

What's for Lunch? An Analysis of Lunch Menus in 83 Urban and Rural Oklahoma Child-Care Centers Providing All-Day Care to Preschool Children

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ABSTRACT

Background More than half of 3- to 6-year-old children attend child-care centers. Dietary intakes of children attending child-care centers tend to fall short of Dietary Reference Intakes (DRIs).

Objective Our aim was to examine macro-/micronutrient content of child-care center menus, compare menus to one third of DRIs, and determine menu differences by population density.

Methods A stratified, random, geographically proportionate sample of Oklahoma child-care centers was obtained. Child-care centers providing all-day care for 2- to 5-year-old children were contacted to complete a telephone questionnaire and asked to send in that month's menus for the 3- to 4-year-old children. Overall means and standard deviations of the nutrient content of 5 days of lunch menus were calculated. Comparisons were made to both the 1- to 3-year-old and 4- to 8-year-old DRIs. One-sample *t* tests compared mean nutrient content of lunches to one third of the DRIs for the overall sample and urban/rural classification. Independent *t* tests compared nutrient content of urban and rural lunches.

Participants/setting One hundred sixty-seven child-care centers were contacted; 83 completed the study (50% response).

Results Menus provided statistically significantly insufficient carbohydrate, dietary fiber, iron, vitamin D, and vitamin E. Calcium was higher than the 1- to 3-year-old DRI, but lower than the 4- to 8-year-old DRI. Folate was higher than the 1- to 3-year-old DRI, but not different from the 4- to 8-year-old DRI. Sodium was higher than the DRI for both age groups. Thirty-four child-care centers (41%) were classified as urban and 49 (59%) as rural. Urban menus provided less than the 4- to 8-year-old DRI for folate, but rural child-care center menus did not.

Conclusions Oklahoma child-care center menus appear to provide adequate protein, magnesium, zinc, vitamin A, and vitamin C, but may be deficient in key nutrients required for good health and proper development in preschool-aged children. These issues can be addressed by including food and nutrition practitioners in the process to ensure child-care center menus are a useful resource and nutritionally appropriate for preschool children.

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SINCE 1965, AN INCREASING NUMBER OF CHILDREN have been enrolled in child-care centers in the United States.¹ In 2011, more than half (55%) of 3- to 6-year-old children not enrolled in kindergarten were being cared for in child-care centers.² These formative years are critical for the development of healthy food preferences³ and for appropriate growth and cognitive development. Because preschool-aged children in child-care centers are eating the majority of their meals outside the home,^{4,5} it is imperative that child-care center providers ensure these meals are healthful and nutritionally adequate.⁵

Child-care centers must comply with menu and dietary regulations enforced by state-level governing agencies, such as the Oklahoma Department of Human Services. However, posting or providing a menu is not a requirement in all states, and specific menu guidelines differ by state.⁵ In Oklahoma, child-care centers are required to have the current menu posted at all times and must follow the menu closely (reasonable substitutions are allowed, providing the posted menus are updated). Recommendations for lunch for 3- to 5-year-olds are the following: $\frac{3}{4}$ cup milk; meat and/or meat alternate ($1\frac{1}{2}$ oz meat/poultry/fish; $1\frac{1}{2}$ oz cheese; $\frac{3}{8}$ cup cooked dry beans; 3 tbsp peanut butter; or 1 egg); two kinds

of fruits and vegetables (totaling $\frac{1}{2}$ cup); and bread and/or bread alternate ($\frac{1}{2}$ slice enriched or whole-grain bread; $\frac{1}{4}$ cup cooked pasta or noodle; or $\frac{1}{4}$ cup cooked cereal grains).⁶

Although nationally mandated standards for child-care center menus have not been established, the Child and Adult Care Food Program (CACFP) of the US Department of Agriculture provides meal reimbursement for qualifying meals and snacks served to low-income children in child-care centers. In order for the child-care center to qualify for reimbursement, menus must follow meal patterns outlined by the CACFP.⁷ Example specifications include portion-size requirements, inclusion of only low-fat/fat-free milk for children older than 2 years of age, and inclusion of at least two different fruits and/or vegetables. However, participation in the CACFP is dependent on the socioeconomic status of the children enrolled at the child-care center; therefore, not all child-care centers are required to comply with this federal policy. Regardless of CACFP participation, menus are an important source of nutritional information for parents and regulators and should be available at all child-care centers.⁸

