# What's on the menu? An evaluation of the foods served in Federally-subsidized child care homes

Bridget Igoe

A thesis
submitted in partial fulfillment of the
requirements for the degree of

Master of Public Health

University of Washington
2012

Committee:
Donna Johnson
Pablo Monsivais

Program Authorized to Offer Degree:
Nutritional Sciences

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## Acknowledgements

The author wishes to express sincere appreciation to the University of Washington Nutritional Sciences Department for its support, and especially to Professors Donna Johnson and Pablo Monsivais for their vast reserves of inspiration, motivation, and expertise. This thesis would never have been completed without the encouragement and devotion of my family and friends.

# Introduction

### *The Child and Adult Care Food Program*

The Child and Adult Care Food Program (CACFP) of the U.S. Department of Agriculture (USDA) provides federal funds for meals and snacks served to children and adults in licensed day care facilities. Facilities include family and group child care homes ("Homes"), child care centers, Head Start programs, after-school programs, and adult day care centers [1]. During the 2011 fiscal year, nearly 3.2 million children nationwide received meals and snacks in child care programs participating in CACFP, at a cost of almost $2.6 billion [2]. The CACFP issues monetary reimbursements to child care providers for the meals and snacks they serve to children. The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 established a two-tier system of reimbursement rates for Homes. Homes are eligible for the higher Tier 1 rates if they are located in low-income areas, have providers whose household income is at or below 185% of the federal income poverty guidelines, or if they serve income-eligible children. The lower Tier 2 rates are for Homes that do not meet these Tier 1 criteria [1].

### *Current CACFP meal pattern requirements, criticisms, and recent developments*

To receive reimbursement, all participating providers are required to serve meals and snacks according to requirements established by the USDA. A meal is reimbursable if it contains foods in the amounts required by the USDA's food-based meal pattern for the specific age group [3]. In each state, CACFP guidelines may also specify some nutritional characteristics of foods and beverages served through a list of "creditable" (i.e. reimbursement-eligible) foods [4]. However, CACFP meal requirements have undergone only minor revisions since they were developed in 1968 [5, 6], a time when the prevalence of childhood obesity was considerably lower than it is today [7]. While it is certainly possible to serve nutritious meals based on CACFP meal requirements [5], the guidelines are broad, do not include nutrient- or food-based standards, and place few limitations on the types of foods within each food group. For example, according to Washington State's Creditable Foods Guide for CACFP [3], a wide variety of refined flour products high in solid fats and added sugars—such as cinnamon/sweet rolls, coffee cake, Danish pastry, doughnuts, muffins, cookies, and brownies—are creditable as grains served at breakfasts and/or snacks. Similarly, fruit pie filling, fruit cobblers and fruit fritters are all creditable as fruit or vegetables under current CACFP guidelines in which fruit/vegetable is a combined meal component.

Such broad guidelines have led to a growing concern that many creditable foods in CACFP clash with current dietary guidance and efforts to prevent childhood obesity and support healthy eating by children [5, 6]. Although CACFP requirements may provide for better nutrition relative to meals and snacks brought from home [8, 9] or compared to nonparticipating centers [5, 10], the requirements do not guarantee uniformly high nutritional outcomes [4, 11] or that food is of high nutritional value [12-16].

Such criticisms of CACFP meal requirements are neither new nor being left unaddressed. Several recent and major developments assure reforms in CACFP policies. The Healthy, Hunger-Free Kids Act of 2010, which re-authorized funding for federal school meal and child nutrition programs, for example, revised the purpose statement of CACFP to include the words "nutrition and wellness" [17]. This legislation also requires the USDA to review and update CACFP nutrition standards and meal costs by 2013 [17]. In a related development, at the request of the USDA, the Food and Nutrition Board of the U.S. Institute of Medicine (IOM) reviewed the CACFP meal patterns and provided recommended revisions in a report released in November 2010 [6]. For all children age 1 year and older and for adults, the IOM recommends meal requirements that significantly increase the variety and amount of whole fruits and vegetables, increase the proportion of whole grains, emphasize lean and low-fat protein choices, and decrease foods that are high in solid fats, added sugars, *trans* fats, and sodium [6] (see **Appendix 1** for more details).

While the IOM's recommended revisions would bring CACFP in alignment with current dietary guidance [18, 19], implementing these higher standards is expected to require more food spending. In its report, the IOM Committee studied the cost implications of its recommendations and estimated the change in cost to serve breakfast, lunch, and one snack to children ages 2 to 4 would be $0.56, a 44% increase. According to the IOM, the largest increases in unit costs of the revised meal components occurred as a result of recommended changes in the fruit/vegetable and grain groups [6]. In related findings, a study which examined the food expenditures of Home child care providers participating in CACFP in Seattle-King County, Washington State found that higher food expenditures were significantly and positively associated with number of portions of whole grains and fresh produce served [20].

Studies in peer reviewed journals have shown that nutrient-dense foods tend to cost more than energy-dense foods (foods high in sugar and fat but otherwise low in nutritional value) [21, 22] and that the price gap between nutrient-dense foods and less nutritious options is growing [23]. In its report [6], the IOM Committee expressly acknowledged the economic impact of its recommendations would likely extend beyond food expenditures, especially since the recommended revisions would make the meal requirements considerably more complex than current CACFP guidelines. Non-food costs noted in the IOM report include costs related to menu planning, food acquisition, food preparation, training and reporting. The IOM Committee also predicted that such non-food costs will vary with provider setting and the extent to which the provider is already implementing meal requirements similar to those recommended [6]. For example, providers serving small numbers of clients and who are unlikely to be able to arrange for food delivery could incur costs related to the time and transportation needed to shop for food. These costs, noted the IOM Committee, may be considerable for Homes and small day care sites located in food deserts, because fewer processed foods (e.g. a variety of fruits and vegetables) may be obtained only from distant stores and transportation may be limited [6, 24-26].

### *Previous research on the food and nutrient content of the meals and snacks served in Homes participating in CACFP*

Among the studies which have examined the food and nutrient content of menus served in CACFP-participating sites, most studies have focused on Head Start and child care centers [10, 11, 13-16, 27-29]. Fewer studies have looked at the foods offered in Homes participating in CACFP [4, 10-12, 20, 30], and at the time of writing only two studies were found which looked at the effects of CACFP's two-tiered reimbursement structure on menu quality [4, 12].

Two review articles published in the last ten years—Glanz, 2004 [31] and Larson et al., 2011 [32]—featured studies which examined the nutrient and food content of meals and snacks offered in child care settings. The Glanz review focused on CACFP-participating sites while the Larson review more broadly examined studies of child care settings for U.S. children ages 2 to 5 years. Most of the studies referenced below are featured in one of these reviews.

Five nationally representative studies published between 1982 and 2010 [10-13, 33] examined the nutrient and/or food content of meals and snacks offered in CACFP child care settings. In these studies, menu nutrients and foods were compared to the recommendations of the American Dietetic Association (ADA) (now called the Academy of Nutrition and Dietetics), the Dietary Reference Intakes (DRIs) developed by the IOM, and/or the *Dietary Guidelines for Americans* (DGAs). Homes, which were sampled in three of these nationally representative studies [10-12], were found to meet the ADA's benchmark of providing a minimum of one-half of daily energy and nutrient needs for children in full-time care. Fox et al., 1997 [11] compared the menus of Homes and Centers and found Homes differed from Centers in many of the foods served at breakfasts, lunches, and snacks. More Homes than Centers served more ready-to-eat cereals, pancakes, waffles and French toast, whole milk, hot dogs, and any fresh fruit, but fewer Homes served 2% milk, any raw vegetables, and beef in mixed dishes [11].

Smaller studies have also evaluated the nutrient or food content of meals and snacks served to children in CACFP Homes [4, 20, 30] and raised several concerns. In a study of the nutrition policies and practices of Home providers in Kansas, researchers found that less than 50% of providers reported receiving training in nutrition annually and less than 14% reported serving low-fat (1% or skim) milk regularly to children ages 2 and older [30]. In 2011, researchers Monsivais and Johnson from the University of Washington published findings from their *Cost and Quality* study in which they tested the effect of CACFP reimbursement rates on menu quality. Monsivais et al., 2011, reported that Home providers who received higher reimbursement rates for food had significantly higher menu food expenditures and significantly higher mean nutritional adequacy compared to providers who received lower reimbursement rates for food [4]. Research preceding the *Cost and Quality* study also looked at the effects of CACFP reimbursement rates. Several years after the introduction of the tiered reimbursement rates, the Economic Research Service of the USDA conducted a study to investigate whether and how Tier 2 providers would respond to the newly lowered reimbursement rates. Crepinsek et al., 2002 was a

study which examined the meals and snacks offered by the lower reimbursement providers and compared them to a group of Home providers from a 1995 study conducted at a time before the tiered structured was in effect. Although Crepinsek et al. concluded reimbursement tiering did not substantially affect quantity or nutritional quality of meals offered in CACFP, their study did find several menu patterns which may have suggested the lower reimbursement group made some adjustments to control costs. For example, compared to the higher reimbursement group, the lower reimbursement group less frequently offered meat and meat alternates at breakfast, and smaller proportions of snacks included more than a single kind of fruit, vegetable, or juice [12].

Research addressing the food and nutrition practices of Home child care providers participating in CACFP is limited, and yet CACFP Homes are a major source of child care in the United States. During the 2009 fiscal year, nearly 141,000 Homes participated in CACFP nationwide, serving on average over 846,000 children daily (reviewed in [34]). Of the various types of facilities that participate in CACFP nationwide, 73% are Homes [6]. In Washington State alone, more than 3,100 Home providers were sponsored in 2010, serving an estimated 24,800 children [35]. The IOM Committee which reviewed the current CACFP guidelines identified a need for ongoing evaluation of program standards and implementation efforts. This thesis project intends to address this apparent gap in research by describing the foods and beverages served by CACFP Home providers in Seattle-King County, Washington State, while considering providers' reimbursement rate and as well as the IOM's recommended revisions to the CACFP meal requirements.

## Purpose

The purpose of this thesis report is to describe the characteristics of foods and beverages offered in home child care settings and as part of CACFP, and to compare the content of meals and snacks to recent recommendations proposed by the IOM.

## Study Background

The present study uses data from the 2008-2009 *Cost and Quality* Study, a cross-sectional study of 60 home child care providers who at the time of data collection were participating in CACFP and residing in Seattle-King County, Washington. The study was led by researchers at University of Washington's Center for Public Health Nutrition, with Donna B. Johnson, RD, PhD as the principal investigator and Pablo Monsivais, PhD, MPH, primary co-investigator on the study. Other major contributors to the *Cost and Quality* Study were members of a study advisory group which included Maria Consuelo Lopez, the vice-president of the Washington State Family Child Care Association and president of the North King County Family Child Care Association; Carol Griffith, MS, RD, CD from the Office of the

Superintendent of Public Instruction which administers CACFP in Washington State; Carol Cartmell, RD from the City of Seattle Child Care Nutrition Program; and Adrienne Dorf, MPH, RD and Kari Fisher MPH, RD from the Child Care Health Program at Public Health-Seattle and King County. The *Cost and Quality* Study was funded by the Robert Wood Johnson Foundation. All instruments and procedures were reviewed and approved by University of Washington's Institutional Review Board. Consent from each study participant was obtained prior to proceeding with the menu log and other data collection procedures.

## Methods

### *Study participants*

A sample of 60 Home child care providers was recruited between July 2008 and September 2009. Detailed recruitment procedures have been described previously [4]. The sample size and study design were determined for testing the effects of CACFP policies on nutritional quality of menus, the primary aim of the *Cost and Quality* Study. Eligible providers had to be currently part of CACFP, reside within Seattle-King County, Washington, and be in either of two strata: lower or higher reimbursement. Thirty providers in each stratum were recruited. Lower reimbursement participants received the Tier 2 rate from their sponsoring agencies in Seattle-King County. Higher reimbursement participants were recruited from two groups: 1) Tier 2 providers who were sponsored by the city of Seattle, which paid these providers at the higher, Tier 1, reimbursement rate; and 2) providers who did not personally meet low income requirements but who had been classified as Tier 1 on the basis of their neighborhood's socioeconomic profile.

### *Study Procedures*

The *Cost and Quality* Study collected data from a variety of sources including daily menu logs, shopping receipts, self-report surveys, and in-person semi-structured interviews. The present study primarily examined data collected from daily menu logs. As described previously [4], each child care provider completed a daily menu log over five consecutive days when the child care program was in operation, usually Monday-Friday. Menus were recorded on forms provided by the study staff. These forms provided space and prompts for recording nutritionally-relevant characteristics of the foods and beverages served (e.g. low-fat/non-fat, whole wheat/whole-grain) as well as characteristics of the purchased form of the produce. Providers also recorded the meals (breakfast, lunch) or snacks (AM snack or PM snack) at which foods and beverages were served, as well as the ingredients and recipes for any foods or beverages that were made from fresh or raw ingredients. Recorded menu items were entered into dietary assessment software (*FoodProcessor SQL,* v. 10.5.0, ESHA Research, Salem OR). In the few cases where providers reported to offer a choice of foods or beverages—for example, if children were given the choice of two

types of cereal at the same breakfast—the nutrient composition of the offerings were averaged into a "composite" food or beverage item. Nutrient composition and analyses of menus yielded values for dietary weight (g), energy (kcal, kJ), and 54 macronutrients and micronutrients.

## Analyses

### *Menu analysis*

All menus were initially analyzed for compliance with CACFP meal component requirements and all reported foods and beverages were standardized to portions appropriate for children aged 3 to 5 years as specified by CACFP and using methods described previously [4]. For menu items that did not have recommended serving sizes (e.g. desserts, butter, condiments, and syrup), portion sizes were standardized to one-half *MyPyramid* serving for desserts and 1 teaspoon for butter, condiments and syrups [4]. Unlike the parent *Cost and Quality* Study which excluded all beverages on the basis that CACFP only provides reimbursements for milk or 100% juice, the present study includes all beverages in the analyses.

## Food frequency and variety

This study provides a comprehensive food-based analysis of the menus served. Two graduate students of nutrition and dietetics coded all menu items, working in excel and using a detailed food coding protocol. The students worked in close collaboration and were able to discuss how to code any questionable items not addressed by the protocol. In excel, menus were first sorted and coded by global food and beverage groups and subgroups listed in **Table 1**. The selection of these food and beverage groups was guided by the CACFP meal components and the IOM's recommended revisions to the CACFP meal requirements [6] (see **Appendix 1** for details). Foods that could be placed in more than one category, such as chili with ground beef and beans, were coded by their constituent parts and were coded as a "mixed dish". Foods that were made from fresh or raw ingredients were coded as "made from scratch". Definitions for select food and beverage types are provided in **Appendix** 2.

Once all the global food and beverage groups and subgroups were coded, types of foods and beverages within each group and subgroup were coded. Variety within different food groups was determined by counting unique types of food and beverages codes.

