a]		
All	88.6	96.3
Some	11.4	3.1
None	0.0	0.7
Sample size (number)	*71*	*933*
Amount consumed		
All	65.4	80.3
Some	31.8	19.2
None	2.7	0.5
Sample size (number)	*71*	*929*

a A chi-squared test on the difference in distribution between respondents with and without a binding constraint was statistically significant at the 0.05 level.

Weighted estimates were obtained with SUDAAN software. Group estimates give equal weight to each State in the group.

Totals may not sum to 100 due to rounding.

Source: Survey of WIC Participants.

Cereal

The six States in this study differed substantially in the restrictions they placed on breakfast cereals. Table 3-1 in chapter 3 shows the brands and the number of different types of cereal (for instance, Cheerios, Kix, corn flakes) that each State allowed. Both California and Oklahoma allowed fewer types of hot and cold cereal (10 to 13) than the other four States (19 to 32), and Oklahoma prohibited purchase of most nationally branded cereals.[14] In the tables that follow, California and Oklahoma form the group of States with cereal restrictions.

When asked about satisfaction with allowed brands of cereal, a cross-State average of 52.9 percent of survey respondents said they were very satisfied.[15] The average distributions of responses for States with and without restrictions are not statistically different (top panel of table 6-6). Two aspects of the table, however, are striking. First, in all six States, the level of satisfaction with allowed cereal brands

[14] In early 2001, when these data were collected, the only national cereal brands allowed in Oklahoma were Quaker and Nabisco, for hot cereals only. In July 2001, Oklahoma added four nationally branded cold cereals to its list of approved foods.

[15] Nationally, 62.3 percent of WIC participants say they are very satisfied with available cereal brands (*National Survey of WIC Participants: Final Report*, Exhibit 3-66).

was relatively low. For example, a cross-State average of only 52.9 percent of respondents were "very satisfied" with allowed brands of cereal, compared to 83.6 percent being "very satisfied" with allowed brands of cheese.[16] Second, the percentage of respondents in Oklahoma who were "very satisfied" with allowed brands was much lower (34.5 percent) than in any other State. When this percentage is compared to the average of the other five States (56.6 percent, not shown in the table), the 22.1 percentage-point difference is statistically significant at the 0.01 level.

The group of respondents who were not very satisfied with allowed brands of cereal includes the cross-State average of 10.0 percent of respondents who faced a binding constraint on cereal purchases (table 6-2).[17] Oklahoma had the highest percentage of respondents facing a binding constraint on cereal due to cost containment (19.4 percent), followed by Connecticut (15.1 percent) and North Carolina (12.7 percent). Only 5.4 percent of California respondents faced a binding constraint, suggesting that California WIC officials were effective in identifying a limited number of cereal types that satisfied the preferences of most of their WIC participants.

Among the six States, the most common binding constraint is the group of hot cereals—oatmeal, grits, and Cream of Wheat.[18] Of the 108 respondents with a binding constraint, 37 mentioned one or more of these three cereals. This preference, in fact, explains the relatively high rate of binding constraints in North Carolina. The next most common preferences, in descending order, were Kix (mentioned by 14 respondents), rice or wheat Chex (8 respondents), raisin bran (7),[19] "national brands" (7, all from Oklahoma), Total (6), Cheerios (5), and corn flakes (4). There were also a number of unique responses for specific cereals (e.g., Frosted Mini-Wheats, high-iron cereal, farina, Special K, Grapenuts).

Table 6-6 also shows levels of satisfaction with allowed package sizes. Texas specified minimum package sizes for cereal that were generally larger than in the other five States, so Texas is treated as the restrictive State with respect to packaging. These restrictions, however, are associated with higher—not lower—levels of satisfaction with package sizes in Texas than elsewhere.

About 95 percent of all respondents had cereal as part of their prescribed food package. As shown in the fourth panel of table 6-6, a cross-State average of 91.6 percent said they purchased all of their prescribed cereal, and the average distribution of amount purchased in California and Oklahoma is not significantly different from the average distribution for the other four States.[20] There is also no statistical difference between the States with and without restrictions in the amount of purchased cereal consumed (bottom panel of table 6-6).

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[16] As presented in appendix I, the cross-State percentages of respondents who were "very satisfied" with allowed brands of other foods were: 89.3 percent for milk, 79.4 percent for infant cereal, and 78.7 percent for juice. Respondents were not asked about brand satisfaction for eggs, peanut butter, or dried beans/peas.

