Research Methods to Assess Dietary Intake and Program Participation in Child Day Care: Application to the Child and Adult Care Food Program: Workshop Summary

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Leslie Pray, Ann Yaktine, and Sheila Moats, Rapporteurs; Food and Nutrition Board; Institute of Medicine

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APPLICATION TO THE CHILD AND ADULT CARE FOOD PROGRAM

WORKSHOP SUMMARY

Leslie Pray, Ann Yaktine, and Sheila Moats, *Rapporteurs*

Food and Nutrition Board

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Willing is not enough; we must do."
—Goethe

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PLANNING COMMITTEE ON THE REVIEW OF THE CHILD AND ADULT CARE FOOD PROGRAM MEAL REQUIREMENTS: A WORKSHOP[1]

SUZANNE P. MURPHY (*Chair*), Professor Emeritus, University of Hawaii Cancer Center, Honolulu
KAREN WEBER CULLEN, Associate Professor of Pediatrics, Baylor College of Medicine, Children's Nutrition Research Center, Houston, TX
LYNNE OUDEKERK, Director, Child and Adult Care Food Program, New York State Department of Health, Albany (Retired)
CHARLENE RUSSELL-TUCKER, Associate Commissioner, Connecticut Department of Education, Middletown

IOM Staff

ANN YAKTINE, Senior Program Officer and Study Director
SHEILA MOATS, Program Officer
HEATHER BREINER, Research Associate
JULIA HOGLUND, Research Associate
ALLISON BERGER, Senior Program Assistant
ANTON L. BANDY, Financial Associate
GERALDINE KENNEDO, Administrative Assistant
LINDA D. MEYERS, Director, Food and Nutrition Board

[1]Institute of Medicine planning committees are solely responsible for organizing the workshop, identifying topics, and choosing speakers. The responsibility for the published workshop summary rests with the workshop rapporteurs and the institution.

Reviewers

This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the National Research Council's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the process. We wish to thank the following individuals for their review of this report:

Mary Kay Crepinsek, Senior Researcher, Mathematica Policy Research, Inc., Cambridge, MA
Suzanne P. Murphy, Professor Emeritus, University of Hawaii, Honolulu
Sandra J. Rhoades, Homes Administrative Unit Director, Child and Adult Care Food Program, New York State Department of Health, Albany
Marlene B. Schwartz, Deputy Director, Rudd Center for Food Policy & Obesity, Yale University, New Haven, CT

Although the reviewers listed above have provided many constructive comments and suggestions, they did not see the final draft of the report be-

fore its release. The review of this report was overseen by **Hugh H. Tilson,** University of North Carolina at Chapel Hill. Appointed by the Institute of Medicine, he was responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authors and the institution.

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Introduction

With over 16 million children living in food-insecure[1] households in 2010 and an increasing number of children either overweight or obese, improving child nutrition has emerged as one of the nation's most urgent public health challenges (ERS, 2011). The Child and Adult Care Food Program (CACFP), a U.S. Department of Agriculture (USDA) food program, is helping to meet this challenge. In fiscal year (FY) 2011, CACFP served about 3.3 million children, many living in food-insecure households, as well as over 124,000 adults who require daily supervision or assistance (FNS, 2012a, Tables 11 and 15c). Because many participants rely on CACFP for the majority of their food intake, the quality of foods provided has the potential to substantially improve the adequacy and healthfulness of their diets. To ensure that the meals and snacks provided by CACFP are consistent with national nutrition guidance, the USDA asked the Institute of Medicine (IOM) to review and recommend improvements, as necessary, to bring CACFP meal requirements into alignment with those of other federally funded food assistance programs and with the *Dietary Guidelines for Americans* (DGA) (USDA and HHS, 2010). The review and recommendations are described in detail in the 2011 IOM report *Child and Adult Care Food Program: Aligning Dietary Guidance for All*.[2] The panel of experts who conducted the review encountered a considerable

[1]The measure of food insecurity was based on respondents' perceptions of whether the household was able to obtain enough food to meet their needs.

[2]Unless otherwise indicated, any reference to "the CACFP report" in this summary is a reference to this report.

BOX 1-1
Child and Adult Care Food Program: Aligning Dietary Guidance for All Recommendations for Program Evaluation and Research

The IOM committee that reviewed and recommended improvements to the meal requirements for CACFP, as described in *Child and Adult Care Food Program: Aligning Dietary Guidance for All* (IOM, 2011), encountered a considerable lack of data relevant to CACFP, including food group and nutrient intake and participant characteristics. As described in detail in Chapter 11 of the 2011 report, the committee made the following recommendations: ongoing evaluation of CACFP; targeted research on nutrient intake, participant characteristics, and certain program outcomes; and periodic reassessment to determine the magnitude of impact of recommended changes in meal requirements. These research recommendations parallel the research objectives identified in the Healthy, Hunger-Free Kids Act of 2010 (see Box 1-3).