**Table 1.** Major food and beverage groups and subgroups used in the menu analysis

| |
|---|
| Milk |
| Whole |
| Reduced-fat (2%) |
| Low-fat (1%) |
| Nonfat (skim) |
| Flavored |
| Alternative |
| Composite |
| Juice |
| 100% |
| <100% (juice drink) |
| Fruit |
| Unsweetened |
| Sweetened |
| Grains |
| Whole, whole-grain |
| Refined |
| Baked or fried grains high in solid fats and/or added sugars (BFGSOFAS) |
| Low-sugar breakfast cereal |
| High-sugar breakfast cereal |
| Vegetables |
| Non-starchy |
| Starchy |
| Fried |
| Dark green |
| Orange |
| Meat and meat alternates (protein foods) |
| Lean meat |
| High-fat meat |
| Processed meat |
| Nuts and seeds |
| Eggs |
| Cheese and yogurt |
| Beans or legumes, tofu |
| Miscellaneous |
| Non-creditable |
| Mixed dish |
| Made from scratch |

## Menu quality

Menu quality was assessed using an original food-based Menu Quality Index (MQI) developed for this study. Food-based indexes have been used in previous studies as a measure of overall diet quality [36, 37]. The MQI was loosely patterned off the index developed by Hecht et al. for use in their statewide assessment of the nutrition environments for licensed child care settings in California [5] (see **Appendix 3** for their quality scoring tool). The scoring system developed for this thesis project, however, is unique because it is based on the IOM's recommended revisions to the CACFP meal requirements [6] (see **Appendix 1** for details).

**Table 2** shows the MQI scoring system used in this study. To control for potential differences in meal composition, only the menus of providers who served both lunch and breakfast (total n=50, higher reimbursement providers n=24, lower reimbursement providers n=26) were scored using the MQI. Snacks were excluded from the scoring system since providers varied on the number of snacks served. Using the MQI, scores for milk, fruit, juice, vegetables, meat/meat alternates, and grains ranged from 0 to 3. One point was deducted for any and every serving of food or beverage the IOM recommends limiting or restricting (i.e. foods with solids fats, added sugars, and or which are high in sodium). "Bonus" points were added and "penalty" points were subtracted for certain foods that exceeded the IOM's minimum or maximum recommended servings over a five-day menu. For example, over a five-day menu, an additional point was added: if a variety of vegetables (i.e. ≥ 3 different kinds) were served; for any serving of dark green vegetable; or, for every additional serving of orange vegetable above the minimum two servings/week recommendation. Conversely, over a five-day menu, one point was subtracted: for every serving of starchy vegetable above the maximum two servings/week recommendation; for every serving of fruit with added sugars, fats, oils and salts above the maximum one serving/week recommendation; for every serving of processed meat above the maximum one serving/week recommendation; and for every serving of baked or fried grains high in solid fats and added sugars (BFGSOFAS) above the maximum one serving/week recommendation.

Using this scoring method, up to 24 points were possible for breakfast and lunch if these meals were compliant with current CACFP meal patterns (i.e. at breakfast, one serving each from milk, fruit/vegetable/juice, and grain components; at lunch, two servings of fruit/vegetable/juice and one serving each of milk, grain, and meat/meat alternate components) *and* in alignment with the IOM's recommended revisions. Over a five-day menu, a final score of 123 points—24 points for each of five days plus three "bonus" points—indicated total confluence with the IOM's recommended revisions, i.e. breakfasts and lunches composed of low-fat milk and dairy, unsweetened fruit, a variety of non-starchy vegetables, lean meat, nuts and seeds, whole grains, and limited energy-dense, nutrient-poor foods and beverages. Scores greater than 123 indicated a five-day breakfast and lunch menu that offered extra recommended food and/or beverages, i.e. above and beyond the requirements. Note, however, that serving extra foods and/or beverages in the restricted or limited categories would not inflate the MQI score but in fact would lower a menu's total score.

**Table 2.** Menu Quality Index to assign a food-based score to the menus.

| Meal Component | Points | | | |
|---|---|---|---|---|
| | **0** | **1** | **2** | **3** |
| Milk | None | Whole only OR only milk alternative was served (e.g. soy, rice, almond milk) | 2% milk | 1% or nonfat milk |
| Fruit | None | *Fruit with added sugars, fats, oils, and salts* | *100% Juice* | *Unsweetened fruit* |
| Vegetable (excludes fried potatoes) | None | *Beans/legumes* processed with high-fat/high-sodium sauces | *Beans/legumes* OR Vegetable | *Beans/legumes* AND Vegetable[a] |
| Meat and Meat Alternatives | None | *Processed meats* | *Higher fat meat/poultry/fish* OR full fat cheese (e.g. American, bleu, Brie, cheddar, hard goat, Monterey Jack, queso, Swiss) and yogurt (whole) | Nut butter/nuts/seeds OR *Lean meat/poultry/fish* OR eggs OR low- and medium-fat natural cheese (e.g. reduced-fat, cottage cheese, feta, mozzarella, string) and yogurt (non-fat, low-fat) |
| Grains/Breads | None | *Baked or fried grain products high in solid fats and added sugars(BFGSOFAS)* | *Refined* | *Whole* |

| **Restricted foods and beverages** | **Points** | |
|---|---|---|
| | **0** | **-1** |
| Flavored milk (of any % fat)[a] | None | For each serving |
| Sweetened beverages (fruit drinks and "ades", sports drinks, sodas) | None | For each serving |
| Juice served more than 1x/day?[a] | None | For each serving |
| Frozen treats [a] | None | For each serving |
| Candy [a] | None | For each serving |
| Fried potatoes | None | For each serving |
| Cheese product (Velveeta, Cheese Whiz Squeeze) [a] | None | For each serving |
| *Sweetened cereals* | None | For each serving |
| Chips that are not grain based | None | For each serving |
| Canned soup (this is not a creditable item) | None | For each serving |
| Bacon | None | For each serving |

| **"Bonus" points added over a 5-day menu** | **Points** | |
|---|---|---|
| | **0** | **+1** |
| Variety of vegetables served (≥3 different kinds)? | No | Yes |
| *Dark green vegetable* served? | No | For any serving |
| *Orange vegetable* served ≥ 2 times? | No | For each additional serving |

| **"Penalty" points subtracted over a 5-day menu** | **Points** | |
|---|---|---|
| | **0** | **-1** |
| *Starchy vegetables* served > 2 times? | No | Yes |
| *Fruit with added sugars, fats, oils, and salts* served > 1 time? | No | For each additional serving |
| *Highly processed meat* served > 1 time? | No | For each additional serving |
| *Baked or fried grain products high in solid fats and added sugars* served > 1 time? | No | For each additional serving |

[a] No providers in the MQI subsample (n=51) served this.

### *Statistical analyses*

Descriptive statistics were used to characterize the menus in terms of their food and beverage offerings. The MQI scores were normally distributed so parametric statistics were used to test for differences between higher and lower reimbursement providers. Student's t-tests for independent samples were used to test for differences in mean servings of foods and beverages between the reimbursement groups. In further analyses for select food groups, linear regression models were used to examine the relation between reimbursement group and food servings, while adjusting for potential confounders which included energy, whether or not providers served all meals, provider's age, educational attainment, household income, number of children in care, years of experience in child care, and years with CACFP. Differences were considered statistically significant at $p < 0.05$. All statistical analyses were conducted using Stata/MP 12.1 for Windows.

## Results

### *Participant characteristics*

All 60 Home child care providers were women, ranging in age from 29 to 64 with a mean (± SD) age of 48.3 (±8.6) years. Demographic, socioeconomic and professional characteristics of the sample are shown in **Table 3**. The sample was primarily non-Hispanic white (46/60) and most had at least some college education. Household income ranged from less than $20,000 to between $140,000 and $159,999 per year, but nearly two-thirds of the sample (38/60) had incomes between $60,000 and $159,999 per year. Substantial professional experience was reported by this sample, with 14.3 (± 8.7) years of experience in child care and 11.7 (± 8.3) years in CACFP. On average these providers had approximately eight children in care per day and the average age of the children was 3.7 (± 1.5 years). **Table 3** also shows a comparison of the participant characteristics in this sample stratified by higher and lower reimbursement group. Between the groups, differences in personal and professional characteristics were not statistically significant.

**Table 3.** Characteristics of 60 CACFP Home child care providers

| Characteristic | All providers (n=60) | Reimbursement Group[a] Higher (n=30) | Lower (n=30) |
|---|---|---|---|
| **Age**[b] (years, mean ± SD) | 48.26±8.6 | 49.86±1.56 | 46.48±1.60 |
| **Race or ethnicity** | | | |
| White | 46 | 23 | 23 |
| Hispanic[c] | 4 | 1 | 3 |
| Black | 3 | 0 | 3 |
| Other races or mixed races | 7 | 4 | 7 |
| **Highest education** | | | |
| High School up to some college | 28 | 15 | 13 |
| Associate's degree (2 years) | 17 | 7 | 10 |
| Bachelor's degree or higher | 15 | 8 | 7 |
| **Household income**[d]**, per year** | | | |
| Up to $59,000 | 21 | 12 | 9 |
| $60,000-$99,000 | 20 | 10 | 10 |
| $100,000-$159,000 | 18 | 7 | 11 |
| **Professional characteristic** (mean ±SD) | | | |
| Number of children in care | 7.92±2.96 | 8.03±0.51 | 7.82±0.58 |
| Years working in CACFP | 11.65±8.31 | 11.16±1.42 | 12.13±1.63 |
| Years working in child care | 14.27±8.73 | 15.21±1.63 | 13.34±1.56 |

[a] Differences by reimbursement group were tested with two-sample t test. No significant differences were found between the two groups for any of the characteristics.
[b] Two providers did not report age
[c] Two providers identified as both Hispanic and mixed race
[d] One provider did not report income

The majority of providers (38/60) in the sample served all meals daily, which were breakfast, lunch, and two snacks. Twelve out of 60 providers served breakfast, lunch, and one snack. None of the providers served a supper meal. Most providers served breakfast (51/60) and lunch (59/60). As previously reported [4], menus showed strong adherence to current CACFP food pattern guidelines for the meals served: for all providers, menus were 96.6% (± 3.8) consistent with the CACFP food patterns.

### *Menu food frequency*

Mean and total servings of foods and beverages offered by providers in this sample over a five-day menu are presented in Tables 4-6. **Table 4** compares mean servings of foods and beverages offered by reimbursement group and in comparison to the IOM's recommended meal patterns. Since the IOM's recommendations are specific to meal or snack occasion, recommended servings are presented as a range in **Table 4** and reflect recommendations for five-day menus offering breakfast, lunch, and one or two snacks. Total number of servings of foods and beverages offered over the five-day menu, presented by meal or snack occasion, are shown in **Table 5**. In **Table 6**, the top five most frequently served types of

foods and beverages from each of the CACFP meal components are presented by reimbursement group. In **Appendix 5**, **Tables 11a-11m** provide additional information on the frequency of select food and beverage types offered by each reimbursement group. Finally, the variety of foods and beverages offered by this sample are presented in **Table 8**, which shows mean number of different types of foods offered over the five-day menus.

As reported above, providers differed with respect to the combinations of meals and snacks served. Since the composition of foods and beverages is expected to change with the meal or snack occasion, additional analyses were completed on a subset of only those providers who served all meals (n=38), i.e. breakfast, lunch, and two snacks. The results of these additional food frequency and variety analyses are presented in **Appendix 4** and referenced in results section below when they differ from the results of analyses which included the menus of all providers (n=60).

What follows are the results from the food-based analyses reported by food and beverage group.

### Milk

Milk was frequently served by this sample of providers—on average more than twice per day over a five day period (**Table 4**). Milk was most often served at breakfast and lunch (**Table 5**). Whole milk and reduced fat (2%) milk were the most frequently offered types of milk (**Table 5, Table 6**). Over half (55.5%) of all milk served was reduced fat (2%) milk and 18.9% of all milk served was whole milk. Nonfat and low-fat milk—types of milk the IOM recommends be served to children age 2 and older—made up less than one-fifth of all milk served by this sample (**Table 5, Table 6**). Between reimbursement groups, there were no statistically significant differences in mean servings of milk by milk type, except for servings of "composite" milk (**Table 4**). Composite milk in this study refers to when a provider offered a choice of different milk types during the same eating occasion. The term composite refers to the nutrient composite that was calculated to reflect the combination of milk types offered (data not shown). The higher reimbursement group offered significantly higher mean (±SE) servings of composite milk compared to the lower reimbursement group: 1.3 (±0.57) servings versus 0.03 (±0.03) servings, respectively ($p=0.031$) (**Table 4**).

### Juice

In this sample, providers infrequently served juice of any type, which included 100% juice or <100% juice ("juice drinks"); on average, both groups served less than one serving of juice per day (**Table 4**). In a five-day menu, less than a quarter of all providers (13/60) served over five servings of 100% juice, whereas over a quarter (16/60) served no juice at all (**Figure 1**). The majority (88.8%) of all juice served was 100% fruit juice (**Table 5**).

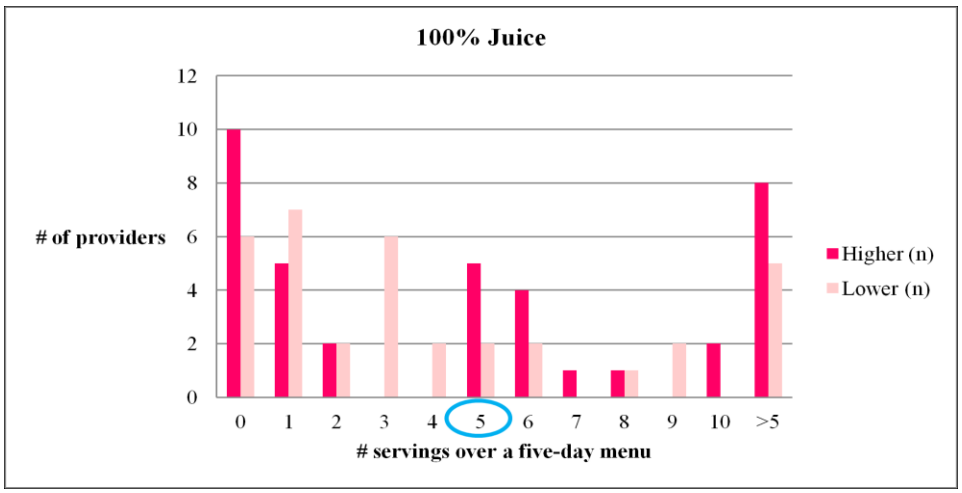


**Figure 1: Servings of 100% fruit juice offered over a five-day menu by each reimbursement group.** This chart shows total number of servings of 100% fruit juice offered over a five-day menu (x-axis) and the number of providers from each reimbursement group who offered this many servings (y-axis). Over a five day period, the IOM recommends restricting the number of servings of 100% fruit juice to five servings, as indicated on this chart with a blue circle.

When the analysis was restricted to providers who served all meals (n=38), mean servings of juice increased for both groups, but the overall results were similar; mean servings (±SE) of 100% juice offered by the higher group over a five-day menu was 4.1 (±0.79) compared to 3.2 (±0.68) offered by the lower group (p=0.384) (**Table 9** in **Appendix 4**).