[17] For respondents not facing a binding constraint, many expressed preferences for cereals with high sugar content, and these cereals are not federally approved for WIC.

[18] Most oatmeal does not have sufficient iron to meet Federal regulations for WIC-approved cereals. Instant oatmeal has enough iron, but it costs more than regular oatmeal. Of the six States, only Ohio allowed instant oatmeal. California and Connecticut did not allow grits, and Texas did not allow Nabisco Cream of Wheat.

[19] Most, but not all, brands of raisin bran include too much sugar to meet Federal regulations.

[20] Nationally, 96.8 percent of WIC participants say they usually purchase all the breakfast cereal prescribed for them (*National Survey of WIC Participants: Final Report*, Exhibit 3-69).

Table 6-6—Satisfaction with, purchase, and consumption of cereal

	Individual States						State groups			
	CA	CT	NC	OH	OK	TX	All States	No restric-tions	Restric-tion	Group differ-ence
						Percent				
Satisfaction with brands[a]										
Very satisfied	65.7	51.4	52.6	51.4	34.5	62.0	52.9	54.3	50.1	−4.2
Somewhat satisfied	28.4	38.7	37.3	37.3	39.8	30.0	35.2	35.8	34.1	
Not satisfied	5.9	9.9	10.2	11.4	25.7	7.9	11.8	9.8	15.8	
Sample size (number)	*206*	*230*	*222*	*213*	*203*	*197*	*1,271*	*862*	*409*	
Satisfaction with package sizes[b]										
Very satisfied	68.5	66.8	72.6	70.1	58.7	77.2	69.0	67.3	77.2	9.9*
Somewhat satisfied	22.8	25.4	22.6	22.8	32.7	16.7	23.8	25.3	16.7	
Not satisfied	8.7	7.8	4.8	7.0	8.6	6.0	7.2	7.4	6.0	
Sample size (number)	*206*	*229*	*220*	*212*	*203*	*190*	*1,260*	*1,070*	*190*	
Percent with prescription	94.8	97.5	96.1	97.2	95.4	89.7	95.1	95.1	95.1	-0.0
Sample size (number)	*178*	*198*	*196*	*191*	*167*	*171*	*1,101*	*756*	*345*	
Amount purchased[a]										
All	92.7	92.3	87.4	95.0	85.5	96.9	91.6	92.9	89.1	−3.8
Some	6.1	7.5	10.4	4.6	9.9	1.7	6.7	6.1	8.0	
None	1.1	0.2	2.2	0.4	4.6	1.4	1.7	1.0	2.9	
Sample size (number)	*167*	*189*	*189*	*183*	*158*	*155*	*1,041*	*716*	*325*	
Amount consumed[a]										
All	76.4	68.8	68.1	75.8	62.8	82.1	72.4	73.7	69.6	−4.1
Some	23.6	29.4	31.9	23.6	35.1	16.0	26.6	25.2	29.3	
None	0.0	1.8	0.0	0.6	2.2	1.8	1.1	1.1	1.1	
Sample size (number)	*164*	*187*	*183*	*181*	*153*	*153*	*1,021*	*704*	*317*	

a A chi-square test on the difference in distribution between States with and without restrictions was not statistically significant.

b A chi-square test on the difference in distribution between States with and without restrictions was statistically significant at the 0.05 level.

Weighted estimates for States were obtained with SUDAAN software. Group estimates give equal weight to each State in the group. Totals may not sum to 100 due to rounding.

Significant differences in means and proportions between State groups are noted by * (0.05 level), ** (0.01 level).

California and Oklahoma approved a relatively narrow choice of breakfast cereals; Oklahoma allowed only private-label and store brands. Texas required purchase of relatively large package sizes of cereal.

Source: Survey of WIC Participants.

As with attitudes about brand satisfaction, cereal use by respondents in Oklahoma differed from that in California, the other State with restrictions. Of the six States, Oklahoma had the lowest percentages of respondents buying all their prescribed cereal (85.5 percent) and eating all their purchased cereal (62.8 percent). When these values are compared to the averages for the other fives States (92.9 percent for purchase and 74.3 percent for consumption, not shown in the table), the differences equal 7.4 and 11.5 percentage points, respectively. Both of these differences are statistically significant at the 0.05 level.

Among those respondents who did not purchase all the prescribed cereal, the most common reason given (a six-State average of 40.5 percent) was that "too much" was prescribed (top panel of table 6-7). The distributions of reasons for not buying all the cereal are not statistically different for the two groups of States, nor is the average percentage of respondents saying that taste was the reason for not buying the cereal. There is also no statistical difference in the distributions of reasons given for not eating all of the cereal purchased (bottom panel of table 6-7).