Program Evaluation Recommendation 1: USDA, in collaboration with relevant agencies, should provide support for research to evaluate the impact of the Meal Requirements on participants' total and program-related dietary intake and consumption patterns, on the food and nutrition content of the meals and snacks served, on demand from eligible providers to participate in CACFP, and on program access by participants.

Program Evaluation Recommendation 2: USDA should take appropriate actions to establish the current baselines prior to implementation of the new Meal Requirements for comparison purposes.

Program Evaluation Recommendation 3: To the extent possible, USDA should take steps to ensure that the final rule for the new Meal Requirements is informed by the results of the evaluation of program impact (described in Recommendation 1 above).

Research Recommendation 1: USDA, in collaboration with relevant agencies and foundations, should support research on topics related to the implementation of the Meal Requirements and to fill important gaps in knowledge of the role of CACFP in meeting the nutritional needs of program participants.

Research Recommendation 2: USDA should review and update, as appropriate, the CACFP Meal Requirements to maintain consistency with the *Dietary Guidelines for Americans* and other relevant science.

lack of up-to-date data relevant to CACFP and recommended that USDA support research to fill important gaps in knowledge. The committee also recommended that USDA support research to evaluate the impact of anticipated changes in CACFP meal requirements (see Box 1-1). The IOM held an additional workshop in February 2012 to discuss the evaluation and research recommendations articulated in the 2011 report (see Appendix A

BOX 1-2
Statement of Task

Following release of the report *Child and Adult Care Food Program: Aligning Dietary Guidance for All*, an ad hoc committee will plan and organize a 1-day public workshop that will discuss questions and indicators that could be used to carry out the evaluation and research recommendations as laid out in the report. The committee will define the specific topics to be addressed at the workshop, develop the agenda, and select and invite speakers and discussants. An unedited transcript of the workshop presentations will be provided to the sponsor and an individually authored summary of the workshop will be prepared and reviewed through National Academies procedures prior to release.

for the workshop agenda). This report summarizes the presentations[3] and discussions that occurred during the February 2012 workshop and has been prepared by the workshop rapporteurs as a factual summary of what occurred at the workshop. The planning committee's role was limited to planning and convening the workshop (see Box 1-2 for the Statement of Task). Statements, recommendations, and opinions expressed are those of individual presenters and participants and are not necessarily endorsed or verified by the IOM, and they should not be construed as reflecting any group consensus.

Workshop participants considered three general areas of research: (1) the dietary intake of children participating in CACFP, including methods for assessing foods and nutrients in meals and snacks offered and served, and how closely that intake aligns with recommendations of the 2010 DGA (USDA and HHS, 2010); (2) barriers and facilitators to providing meals and snacks that align with the current dietary guidance; and (3) program access and participation trends. As Suzanne Murphy, workshop moderator, stated, the intention was not to present data or to conduct any sort of evaluation of CACFP. Rather, the focus was directed toward methodology, specifically to discuss how to design and conduct a nationally representative study assessing children's dietary intake and participation rates in child care[4] facilities, including CACFP-sponsored child care centers and homes (see Appendix A for the workshop purpose). Much of the workshop discussion revolved

[3]Slides are available at http://www.iom.edu/Activities/Nutrition/ChildAdultCareFood/2012-FEB-07.aspx.

[4]Throughout this summary "child care" refers to child care centers and family or group day care homes.

around past studies, some of CACFP but mostly of other programs, and the adaptability of methods used in those studies for evaluating CACFP.

In addition to exploring the evaluation and research recommendations laid out in the 2011 IOM report, workshop participants explored ways to answer the research mandate prescribed by the Healthy, Hunger-Free Kids Act of 2010 (P.L. 111-296). Considered a major step forward in U.S. efforts to provide all children with healthy foods, the 2010 act has been widely recognized for the significant improvements it requires of school meal programs. However, the legislation is more comprehensive than its requirements for school lunch programs. It also authorizes funding and sets policy for the other USDA core child nutrition programs, including CACFP. In addition to expanding CACFP, the act requires a study of nutrition and wellness quality in all child care settings, including but not limited to CACFP programs, and provides USDA with $5 million for conducting such research. The legislative language of the 2010 act very closely aligns with some of the evaluation and research recommendations of the CACFP report (see Box 1-3).

ORGANIZATION OF THIS REPORT

Organization of this report parallels organization of the workshop itself, with Chapter 1 summarizing introductory remarks made by Jay Hirschman and Julie Brewer, and the keynote address by Virginia Stallings, in addition to providing background information. Chapters 2, 3, and 4 summarize the presentations and discussion that took place during sessions 1, 2, and 3, respectively, and Chapter 5 summarizes the open discussion that took place at the end of the workshop. Appendix A contains the workshop agenda, Appendix B contains the biographical sketches of the moderators and speakers, Appendix C lists the workshop attendees and their affiliations, and Appendix D identifies acronyms and abbreviations.

