

Perspectives in Practice

Participants' Comments on Changes in the Revised Special Supplemental Nutrition Program for Women, Infants, and Children Food Packages: The Maryland Food Preference Study

MAUREEN M. BLACK, PhD; KRISTEN M. HURLEY, PhD; SARAH E. OBERLANDER, PhD; ERIN R. HAGER, PhD; ADRIENNE E. MCGILL, MHS; NNEKA T. WHITE, MSW; ANNA M. QUIGG, MA

ABSTRACT

The Institute of Medicine recommended changes in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) food packages to help families from diverse populations establish more healthful dietary patterns. A cross-sectional study conducted during summer 2007 included interviews and focus groups with 223 WIC participants throughout Maryland. The objectives were to examine participants' responses to food package changes, to identify racial/ethnic differences, and to assess costs. All participants (100%) consumed fruits and vegetables. They preferred fresh for taste, but many endorsed canned and frozen for convenience and cost. Most women (56%) and children (69%) consumed whole milk and did not want reduced-fat milk. Few participants (13%) consumed soy products and most were uninterested in future consumption. Participants endorsed whole-wheat bread as more healthful and reported that they (59%) and their children (51%) would increase consumption if provided by WIC. Non-Hispanic participants preferred peanut butter over beans, Hispanic participants reported that they (44%) and their children (57%) would consume more beans (substituting for peanut butter) if provided by WIC. There were few differences in preferences between African-American and white participants. Hispanics differed from non-Hispanics in preference for beans and dislike of frozen and canned vegetables, suggesting the importance of choices. The proposed food packages were cost-neutral, except when exten-

sive substitutions with soy products were allowed. By providing fruits and vegetables, reduced-fat options, and increased opportunities for nutrition education, the revised food packages may reduce the risk of obesity among low-income women, infants, and children.

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The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is the largest supplemental food program in the United States, providing food, nutrition counseling, and health referrals to more than 8 million low-income pregnant and postpartum women, infants, and children up to age 5 years (1). WIC has been effective in reducing low birth weight and iron deficiency (2-6), two primary goals associated with initiation of the program in 1974 (1). During the past 30 years many changes have influenced the nutrition needs of low-income women and children. Energy intakes often exceed energy requirements and fruit and vegetable consumption is low among WIC participants (7). Obesity has become a major public health problem (8,9), there are advances in knowledge regarding nutrition and children's feeding behavior (10-12), the national food supply has expanded, cultural diversity in the US population has increased (13,14), and the dietary patterns of US families have changed (7-10). To address the changing nutritional needs of the WIC population, the Institute of Medicine of the National Academy of Sciences reviewed the WIC food packages and recommended specific changes (15).

The Institute of Medicine developed criteria for the revisions to the food packages, including reduction of inadequate and excessive nutrient intake, adherence to Dietary Guidelines, promotion of breastfeeding, inclusion of available and affordable foods for low-income families, attention to culturally acceptable foods, and consideration of the effects of changes on vendors and WIC agencies (15). The recommended food packages promote breastfeeding by increasing the variety and quantity of food provided to breastfeeding mothers and their infants and providing baby food meats for fully breastfed infants to prevent iron deficiency. For older infants (aged 6 to 11 months), 100% juice is replaced with commercial baby food fruit and vegetables. For children (aged 1 to 4 years), 100% juice is partially replaced with a voucher for fruits and vegetables, the amount of milk and eggs is decreased,

M. M. Black is a professor, K. M. Hurley is an assistant professor, S. E. Oberlander is a postdoctoral fellow, E. R. Hager is a research coordinator, A. E. McGill and A. M. Quigg are project coordinators, and N. T. White is a research assistant, Department of Pediatrics, University of Maryland School of Medicine, Baltimore.

Address correspondence to: Maureen M. Black, PhD, University of Maryland School of Medicine, Department of Pediatrics; 737 W. Lombard St, Room 161, Baltimore, MD 21201. E-mail: mblack@ped.s.umd.edu

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whole-fat dairy products are reduced, and variety is added through whole grains and canned beans. There are similar changes for pregnant and postpartum women.