Studies have reported that dietary intakes of children attending child-care centers fall short of recommendations. A recent study found 83% of children in New York City child-care centers did not meet half of the MyPyramid recommendations for vegetables and 58% did not consume enough fruits.⁹ Another study in North Carolina reported only 13%, 17%, and 21% of the MyPyramid daily recommendation for whole grains, vegetables, and fruit (respectively) were consumed.¹⁰ Few studies have specifically analyzed the composition and nutrient content of child-care center menus compared to the Dietary Reference Intakes (DRIs).¹¹⁻¹⁶ In sum, they reported unfavorable trends in the nutrient content of menus, with a tendency toward low total energy¹¹⁻¹⁵ and micronutrients (such as iron,¹¹⁻¹⁶ zinc,^{11,15} vitamin E,^{11,12} and calcium^{11,12}), and high total fat^{11,14} and sodium.^{11,14} Although they contribute valuable information, the majority of these studies were published a decade or more ago. Although the CACFP guidelines have not changed drastically during this time, childhood-obesity prevalence among 2- to 5-year-old children has risen from 5% in the 1980s¹⁷ to nearly 10% in 2010,¹⁸ with a particularly high prevalence among Hispanic (15%) and non-Hispanic African-American (17%) children. Relevant to the current study, there is a notably high rate of overweight (31%) and obesity (14%) among low-income preschool children in the state of Oklahoma.¹⁹ This necessitates a re-examination of child nutrition in child-care centers, particularly in areas at highest risk for overweight and obesity, such as rural communities.²⁰

The purpose of this study was to determine the nutrient content of foods served at lunch as outlined on child-care center menus in the state of Oklahoma. Specifically, this study aimed to examine the macro-/micronutrient content of the planned lunches, the frequency of lunches meeting one third of the DRIs, as well as differences between urban and rural child-care centers in these dietary criteria.

METHODS

Study Sample

A stratified proportionate sample of Oklahoma child-care centers participated in a self-reported survey of obesogenic

practices and policies in the fall of 2010.²¹ Child-care centers were eligible to participate in the survey if they provided all-day care to 2- to 5-year-old children. A 45% response rate was expected for the current study, based on the response to the initial statewide survey.²¹ To obtain a sample of at least 75 child-care centers, a stratified, random, geographically proportionate (northwest, northeast, southeast, southwest, central/Oklahoma City, and Tulsa) sample of 167 child-care centers from those that previously returned a survey (n=314) was selected by section of the state using SPSS Statistics (version 19.0, 2010, IBM) random-number generator. This allowed for proportionate representation of child-care centers across the state of Oklahoma in congruence with the frequency of overall centers in each region. In addition, this ensured an adequate sample size for each region.

Selected child-care centers were contacted via telephone and invited to participate in the current cross-sectional study in the spring of 2012. Of the 167 child-care centers that were contacted, 18 had disconnected/invalid numbers, were no longer in business, or did not meet eligibility requirements (ie, no longer provided all-day care to 2- to 5-year-old children), and 41 declined participation. Common reasons for declining participation were lack of time and disinterest in the current study. Twenty-five agreed to participate but did not complete the study, leaving 83 child-care centers that completed the study (50% response rate). The study was reviewed by the University of Oklahoma Health Sciences Center Institutional Review Board and determined to be exempt and informed consent was not required.

Telephone Interviews

Child-care center directors verbally completed a short seven-question telephone interview administered by a researcher and typically lasted 5 minutes. The brief questionnaire was developed by the authors with the primary purpose of obtaining basic, relevant, menu-related, and child-care center level demographic information with minimal participant burden. Questions ascertained the following information: participation in the CACFP, number of 3- to 4-year-old classrooms in the facility, number of children in each classroom, title of the person planning the menus for the facility and the education level of that individual, how meals were served (eg, family style, portioned by staff in front of children, etc), and the ethnic/racial group of the majority of children attending (reported by the director). After completion of the interview, the most recent monthly menu for the preschool children, including portion sizes served, if available, was requested. Directors had the option of mailing, faxing, or emailing the menu. Upon request, a self-addressed stamped envelope was mailed to the center director to enhance participation.

Menu Analysis

Menus were received for the months of February or March 2012. Although menu style was not requested in the telephone interview, it appeared that 29% of child-care centers used a monthly menu (menus planned for each calendar month) and 71% used a cycle menu (a series of menus planned for a specific period of time [eg, 1 week, 6 weeks, etc]). Given that this information was gleaned after receiving menus, this might not completely reflect Oklahoma child-care center menu practices. For purposes of analyses, if a

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