The workshop was designed to address three broad areas of research. Session 1 focused on methods for evaluating whether and how dietary intake in young children aligns with current dietary guidelines. Speakers and participants discussed and debated which specific research questions to address, the type of data needed to answer those questions and ways to collect those data, and existing methodologies used in previous studies. An overarching theme of the session was the importance of being very clear about the specific research question before deciding which method(s) to use. As Beth Dixon said, "Begin with the end in mind." Choice of method should depend on the nature and level of detail of evidence sought. Another overarching theme was that there are plentiful lessons to be learned from past studies, including past studies on CACFP but mostly studies on other

BOX 1-3
The Healthy, Hunger-Free Kids Act of 2010

The research and evaluation recommendations described in *Child and Adult Care Food Program: Aligning Dietary Guidance for All* (IOM, 2011) align with the legislative directive in the Healthy, Hunger-Free Kids Act of 2010 (P.L. 111-296) to conduct a nationally representative study of child care settings. Thus, as Jay Hirschman explained during the workshop, even though the 2010 act is not specific to CACFP, but covers all child care centers and homes, USDA will nonetheless use the presentations and discussion summarized in this report to help guide its preparation of a Request for Proposal (RFP) as mandated by Section 223(a) of the 2010 act (see below; research topics that were addressed during the workshop are in ***boldface italics***).

SEC. 223. STUDY ON NUTRITION AND WELLNESS QUALITY OF CHILD CARE SETTINGS.

(a) IN GENERAL.—Not less than 3 years after the date of enactment of this Act, the Secretary, in consultation with the Secretary of Health and Human Services, shall enter into a contract for the conduct of a ***nationally representative study of child care centers and family or group day care homes that includes an assessment of***—

(1) the ***nutritional quality of all foods*** provided to children in child care settings as ***compared to the recommendations in most recent Dietary Guidelines for Americans*** published under section 301 of the National Nutrition Monitoring and Related Research Act of 1990 (7 U.S.C. 5341);
(2) the quantity and type of opportunities for physical activity provided to children in child care settings;
(3) the quantity of time spent by children in child care settings in sedentary activities;
(4) an assessment ***of barriers and facilitators*** to—
  (A) ***providing foods*** to children in child care settings ***that meet the recommendations of the most recent Dietary Guidelines for Americans*** published under section 301 of the National Nutrition Monitoring and Related Research Act of 1990 (7 U.S.C. 5341);
  (B) providing the appropriate quantity and type of opportunities of physical activity for children in child care settings; and
  (C) ***participation by child care centers and family or group day care homes in the child and adult care food program*** established under section 17 of the Richard B. Russell National School Lunch Act (42 U.S.C. 1766); and
(5) such other assessment measures as the Secretary may determine to be necessary.

child nutrition programs, such as the School Nutrition Dietary Assessment (SNDA) study, and studies in the published literature.

Session 2 focused on ways to evaluate barriers and facilitators to providing meals and snacks in child care centers and homes that align with the current dietary guidelines. Speakers and participants discussed the types of barriers and facilitators to consider, survey and other tools for measuring barriers and facilitators, and methodological lessons learned from past studies. As with the first session, a common theme was that the best methods depend on the desired outcomes. Another common theme was the relevancy of past studies, not just studies in child care settings but also studies in the (non–child care) home environment that could be adapted to the home day care setting.

Session 3 focused on how to evaluate CACFP program access and participation trends. Speakers and participants considered the type of data needed, potentially useful data that already exist in various databases, and methodological lessons learned from past research. Again, a common theme of the session was the importance of defining the outcome of interest first and then determining how to collect data based on that outcome.

The open session at the end of the workshop centered around a set of prepared questions on baseline data (e.g., what type of data to collect), research priorities, survey design (e.g., whether there is an ideal design for a nationally representative study), the value of state-level data (i.e., in relation to national survey data), the use of survey tools in different settings (i.e., child care centers versus family day care homes), and other research topics to consider that were not addressed during the workshop.

THE IMPORTANCE OF DATA IN SETTING POLICY[5]

Over the past decade, the IOM Food and Nutrition Board (FNB) has played a vital role in providing expert guidance to the USDA Food and Nutrition Service (FNS) on how to best use resources provided by Congress for managing FNS food and nutrition programs. FNS sponsored a series of IOM reports with the first addressing food package revisions to the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) (IOM, 2004, 2006). In 2009 USDA implemented revisions to WIC food packages based on recommendations in the 2006 IOM report. The IOM FNB carried out a similar study on revisions to nutrition standards for meals provided through the National School Lunch and School Breakfast

[5]This section summarizes introductory remarks made by Jay Hirschman from the USDA Food and Nutrition Service, with some additional comments (where indicated) by Julie Brewer, Chief of the Policy and Program Branch in the Child Nutrition Division of the USDA Food and Nutrition Service.