Table 6-7—Reasons for not purchasing or consuming prescribed cereal

	All States[a]	No restrictions	Restriction	Group difference
		Percent		
Reasons for not purchasing some or all of prescribed item[b]				
Don't like	24.0	25.4	21.2	–4.2
Voucher expired or lost	11.7	9.1	16.8	
Too much	40.5	45.0	31.5	
Other	23.8	20.4	30.6	
Sample size (number)	*91*	*63*	*28*	
Reasons for not eating some or all of prescribed item[b]				
Don't like	24.4	23.7	25.8	2.2
Too much	2.6	2.5	3.0	
Don't normally eat	8.9	9.8	7.0	
Consumed by others	41.9	40.4	44.8	
Other	22.2	23.6	19.3	
Sample size (number)	*284*	*199*	*85*	

a Results presented for the six States in the study. Due to small sample sizes, State-specific results are not reported.

b A chi-square test on the difference in distribution between States with and without restrictions was not statistically significant.

Weighted estimates for States were obtained with SUDAAN software. Group estimates give equal weight to each State in the group. Totals may not sum to 100 due to rounding.

Significant differences in means and proportions between State groups are noted by * (0.05 level), ** (0.01 level).

California and Oklahoma approved a relatively narrow choice of cereals; Oklahoma allowed only private-label and store brands.

Source: Survey of WIC Participants.

When one compares respondents with and without a binding constraint for cereal, as in table 6-8, respondents with a binding constraint were less satisfied with allowed brands than other respondents, but this reduced satisfaction did not carry over into purchase or consumption behavior. Chi-squared tests on the bottom two sets of distributions in the table indicate no statistically significant differences.

Table 6-8—Binding constraints and participant satisfaction with and use of prescribed cereal

	Binding	Not binding
	Percent	
Satisfaction with allowed brands or types[a]		
Very satisfied	39.0	54.4
Somewhat satisfied	52.1	35.2
Not satisfied	8.9	10.5
Sample size (number)	*108*	*929*
Amount purchased		
All	84.2	92.4
Some	11.8	6.0
None	4.0	1.6
Sample size (number)	*108*	*933*
Amount consumed		
All	76.2	72.2
Some	17.8	26.8
None	5.9	1.0
Sample size (number)	*105*	*916*

a A chi-square test on the difference in distribution was statistically significant at the 0.05 level..

Weighted estimates were obtained with SUDAAN software. Group estimates give equal weight to each State in the group.

Totals may not sum to 100 due to rounding.

Source: Survey of WIC Participants.

Summary of Findings

For the six States included in this study, food-item restrictions designed to reduce WIC food package costs did not have much effect on WIC participants' satisfaction with prescribed foods, or on their purchase and consumption of these foods. Nevertheless, as presented in this chapter and appendix I, there are several exceptions to this general finding. Oklahoma's restriction against purchase of national brands of breakfast cereal reduced satisfaction with allowed brands in the State, and respondents in Oklahoma purchased and consumed less of their prescribed cereal than respondents in the other States. The State's use of a least cost policy for dried beans/peas also appears to have reduced consumption. Finally, restrictions that were binding on respondents affected their satisfaction with allowed brands of cheese and cereal, but the impacts on purchase and consumption decisions were mixed.

When asked why they did not purchase all of the WIC food prescribed for them, or eat or drink all the food they purchased, survey respondents provided a variety of reasons. Not liking the food item was mentioned by some respondents, but other reasons were given more frequently. This suggests that cost-containment practices limiting types and brands of allowed foods were usually not the main reason survey respondents did not buy or consume all of their prescribed food.

Among the other reasons given for not buying or consuming all the prescribed food, common responses were that too much was prescribed or that some of the purchased food was consumed by non-WIC members of the family. This may suggest that, for some WIC participants, the program is overprescribing certain foods—an issue of concern to some WIC officials.[21] Given that this research was not designed to examine the appropriateness of prescription amounts, however, one should treat the evidence as suggestive rather than conclusive.

A list follows of the primary findings with respect to each of the food categories examined.