The Institute of Medicine recommended that pilot tests be conducted before implementation of the revised food packages to understand how participants view them and to incorporate recommendations from participants into state-level decisions. There were three study objectives: to examine WIC participants' current food preferences and responses to anticipated changes, to assess whether responses varied by race/ethnicity, and to examine the costs of the proposed WIC food packages.

METHODS

Study Sample and Procedures

Data were collected during summer 2007 from seven WIC clinics in five ethnically and geographically diverse counties in Maryland. Participants were approached by interviewers and invited to take part in individual interviews or focus groups. Eligibility criteria included WIC participation, age at least 18 years, English- or Spanish-speaking, and either pregnant or the primary caregiver to a WIC-enrolled infant or child. Participants were assured of confidentiality and WIC staff was not present during the interviews or focus groups.

A cost analysis of WIC foods was conducted in two WIC-approved stores in each county. Visits were made to grocery stores most frequently used by WIC participants.

The protocol was approved by Institutional Review Boards from the Maryland Department of Health and Mental Hygiene and the University of Maryland School of Medicine. All participants signed Informed Consent Forms and were compensated with a \$10 gift card. All materials were written in English and Spanish. Bilingual interviewers were available and interviews and focus groups were conducted in the preferred language of the participants.

Six focus groups (four English and two Spanish) were conducted by graduate students in social work who had training and supervision in qualitative methods. Each focus group included a transcriber who systematically recorded the participants' comments for subsequent analysis.

Measures

Demographic Questionnaire. Background characteristics were collected on maternal age and education, age of the target child, and household composition.

Food Questionnaire. Following guidelines from Gibson (16), a self- or interviewer-administered food frequency questionnaire was developed that included WIC-approved foods on the existing and revised food packages. Participants were asked if they ate specific foods and the frequency of their consumption (daily, four to five times per week, two to three times per week, once per week, or less than once per week). Participants were also asked if their consumption of specific foods would increase if provided by WIC. Three forms of the food questionnaire were designed, corresponding to the WIC food packages: pregnant, breastfeeding, and postpartum women; infants (aged 6 to 11 months); and children (aged 1 to 4 years).

The emphasis was on women, older infants, and children because most proposed changes occurred within these food packages. If a woman and her child(ren) both received a WIC food package, the mother chose which questionnaire to complete. To reduce the problem of under- or overreporting inherent in food frequency questionnaires (17), interviewers were trained to probe and questionnaires were reviewed before the conclusion of the interview.

Grocery Store Inventory. An inventory of WIC foods was developed based on all WIC food packages. The inventory included size, brand, and price (most and least expensive) for each WIC-approved food.

Focus Group. Ethnographic field guides were developed following guidelines from the food questionnaires, but using open-ended questions (18). Participants were encouraged to discuss reasons behind their food preferences and reactions to the anticipated changes in the food packages.

Statistical Analysis

Data from the interviews were organized by respondent: pregnant, breastfeeding, and postpartum women; infants; and children. Data were reviewed for accuracy and completeness, double entered into QDS (version 2.5, 2006, NOVA Research Co, Bethesda, MD), and converted to analytical software. Within each group, descriptive analyses were used to examine participants' consumption of specific foods and responses to proposed changes in the food packages.

Data from the focus groups were transcribed and entered into a word processing program. Investigators read the transcripts and identified emerging themes, focusing on responses to questions, probes from the ethnographic guides, and topics raised by the participants. Using a matrix-based approach (19), responses within and across participants were compared and commonalities identified. Representative quotes were chosen to clarify or explain the findings and aid in interpretation (20).

To examine whether there were differences by race/ethnicity, χ^2 analyses were conducted comparing responses by non-Hispanic whites, African Americans, and Hispanics. A *P* value of <0.05 was considered statistically significant. All analyses were conducted using SPSS (version 15, 2006, SPSS Inc, Chicago, IL).