Program (IOM, 2008, 2010). School meal nutrition standard revisions based on recommendations in the 2010 report are in the process of implementation based on a final rule published by FNS in January 2012. Most recently, the FNS commissioned the study that produced the 2011 CACFP report referenced above (IOM, 2011). Meal requirement revisions recommended in that report are under review by USDA.

Jay Hirschman noted that recommendations in the 2010 IOM report, *School Meals: Building Blocks for Healthy Children,* were based partly on data compiled from a number of FNS-sponsored studies, including the School Nutrition Dietary Assessment studies (SNDA-I, II, III[6]) (FNS, 1993, 2001, 2007), the School Lunch and Breakfast Cost Studies (I and II) (FNS, 1994, 2008), and the School Food Purchase Studies (SFPS-I, II[7]) (FNS, 1987, 1998). The intention was to use the same analytical approach and compile the same type of dataset for use when deliberating recommendations for the 2011 CACFP report. But the expert committee that was convened to put together the 2011 report, some members of which had worked on the 2010 report, fell into what Hirschman described as a "black hole." That is, comparable data on CACFP do not exist. There are many unanswered questions about what children are eating in child care and what needs to be done to improve nutrition in child care.

Data on CACFP are sparse partly because USDA has invested so heavily in the much larger National School Lunch and School Breakfast Programs, with a majority of available child nutrition research money having gone toward studying school meals (see Table 1-1). But the USDA research agenda is shifting, according to Hirschman. While the school meal programs and program integrity issues will continue to draw research funds, the Healthy, Hunger-Free Kids Act of 2010 (P.L. 111-296) directs $5 million toward research on nutrition and wellness quality in child care settings (see Box 1-3). While not specific to CACFP, the legislatively required research will include CACFP child care centers and homes. The law requires the main focus of this research to be on the nutritional quality of foods provided to children, physical activity provided to the children, barriers and facilitators to meeting the 2010 DGA and to providing opportunities for physical activity, and barriers and facilitators to provider participation in CACFP. Hirschman remarked that, for many of components of the study, the question is, how do you actually obtain those data in a child care setting? Moreover, how does a study with finite resources address these questions not just in one child care setting but in a range of child care settings *and* nationwide?

The standard procedure for FNS is to put out a Request for Proposals

[6]The SNDA-IV report will be published in 2012.

[7]The SFPS-III was published in March 2012 (FNS, 2012c) and therefore was not available to the IOM committee that developed the recommendations in the 2010 report on school meals.

TABLE 1-1 FNS Food and Nutrition Programs Funding and Participation, Fiscal Year 2010

Program	Cost ($ million)	Participation (millions)*
Supplemental Nutrition Assistance Program, or SNAP (formerly the Food Stamp Program)	68,180	40.3
National School Lunch Program	10,458	31.6
Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)	6,756	9.2
School Breakfast Program	2,843	11.6
Child and Adult Care Food Program (CACFP)	2,641	3.4
Nutrition Assistance for Puerto Rico	2,048	1
The Emergency Food Assistance Program	700	746 million pounds
Summer Food Service Program	357	2.3
Commodity Supplemental Food Program	161	0.519
Food Distribution Program on Indian Reservations	93	0.85
Fresh Fruit and Vegetable Program	73	n/a
WIC Farmers' Market Nutrition Program	22	2.4
Senior Farmers Market Nutrition Program	22	0.9
Special Milk Program	12	72 million 1/2-pints

*Participation is listed as millions of people unless otherwise noted.
SOURCE: FNS, 2010, 2012b.

(RFP) and then fund contracts for research that will answer the questions and produce the necessary reports for Congress. The RFP in response to the child care research directive in the Healthy, Hunger-Free Kids Act of 2010 (P.L. 111-296) is currently being developed. The legislation provides funding not less than 3 years from the date of enactment, which was December 13, 2010. So FNS will have access to the money on December 13, 2013. According to Hirschman, FNS would like to be in a position at that time to award contracts.

Julie Brewer of FNS echoed Hirschman's remarks about the important role that the IOM FNB plays in FNS efforts to improve nutrition services, as evident by the fact that IOM recommendations—and the science upon which they are based—really do inform policy decisions. Brewer remarked that it is "disheartening" when FNS is asked to make a decision about policy without having a strong scientific evidence base for making that decision. Personal experiences and anecdotal stories do not provide the nec-

essary strength for moving forward. Data collected as part of a nationally representative study will provide a picture of the current state of nutrition in child care and play a vital role in future policy decisions around child nutrition.

What Is the Child and Adult Care Food Program?

CACFP is one of 15 domestic food and nutrition programs managed by FNS. The program provides reimbursement for nutritious meals and snacks served to children and adults receiving care at participating family child care homes, child care centers, at-risk after-school care facilities, outside-school-hours care facilities, adult care facilities, and emergency shelters. As shown in Table 1-1, CACFP is by no means the largest FNS program, nor is it the only program that provides services to children. CACFP serves more than 3.4 million participants. The program's FY 2010 national budget was $2,641 billion. In FY 2011, there were approximately 186,000 CACFP-funded outlets, or service sites. The larger share was family day care homes (132,297), with the remainder being child care centers (53,572). While family day care homes make up about two-thirds of all service sites, they make up only about one-fourth of all participants. Most participants are in various types of child care centers (see Figure 1-1).