Juice was most often served at snacks (**Table 5**). The types of juice most commonly served by both groups were 100% apple juice (~ 53% of all juice served in the sample) and 100% orange juice (~ 30% of all juice served in the sample) (**Appendix 5, Table 11a**). Non-creditable juice drink was rarely served by this sample (**Table 4, Table 5**). Over the five days, only eight providers (four from each reimbursement group) served any juice drink, with one provider alone responsible for nearly half of all juice drink servings offered in this sample (data not shown).

## Fruit

The majority (86.7%) of fruit served by this sample was unsweetened fruit (**Table 5**). The IOM recommends menus which provide breakfast, lunch and one to two snacks offer 12 to 14 servings of unsweetened fruit over a five-day menu. Mean (±SE) servings of unsweetened fruit was 9.9 (±0.63) for the higher group and 10.6 (±0.63) for the lower group (p=0.438) (**Table 4**). When the analysis was restricted to providers who served all meals, servings of unsweetened fruit decreased among the higher group and increased among the lower group, but the difference between the groups remained non-significant (**Table 9** in **Appendix 4**).

The IOM recommends restricting servings of fruit to unsweetened varieties only. **Figure 2** shows that 22/60 providers offered no sweetened fruit over the five days. Moreover, over the five-day menu, both reimbursement groups reported to offer less than two servings of sweetened fruit, with the lower

group offering slightly more servings of sweetened fruit than the higher group: 1.7 (±0.33) versus 1.4 (±0.32) (p=0.562) (**Table 4**).

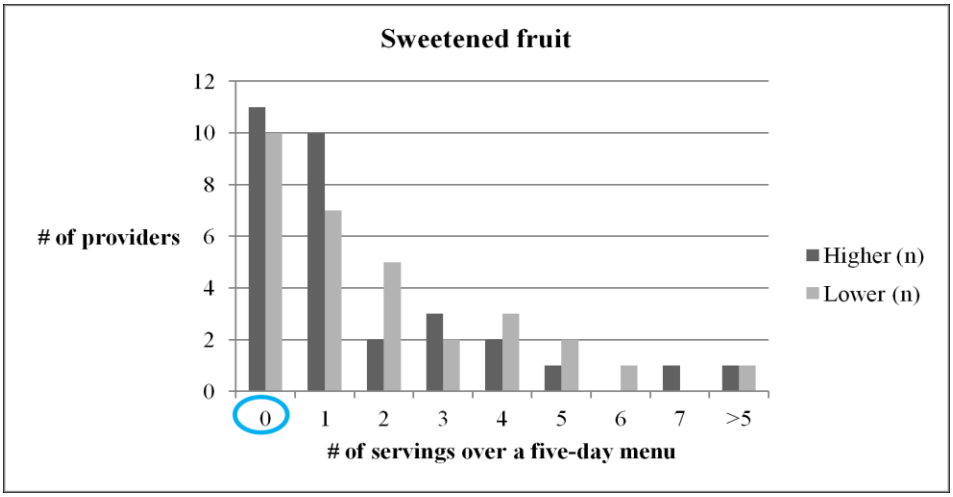


**Figure 2: Servings of sweetened fruit offered over a five-day menu by each reimbursement group.** This chart shows total number of servings of sweetened fruit offered over a five-day menu (x-axis) and the number of providers from each reimbursement group who offered this many servings (y-axis). The IOM recommends eliminating sweetened fruit as a creditable food item in CACFP, as indicated on this chart with a blue circle.

Restricting the analysis to providers who offered all meals (n=38), mean servings of sweetened fruit increased for both groups and the higher group apparently offered more sweetened fruit than the lower group. Mean (±SE) servings of sweetened fruit offered by higher reimbursement providers who served all meals was 2.2 (±0.44) servings versus 1.8 (±0.43) servings offered by providers who served all meals and who were in the lower group (p=0.439) (**Table 9** in **Appendix 4**). Peaches canned in syrup, sweetened applesauce and fruit cocktail were the most commonly served sweetened fruits by both group (data not shown).

The majority of all fruit (both unsweetened and sweetened) served by this sample was served at lunch (~ 39% of all fruit served) and breakfast (~ 31% of all fruit served) (**Table 5**). The top five types of fruit served were the same for both reimbursement groups and were as follows: apples, bananas, berries, citrus, and grapes—all unsweetened (**Table 6, Table 11b**).

## Vegetables

The IOM recommends substantially increasing the number of servings and variety of vegetables served to children in CACFP. For example, a five-day menu offering breakfast, lunch and one to two snacks would require 12 to 14 servings of vegetables (**Table 4, Figure 3**), including at least two servings each of dark green and orange vegetables (**Table 4, Figure 4,** and **Figure 5**). At the same time, the IOM recommends limiting starchy vegetables to one serving per week and excluding any fried vegetables (**Table 4, Figure 6,** and **Figure 7**). See **Appendix 3** for definitions and/or examples of non-starchy, starchy, dark green and orange vegetables.

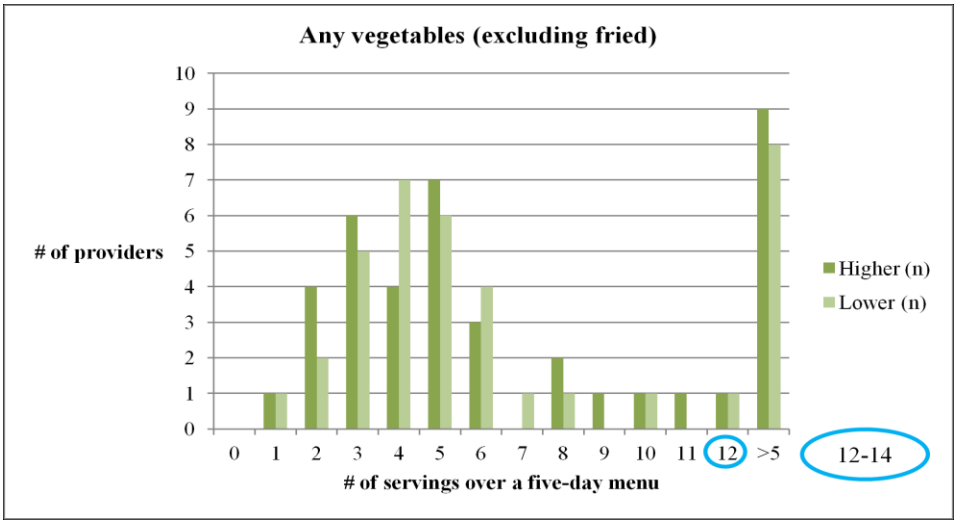


**Figure 3: Servings of any vegetables (excluding fried) offered over a five-day menu by each reimbursement group.** This chart shows total number of servings of any vegetables offered over a five-day menu (x-axis) and the number of providers from each reimbursement group who offered this many servings (y-axis). As indicated by the blue circle, the IOM recommends 12 to 14 servings of total vegetables for five-day menus offering breakfast, lunch, and one or two snacks.

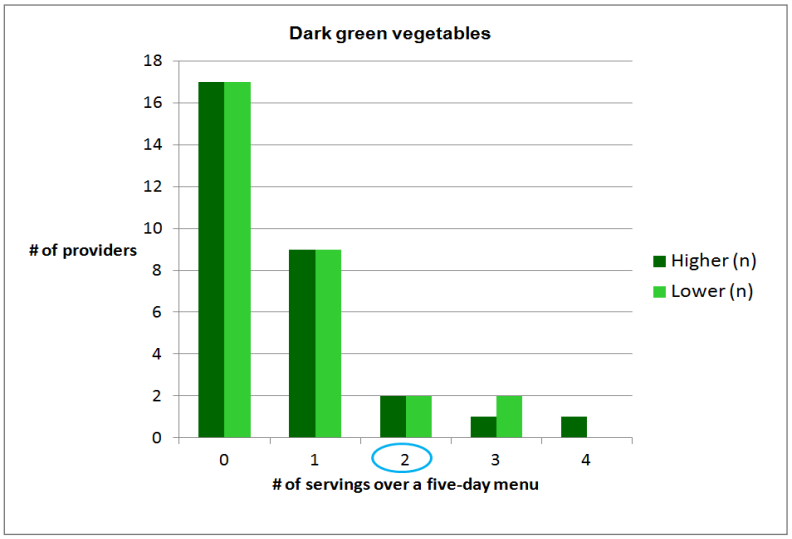


**Figure 4: Servings of dark green vegetables offered over a five-day menu by each reimbursement group.** This chart shows total number of servings of dark green vegetables offered over a five-day menu (x-axis) and the number of providers from each reimbursement group who offered this many servings (y-axis). As indicated by the blue circle, the IOM recommends at least 2 servings of dark green vegetables over a five-day menu.

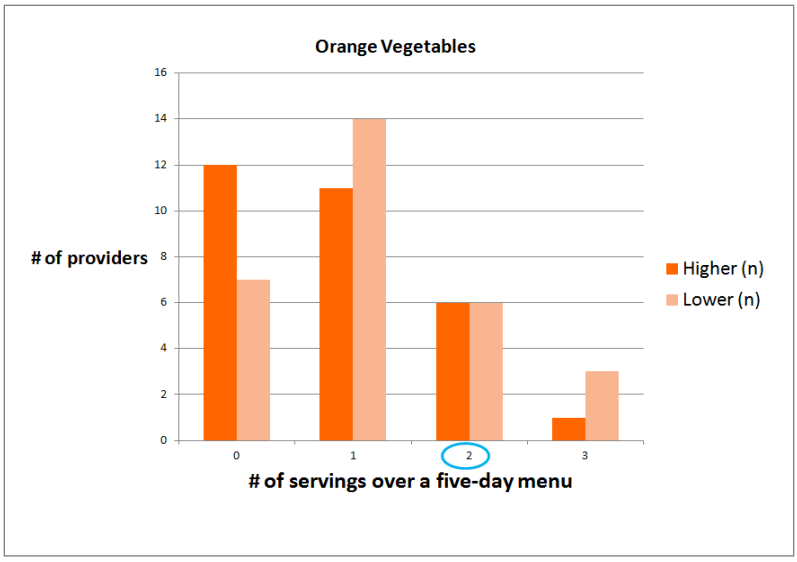


**Figure 5: Servings of orange vegetables offered over a five-day menu by each reimbursement group.** This chart shows total number of servings of orange vegetables offered over a five-day menu (x-axis) and the number of providers from each reimbursement group who offered this many servings (y-axis). As indicated by the blue circle, the IOM recommends at least 2 servings of orange vegetables over a five-day menu.

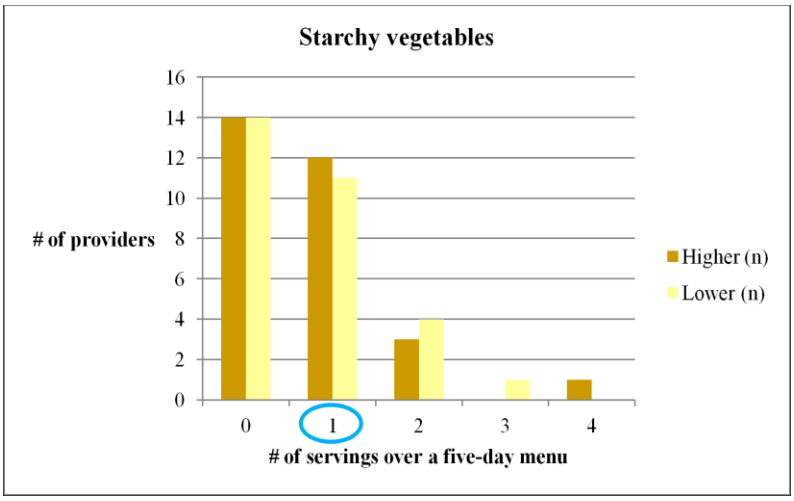


**Figure 6: Servings of starchy vegetables offered over a five-day menu by each reimbursement group.** This chart shows total number of servings of starchy vegetables offered over a five-day menu (x-axis) and the number of providers from each reimbursement group who offered this many servings (y-axis). The IOM recommends limiting starchy vegetables to one serving per five-day menu, as indicated on the chart by the blue circle.

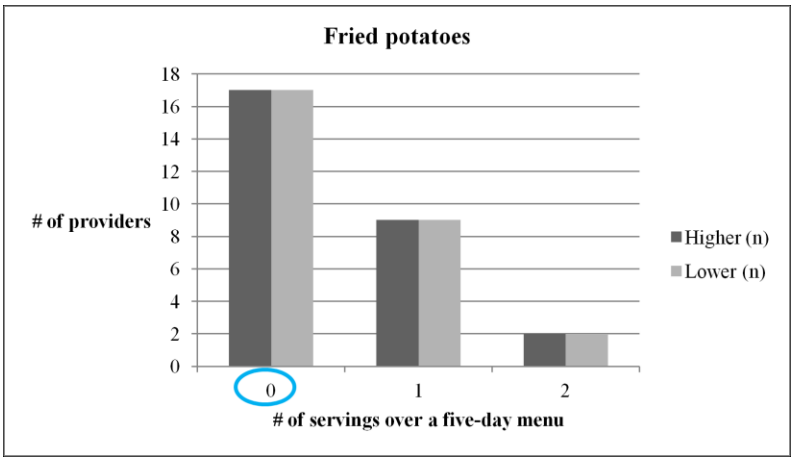


**Figure 7: Servings of fried potatoes offered over a five-day menu by each reimbursement group.** This chart shows total number of servings of fried potatoes offered over a five-day menu (x-axis) and the number of providers from each reimbursement group who offered this many servings (y-axis). The IOM recommends eliminating any fried vegetables as a creditable food item in CACFP, as indicated on this chart with the blue circle.

Among providers who served all meals, mean servings (±SE) of any vegetables (excluding fried) was 5.9 (±0.70) for the higher group and 5.2 (±0.58) for the lower group (p=0.419) (**Table 9** in **Appendix 4**). When the analysis included the menus of all providers in the sample, mean servings of any vegetable decreased to less than five servings over five-days for both groups (**Table 4**). Half (30/60) of all providers (15 providers from each group) offered five or more servings of vegetables over a five-day menu (**Figure 3**). Only 8/60 providers served two or fewer servings of vegetables over five days (**Figure 3**).

Mean servings of dark green vegetables offered by each group was less than a single serving over the five days (**Table 4**). Over half (34/60) of all providers (17 from each group) did not serve dark green vegetables and only 4/60 providers served the recommended two servings in five days (**Figure 4**). For orange vegetables, mean (±SE) servings were 0.9 (±0.16) offered by the higher group and 1.2 (±0.17) offered by lower group (p=0.195). Forty-four out of 60 providers served one or fewer servings of orange vegetables and less than a quarter (12/60) of providers served the recommended two servings in five days (**Figure 5**). Servings of dark green and orange vegetables, however, were more frequent than were servings of fried potatoes (**Table 4, Figure 7**). Approximately two-thirds (41/60) of all providers did not serve fried potatoes and about a quarter (16/60) of providers served fried potatoes once in a five-day menu (**Figure 7**).