To analyze the costs of food package revisions, data from the grocery inventories were combined. The average cost of each food package (child, pregnant/partially breastfeeding, postpartum/non-breastfeeding, exclusively breastfeeding) was calculated by averaging the lowest and highest price of each food in the package. A cost comparison between current and proposed (with and without substitutions) food packages was done.

RESULTS

Demographic Characteristics

A total of 286 individuals were approached. Of the eligible participants (*n*=257), 34 (13.2%) refused primarily due to time constraints, 187 completed the interview, and 36 participated in focus groups. The sample was ethnically diverse: 39% were white; 35% were African American;

18% were Hispanic; and 12% were Asian, another race, or undeclared. The women's age ranged from 18 to 64 years (mean 28 years). Nearly one third (31%) lived in rural locations, 28% lived in suburban locations, and 41% lived in urban locations. The majority (82%) had finished high school or obtained a General Educational Development degree, 40% had attended college/vocational school, and nearly half (47%) were employed. Thirty-seven percent were married and more than half (55%) resided with the biological father of a child enrolled in WIC. The participants had an average of two children (range zero to seven children).

Sixty-eight percent of women had moved at least once during the past year. Most women (79%) were receiving medical assistance for their child and approximately one third (32%) were receiving medical assistance for themselves. Thirty-two percent were receiving food stamps and 9% were receiving Temporary Cash Assistance (often referred to as Temporary Assistance to Needy Families).

Most questionnaires were completed in English (85%), rather than Spanish, and were interviewer administered (69%), rather than self-administered. Approximately one quarter (29%) of women completed the "mother" interview; 33% were pregnant, 56% were postpartum/not currently breastfeeding, and 11% were currently breastfeeding. Twenty-one percent of women completed the "infant" interview; 23% were currently breastfeeding. Half (49%) completed the "child" interview.

Fruits and Vegetables

The revised WIC food packages would limit 100% juice and include commercial baby food fruits and vegetables for older infants and cash-value vouchers (for fresh, canned, dried, or frozen fruits and vegetables) for women and children (15). Based on interview data, all mothers and children consumed fruits (including 100% juice) and vegetables. Fresh fruits and vegetables were most popular, but many also consumed frozen and canned varieties (Table 1). Nearly all infants consumed fruits and vegetables, commonly in the form of commercial baby foods (Table 1). Vegetable consumption differed significantly by race/ethnicity: African Americans were the least likely to consume fresh vegetables ($\chi^2=6.5$, $P<0.05$) and Hispanics were the least likely to consume frozen ($\chi^2=10.0$, $P<0.01$) and canned ($\chi^2=18.1$, $P<0.001$) vegetables (Table 2).

Findings from the focus groups were consistent with interview data. The women reported that cost and taste influenced their choice of fruits and vegetables. They endorsed fresh fruits and vegetables as being the most healthful options. Some women reported purchasing frozen or canned fruits and vegetables, primarily associated with preparation convenience. Many women reported that they tried to abstain from purchasing canned fruits and vegetables due to the "canned taste" and did not feel comfortable feeding canned products to their children. Many women stated that they would purchase more fruits and vegetables (fresh, frozen, canned, or jarred) if WIC provided vouchers.

Milk and Milk Alternatives

The revised WIC food packages would provide reduced-fat (2%), low-fat (1%), or nonfat milk and milk alternatives (ie, reduced-fat cheese, calcium-rich soy beverages, and tofu) for women and older children (aged 2 to 4 years) (15). The majority of mothers (67%) and children (82%) consumed milk every day. More than half of women and 70% (45/64) of children between 2 and 4 years of age consumed whole milk (Table 1). Although 44% purchased reduced-fat milk, many women did not want to switch to low-fat or non-fat milk. Based on focus group data, many women who drank whole milk believed that reduced-fat milk would be "too watered down." Milk consumption differed significantly by race/ethnicity. Whites were less likely to drink whole milk than African Americans ($\chi^2=4.5$, $P<0.05$) and African Americans were less likely to consume low-fat or non-fat milk than whites or Hispanics ($\chi^2=12.5$, $P<0.01$) (Table 2).