DATA NEEDS FOR THE CHILD AND ADULT CARE FOOD PROGRAM[8]

Virginia Stallings agreed with Hirschman and Brewer that the IOM FNB has made a major contribution to child health and nutrition by examining existing data and thinking about how to move programs forward based on that evidence. She described the changes in the WIC food packages that occurred as a result of IOM work (IOM, 2002, 2006) as "amazing" and commented that the committee behind the report on the National School Lunch and School Breakfast Programs (IOM, 2010) is looking forward to seeing the new regulations based on recommendations in that report being implemented nationwide. While the committee behind the CACFP report (IOM, 2011) wanted to be as efficient and task oriented as possible, adapting lessons learned from previous work on WIC and the school meal programs to the child care setting, the committee faced several new challenges, not the least of which was the lack of data on CACFP providers and participants. In the Executive Summary of the report, the committee wrote, "While conducting this study, the committee encountered

[8]This section summarizes the keynote address by Virginia A. Stallings, from the University of Pennsylvania and The Children's Hospital of Philadelphia.

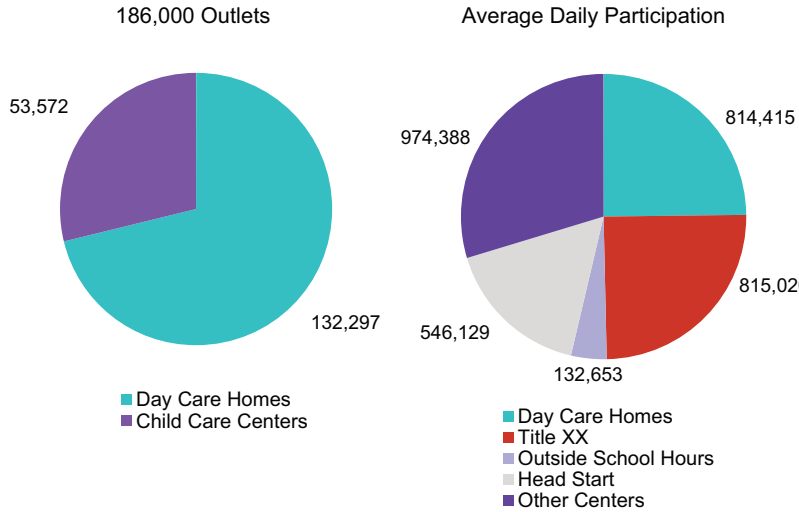

FIGURE 1-1 Types of CACFP service sites and participation within each type, fiscal year 2011.
NOTE: Day Care Homes refers to nonresidential day care in private homes that are licensed, registered, or approved to provide family child care. Child Care Centers refers to a variety of public or private nonprofit child care centers which are licensed or approved to provide day care services to children. Title XX refers to the Social Security Act Title XX—Block Grants to States for Social Services and Elder Justice.
SOURCE: Hirschman, 2012.

a considerable lack of up-to-date data relevant to CACFP." They referred to "a need to improve data-gathering in all aspects of the program" (IOM, 2011).

In her keynote address, Stallings identified two major challenges to collecting and interpreting CACFP data, that is, variation in ages of the participants and variation in child care settings. She urged that baseline data be collected before recommended meal requirement revisions are implemented or as soon as possible and emphasized the need for research on the impact of CACFP on participants, providers, and caregivers.

Variation in Age: A Major Challenge

One of the greatest challenges to collecting data on CACFP is the fact that CACFP covers a very broad age range relative to WIC and the National School Lunch and School Breakfast Programs. While the program covers many more children (3.3 million in 2010) than it does impaired or older (over 60 years) adults (114,000 in 2010), nonetheless it spans the entire

human life cycle. Because some after-school and at-risk programs are supported by CACFP, CACFP also covers the teenage years. Specifically, the IOM report recommends consideration of seven age groups that are covered by CACFP: 0–5 months, 6–11 months, 1 year, 2–4 years, 5–13 years, 14–18 years, and 19 years and older. The fact that half of the age groups are below 4 years reflects varying nutrient requirements at different early developmental stages.

Data on infants and young children are especially sparse. In fact, they are so sparse that there is a significant gap in child health policy for children from birth to 2 years. There are no national dietary guidelines for those age groups. Instead, guidance is sought from the American Academy of Pediatrics, which Stallings described as a very creditable organization, but one without resources to do the type of evidence-based review upon which the DGA are based. Evolving science indicates that nutrition in the birth-to-2-years age range is more important than was thought 30 years ago and may have major health implications. Evidence of its importance is coming from areas of research such as breastfeeding (e.g., effect of exclusivity of breastfeeding, effect of duration of breastfeeding), the introduction of complementary foods and beverages (i.e., the introduction into the infant's diet of foods and beverages in addition to breast milk), and rate of growth (e.g., as an early indicator of obesity). Stallings urged collection of nutrient intake data among both breast-fed and formula-fed infants.