Both groups met the IOM's recommendation to limit starchy vegetables to no more than one serving over the five-day menu (**Table 4**). Only 9/60 providers exceeded this recommendation and nearly half (28/30) did not serve starchy vegetables (**Figure 6**).

The majority (40.3%) of all vegetable served was non-starchy (**Table 5**) and 88.3% of all vegetables were served at lunch (**Table 5**). Orange (~ 19% of all vegetables served) and starchy (~ 15%

of all vegetables served) were the next most frequent type of vegetables served (**Table 5**). The types of vegetables served by each group from the different vegetable categories are presented in **Tables 11c-11f** in **Appendix 5**. The top five types of vegetables served in the sample and by each group were carrots, snap peas, corn, tomato and tomato-based sauces, and broccoli (**Table 6**). Fried potatoes were in the top five types of vegetables served for the lower group only; fried potatoes and broccoli each made up 5.9% of all vegetables served by the lower group (**Table 6**).

**Table 4.** Mean (±SE) servings of food and beverages[a] offered over a five-day menu, by reimbursement group and in comparison to the IOM's recommendations for five-day menus served to children ages 2-4 years

| Food/Beverage | IOM's recommendation [6] | Higher (n=30) | Lower (n=30) | P value[c] |
|---|---|---|---|---|
| | *servings/5-day menu*[b] | ← *mean ± SE* → | | |
| **Milk** | **7- 9** | **11.2 ± 0.59** | **10.6 ± 0.60** | **0.452** |
| Nonfat (skim) or low-fat (1%) | All servings of milk | 2.5 ± 0.87 | 1.6 ± 0.63 | 0.441 |
| Whole milk | None | 2.4 ± 0.88 | 1.8 ± 0.69 | 0.614 |
| Reduced fat (2%) milk | None | 5.6 ± 1.06 | 6.8 ± 1.09 | 0.445 |
| Low fat (1%) milk | | 1.6 ± 0.70 | 0.4 ± 0.37 | 0.136 |
| Nonfat (skim) milk | | 0.8 ± 0.60 | 1.2 ± 0.55 | 0.654 |
| Milk alternative | | 0.0 ± 0.0 | 0.3 ± 0.27 | 0.322 |
| Composite milk | | 1.3 ± 0.57 | 0.03 ± 0.03 | 0.031 |
| Flavored milk | None | 0.0 ± 0.0 | 0.0 ± 0.0 | 1.000 |
| **Juice** | **Limit to 5** | **3.3 ± 0.62** | **3.2 ± 0.54** | **0.872** |
| 100% Juice | Limit to 5 | 3.1 ± 0.59 | 2.7 ± 0.50 | 0.638 |
| <100% Juice (juice drink) | None | 0.2 ± 0.11 | 0.5 ± 0.29 | 0.454 |
| **Fruit** | **12-14** | **11.3 ± 0.54** | **12.3 ± 0.58** | **0.228** |
| Unsweetened fruit | All servings of fruit | 9.9 ± 0.63 | 10.6 ± 0.63 | 0.438 |
| Sweetened fruit | None | 1.4 ± 0.32 | 1.7 ± 0.33 | 0.562 |
| **Any vegetable (not fried potatoes)** | **12-14** | **5.0 ± 0.51** | **4.8 ± 0.42** | **0.801** |
| Non-starchy vegetables | | 2.3 ± 0.38 | 1.9 ± 0.28 | 0.439 |
| Starchy vegetables | ≤1 | 0.8 ± 0.15 | 0.7 ± 0.17 | 0.770 |
| Fried potatoes | None | 0.2 ± 0.08 | 0.5 ± 0.12 | 0.076 |
| Dark green vegetables | ≥2 | 0.7 ± 0.18 | 0.6 ± 0.16 | 0.892 |
| Orange vegetables | ≥2 | 0.9 ± 0.16 | 1.2 ± 0.17 | 0.195 |
| Mixed vegetables | N/A | 0.3 ± 0.12 | 0.3 ± 0.13 | 1.000 |
| **Grain/bread** | **14-16** | **17.2 ± 0.85** | **16.6 ± 0.60** | **0.568** |
| Whole | ≥7, ≥8 (i.e. at least half of all grain/bread) | 5.0 ± 0.54 | 3.4 ± 0.43 | 0.027 |
| Refined | | 7.4 ± 0.64 | 8.6 ± 0.64 | 0.176 |
| BFGSOFAS[d] | ≤1 | 2.5 ± 0.31 | 2.9 ± 0.26 | 0.414 |
| Cold, pre-made cereal | | 2.3 ± 0.27 | 1.7 ± 0.23 | 0.081 |
| **Meat or meat alternate** | **10-12** | **9.9 ± 0.57** | **10.0 ± 0.53** | **0.898** |
| Lean meat | | 1.2 ± 0.22 | 0.8 ± 0.19 | 0.169 |
| High-fat meat | None | 0.2 ± 0.11 | 0.2 ± 0.10 | 0.828 |
| Processed meat | ≤1 | 2.0 ± 0.26 | 2.0 ± 0.30 | 0.933 |
| Low-fat cheese and yogurt | | 1.0 ± 0.25 | 1.8 ± 0.27 | 0.029 |
| High-fat cheese and yogurt | Low-fat cheese encouraged. No yogurt > 1% fat | 2.7 ± 0.29 | 2.3 ± 0.21 | 0.309 |
| Beans or legumes | ≥1 | 1.3 ± 0.27 | 0.9 ± 0.24 | 0.235 |
| Nuts or seeds | | 1.1 ± 0.23 | 1.5 ± 0.34 | 0.334 |
| Eggs | | 0.7 ± 0.17 | 0.5 ± 0.15 | 0.303 |
| **Miscellaneous** | | | | |
| Non-creditable[e] | None | 4.4 ± 0.95 | 2.5 ± 0.80 | 0.131 |
| Made from scratch | | 1.8 ± 0.33 | 1.2 ± 0.25 | 0.156 |

[a] For food and beverage definitions, see **Appendix 2**.
[b] For breakfast, lunch, and 1 to 2 snacks. 38/60 providers served menus offerings breakfast, lunch, and 2 snacks per day. See **Appendix 4** for results for providers who served all meals.
[c] Two-tailed p-value computed using the t distribution
[d] BFGSOFAS=baked or fried grains high in solid fats and/or added sugars (see **Appendix 2** for examples)
[e] Non-creditable= food items not reimbursable in CACFP. Excludes <100% juice which is non-creditable but was reported in a separate category.

**Table 5.** Total servings[a] of foods and beverages[b] offered over a five-day menu, by meal/snack occasion

| | Breakfast | AM Snack | Lunch | PM Snack | Total |
|---|---|---|---|---|---|
| | ← | *# servings (% Total)* | | → | |
| **All Milk** | 235 (35.0) | 81 (12.1) | 274 (40.8) | 82 (12.2) | 672 |
| Whole milk | 44 | 15 | 52 | 16 | 127 (18.9) |
| Reduced fat (2%) | 131 | 44 | 149 | 49 | 373 (55.5) |
| Low-fat (1%) | 21 | 9 | 28 | 4 | 62 (9.2) |
| Non-fat (skim) | 19 | 7 | 24 | 11 | 61 (9.1) |
| Milk alternative | 3 | 0 | 3 | 2 | 8 (1.2) |
| Milk composite | 17 | 6 | 18 | 0 | 41 (6.1) |
| Flavored | 0 | 0 | 0 | 0 | 0 (0) |
| **All Fruit juice** | 36 (18.3) | 75 (38.1) | 2 (1.0) | 83 (42.1) | 197 |
| 100% unsweetened | 34 | 68 | 1 | 72 | 175 (88.8) |
| <100% juice (juice drink) | 2 | 7 | 1 | 11 | 21 (10.7) |
| **All Fruit** | 221 (31.2) | 104 (14.7) | 280 (39.5) | 104 (14.7) | 709 |
| Unsweetened | 193 | 93 | 228 | 101 | 615 (86.7) |
| Sweetened | 28 | 11 | 52 | 3 | 94 (13.3) |
| **All Vegetables** | 1 (0.3) | 22 (7.0) | 278 (88.3) | 14 (4.4) | 315 |
| Non-starchy | 0 | 8 | 112 | 7 | 127 (40.3) |
| Starchy | 0 | 0 | 46 | 0 | 46 (14.6) |
| Fried potato | 1 | 2 | 18 | 1 | 22 (7.0) |
| Dark green | 0 | 1 | 37 | 1 | 39 (12.4) |
| Orange | 0 | 10 | 47 | 4 | 61 (19.4) |
| Mixed vegetables | 0 | 1 | 18 | 1 | 20 (6.3) |
| **All Grains** | 275 (27.0) | 198 (19.5) | 294 (28.9) | 250 (24.6) | 1017 |
| Whole grains | 71 | 35 | 113 | 34 | 253 (24.9) |
| Refined grains | 112 | 142 | 181 | 208 | 643 (63.2) |
| *BFGSOFAS* | *61* | *33* | *5* | *63* | *162* |
| Cold breakfast cereal | 92 | 21 | 0 | 8 | 121 (11.9) |
| *Low-sugar* | *60* | *15* | *0* | *5* | *80* |
| *High-sugar* | *21* | *6* | *0* | *2* | *29* |
| *Composite* | *11* | *0* | *0* | *1* | *12* |
| **Meat or meat alternate** | 50 (8.3) | 83 (13.7) | 372 (61.4) | 101 (16.7) | 606 |
| All meat, poultry, or fish | 9 | 4 | 174 | 5 | 192 (31.7) |
| Lean | 0 | 1 | 59 | 0 | 60 |
| High-fat | 0 | 0 | 13 | 0 | 13 |
| Processed | 9 | 3 | 102 | 5 | 119 |
| Cheese and yogurt | 11 | 50 | 110 | 63 | 234 (38.6) |
| Low-fat cheese and yogurt | 10 | 21 | 21 | 31 | 83 |
| High-fat cheese and yogurt | 1 | 29 | 89 | 32 | 151 |
| Nuts and Seeds | 11 | 21 | 19 | 27 | 78 (12.9) |
| Beans and legumes | 0 | 4 | 58 | 5 | 67 (11.1) |
| Eggs | 19 | 4 | 11 | 1 | 35 (5.8) |
| **Made from scratch** | 31 | 10 | 34 | 17 | 92 |
| **Non-creditable** | 3 | 3 | 19 | 11 | 36 |

[a] Servings standardized to portion sizes for 3 to 5 year olds as specified by CACFP

[b] For food and beverage definitions see **Appendix 2**.

[c] Non-creditable = food items not reimbursable in CACFP. Excludes <100% juice which is non-creditable but was reported in a separate category.

**Table 6.** Top five food and beverage types offered over a five-day menu, by reimbursement group

| Top Five Foods and Beverages | All providers (n=60) | Higher (n=30) | Lower (n=30) |
|---|---|---|---|
| **All Milk, total servings** | **n=672** | **n=355** | **n=317** |
| Reduced fat (2%), % total | 55.5 | 47.6 | 64.4 |
| Whole, % total | 18.9 | 20.3 | 17.4 |
| Low-fat (1%), % total | 9.2 | 13.8 | 4.1 |
| Nonfat (skim), % total | 9.1 | 7.0 | 11.4 |
| Milk composite, % total | 6.1 | 11.3 | 0.3 |
| Milk alternative, % total | 1.2 | 0.0 | 2.5 |
| **All Juice, total servings** | **n=197** | **n=100** | **n=97** |
| 100% apple juice, % total | 46.7 | 40.0 | 53.6 |
| 100% orange juice, % total | 27.4 | 35.0 | 19.6 |
| 100% grape juice, % total | 6.1 | 4.0 | 8.2 |
| Cranberry apple juice drink, % total | 3.6 | 0.0 | 7.2 |
| Cranberry cocktail (a juice drink), % total | 3.0 | 0.0 | 5.2 |
| Apple cider (100% juice), % total | | 5.0 | - |
| 100% pineapple juice, % total | | 3.0 | 1.0 |
| **All Fruit, total servings** | **n=709** | **n=340** | **n=369** |
| Apple, % total | 19.3 | 21.5 | 17.3 |
| Banana, % total | 18.2 | 21.2 | 15.4 |
| Berries, % total | 10.2 | 10.3 | 10.0 |
| Citrus, % total | 9.2 | 7.4 | 10.8 |
| Grapes, % total | 8.9 | 7.4 | 10.3 |
| **All Vegetable, total servings** | **n=322** | **n=198** | **n=186** |
| Carrot, % total | 18.3 | 12.6 | 18.3 |
| Snap peas, % total | 12.1 | 10.9 | 9.7 |
| Corn, % total | 12.1 | 9.1 | 11.3 |
| Tomato and tomato-based sauces, % total | 10.6 | 9.6 | 8.1 |
| Broccoli, % total | 8.1 | 7.6 | 5.9 |
| Fried potato, % total | 4.7 | 2.0 | 5.9 |
| **All Grains, total servings** | **n=1017** | **n=518** | **n=499** |
| Refined-grain snack foods (crackers, pretzels, etc.), % total | 21.6 | 21.0 | 22.2 |
| Refined-grain bread products, % total | 16.4 | 12.7 | 20.2 |
| 100% whole-grain bread products, % total | 14.4 | 15.8 | 12.8 |
| Cold, ready-to-eat breakfast cereal, % total | 11.9 | 13.5 | 10.2 |
| Pancakes or waffles with syrup, % total | 5.5 | 4.4 | 6.6 |
| Pasta or noodles, % total | 4.2 | 4.6 | 3.8 |
| **All Meat/Meat alternatives, total servings** | **n=535** | **n=264** | **n=271** |
| High-fat cheese (all types), % total | 27.3 | 28.0 | 25.1 |
| Beans or legumes (all types), % total | 12.5 | 15.2 | 10.0 |
| Nut and seed butters, % total | 11.0 | 9.9 | 12.2 |
| Low-fat yogurt, % total | 7.5 | 4.9 | 9.6 |
| Lunchmeat, % total | 7.1 | 8.0 | 6.3 |

Gray-filled cells indicate the particular food item was not in the top five for either the reimbursement group or the overall sample of providers

## Grains

The IOM recommends 14 to 16 servings of grain and/or bread for a five-day menu providing breakfast, lunch, and one to two snacks, with at least half the grains and breads coming from whole grains. Additionally, the IOM recommends limiting baked or fried grains high in solid fats and/or added sugars (BFGSOFAS) to one serving per week (see **Appendix 2** for examples and definitions of BFGSOFAS, whole grains, refined grains, and low- and high-sugar cereals).