Most women consumed cheese, but few reported eating reduced-fat varieties (Table 1). Women in focus groups reported they did not purchase reduced-fat cheese and would only purchase reduced-fat cheese if they were no longer able to receive regular cheese from WIC.

Very few women and children consumed tofu (6% and 3%, respectively) or soy beverages (12% and 9%, respectively) and few expressed interest in getting them from WIC. However, more than one-fourth said they would give their children tofu if they received it from WIC (Table 1). Focus group data revealed that most women were unfamiliar with tofu. After being told that tofu was made from soy beverages, some focus group participants expressed an interest in learning to cook tofu. However, the majority of the women remained uninterested.

Whole Grains

The revised WIC food packages for children and fully/partially breastfeeding women would provide additional whole-grain options such as whole-wheat bread, brown rice, corn tortillas, oatmeal, and barley (15). Bread was consumed by nearly all women and children. White bread was more popular than whole-wheat bread, but approximately half of women and children consumed whole-wheat bread (Table 1). Nearly half of women and children consumed brown rice (45% and 42%, respectively), corn tortillas (47% and 47%, respectively) and oatmeal (49% and 62%, respectively), but very few reported consuming barley (6% and 7%, respectively), bulgur (2% and 0%, respectively), and whole-wheat tortillas (13% and 12%, respectively). In focus groups, women reported that they would purchase more whole-wheat bread and whole grains if WIC offered them because they would not have to pay for them out of pocket and because whole grains are more healthful. However, some women said they did not know if their bread is whole grain or not.

Legumes and Peanut Butter

Canned beans would be provided as an alternative to dry beans and peanut butter in the revised WIC food packages to increase appeal to diverse populations (15). Approximately half of women and children consume the dry beans currently provided by WIC (Table 1). Dry bean consumption

Table 1. Foods in the proposed Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) packages consumed by mothers and children^a

Foods	Mothers n=55		Children n=92		Infants n=40	
	n	%	n	%	n	%
Fruit	55	100	90	100	37	97
Fresh	55	100	89	100	24	62
Frozen	13	25	9	10	1	3
Canned	31	57	69	78	10	26
Would eat more fruits if WIC provided	38	76	61	70	—	—
100% fruit juice	52	96	91	100	—	—
Baby food fruits	—	—	—	—	31	84
Would give more baby food fruits if WIC provided	—	—	—	—	21	57
Would give more fresh bananas if WIC provided	—	—	—	—	15	40
Vegetables	53	98	90	99	40	100
Fresh	50	94	80	90	23	59
Frozen	42	79	57	65	6	15
Canned	41	77	67	76	11	28
Would eat more vegetables if WIC provided	33	63	58	67	—	—
Baby food vegetables	—	—	—	—	33	85
Would give more baby food vegetables if WIC provided	—	—	—	—	16	41
Milk	53	98	87	97	—	—
Whole	31	56	61	69	—	—
Reduced-fat (2%)	24	44	26	29	—	—
Low-fat (1%)	5	9	5	6	—	—
Non-fat	5	9	3	3	—	—
Would drink more reduced-fat milk if WIC provided ^b	7	13	9	16	—	—
Tofu	3	6	3	3	—	—
Would eat more tofu if WIC provided	5	12	21	29	—	—
Soy beverages	6	12	8	9	—	—
Would drink more soy beverages if WIC provided ^b	8	18	15	31	—	—
Bread	53	98	89	98	—	—
White	39	72	74	83	—	—
Whole wheat	29	54	44	49	—	—
Would eat more whole-wheat bread if WIC provided	31	59	45	51	—	—
Would eat more whole grains if WIC provided	28	64	47	55	—	—
Dry beans	29	55	54	59	—	—
Canned beans	31	60	50	56	—	—
Would eat more beans if WIC provided	21	44	32	40	—	—
Peanut butter ^b	40	77	45	73	—	—
Reduced-fat peanut butter	12	25	12	25	—	—
Would eat more reduced-fat peanut butter if WIC provided	21	18	11	19	—	—
Would eat less peanut butter if WIC provided a canned bean alternative	21	44	35	57	—	—
Cheese	52	96	—	—	—	—
Reduced-fat cheese	6	12	—	—	—	—
Would eat more reduced-fat cheese if WIC provided	12	24	—	—	—	—
Canned fish	28	52	—	—	—	—
Would eat more fish if WIC provided canned sardines and salmon	27	33	—	—	—	—
Baby food meats	—	—	—	—	15	38
Non-baby-food meats	—	—	—	—	14	36
Would give more plain jarred baby food meats if WIC provided	—	—	—	—	10	32