Variation in Setting: Another Challenge

In addition to variation in age, a second major challenge to CACFP data collection and interpretation is variation in setting. The range of CACFP child and adult day care settings includes family homes (73 percent), child care centers (20 percent), at-risk after-school facilities, Head Start programs, and emergency shelters. Stallings emphasized the need to collect data from all CACFP settings (from different types of programs, such as child care home versus day care center; and from programs with varying numbers of participants), as well as all regions of the country. Moreover, in order to fully comprehend the impact of CACFP, she recommended that data also be collected from child care facilities not supported by CACFP.

The Urgency of Collecting Baseline Data

Stallings emphasized the urgency of collecting baseline data before the recommended meal requirement changes are implemented. Unlike the WIC and school meal settings, both of which have a history of routine surveillance, CACFP has very little baseline data upon which to build. If there is not enough time or money to collect baseline data before the changes are

initiated, she urged designing a study that allows for the collection of data as soon as changes are rolled out.

The Need for Impact Research

In addition to baseline data, another important need is for data that measure the impact of CACFP. Stallings identified three key impact research questions:

1. Does the program improve participants' daily or weekly food intake as compared to the DGA?
2. Does the program improve the intake of at-risk nutrients (i.e., nutrients whose intakes were identified by the CACFP committee as being too low or too high)?
3. How does food intake and intake of at-risk nutrients in children participating in CACFP compare to similar intake in children who are not involved with CACFP?

Other Data to Collect as Part of a Nationally Representative Study

In addition to program impact data and nutrient intake data for infants and young children, Stallings listed several other general areas where more data are especially needed: participant characteristics; the types of foods being served and their nutrient composition; and the impact of programmatic cost (e.g., the cost of food and the regulatory burden), which Stallings said can be more difficult to assess in CACFP settings than in other settings.

Stallings encouraged consideration of collecting several other types of data as part of a nationally representative study to assess nutrition and physical activity in child care facilities: body mass index (BMI) data,[9] biomarker data (specifically iron and vitamin D status), nutritional status data (e.g., obesity and undernutrition prevalence), nutrition-related health status data (e.g., obesity, hypertension, cardiovascular disease, diabetes, lactose intolerance or liquid milk refusal, celiac disease), and data on the use of supplements (i.e., vitamins, minerals, and other supplements). Finally, Stallings remarked that while the CACFP report did not make any gender-specific recommendations, it may be interesting to collect the data necessary to compare findings for participants of both genders to gender-specific nutrient requirements.

[9]While collecting height and weight data would be helpful for understanding the CACFP population, Stallings cautioned that those data need to be collected accurately, which may be beyond the scope of a nationally representative study. If collected, they need to be handled carefully so that any detected association between CACFP and either underweight or overweight is not misinterpreted as causal.

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2

Alignment of Young Children's Dietary Intake with Current Dietary Guidance

There are very few data on the quality of meals and snacks served to children in the Child and Adult Care Food Program (CACFP) and the contributions of those meals and snacks to children's overall dietary intakes. Thus, a major goal of future research identified in the CACFP report is to assess the food and nutrient content of meals and snacks served to and consumed by children and the impact of these meals and snacks on children's overall diets. This chapter summarizes presentations and discussion on existing methodologies that might be useful in implementing a study that would address these and related issues.

Mary Kay Fox began the presentation by describing potentially relevant methodologies used in previous national studies of child nutrition. These included the School Nutrition Dietary Assessment (SNDA) studies, the Feeding Infants and Toddlers Study (FITS) studies, and two previous studies of CACFP. She explored ways that the methods used in these studies could provide "some starting ground" for thinking about optimal approaches to collecting data in a nationally representative study of child day care, including CACFP. She also pointed out how the child day care setting presents unique challenges that need to be addressed.

In addition to national surveys, smaller studies in the published literature serve as another source of information for potentially relevant methodologies. Dianne Ward presented an overview of the scientific literature on methods for assessing foods served in child care settings. She argued that, regardless of the method(s) chosen, researchers should consider using multiple methods to ensure accuracy. She also encouraged testing protocols before widespread implementation.

While Ward focused on foods served, Sara Benjamin Neelon focused on foods consumed. She explored the various methods that have been used in the past, as well as some potentially new methods, to assess food and nutrient intake both in and out of child care. Based on comments made at various times throughout the workshop, other speakers and participants seemed to generally agree with Benjamin Neelon's assessment that the preferred method for collecting data to assess nutrient intake is direct observation in the child care setting, coupled with 24-hour dietary recalls[1] of intake both inside and outside the care facility.