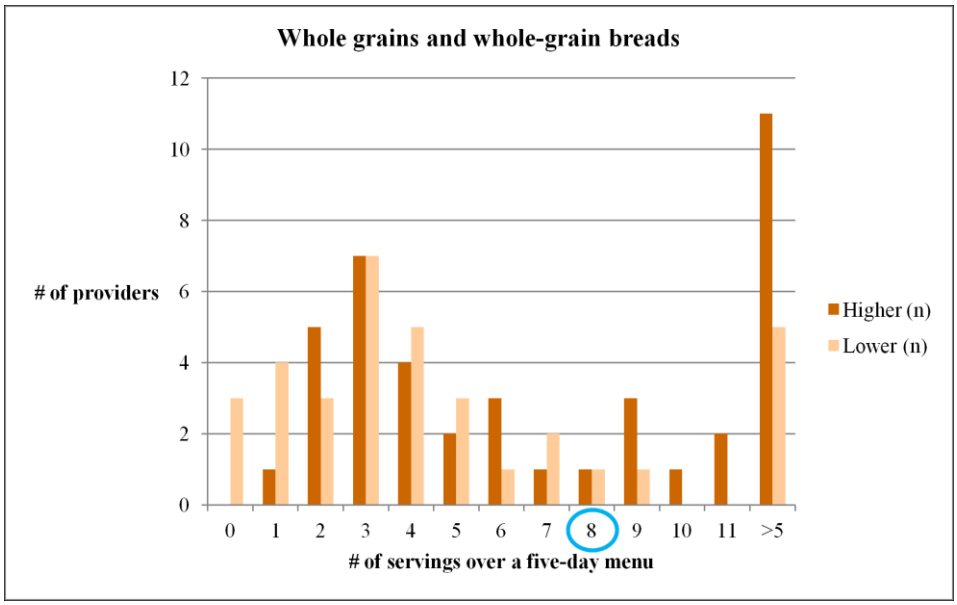


**Figure 8: Servings of whole grains and whole-grain breads offered over a five-day menu by each reimbursement group.** This chart shows total number of servings of whole grains and whole-grain breads offered over a five-day menu (x-axis) and the number of providers from each reimbursement group who offered this many servings (y-axis). The IOM recommends 14 to 16 servings of grains in a five-day menu which offers breakfast, lunch, and one or two snacks, and at least half of all grains and breads as whole grains. On this chart, the IOM's recommended number of servings of whole grains is indicated by the blue circle.

On average, both reimbursement groups exceeded 16 servings of grains and bread over the five-day menu (**Table 4**). Mean (±SE) servings of all grains and bread were 17.2 (±0.85) and 16.6 (±0.60) for the higher and lower group, respectively (p=0.568) (**Table 4**). However, this sample did not meet the recommendation for whole grains (excludes cold, ready-to-eat breakfast cereals) and whole-grain breads (**Table 4**); 25% of all grains and breads offered by this sample were whole grains (**Table 5**), with only 9/60 providers from both groups (7 from the higher reimbursement group and 2 from the lower reimbursement group) meeting the whole grain recommendation (**Figure 8**).

Between the groups, menus of the higher group offered significantly more servings of whole grains and whole-grain bread. Considering only the providers who served all meals, menus of the higher group offered 5.6 (± 0.79) servings of whole grains and whole-grain breads compared to 3.5 (±0.62) servings offered by menus of the lower group (p= 0.046) (**Table 9** in **Appendix 4**). When menus of all providers were included in the analysis, findings for whole grains and whole-grain breads were similar: menus of the higher group offered 5.0 (±0.54) servings compared to 3.43 (±0.43) offered by menus of the

lower group (p=0.027) (**Table 4**). In further analyses, linear regression was used to test for differences in whole grains servings between the two groups, adjusting for potential confounders (see methods). Results from this analysis were similar and indicated providers from the higher group served an additional 1.5 servings of whole grains and whole-grain breads compared to their counterparts in the lower group (p=0.050).

Of the whole grains and whole-grain breads served by this sample, 100% whole wheat breads were most commonly served type by both reimbursement groups, followed by 100% whole-grain crackers for the higher group and oats or farina for the lower group (**Table 11g** in **Appendix 5**).

The majority (63.2%) of grains and bread served in this sample were refined grains. Between the groups there were no significant differences in mean servings of refined grains (**Table 4, Table 9** in **Appendix 4**). Analyses including the menus of all providers and only the menus of providers who served all meals showed the lower group consistently offered, on average, approximately one additional serving of refined grains than the higher group offered (**Table 4, Table 9** in **Appendix 4**). Among the refined grains and breads, refined-grain snack foods (e.g. crackers and pretzels) (46%) and refined-grain bread products (35%) were the most commonly served (**Table 11h** in **Appendix 5**).

A quarter (25.2%) of all refined grains consisted of BFGSOFAS, which were most often served at breakfast and afternoon snack (**Table 5**). Only 16/60 providers met the IOM recommendation to limit BFGSOFAS to one or fewer servings per week (**Figure 9**). Among all providers, mean (±SE) servings of BFGSOFAS was 2.5 (±0.31) for the higher group and 2.9 (±0.26) for the lower group (p=0.414) (**Table 4**); in analyses restricted to menus which included all meals, mean (±SE) servings of BFGSOFAS was 2.4 (±0.41) for the higher group and 2.4 (±0.33) for the lower group (p=0.433) (**Table 9** in **Appendix 4**). Pancakes and waffles served with syrup (35%) and quick breads and muffins (25%) were the most commonly served BFGSOFAS, followed by cookies (12%) and cereal and granola bars (11%) (**Table 5, Table 11i** in **Appendix 5**).

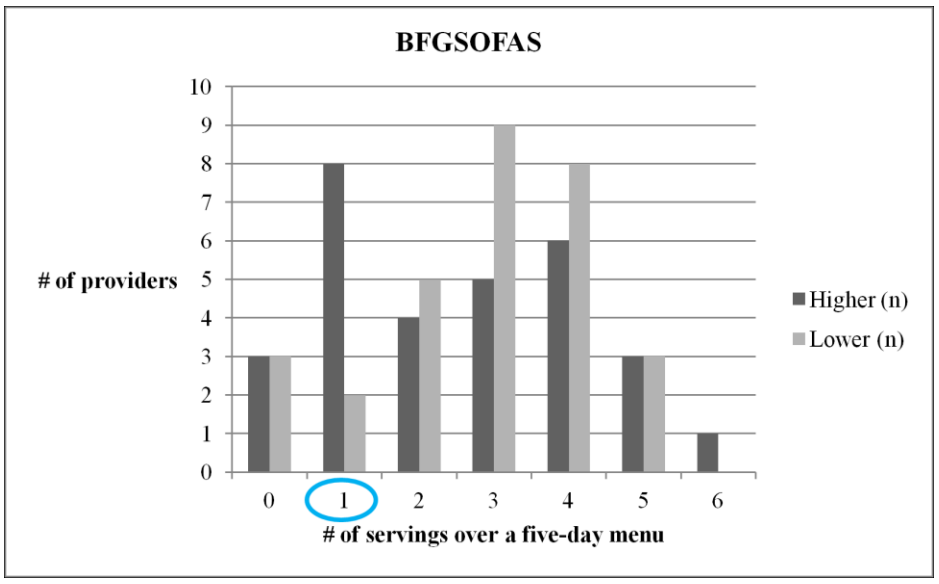


**Figure 9: Servings of baked or fried grains high in solid fats and added sugars (BFGSOFAS) offered over a five-day menu by each reimbursement group.** This chart shows total number of servings of BFGSOFAS offered over a five-day menu (x-axis) and the number of providers from each reimbursement group who offered this many servings (y-axis). The IOM recommends limiting BFGSOFAS to one serving over five-day menu, as indicated by the blue circle.

Approximately 12% of all grains served were cold, ready-to-eat breakfast cereals. Approximately a quarter (~ 24%) of all cereals served was high-sugar cereal (**Table 11j**). Overall, the top five types of grains served in the sample were refined-grain snack foods (e.g. crackers and pretzels) (#1 for both groups); refined-grain breads (#2 for the lower group, #3 for the higher group); 100% whole-grain breads (#2 for the higher group, #3 for the lower group); cold, ready-to-eat cereals (#4 for both groups); and pasta/noodles (#5 for the higher group only) or pancakes/waffles (#5 for the lower group only) (**Table 6**).

## Meat and meat alternates

Following the IOM's recommendations, a five-day menu offering breakfast, lunch, and one to two snacks would provide 10 to 12 servings of meat or meat alternates, include meat/meat alternates at breakfast, exclude any high-fat meats and high-fat yogurts, and restrict processed meat to one serving or fewer across all eating occasions. Mean (±SE) servings of meat/meat alternates was 9.87 (±0.57) for menus of the higher group and 9.97 (±0.53) for menus of the lower group (**Table 4**). The majority (61.4%) of meat/meat alternate servings were offered at lunch (**Table 5**).

The types of meat/meat alternates offered by providers in this sample were as follows: high-fat cheese and yogurt (~25% of all meat/meat alternates served), processed meat (~20%), low-fat cheese and yogurt (~14%), nuts and seeds (~13%), beans or legumes (~11%), lean meat (~10%), eggs (~6%), and high-fat meat (~2%).

Between the reimbursement groups, menus of the higher group offered more—but not significantly more—servings of lean meat, high-fat cheese and high-fat yogurt, bean or legumes, and eggs. These findings were consistent when the analysis included all menus (**Table 4**) or when it was restricted to only those menus which offered all meals (**Table 9** in **Appendix 4**). Meanwhile, menus of the lower group offered more servings of nuts and seeds and significantly more low-fat cheese and low-fat yogurt. When the analysis included all menus, mean servings of low-fat cheese and low-fat yogurt was significantly higher for the lower group compared to the higher group: 1.8 (±0.27) servings versus 1.0 (±0.25) (p=0.029) (**Table 4**). However, the difference in mean servings of low-fat cheese and low-fat yogurt decreased and lost significance when the analysis was restricted to menus of providers who served all meals (**Table 9** in **Appendix 4**).

Both reimbursement groups served high-fat meat with the same, low frequency—less than one-half serving per five-day menu (**Table 4, Table 9** in **Appendix 4**). Processed meat was served more often and with the same frequency across groups—on average approximately two servings per five-day menu (**Table 4**), and slightly more often according to analyses which included only the menus of providers who served all meals (**Table 9** in **Appendix 4**). Approximately 20% of all meat/meat alternates served in this sample were processed meats. Lunchmeat and breaded chicken nuggets made up over half of all processed meat served (**Table 11m**).

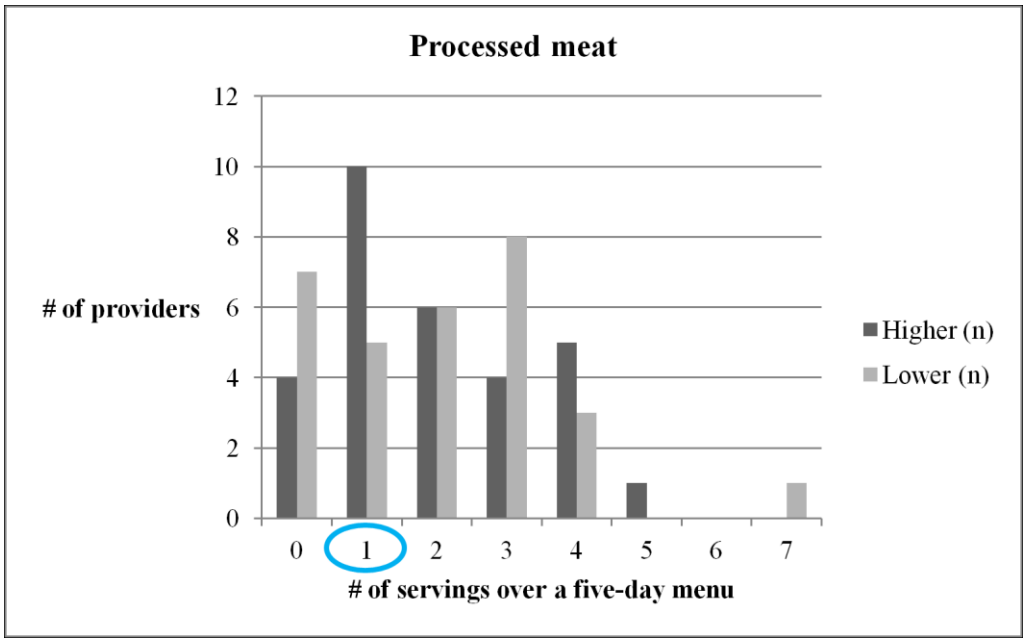


**Figure 10: Servings of processed meat offered over a five-day menu by each reimbursement group.** This chart shows total number of servings of processed meat offered over a five-day menu (x-axis) and the number of providers from each reimbursement group who offered this many servings (y-axis). The IOM recommends limiting processed meat to one or fewer servings over all eating occasions, as indicated by the blue circle.

Overall, the top five types of meat/meat alternates served in the sample were high-fat cheese (#1 for both groups); beans or legumes (#2 for both groups); nut and seed butter (#3 for both groups); low-fat cheese and yogurt (#4 for the lower group, #5 for the higher group); and lunchmeat (#4 for the higher group, #5 for the lower group) (**Table 6**).

## Menu quality and variety

Results from the Menu Quality Index scoring system which was developed to reflect confluence with the IOM's recommended meal patterns (see methods) are presented in **Table 7**. None of the providers met or exceeded 123 points—a "perfect" score which would reflect breakfast and lunch meal patterns consistent with current CACFP requirements and menus consisting of foods in total alignment with the IOM recommendations. Mean MQI score for the entire sample was 65.9% (81 out of a possible 123 points). Between the groups, the higher reimbursement group had a higher mean (±SE) MQI score compared to the lower group, 83 (±3.26) versus 79 (±2.38) (p=0.298). The distribution of menu quality scores was wider for the higher group since two providers in this group served menus which scored below the minimum score of the lower group. However, the interquartile range of the lower group was slightly wider and lower compared to the higher group.

**Table 7.** Distributions of Menu Quality Index (MQI) scores for menus which served breakfast and lunch (n=50)

| | Min | 25th | 50th | Mean ± SE | 75th | Max |
|---|---|---|---|---|---|---|
| **Reimbursement group** | | | | | | |
| Higher | 45 | 76.5 | 81.5 | 83 ± 3.26 | 95 | 112 |
| Lower | 60 | 70 | 78.5 | 79 ± 2.38 | 89 | 103 |

**Table 8** shows the mean (±SE) number of *different types* of food offered for a five-day menu in the sample as a whole and by reimbursement group. Unsweetened fruit and refined grains were the two food groups which were served at least once by all providers and for which the most variety was served. On average, approximately 5 different types of unsweetened fruit were offered. Between the two groups and considering all providers, there was no significant difference in the variety of unsweetened fruit offered. However, in analyses of only the menus of providers who served all meals, results showed the lower group offered significantly greater variety of unsweetened fruit: 5.6 (±0.44) different types of unsweetened fruit versus 4.3 (±0.29) different types of unsweetened fruit offered by menus of the higher group (p=0.030) (**Table 10** in **Appendix 4**). Variety in refined grains ranged from 1 to 6 different types offered over a five-day menu with an average (±SE) of 3.0 (±0.92) different types (**Table 8**). Between the two groups there were no significant differences in the variety of refined grains offered, though menus of the lower group offered greater variety of refined grains (**Table 8, Table 10** in **Appendix 4**).