^aSample sizes varied slightly by variable due to skip patterns in questionnaire.

^bIf child was less than age 2 years, participants were instructed to skip questions about lower-fat milk (nonfat, 1%, and 2%), soy beverage, and peanut butter. Percentages are based on smaller sample.

was significantly higher among Hispanics than whites or African Americans ($\chi^2=10.1, P<0.01$) (Table 2). Nearly half of participants would purchase more canned beans (and substitute them for peanut butter) if provided by WIC (Ta-

ble 1). Hispanics were significantly more likely than whites or African Americans to report that if WIC provided canned beans, they would be willing to receive less peanut butter ($\chi^2=17.5, P<0.001$) (Table 2).

Table 2. Race/ethnic differences in food consumption by Maryland Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) participants

Food	Total ^a N=165		White n=70		African American n=62		Hispanic n=33	
	n	%	n	%	n	%	n	%
Fresh vegetables*	135 ^b	83	61 ^y	88	45 ^{yz}	74	29 ^z	91
Frozen vegetables**	95 ^b	59	44 ^y	65	40 ^z	66	11 ^{yz}	34
Canned vegetables***	106 ^b	66	52 ^y	77	43 ^z	71	11 ^{yz}	34
Whole milk*	81 ^c	65	28 ^y	54	35 ^y	75	18	69
Nonfat or low-fat (1%) milk**	15 ^c	12	12 ^y	23	0 ^{yz}	0	3 ^z	12
Beans**	73 ^c	57	26 ^y	48	25 ^z	53	22 ^{yz}	87
Peanut butter***	73 ^c	73	36 ^y	90	30 ^z	81	7 ^{yz}	30
If WIC provided canned beans, willing to get less peanut butter***	47 ^c	49	12 ^y	31	16 ^z	47	19 ^{yz}	86

^aThe sample was reduced by participants who refused to report their race/ethnicity (n=8), reported race/ethnicity of Asian (n=6) or other (n=8), leaving an analysis sample of n=165. Differences in sample size between food items reflect different WIC food package provisions.

^bResponses were reported for mothers (n=55), children (n=92), and infants (n=40).

^cResponses were reported for mothers (n=55) and children (n=92).

^{y,z}Identical superscripts (^{y,z}) indicate statistically significant differences.

*P<0.05.

**P<0.01.

***P<0.001.

Most women and children consumed peanut butter (77% and 73%, respectively). Reduced-fat peanut butter is not a requirement; few participants reported consuming reduced-fat peanut butter or that they would eat more reduced-fat peanut butter if WIC provided it (Table 1). Peanut butter consumption was significantly lower among Hispanics than whites or African Americans ($\chi^2=28.2$, $P<0.001$) (Table 2). During the focus groups women said they did not purchase reduced-fat peanut butter because they believed it did not taste as good as regular peanut butter and they regarded purchasing reduced-fat as suggesting being on a diet. One focus group participant stated, "I don't need to lose weight" and another woman said, "[I] want all the fat in my food." The women were not interested in receiving reduced-fat peanut butter from WIC.

Canned Fish and Baby Food Meat (Fully Breastfeeding/Breastfed)

The revised WIC food package for fully breastfeeding women would provide additional types and amounts of canned fish (15). Approximately half of women consumed canned fish (Table 1). One third of all women, and 67% of breastfeeding women would eat more canned fish if WIC provided salmon and sardines.