Finally, Beth Dixon considered the different types of dietary data that can be collected in child care settings and elaborated on the trade-off between project scope and data detail (i.e., with fixed funding, the larger the scope of a study, the less detailed the dietary data collection). The more detailed the data, the greater the opportunity for accurate comparisons with recommended dietary intakes or meal pattern recommendations. While direct observation provides the greatest level of detail, it is an expensive data collection method, especially because of the labor involved in collecting the data on site by trained observers.

A recurrent theme over the course of the 1-day workshop was the need to be very clear about the desired outcome(s) of a study before developing the methodology—addressing the "what" before the "how." This is because the "best" method depends on the desired outcome(s). Different methods yield different types of information. This theme was especially prominent in the dialogue summarized in this chapter. For example, the preferred methodology for assessing what children are being served is not necessarily the same as the preferred methodology for assessing what children are actually consuming. Nor are the best methods in one setting necessarily the best methods for another setting. All of the speakers featured in this chapter emphasized the importance of formulating the research question(s) and desired outcome(s) before deciding on which methods, tools, or research design to use.

ADAPTING METHODOLOGY FROM PREVIOUS NATIONAL STUDIES TO ASSESS THE CHILD AND ADULT CARE FOOD PROGRAM[2]

A useful starting point for considering how to move forward with a nationally representative study of child day care, including CACFP, is to

[1]The 24-hour recall method involves collecting data on everything consumed by the participant over the previous 24 hours.

[2]This section summarizes the presentation *Adapting Methodology from SNDA and FITS Studies to CACFP* by Mary Kay Fox of Mathematica Policy Research.

examine methodologies used in similar large national studies. Mary Kay Fox identified two series of studies, conducted by Mathematica Policy Research, Inc. for the U.S. Department of Agriculture (USDA), which might be especially helpful: (1) the SNDA studies and (2) the FITS studies. USDA has been conducting the SNDA studies since the early 1990s to assess the food and nutrient content of meals offered and served to students in schools as well as the contribution of these meals to students' total diets. The 2002 and 2008 FITS studies assessed the usual dietary intakes of infants and toddlers and included special procedures for collecting and processing dietary intake data for these age groups. In addition, the SNDA and FITS studies included national samples and provided data that informed previous Institute of Medicine (IOM) Food and Nutrition Board committee work. While components of the SNDA and FITS studies data collection methodologies may be useful in designing the approach for a study of child care, including the CACFP, Fox emphasized that the methodologies would need to be tailored to the CACFP child care setting(s). She indicated that she would also discuss data collection approaches used in two previous studies of the CACFP, which were modeled on the approaches used in the SNDA studies.

Relevance of the SNDA Studies

USDA has relied on the SNDA studies since the early 1990s to monitor the quality of school meals and contributions of school meals to children's overall dietary intakes. Ideally, a national study of child care would provide "SNDA-like" data for the CACFP. The two most recent rounds of the SNDA studies, SNDA-III and SNDA-IV,[3] were conducted in school years 2004–2005 (Gordon and Fox, 2007) and 2009–2010, respectively. Both studies included large national samples of school districts and schools—SNDA-III included 129 school districts and 398 schools in 36 states, and SNDA-IV included 578 school districts and 884 schools in 48 states—and collected data on meals offered and served in schools. SNDA-III also collected detailed information on students' dietary intakes both in school and outside of school (2,314 students in 287 schools).

Relevance of the FITS Studies

The FITS studies, which were sponsored by the Nestlé Nutrition Institute in 2008 and Gerber Products Company in 2002, included a comprehensive assessment of food and nutrient intakes of infants, toddlers, and preschoolers. FITS 2002 included 3,022 infants and toddlers 4 to 24 months of age. FITS 2008 had a slightly larger sample (3,273) and included

[3]Data will be published in 2012.

infants, toddlers, and preschoolers from birth to 48 months of age. FITS researchers developed special procedures for collecting and processing dietary intake data for infants and young toddlers. Given that CACFP feeds infants and toddlers and the unique challenges of collecting dietary intake data on those age groups, Fox suggested that some of the procedures developed by FITS researchers may be useful in a national study of child care, including CACFP.

Previous Food and Nutrition Service (FNS)-Sponsored Studies of CACFP

Dating back to 1979, USDA has conducted at least three studies of meal quality in CACFP. Fox suggested that the data collection methodologies used in the two most recent studies—the Early Childhood and Childcare Study (Fox et al., 1997) and the Family Child Care Homes Legislative Changes Study (Crepinsek et al., 2002)—should also be reviewed in planning a national study. The Early Childhood and Childcare Study collected data on the foods included in meals and snacks offered by 1,962 CACFP providers, including both child care centers and family child care homes. To obtain information about the amounts of food served, the study included observations of 1,347 children. The CACFP Legislative Changes Study collected data on a smaller sample of Tier 2[4] CACFP family child care homes to see if changes in the way homes were categorized for reimbursement purposes (i.e., dividing homes into Tier 1 and Tier 2 categories) had any impact on the quality of meals provided. The study adapted and used most of the data collection methods used in the Early Childhood and Childcare Study.