**Table 8.** Mean number of different types of food offered over a five-day menu

| Food/beverage category | All providers (n=60) | | | Higher (n=30) | Lower (n=30) | P value[a] |
|---|---|---|---|---|---|---|
| | *mean ± SD* | *Min* | *Max* | *mean ± SE* | | |
| 100% Juice | 1.2 ± 1.02 | 0 | 4 | 1.2 ± 0.21 | 1.2 ± 0.17 | 0.803 |
| Unsweetened fruit | 4.9 ± 1.59 | 2 | 10 | 4.6 ± 0.23 | 5.2 ± 0.33 | 0.105 |
| Sweetened fruit | 1.2 ± 1.21 | 0 | 4 | 1.0 ± 0.20 | 1.3 ± 0.24 | 0.398 |
| Whole grains | 1.7 ± 1.07 | 0 | 5 | 1.9 ± 0.19 | 1.4 ± 0.20 | 0.069 |
| Refined grains | 3.0 ± 0.92 | 1 | 6 | 2.8 ± 0.15 | 3.2 ± 0.18 | 0.093 |
| BFGSOFAS[a] | 1.9 ± 1.02 | 0 | 4 | 1.7 ± 0.19 | 2.0 ± 0.18 | 0.381 |
| Non-starchy vegetables | 1.8 ± 1.27 | 0 | 6 | 1.9 ± 0.24 | 1.6 ± 0.22 | 0.365 |
| Beans or legumes | 1.0 ± 1.13 | 0 | 5 | 1.2 ± 0.21 | 0.8 ± 0.20 | 0.138 |
| Lean meat | 0.9 ± 0.84 | 0 | 3 | 1.0 ± 0.17 | 0.7 ± 0.14 | 0.169 |
| Processed meat | 1.8 ± 1.32 | 0 | 5 | 1.7 ± 0.17 | 1.8 ± 0.24 | 0.771 |

[a] Two-tailed p-value computed using the t distribution
[b]BFGSOFAS = Baked or fried grains high in solid fats and/or added sugars

Mean (±SE) number of different types of non-starchy vegetables offered was 1.8 (±1.27), ranging from 0 to 6 different types (**Table 8**). Providers who served all meals and who were in the higher reimbursement group served menus with the greatest variety of non-starchy vegetables, averaging 2.2 (±0.30) different types over a five-day menu (**Table 10** in **Appendix 4**). These providers also served a greater variety of lean meats compared to providers in the lower group who served all meals: 1.3 (±0.21) versus 0.8 (±0.17), respectively (p=0.058) (**Table 10** in **Appendix 4**). There was less of a difference between the groups in the variety of lean meats offered when the analyses included the menus of all providers (**Table 10** in **Appendix 4**).

Providers in this sample served a greater variety of processed meat and BFGSOFAS relative to lean meats and whole grains, respectively. Even so, less than two different types from each of these food categories were served. Between the groups, only the lower group offered a greater variety of BFGSOFAS compared to whole grains whereas the higher group offered a greater variety of whole grains than the lower group (**Table 8, Table 10** in **Appendix 5**).

## Discussion

There is a dearth of studies which address the foods and beverages served in home child care settings [6, 26], and yet the child care environment has received growing attention in recent years. According to policy analysts and public health nutrition researchers, child care is a critical setting to enhance childhood obesity prevention efforts [38]. By describing the foods and beverages offered to preschool-aged children in Home child care settings in CACFP, this study helps to address the apparent need for research which evaluates the foods served in these settings [6]. Findings from this study can be used as a baseline, prior to the implementation of any future changes in CACFP meal requirements, for comparison purposes and

to develop training and technical assistance interventions targeted at weaknesses in current menu practices as identified here.

In the current study, mean servings of foods and beverages offered were calculated for all the main food groups and several subgroups and then compared to the IOM's proposed revisions to the CACFP meal requirements. The IOM's meal pattern recommendations are consistent with the *MyPyramid* food patterns for preschoolers [6] which were designed to meet the 2005 DGAs [19]. The child care providers in this sample, however, were not expected to meet any nutrient- or food-based standards beyond the guidelines designated in the Washington State's Creditable Foods Guide for CACFP [3]. In this study, the IOM recommendations were merely used as a benchmark to facilitate interpretation of the data and to gauge the degree to which providers were meeting established dietary guidance and the proposed revisions to the CACFP meal requirements.

Findings from this study indicate that the Home child care providers sampled have strengths and weaknesses when it comes to offering menus which meet food patterns for optimal health for preschoolers. Areas in which weaknesses were identified include infrequent servings of low-fat and nonfat milk, inadequate servings and limited variety of vegetables, imbalanced proportions of grains and breads that were refined, whole-grain, or which contained solid fats and/or added sugars, and excessive servings of processed meat. Given that menus served by providers in this sample were nearly 97% consistent with current CACFP guidelines, these substantial weaknesses also reflect the limitations of current CACFP guidance in assuring meal patterns that measure up to established dietary guidance.

Conversely, providers in this sample performed well with regard to offering moderate servings of 100% fruit juice and infrequent servings of juice drinks, adequate servings and a variety of unsweetened fruit, and limited servings of high-fat meat and fried potatoes. Finally, the present study found several examples in which reimbursement rate was significantly associated with servings of particular foods or beverages, including low-fat cheese and low-fat yogurt, whole grains and whole-grain breads, and a choice of different milk types offered at the same eating occasion (i.e. "composite" milk).

This study is not the first to show that higher fat milk was frequently served to preschool-age children in Home child care settings [11, 30], a practice which clashes with established child nutrition recommendations to serve only nonfat (skim) or low-fat (1%) milk to children age 2 and older [6, 19]. The purpose of this milk recommendation is to decrease the content of solid fats and extra energy in the meal pattern while still meeting other nutrient requirements (e.g. calcium). In 2009, a study of CACFP child care Homes in Kansas found that less than 14% of providers reported serving 1% or skim milk regularly [30].

With respect to the type of milk served, this study also found that providers in the higher reimbursement group offered, on average, significantly more servings of "composite milk", which signified a variety of different milk types were offered during the same meal occasion. This finding may

be related to the observation that additional income to spend on food purchases is often spent on traits such as variety, quality, taste, convenience, and enjoyment [45].

As with servings of low-fat and nonfat milk, results from this study showed that the amount and variety of vegetables served did not meet the IOM's recommendations. This finding is consistent with previous studies which also found that servings of vegetables in Home child care settings fell short of established recommendations [11, 14]. The top five types of fruits and vegetables served by providers in this sample are also similar to findings from a study which used food intake data from 1994-1996 and showed that Iceberg lettuce, tomatoes, French fried potatoes, bananas and orange juice were the most commonly consumed fruits and vegetables by Americans [39]. The IOM's vegetable specifications emphasize non-starchy, nutrient-dense vegetables, which include green leafy, yellow/orange, and cruciferous vegetables, because these vegetables are rich sources of vitamins A and C, potassium, and fiber, which are all nutrients of concern according to the 2005 DGAs [19]. A positive finding with respect to vegetable servings in the present study was that carrot and broccoli were in the top five types of vegetables served. On a similar note, energy-dense and nutrient-poor fried potatoes were infrequently served, another positive finding. This is dissimilar from results noted in studies of food consumption patterns, which have shown that French fried potatoes and other fried potatoes are among the most commonly consumed vegetable by children ([40] and reported in [41]).

For servings of grains and bread, results presented here indicate that, compared to current dietary guidance and the IOM's recommendations, providers in this sample offered disproportionately more refined grains and breads and BFGSOFAS and relatively less whole grains and whole-grain breads. Current CACFP requirements do not specify proportions of whole versus refined grains that need to be served, nor do they place any limitations or restrictions on grains and breads high in solid fats and/or added sugars [3]. This study found that grain products high in solid fats and/or added sugars, such as pancakes and waffles served with syrup, muffins and quick breads, flour tortillas, granola/cereal bars, and cookies, were served frequently. Similar results were noted in the IOM report [6] and in a nationally representative conducted by Fox et al., 1997 [11], which looked at the menus served in Head Start centers, child care centers, and Homes. Additionally, in the present study, results from analyses which controlled for demographic, socioeconomic and professional characteristics showed that servings of whole grains and whole-grain breads were significantly associated with higher reimbursement group, suggesting that providing a higher rate of CACFP reimbursements may increase servings of whole grains.

Findings related to grains and vegetables served by providers in this sample indicate a need for the USDA to revise the CACFP implementation plans to increase the amount and variety of vegetables and whole grains served to children in this nutrition assistance program. This will likely require more food spending and increased reimbursements, as was shown in the projected food costs estimated by the IOM [6] and in previous research which found that higher food expenditures were strongly and positively

associated with number of portions of whole grains and whole produce served to children in CACFP Homes [20].

As for meat/meat alternates served by providers in this sample, results indicated that 20% of all meat/meat alternates were processed meat. This greatly exceeds the IOM's recommendation but is similar to reported processed meat consumption patterns in the United States [42]. Processed meat is differentiated from fresh meat by preparation methods such as smoking, curing, salting, and/or addition of preservatives [42]. Per IOM specifications, processed meat also includes breaded fried products [6]. Numerous epidemiological studies have researched meat and processed meat intake and risk of cancer [43-46]. In 2007, panel experts with the World Cancer Research Fund International judged the evidence on processed meat to be a "convincing" cause of colorectal cancer [47]. Current CACFP guidelines, however, make no restrictions on the type of meat/meat alternates that are creditable [3].

In addition to the limitations on processed meat, the IOM recommends eliminating high-fat fresh meats and high-fat yogurt (i.e. full fat, whole yogurt) and encourages, but would not require, reduced-fat cheese [6]. The IOM's emphasis on low-fat animal products has origins in the 2005 DGAs which advised saturated fat intake limited to 10% of total food energy [19]. In secondary nutrient analyses conducted on the menus (data not shown), results indicated mean saturated fat as a percentage of total menu energy was approximately 12.5% for both reimbursement groups, which is consistent with the findings from the food-based analysis for meat/meat alternates and above the acceptable macronutrient distribution range established by the 2005 DGAs [19].

Comparing mean servings of meat/meat alternates between the reimbursement groups, findings from the present study indicated that the higher reimbursement group offered more servings of lean meat, high-fat cheese and yogurt, beans or legumes, and eggs whereas the lower reimbursement group offered more servings of nuts and seeds (usually peanut butter), and significantly more servings of low-fat cheese and low-fat yogurt. Future studies are needed to examine more thoroughly how reimbursement rate impacts the type of protein-rich foods served.

The providers in this sample performed well with respect to servings of juice and fruit. Less than 100% juice or juice which contains added sugars ("juice drinks") are not creditable under current CACFP guidelines [3] and findings from this study indicated juice drinks and other non-creditable beverages were rarely served. On average, 100% fruit juice was served less than once per day and results suggested the IOM's recommendations for juice are already practiced by two-thirds of the providers in this sample. Adequate servings and wide variety of unsweetened fruits was another positive menu practice found among providers in this study. Since the 2005 DGAs, whole fruit has been emphasized for its vitamin, mineral, and antioxidant content, as well as a way to promote adequate fiber intake [19]. Although current CACFP guidelines reimburse for sweetened fruits such as fruit pie filling and fruit fritters, on average, sweetened fruits were served infrequently by this sample of providers.

Overall menu quality as assessed by the food-based Menu Quality Index (MQI), which was developed to reflect confluence with the IOM's recommended meal patterns over a five-day menu, showed that, on average, the providers in this sample were 65.9% consistent with the IOM's recommendations. Between the reimbursement groups no significant differences were detected, but the higher group was found to have a slightly higher mean MQI score. The MQI, however, is not without limitations. First, since it is a food-group-based scoring system, a perfect score may not ensure a menu contains adequate nutrients or an appropriate nutrient profile for preschool-aged children. Second, while the MQI attempts to account for servings of energy-dense, nutrient-poor foods by deducting points for certain types of foods served, this tool cannot directly capture menus with excessive servings of individual food components or of fats, sugars, and sodium—nutrients which contribute to dietary imbalance and which the IOM recommendations attempt to limit. Third, the MQI score is not adjusted for energy so a menu which contains extra or excessive food may inflate the MQI score.

A final food-based analysis featured in the present study was an examination of the variety of foods served. Increased variety, especially variety of fruits and vegetables, is a key component of the IOM's recommended revisions for CACFP meal requirements [6] and of the 2005 DGAs [19]. Dietary variety has been shown to be associated with improved dietary quality [48-50]. Choosing a variety of foods within and across food groups, in the amounts recommended, may improve diet quality over time because foods within the same food group have different combinations of nutrients and other healthful constituents like fiber. In the present study, variety was defined as count of different types of foods and beverages served in each of the major food and beverage groups and subgroups. In other words, variety *within* food groups was of interest since variety across food groups is achieved by the CACFP guidelines which specify meal components.

Results from the variety analysis indicate that menus showed a wide range in the variety of foods and beverages offered in each major food group. With the exception of unsweetened fruit and refined grains, however, less than two different types of foods within each food group were served on average over a five-day menu. Notably, a greater variety of processed meat and BFGSOFAS were served relative to lean meats and whole grains, respectively. Although it is outside the scope of this study, future studies of the foods served in child care settings should consider the impact of variety and variety ratio (e.g. variety of vegetables/variety of BFGSOFAS) on menu quality and children's intake. Few studies have focused on the impact of dietary diversity within specific food groups on overall consumption [51]; however, in light of research suggesting that children's food preferences are learned through repeated exposure to foods [51, 52], it is conceivable that variety ratio may be a relevant indicator of menu quality.

## Study limitations

As has been described previously [4, 20], the design and analytical methods used in this study are not without limitations and results need to be cautiously interpreted. This is a cross-sectional descriptive study based on a convenience sample of providers that is relatively homogenous with respect to socio-demographic characteristics. As such, this study is unable to address causality and is limited with respect to generalizability. In addition, the analyses are based on food that was reportedly *offered* to children, rather than the foods actually consumed. The reliance on menu records has intrinsic weaknesses similar to diet records used in traditional dietary assessment. However, menu records in this study were completed in real time by each care provider and were verified for accuracy and completeness, and receipts of foods purchased provided a form of "validation" of the foods served [4, 20]. Finally, since the menu data was collected for only a five-day period, the variety analysis may not reflect the true variety served over a longer period of time.

## Conclusions

Characterizing the menus served in child care settings is important because children obtain a large portion of daily calories from full-time day care [11]. Studies indicate that the preschool years are an especially critical time for shaping children's eating habits and taste preferences [53-56]. The availability of foods and beverages in day care may affect the quality of a child's diet and eating habits that track into adolescence [57-59]. Findings from the present study support the need for improved menu standards and regulations in order to bring the meals served in CACFP into greater alignment with established dietary guidance. At the same time, more research is needed to understand how the two-tiered reimbursement structure is impacting menu quality as defined by food- and variety-based indicators.