The revised package for fully breastfed, older infants would provide commercial baby food meats to supplement intakes of iron. More than one-third of women, and 44% of breastfeeding women, offered baby food meat to their infants (Table 1). In addition, one third of women offered non-baby-food meat. Among those who did not offer baby food meat, 71% said they would give it to their infant if provided by WIC. One third of all participants with infants said they would give more baby food meat if WIC provided it.

Cost of WIC Food Packages

For children and postpartum/nonbreastfeeding women, the costs of the current and proposed food packages are similar (Table 3), except in the case of extensive substitutions, which include soy beverages and tofu for milk and cheese. For pregnant and breastfeeding women, the costs of the current and restrictive food packages (no substitutions of cheese for milk) are similar. Costs for basic and limited substitutions are slightly higher (between 7% and 15%) than the current package and costs for extensive substitutions (soy beverages and tofu) are substantially higher (between 37% and 43%).

DISCUSSION

This study yielded six major findings. First, participants reported frequent consumption of fresh (preferred), frozen, and canned fruits and vegetables. They were pleased that fruit and vegetable vouchers were being added to the food packages and they reported that fruit and vegetable consumption for themselves and their children would increase. These findings are consistent with results of a study examining the effectiveness of providing fruits and vegetable to WIC participants in Los Angeles, CA (21,22). Overall vegetable consumption did not differ by race/ethnicity, but preference for fresh, frozen, or canned did, suggesting that food packages should include multiple choices.

Consumption of fruits and vegetables is necessary in establishing healthful dietary and growth patterns (23,24). Contrary to the current findings, many women, infants, and children do not routinely consume fruits and vegetables (10,12,24,25). In addition, fruit and vegetable consumption and dietary variety decline from infancy to toddlerhood as children phase out of commercial baby food and into the family diet (Hurley KM, Black MM,

Table 3. Cost comparison of Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) food packages by participant status and current vs proposed (including restrictive, limited, and extensive substitutions)

Food Package	Children (1-4 y) ^a	Pregnant/Partially Breastfeeding ^b	Postpartum/Nonbreastfeeding ^c	Exclusively Breastfeeding ^d
Current WIC Food Package ^e	\$54.92	\$51.56	\$48.23	\$72.48
Proposed WIC Food Package: Basic ^f	\$50.43	\$58.02	\$45.78	\$77.77
Proposed WIC Food Package: Restrictive ^g	\$44.77	\$51.33	\$40.13	\$72.12
Proposed WIC Food Package: Limited ^h	\$50.39	\$59.08	\$49.26	\$78.95
Proposed WIC Food Package: Extensive ⁱ	\$60.16	\$73.59	\$67.58	\$95.70

^aWIC Food Package II (includes children aged 1 through 4 years).
^bWIC Food Package V (includes pregnant and partially breastfeeding women).
^cWIC Food Package VI (includes nonbreastfeeding postpartum women).
^dWIC Food Package VII (includes exclusively breastfeeding women).
^eCurrent food package is based on the WIC Food Package—Maximum Monthly Allowances listed on the US Department of Agriculture Food and Nutrition Service Web site (www.fns.usda.gov/wic/benefitsandservices/foodpkgtable.htm).
^fProposed food package is based on the WIC Food Package—Maximum Monthly Allowances changes listed in the August 7, 2006, version of the US Department of Agriculture Federal Register 7 CFR Part 246.
^gProposed food package with restrictive substitutions (ie, participant not allowed to substitute cheese for milk).
^hProposed food package with limited substitution (ie, canned beans for dry beans, whole grains for whole-wheat bread).
ⁱProposed food package with extensive substitutions (ie, soy beverages and tofu for milk).

unpublished data, December 15, 2007). One possible explanation for the strong endorsement of fruits and vegetables in the current sample is the nutrition education all participants receive from WIC. The findings on women's enthusiasm regarding fruits and vegetables, in addition to recent evidence on the beneficial effects of providing fruit and vegetable subsidies to WIC participants (26) suggest that providing vouchers and emphasizing fruits and vegetables through nutrition education should enhance dietary variety and fruit and vegetable consumption.