Cheese

- Connecticut and Oklahoma imposed least cost restrictions on cheese, and California limited the number of allowed types of cheese.
- The presence of restrictions on cheese was not related to brand satisfaction or amount purchased.
- Consumption of purchased cheese was lower in the restricted than in the nonrestricted States, but the evidence suggests that factors unrelated to restrictions account for the difference in consumption. Factors cited most frequently were that the WIC food instrument was lost (or had expired) and that "too much" cheese had been prescribed.
- State restrictions on brand, type, and packaging of cheese were binding on a State average of 8.8 percent of survey respondents, with the highest rates in Oklahoma (15.7 percent) and Ohio (12.6 percent). Respondents with a binding restriction were, on average, less satisfied than others with allowed brands of cheese, less likely to buy their prescribed cheese, and less likely to eat the cheese they bought

Cereal

- California and Oklahoma imposed relatively stringent restrictions on the brands or types of cereal that could be purchased. California limited the number of allowed types of cereal, and Oklahoma limited most cereals to store-brand or private label.
- When the average distribution of respondent satisfaction in California and Oklahoma is compared to the average distribution in the other four States, there is no significant difference in the two distributions.
- There is no significant difference in the distributions of amount of cereal purchased between States with and without restrictions on cereal types and brands.

[21] The National Association of WIC Directors (NAWD) has issued a position paper, "NAWD WIC Food Prescription Recommendations" that calls for a reduction in the maximum quantity of milk and protein-rich foods prescribed for children (undated).

- Similarly, the presence of cereal restrictions was not related to the amount of cereal consumed.
- If Oklahoma is defined as the only State with cereal restrictions, then satisfaction with allowed brands was significantly lower in Oklahoma than elsewhere, as was purchase and consumption of cereal. In July 2001, after data for this study were collected, Oklahoma added four nationally branded cereals to its list of approved foods.
- State restrictions on cereal were binding on a State average of 10.0 percent of survey respondents, with the highest rates in Oklahoma (19.4 percent), Connecticut (15.1 percent), and North Carolina (12.7 percent). Respondents with a binding restriction were, on average, less satisfied than others with allowed brands of cereal and somewhat less likely to buy their prescribed cereal. They were not, however, less likely to eat the cereal they purchased.

Dried Beans or Peas

- Oklahoma was the only State in the study that imposed a least cost restriction on the purchase of dried beans or peas.
- The restriction has no impact on the amount of dried beans/peas purchased.
- The restriction appears to have reduced the amount of purchased dried beans/peas that was eaten.

Milk

- Connecticut, North Carolina, Oklahoma, and Texas imposed least cost restrictions on milk.
- The presence of restrictions was not related to brand satisfaction.
- The percentage of respondents purchasing all their prescribed milk was not related to the presence of least cost restrictions.
- The percentage of respondents drinking all their purchased milk was lower in the States with restrictions than in the nonrestrictive States, but the evidence suggests that factors other than brand dissatisfaction accounted for this difference. The factor cited most often by respondents was that "too much" milk was prescribed.

Eggs

- Connecticut and Oklahoma imposed least cost restrictions on the purchase of eggs.
- The restrictions had no impact on amount purchased.
- There was less consumption of purchased eggs in the restricted States, but apparently not because of the imposed restrictions. The most commonly cited factor for not eating all the purchased eggs was that too much was prescribed.

Infant Cereal

- Three States—California, Connecticut, and Texas—restricted purchases of infant cereal to a single brand.

- This brand restriction was binding on almost no WIC participants in these three States.
- The brand restriction was not related to levels of brand satisfaction or amount of prescribed infant cereal that was purchased.
- The brand restriction did not reduce the amount of infant cereal consumed.

Juice

- Four States—California, Connecticut, Oklahoma, and Texas—imposed restrictions on either the brand or type of juice that could be purchased.
- The State restrictions had no impact on expressed levels of satisfaction with approved brands, nor did they reduce the amount of prescribed juice that was purchased.
- The presence of restrictions on juice was not related to the amount of purchased juice that was consumed.
- State restrictions were binding on a State average of 6.9 percent of survey respondents, with the highest rates in California (13.3 percent) and Texas (12.1 percent). These binding restrictions, however, did not affect satisfaction with allowed brands or the purchase or consumption of prescribed juice.

Peanut Butter

- Connecticut imposed a least cost restriction on the purchase of peanut butter.
- The restriction had no impact on the amount of peanut butter purchased.
- The restriction had no impact on the amount of purchased peanut butter that was consumed.

Overall, the food-item restrictions imposed in these six States created some binding constraints and lowered participant satisfaction with allowed brands in some instances. In general, however, satisfaction with allowed brands and packaging was high, and purchase and consumption of prescribed foods were not affected by the restrictions.