# Appendix 1

### *A. Comparison of Current Requirements with Recommended Meal Requirements and Specifications (Adapted from Table 7-10, p.132, in [6])*

| Eating Occasion | Current Requirements | Recommended Requirements and Specifications |
|---|---|---|
| **All** | Must meet daily pattern | Must meet daily and weekly patterns to provide more flexibility and better alignment with the *Dietary Guidelines* |
| Breakfast | 3 meal components | 4 or 5 meal components |
| Lunch or supper | 4 meal components | 5 meal components |
| Snack | Any 2 of 4 components | Variety specified for the week<br>Choice between 2 small snacks or 1 enhanced snack |
| **Meal Component** | | |
| Fruit | Fruits and vegetables are combined as a category | Fruits are a separate category, and servings are increased; juice is not provided for infants and is limited for children; fruits containing added sugars are limited |
| Vegetable | | Vegetables are a separate category from fruit, and servings are increased; must provide variety including dark green leafy, bright yellow/orange, legumes; sodium content is limited; starchy vegetables are limited |
| Grain | Enriched or whole grain, proportions not specified | At least half must be whole grain-rich; additional whole grains are encouraged; grain products high in solid fats and added sugars are limited to control calories and saturated fat; high-sodium grain products are also limited |
| Meat/ meat alternate | None at breakfast<br>No restrictions on high-fat, highly processed meats | Included in weekly breakfast pattern<br>Some types are limited to help control calories, solid fat, and sodium |

### *B. Select IOM recommendations for CACFP meal components [6]*

**Milk**

- *Milk and yogurt must be low-fat or nonfat for those ages 2 years or older (whole milk for 1-year-old children)* (p 115)
- *Nonfat (skim) and low-fat (1%), no higher fat milks* [for children age ≥ 2 y] (p 127)
- *Nonfat flavored milk containing no more than 22 g of sugar per 8 fl oz is allowed only for children age 5 and older in at-risk afterschool programs and for adults* (p 127)

**Juice**

- *100% fruit juice with no added sugars, limited to one serving per day* (p 125)

**Fruit and Vegetables**

- *One fruit and two vegetables are to be served at each lunch and supper meal. Over the course of a 5-day week, different types of vegetables are to be served at each lunch and supper, as follows: dark green vegetables at least twice per week, orange vegetables at least twice/week, legumes at least once/week, starchy vegetables no more than twice per week, and other vegetables at least three times per week* (p 114)

- *Variety is to be encouraged through the weekly food pattern and nutrition education* (p 125)

- *Fruit rather than fruit juice is to be served at most meals; unsweetened 100 percent juice is allowed only once per day in a serving size tailored to the age group's needs* (p 114)

- *Any variety of fresh, canned, or plain frozen vegetables. Vegetables may be boiled, steamed, baked, or stir fried in a small amount of vegetable oil. No deep-fried vegetables* (p 128)

**Grains**

- *Over the course of the week and day, at least half of the grains are whole grains* (p 114)

- *Baked or fried grain products that are high in solid fats and added sugars are limited to one serving per week across all eating occasions. Examples of grain foods that are high in solid fats and added sugars and that are commonly served in CACFP include pancakes and waffles served with syrup, muffins and quick breads, sweet rolls, croissants, toaster pastries, donuts, flour tortillas, granola/cereal bars, cookies, brownies, cake, and pie* (p 126)

- *With regard to grain foods that are high in added sugars, consider setting the initial limit to be two per week rather than one, but set a final date for achieving the goal of no more than once per week* (p 129)

**Breakfast cereals**

- *Ready-to-eat cereals and hot cereals (instant-, quick-, and regular-cooking forms), whether whole grain-rich or enriched [must conform to FDA standard of identity], must contain less than or equal to 21.2 g sucrose and other sugars per 100 g dry cereal (less than or equal to 6 g per dry oz of cereal, as specified in WIC Food Packages [IOM, 2006])* (p 126)

**Meat/Protein**

- *Limit highly processed meat, poultry, and fish (including highly salted products and breaded fried products) to one time per week across all eating occasions* (p 128)

- *No processed cheese, cheese food, or cheese spread because of their higher sodium content and lower content of other nutrients* (p 128)

- *Yogurt must conform to the FDA's Standard of Identity (21 C.F.R. 131.200) and any updates of these regulations; low-fat yogurt, (21 C.F.R. 131.203); nonfat yogurt, (21 C.F.R. 131.206); plain or flavored; fortified with vitamin D to be comparable to milk; ≤ 17 g of total sugars per 100 g yogurt (40 g/8 oz serving). Yogurt may not contain more than 1% milk fat. May be used as an alternative to either milk or meat no more than once per day* (p 127)

- *Fresh or plain frozen lean beef, pork, lamb, venison, chicken, turkey, other poultry: broiled, roasted, braised, stewed, stir fried in mixed dishes with nonstick spray or vegetable oil. Remove skin from poultry before serving. Limit higher fat meats (e.g., hamburger with ≥ 20% fat, fatty pork)* ( p 127)

- *Natural cheese. Low-fat cheese is encouraged. No processed cheese, cheese food, or cheese spread because of their higher sodium content and lower content of other nutrients* (p 128)

**Emphasis on variety**

- *…offering varied selections from the combination of vegetable subgroups each week improves the nutritional quality of the diet and alignment with current dietary guidance. The snack pattern also calls for variety to help ensure nutritional quality over time. Similarly, increased variety was a key component of the Institute of Medicine's recommended revisions of the* WIC Food Packages *and of the* Dietary Guidelines (p 115)

# Appendix 2

***Definitions [3, 6] of food and beverage groups used for the food-based analysis***

| Food or Beverage Group | Select definitions or examples |
|---|---|
| Milk | |
| Whole | |
| Reduced-fat (2%) | |
| Low-fat (1%) | |
| Nonfat (skim) | |
| Flavored | Sweetened dairy drink made with milk, sugar, colorings, and artificial or natural flavorings. |
| Alternative | E.g. almond, rice, soy, coconut, etc. |
| Composite | A choice of different milks was offered during the same eating occasions. |
| Juice | |
| 100% | 100 percent fruit or vegetable juice with no added sugars |
| <100% (juice drink) | Contains juice and/or added vitamin C but is not 100% juice |
| Fruit | |
| Unsweetened | Any variety of unsweetened fresh fruits; frozen unsweetened fruits; canned fruits that are packed in 100% juice or water; or dried fruit without added sugars, fats, oils, or salt. |
| Sweetened | Fruit with added sugars, fats, oils, or salt, e.g. cranberry sauce, covered raisins, dried fruit with added sugar. |
| Grains | |
| Whole | E.g. amaranth, brown rice, buckwheat, bulgur (cracked wheat), millet, muesli, oatmeal, popcorn, quinoa, sorghum, triticale, whole grain barley, whole grain cornmeal, whole rye, whole wheat bread, whole wheat cereal flakes, whole wheat crackers, whole wheat pasta, whole wheat sandwich buns and rolls, and wild rice. |
| Refined | E.g. cornbread, corn flakes cereal, corn tortillas, taco shells, couscous, crackers, grain-based chips, trail mix/gorp/party mix, flour tortillas, grits, macaroni, noodles, pitas, spaghetti, white bread, white rice, white buns, rolls, and bagels. Crackers include animal crackers, teddy grahams, graham crackers as well as salty crackers (e.g. cheese crackers). Grain-based chips include bagel chips, tortilla chips, pretzel chips, and pretzels. White bread includes sticks, stuffing, English muffins, and biscuits |
| Baked or fried grains high in solid fats and/or added sugars (BFGSOFAS) | E.g. cookies/bars/granola, multi-grain/fruit bars, brownies, and granola/cereal bars (credible), Cinnamon/sweet rolls, coffee cake, Danish pastry, donut (credible), quick breads (banana, carrot, pumpkin, zucchini) (credible), cake/cupcake (not credible), pie (credible), muffins (credible), pop tarts/toaster pastries (credible). Pancakes and waffles served with syrup (credible). |
| Low-sugar breakfast cereal | Ready-to-eat cereals and hot cereals (instant-, quick-, and regular-cooking forms), whether whole grain-rich or enriched, containing ≤ 21.2 g sucrose and other sugars per 100 g dry cereal (less than or equal to 6 g per dry oz of cereal). |
| High-sugar breakfast cereal | Ready-to-eat cereals and hot cereals (instant-, quick-, and regular-cooking forms), whether whole grain-rich or enriched, containing more than 6 g per sugar/serving. |
| Composite breakfast cereal | A choice of low-sugar and high-sugar cereals was offered, or a mix of low-sugar and high-sugar cereals was served. |
| Vegetables | Any variety of fresh, canned, or plain frozen vegetables. Vegetables may |

| | |
|---|---|
| | be boiled, steamed, baked, or stir fried in a small amount of vegetable oil. No deep-fried vegetables. |
| Non-starchy | E.g. Artichokes, asparagus, bean sprouts (cooked or canned only), beets, Brussels sprouts, cabbage, cauliflower, celery, cucumbers, eggplant, green beans, green or red peppers, iceberg (head) lettuce, mushrooms, okra, onions, parsnips, tomatoes, tomato juice, vegetable juice, turnips, wax beans, zucchini |
| Starchy | E.g. corn, green peas, lima beans, and potatoes. Green peas and fresh, frozen, or canned lima beans are also considered part of the beans/legumes group |
| Fried potatoes | Tater tots, French fries |
| Dark green | E.g. bok choy, broccoli, collard greens, dark green leafy lettuce, kale, mesclun, mustard greens, romaine lettuce, spinach, turnip greens, and watercress |
| Orange | E.g. acorn squash, butternut squash, carrots, Hubbard squash, pumpkin, and sweet potatoes |
| Meat and meat alternates | |
| Lean meat | Fresh or plain frozen lean beef (10% ground, select or choice, trimmed of fat, ground roast, round, sirloin, tenderloin), pork (lean, chop, ham, tenderloin), lamb (roast, chop, leg), wild game (buffalo, ostrich, rabbit, venison), poultry (without skin); fish (fresh, shellfish, cnd fish), and prepared with lean methods, i.e. broiled, roasted, braised, stewed, stir fried in mixed dishes with nonstick spray or vegetable oil |
| High-fat meat | Fresh or plain frozen beef (corned beef, ground beef—unless ground lean, meatloaf, prime rib, short ribs, tongue), lamb (ground, rib roast), pork (cutlet, shoulder roast), poultry (fried, served with skin, ground turkey), sausage, fish (fried), or otherwise lean meat that is served with a high-fat sauces or other high-fat preparation/cooking method. |
| Processed meat | Meat that is prepared with methods such as smoking, curing, salting, and/or addition of preservatives, e.g. hot dogs, corndogs, bratwurst, fish sticks, chicken nuggets, lunch meat, canned stews/chilis, and other highly processed meat, poultry, and fish. Including highly salted products and breaded fried products. Per the IOM recommendations, processed meat includes highly salted products and breaded fried products. |
| Nuts and seeds | Whole or as nut- or seed-butter |
| Eggs | |
| Cheese or yogurt | Natural cheese and low-fat or non-fat yogurt. Does not include cream cheese or sour cream (these are condiments), or sugary yogurt i.e. ≤ 17 g of total sugars per 100 g yogurt (40 g/8 oz serving) (such yogurt is not creditable). |
| High-fat dairy | Natural and processed cheeses (American, bleu, Brie, cheddar, hard goat, Monterey Jack, queso, Swiss). Includes cheese added to homemade Mac & Cheese. Whole (full fat) yogurt. |
| Low-fat dairy | Natural and processed reduced-fat cheeses, e.g. cottage cheese, feta, mozzarella, or string cheese. Non-fat or low-fat yogurt |
| Beans, legumes, and tofu | E.g. black beans, black-eyed peas, garbanzo beans (chickpeas), kidney beans, lentils, navy beans, pinto beans, soy beans, split peas, tofu (bean curd made from soybeans), white beans.<br><br>Tempeh, texturized vegetable protein, and tofu although these are not considered creditable foods in the CACFP program, are included in this food group. |

| | |
|---|---|
| | Green peas and fresh, frozen, or canned (not dried) lima beans are considered part of this group as well but should be counted as a starchy vegetable. |
| Miscellaneous | |
| Not-creditable | Items non-creditable under the CACFP meal, e.g. processed cheese, cheese food, or cheese spread; chips that are not grained base; bacon; candy and frozen treats; soda; canned soups; high-sugar and high-fat yogurts , i.e. ≤ 17 g of total sugars per 100 g yogurt (40 g/8 oz serving) or more than 1% milk fat.<br><br>Excludes juice drinks and sweetened cereals, which are not creditable but were categorized in separate groups. |
| Mixed dishes | Foods that could be placed in more than one major food group, e.g. pasta with tomato sauce; quiche with spinach; stews, chili mac, burritos, ravioli, pot pies, chili, homemade soups, rice pilaf, pizza. |
| Made from scratch | Foods prepared at home from fresh or raw ingredients. |

# Appendix 3

### *Quality Scoring for Breakfast and Lunch used by Hecht et al. (2009) [5]*

| Category | Points | | |
|---|---|---|---|
| | 0 | 1 | 2 |
| Milk | None | Whole | 2% or 1% OR rice or soy OR non-fat |
| Water at meals | Water served rarely or never | Water served some of time | Water served most or all of time |
| Fruits | None | 100% juice | Other fruit |
| Vegetables | None | Beans OR other vegetables | Beans AND other vegetables |
| Meats/Proteins | None | Other meat | Peanut butter/nuts/seeds OR vegetarian substitute OR baked/broiled poultry/fish |
| Grains | None | White grain | Whole grain |

| Category | Points | |
|---|---|---|
| | 0 | -1 |
| Flavored milk | None | Flavored (of any % fat) |
| Sweetened beverages | None | Any |
| Frozen treats | None | Any |
| Candy | None | Any |
| Sweet cereals | None | Any |
| Sweet grains/pastries | None | Any |
| Chips | None | Any |
| Fried potatoes | None | Any |
| Fruit canned in syrup | None | Any |
| Drinking water inside | Available for self-serve or upon request | Not easily available or only during breaks |