Second, most infants in this low-income sample consume commercial baby foods. These data are consistent with nationwide findings that approximately 85% of infants consume commercial baby foods (10). During later infancy (age 6 to 11 months), consumption of fruits and vegetables is essential to the development of healthful dietary and growth patterns (23,27) and the consumption of meat prevents iron deficiency (28,29). The high prevalence of commercial baby food consumption suggests that baby food fruit, vegetables, and meats are culturally acceptable and readily available in grocery stores.

Third, participants are not in favor of reduced-fat options. Their choice appeared to be motivated by taste and the perception that only those who are overweight or on a diet need to choose reduced-fat products.

Fourth, women prefer white bread over whole-grain bread. Although there is a willingness to purchase whole-grain bread if provided by WIC, there is confusion over the labeling of whole-grain options. Most Americans consume only about half the recommended daily amount of fiber (30,31), demonstrating the need for WIC's nutrition education to emphasize the health benefits of whole-grain products. For example, fiber consumption was increased among WIC participants through a multifaceted nutrition education intervention (32).

Fifth, most breastfeeding women said they would eat more canned fish if WIC provided vouchers. Fish consumption increases the n-3 fatty acids in breastmilk,

potentially promoting infants' brain, eye, and nerve development (33). Increasing the variety and quantity of canned fish (that do not pose mercury hazards) (34) may encourage breastfeeding and benefit infants.

Sixth, for the most part, the revised food packages were cost-neutral in comparison to the current packages, with slightly higher costs for breastfeeding mothers. However, the costs were substantially higher when extensive substitutions, including soy products, were permitted. In Maryland, participants were not interested in the provision of soy products, suggesting that the Maryland WIC program could exclude the extensive substitutions and maintain cost-neutrality. Analysis of costs is complicated by recommendations that states provide the maximum amount of each food in the revised packages.

Methodological Considerations

Several methodological issues should be considered in interpreting the data. First, there is the possibility of recall error when using self-report dietary recall (16). However, several strategies were introduced to reduce the possibility of recall error, including training the interviewers to probe, monitoring the questionnaires before the conclusion of the interview, and incorporating both interview and focus group data. Second, this cross-sectional study was conducted during one season (summer), thus providing data from a single time point when fruits and vegetables are in abundance. Third, although the sites were chosen to provide relatively wide diversity across the state, the participants were a convenience sample of caregivers recruited from WIC clinics and may not be representative of WIC participants nationally. Fourth, the food questionnaire was designed specifically for this study and does not have demonstrated psychometric properties. However, two data collection methods were employed (individual interviews and focus groups) and the questionnaire captured information specific to the current and proposed WIC food packages. Finally, the

investigation addressed potential changes to the foods offered in the revised food packages, but it did not query participants about reductions in WIC-approved foods, including formula, 100% juice, or eggs. It is possible that participants' enthusiasm may be tempered when they consider the reductions that will be made to pay for new foods.

Future Recommendations

Several recommendations emerge from this investigation. First, the WIC nutrition education program should be updated to help participants make informed decisions about WIC-approved foods. For example, proposed restrictions on access to whole milk among normal or overweight women and children older than age 2 years might provide opportunities for WIC to promote decreased dietary fat consumption. Taste tests may be particularly important to introduce participants to reduced-fat options. Second, further research should be done after the proposed changes have been implemented to assess the impact of the overall revised packages, not just the acceptance of individual foods. Third, other WIC agencies need to evaluate their participants' food preferences and local food costs to determine implementation strategies.

CONCLUSIONS

The home environment is critical in establishing children's dietary behavior (28,35,36). Because mothers and toddlers often eat the same foods (25), mothers who make healthful choices are likely to impart healthful eating habits to their children. The enthusiasm and anticipation of the WIC participants surveyed suggest that many of the foods will be welcomed, potentially providing more healthful dietary choices and reducing the risk of obesity among low-income women, infants, and children.

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