# Appendix 4

### *Additional results from analyses performed on the subset of providers who served all meals (n=38)*

**Table 9.** Mean (±SE) servings of food and beverages[a] offered over a five-day menu by providers who served all meals (**n=38**), by reimbursement group and compared to the IOM's recommendations for five-day menus served to children ages 2-4 years

| Food/Beverage | IOM's recommendation [6] | Higher (n=18) | Lower (n=20) | P value[b] |
|---|---|---|---|---|
| | *servings/week* | *mean ± SE* | | |
| **Milk** | **9** | **11.7 ± 0.71** | **10.7 ± 0.67** | **0.300** |
| Nonfat (skim) or low-fat (1%) | 9 (all servings of milk) | 1.4 ± 0.95 | 1.7 ± 0.84 | 0.807 |
| **Juice** | **Limit to 5** | **4.4 ± 0.85** | **3.5 ± 0.67** | **0.412** |
| 100% Juice | Limit to 5 | 4.1 ± 0.79 | 3.2 ± 0.68 | 0.384 |
| <100% Juice (juice drink) | None | 0.3 ± 0.16 | 0.3 ± 0.18 | 0.927 |
| **Fruit** | **14** | **11.8 ± 0.60** | **12.9 ± 0.61** | **0.199** |
| Unsweetened fruit | 14 (all servings of fruit) | 9.6 ± 0.84 | 11.1 ± 0.76 | 0.183 |
| Sweetened fruit | None | 2.2 ± 0.44 | 1.8 ± 0.43 | 0.439 |
| **Any vegetable (excludes fried)** | **14** | **5.9 ± 0.70** | **5.2 ± 0.58** | **0.419** |
| Non-starchy vegetables | | 2.8 ± 0.55 | 1.9 ± 0.38 | 0.190 |
| Starchy vegetables | ≤ 1 | 0.8 ± 0.22 | 0.9 ± 0.23 | 0.959 |
| Fried potatoes | | 0.2 ± 0.10 | 0.6 ± 0.17 | 0.070 |
| Dark green vegetables | ≥ 2 | 0.8 ± 0.29 | 0.8 ± 0.23 | 0.818 |
| Orange vegetables | ≥ 2 | 1.0 ± 0.23 | 1.3 ± 0.23 | 0.445 |
| **Grain/bread** | **16** | **18.8 ± 0.72** | **17.5 ± 0.80** | **0.223** |
| Whole | ≥ 8 (i.e. at least half of all grain/bread) | 5.6 ± 0.79 | 3.5 ± 0.62 | 0.046 |
| Refined | < 8 | 8.4 ± 0.83 | 9.4 ± 0.83 | 0.447 |
| BFGSOFAS[c] | ≤ 1 | 2.4 ± 0.41 | 2.4 ± 0.33 | 0.433 |
| Cold, pre-made cereal | | 2.5 ± 0.35 | 2.0 ± 0.30 | 0.244 |
| **Meat or meat alternative** | **12** | **10.8 ± 0.67** | **10.3 ± 0.73** | **0.596** |
| Lean meat | | 1.6 ± 0.29 | 1.0 ± 0.26 | 0.097 |
| High-fat meat | None | 0.3 ± 0.18 | 0.2 ± 0.12 | 0.711 |
| Processed meat | ≤ 1 | 2.1 ± 0.37 | 2.2 ± 0.39 | 0.862 |
| Low-fat cheese and yogurt | | 1.2 ± 0.37 | 1.6 ± 0.29 | 0.363 |
| High-fat cheese and yogurt | Low-fat cheese encouraged. No yogurt > 1% fat | 2.7 ± 0.32 | 2.3 ± 0.27 | 0.389 |
| Beans or legumes | ≥ 1 | 1.3 ± 0.39 | 1.0 ± 0.34 | 0.533 |
| Nuts or seeds | | 1.2 ± 0.35 | 2.0 ± 0.46 | 0.187 |
| Eggs | | 0.7 ± 0.16 | 0.4 ± 0.17 | 0.264 |
| **Miscellaneous** | | | | |
| Non-creditable[d] | None | 4.6 ± 1.37 | 2.1 ± 0.95 | 0.135 |
| Made from scratch | | 1.8 ± 0.35 | 1.4 ± 0.33 | 0.322 |

[a] For food and beverage definitions, see **Appendix 2**.
[b] Two-tailed p-value computed using the t distribution
[c] BFGSOFAS=Baked or fried grains high in solid fats or added sugars
[d] Non-creditable=items not reimbursable by CACFP. Excludes non-creditable juice drinks which are reported in a separate category.

**Table 10.** Mean number of different types of food offered over a 5-day menu by providers who served all meals (**n=38**)

| Food/beverage category | Sample overall | | | Higher (n=18) | Lower (n=20) | *P* value[a] |
|---|---|---|---|---|---|---|
| | *mean ± SD* | *Min* | *Max* | *mean ± SE* | | |
| 100% Juice | 1.3 ± 0.93 | 0 | 3 | 1.5 ± 0.23 | 1.1 ± 0.19 | 0.188 |
| Unsweetened fruit | 5.0 ± 1.75 | 2 | 10 | 4.3 ± 0.29 | 5.6 ± 0.44 | 0.030 |
| Sweetened fruit | 1.5 ± 1.22 | 0 | 4 | 1.6 ± 0.26 | 1.4 ± 0.30 | 0.612 |
| Whole grains | 1.7 ± 1.07 | 0 | 5 | 1.9 ± 0.28 | 1.6 ± 0.28 | 0.395 |
| Refined grains | 3.2 ± 0.92 | 1 | 6 | 3.0 ± 0.20 | 3.3 ± 0.26 | 0.376 |
| BFGSOFAS[a] | 1.9 ± 1.07 | 0 | 4 | 1.7 ± 0.25 | 2.0 ± 0.24 | 0.432 |
| Non-starchy vegetables | 1.9 ± 1.35 | 0 | 6 | 2.2 ± 0.30 | 1.6 ± 0.31 | 0.159 |
| Beans or legumes | 1.0 ± 1.26 | 0 | 5 | 1.1 ± 0.30 | 0.9 ± 0.28 | 0.532 |
| Lean meat | 1.1 ± 0.87 | 0 | 3 | 1.3 ± 0.21 | 0.8 ± 0.17 | 0.058 |
| Processed meat | 1.8 ± 1.39 | 0 | 5 | 1.7 ± 0.34 | 2.0 ± 0.30 | 0.620 |

[a]Two-tailed p-value computed using the t distribution
[b]BFGSOFAS = Baked or fried grains high in solid fats and/or added sugars

# Appendix 5

**Tables 11a-11m.** Frequencies of food and beverage types offered, by reimbursement group. For food and beverage definitions used in the coding and analysis, see **Appendix 2**.

**Table 11a.** Frequency of 100% juice types offered, by reimbursement group

| 100% Juice | Higher (n=30) | Lower (n=30) | Total |
|---|---|---|---|
| | *# servings (% total)* | | |
| Apple juice | 40 | 52 | 92 (52.57) |
| Orange juice | 35 | 18 | 53 (30.29) |
| Grape juice | 4 | 8 | 12 (6.86) |
| Apple cider | 5 | 0 | 5 (2.86) |
| Pineapple juice | 3 | 1 | 4 (2.29) |
| Pineapple orange banana | 0 | 1 | 1 (0.57) |
| Cranberry raspberry | 2 | 0 | 2 (1.14) |
| Orange peach mango | 2 | 0 | 2 (1.14) |
| Strawberry juice | 2 | 2 | 4 (2.29) |
| **Total** | **93** | **82** | **175** |

**Table 11b.** Frequency of unsweetened fruit types offered, by reimbursement group

| Unsweetened fruit | Higher (n=30) | Lower (n=30) | Total |
|---|---|---|---|
| | *# servings (% total)* | | |
| Apple | 73 (24.58) | 64 (20.13) | 137 (22.28) |
| Banana | 72 (24.24) | 57 (17.92) | 129 (20.98) |
| Berries | 35 (11.78) | 37 (11.64) | 72 (11.17) |
| Citrus | 25 (8.42) | 40 (12.58) | 65 (10.57) |
| Grapes | 25 (8.42) | 38 (11.95) | 63 (10.24) |
| Melon | 19 (6.40) | 30 (9.43) | 49 (7.97) |
| Pear | 12 (4.04) | 8 (2.52) | 20 (3.25) |
| Peach | 11 (3.70) | 7 (2.20) | 18 (2.93) |
| Pineapple | 9 (3.03) | 9 (2.83) | 18 (2.93) |
| Raisin | 2 (0.67) | 9 (2.83) | 11 (1.79) |
| Cherries | 2 (0.67) | 6 (1.89) | 8 (1.30) |
| Mango | 2 (0.67) | 4 (1.26) | 6 (0.98) |
| Apricot | 3 (1.01) | 1 (0.31) | 4 (0.65) |
| Avocado | 2 (0.67) | 2 (0.63) | 4 (0.65) |
| Kiwi | 3 (1.01) | 1 (0.31) | 4 (0.65) |
| Other | 2 (0.67) | 5 (1.57) | 7 (1.14) |
| **Total** | **297** | **318** | **615** |

**Table 11c.** Frequency of non-starchy vegetable types offered, by reimbursement group

| Non-starchy vegetable | Higher (n=30) | Lower (n=30) | Total |
|---|---|---|---|
| | *# servings (% total)* | | |
| Snap peas | 21 | 18 | 39 (30.7) |
| Tomato, tomato-based sauces | 19 | 15 | 34 (26.9) |
| Celery | 3 | 10 | 13 (10.2) |
| Lettuce | 6 | 7 | 13 (10.2) |
| Cucumber | 7 | 5 | 12 (9.5) |
| Bell pepper | 4 | 2 | 6 (4.7) |
| Zucchini | 4 | 1 | 5 (3.9) |
| Cabbage | 2 | 0 | 2 (1.6) |
| Onion | 2 | 0 | 2 (1.6) |
| Beets | 1 | 0 | 1 (0.8) |
| **Total** | **69** | **58** | **127** |

**Table 11d.** Frequency of starchy vegetable types offered, by reimbursement group

| Starchy vegetable | Higher (n=30) | Lower (n=30) | Total |
|---|---|---|---|
| | *# servings (% total)* | | |
| Corn | 18 | 21 | 39 |
| White potatoes | 6 | 1 | 7 |
| **Total** | **24** | **22** | **46** |

**Table 11e.** Frequency of dark green vegetable types offered, by reimbursement group

| Dark green vegetable | Higher (n=30) | Lower (n=30) | Total |
|---|---|---|---|
| | *# servings (% total)* | | |
| Broccoli | 15 | 11 | 26 |
| Leafy greens | 3 | 7 | 10 |
| Cabbage | 2 | 1 | 3 |
| **Total** | **20** | **19** | **39** |

**Table 11f.** Frequency of orange vegetable types offered, by reimbursement group

| Orange vegetable | Higher (n=30) | Lower (n=30) | Total |
|---|---|---|---|
| | *# servings (% total)* | | |
| Carrots | 25 | 34 | 59 |
| Squash | 1 | 0 | 1 |
| Sweet potato | 0 | 1 | 1 |
| **Total** | **26** | **35** | **61** |

**Table 11g.** Frequency of whole grain and whole-grain bread types offered, by reimbursement group

| Whole grain | Higher (n=30) | Lower (n=30) | Total |
|---|---|---|---|
| | *# servings (% total)* | | |
| 100% whole grain bread products | 82 (55.8) | 64 (62.1) | 146 (58.4) |
| 100% whole grain crackers | 22 (15.0) | 7 (6.8) | 29 (11.6) |
| Oats or farina | 17 (11.6) | 11 (10.7) | 28 (11.2) |
| 100% whole wheat pasta | 12 (8.2) | 9 (8.7) | 21 (8.4) |
| 100% corn tortilla chips | 7 (4.8) | 7 (6.8) | 14 (5.6) |
| Quinoa | 1 (0.7) | 1 (1.0) | 2 (0.8) |
| Brown rice | 1 (0.7) | 0 (0.0) | 1 (0.4) |
| Corn tortilla | 5 (3.4) | 4 (3.9) | 9 (3.6) |
| **Total** | **147** | **103** | **250** |

**Table 11h.** Frequency of refined grain types offered, by reimbursement group

| Refined grain | Higher (n=30) | Lower (n=30) | Total |
|---|---|---|---|
| | *# servings (% total)* | | |
| Grain crackers, pretzels | 109 (49.1) | 111 (42.9) | 220 (45.7) |
| Grain bread products | 66 (29.7) | 101 (39.0) | 167 (34.7) |
| Pasta, noodles | 24 (10.8) | 19 (7.3) | 43 (8.9) |
| Boxed macaroni and cheese | 8 (3.6) | 15 (5.8) | 23 (4.8) |
| Wheat tortilla | 9 (4.1) | 9 (3.5) | 18 (3.7) |
| White rice | 6 (2.7) | 4 (1.5) | 10 (2.1) |
| **Total** | **222** | **259** | **481** |

**Table 11i.** Frequency of baked or fried grains high in solid fats and/or added Sugars (BFGSOFAS) types offered, by reimbursement group

| BFGSOFAS | Higher (n=30) | Lower (n=30) | Total |
|---|---|---|---|
| | *# servings (% total)* | | |
| Pancakes and waffles | 23 | 33 | 56 (34.6) |
| Quick bread, muffins | 21 | 20 | 41 (25.3) |
| Cookies | 12 | 7 | 19 (11.7) |
| Cereal bars, granola bars | 6 | 12 | 18 (11.1) |
| Brownies, cake, donuts | 4 | 7 | 11 (6.8) |
| Sandwich crackers | 6 | 3 | 9 (5.6) |
| Butter popcorn | 3 | 2 | 5 (3.1) |
| Toaster pastries | 1 | 2 | 3 (1.8) |
| **Total** | **76** | **86** | **162** |

**Table 11j.** Frequency of low-sugar vs. high-sugar cereal offered, by reimbursement group

| Cold pre-made cereal | Higher (n=30) | Lower (n=30) | Total |
|---|---|---|---|
| | *# servings (% total)* | | |
| Low-sugar | 49 | 31 | 80 (66.1) |
| High-sugar | 14 | 15 | 29 (24.0) |
| Composite[a] | 7 | 5 | 12 (10.0) |
| **Total** | **70** | **51** | **121** |

[a] Composite = providers reported mixing low-sugar and high-sugar cereals or offered both types as an option.

**Table 11k.** Frequency of lean meat types offered, by reimbursement group

| Lean meats | Higher (n=30) | Lower (n=30) | Total |
|---|---|---|---|
| | *# servings (% total)* | | |
| Chicken | 13 | 6 | 19 |
| Fish (canned tuna) | 7 | 10 | 17 |
| Beef | 9 | 7 | 16 |
| Pork | 4 | 0 | 4 |
| Turkey | 3 | 1 | 4 |
| **Total** | **36** | **24** | **60** |

**Table 11l.** Frequency of high-fat meat types offered, by reimbursement group

| High fat meats | Higher (n=30) | Lower (n=30) | Total |
|---|---|---|---|
| | *# servings (% total)* | | |
| Beef | 3 | 3 | 6 |
| Turkey | 3 | 2 | 5 |
| Chicken | 0 | 1 | 1 |
| Pork | 1 | 0 | 1 |
| **Total** | **7** | **6** | **13** |

**Table 11m.** Frequency of processed meat types offered, by reimbursement group

| Processed meat | Higher (n=30) | Lower (n=30) | Total |
|---|---|---|---|
| | *# servings (% total)* | | |
| Lunchmeat | 21 | 17 | 38 (31.9) |
| Chicken tenders, nuggets | 9 | 15 | 24 (20.2) |
| Hot dogs | 6 | 10 | 16 (13.5) |
| Fish sticks | 7 | 6 | 13 (10.9) |
| Sausage | 8 | 2 | 10 (8.4) |
| Corn dogs | 2 | 4 | 6 (5.0) |
| Cured meats (e.g. salami, pepperoni) | 3 | 4 | 7 (5.9) |
| Other (processed beef and pork products) | 3 | 2 | 5 (4.2) |
| **Total** | **59** | **60** | **119** |

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