Modifying Existing Methodologies for Use in a National Study of CACFP

When considering how existing methodologies might be useful for a nationally representative study of CACFP, Fox suggested that a good first step is to identify key research question(s). With the desired outcome(s) in mind, one can then evaluate whether and how the methodologies can be used or adjusted to accommodate the unique challenges that must be addressed when collecting data in child care settings. She identified two potential overarching research questions for the study. First, how do the meals and snacks offered in child day care centers and homes, including

[4]Family child care homes that participate in the CACFP are categorized as either Tier 1 or Tier 2 for reimbursement purposes. Tier I homes are those that are located in low-income areas, or those in which the provider's household income is at or below 185 percent of the federal income poverty guidelines. Tier II homes are those that do not meet the location or provider income criteria for a Tier I home. However, Tier II providers may elect to have their sponsoring organizations identify income-eligible children, so that meals served to those children who qualify for free and reduced-price meals could be reimbursed at the higher Tier I rates.

those participating in CACFP, align with required meal patterns and the underlying requirements for calories and nutrients? Second, how do the meals and snacks consumed in these settings contribute to children's overall dietary intakes, and how do children's overall dietary intakes align with current dietary recommendations?

To answer the first question, Fox pointed to the menu survey used in SNDA-IV as a potentially useful tool. She described the SNDA-IV menu survey as a sophisticated and well-organized data collection tool that has been continually tested, refined, and improved since the early 1990s. The original survey was a blank form on which participants simply recorded what they served at lunch and breakfast for a full school week. Over time, SNDA researchers found ways to decrease the burden on respondents while increasing the completeness and quality of the data they provided. The menu survey used in SNDA-IV is now precoded with foods and beverages commonly offered in school meals and includes check boxes and prompts to elicit descriptive information about the foods needed for nutrient analysis (for example, the fat content of milk and whether canned fruit was packed in heavy syrup, light syrup, juice, or water). Menu survey respondents receive an instruction booklet that includes simple but detailed instructions about how to complete each form. In addition, respondents receive in-depth training (by telephone) before they start completing the menu survey, as well as assistance throughout the course of data collection. There is also a detailed editing process that occurs after the surveys are completed (e.g., if there is no mention of condiments, does that mean that no condiments were served or that the respondent forgot to record the condiments?). Finally, respondents in SNDA-IV were offered a $40 to $50 incentive to complete the menu survey.

According to Fox, the menu survey methodology used in SNDA-IV could be used as a starting point in developing a menu survey for a study of CACFP, but the materials would need to be modified to accommodate important differences between schools and CACFP settings. Although the meals offered in CACFP settings are generally simpler than meals offered in schools (i.e., they tend to be "set" menus with few choices), CACFP providers typically have less technical food service skills than school food service operators. Additionally, they serve a broad range of age groups, from infants through school-age children, and may serve different foods and beverages to children of different ages. Finally, obtaining information about portion sizes is a particular challenge in CACFP settings. CACFP providers do not typically serve standardized portions the way schools do (e.g., No. 8- or 4-ounce scoops). Many child care providers use family-style meal service at tables where one provider sits with multiple children; providers do not formally track how much food any individual child is receiving.

The Early Childhood and Child Care Study used a menu survey that

was adapted from the tools used in the early SNDA studies. It included fewer forms and simpler step-by-step instructions. Fox suggested that this tool could be improved by incorporating precoded lists of foods and check boxes and prompts like those used in the SNDA-IV menu survey. These changes would make it easier for respondents to complete the survey and make it less likely that they would leave out valuable descriptive information about the foods offered.

With respect to the second key research question, which pertains to children's dietary intakes and contribution of CACFP meals and snacks, useful insights about potential data collection methodologies can be obtained from SNDA, FITS, and previous CACFP studies. SNDA-III and both rounds of FITS studies (2002 and 2008) collected data on dietary intakes using 24-hour recalls. Each study included a second 24-hour recall on a subset of the study population in order to estimate usual nutrient intake distributions (IOM, 2000). The FITS studies also collected data on vitamin and mineral supplements, which Fox noted would be important to include in a national study of CACFP if the goal is to assess total nutrient intake. She also emphasized the importance of incentives in gaining cooperation from parents and caregivers. Both SNDA-III and the FITS studies offered incentives, SNDA-III provided $5 to $10 for each recall, and the FITS studies provided $20 for the first recall and $10 for the second.

Fox identified two unique challenges that need to be considered in thinking about adapting SNDA-III and FITS methodologies to a study of child day care. The first is how to collect data on the foods consumed while the child is in care. In SNDA-III, data collectors interviewed children about their in-school food consumption shortly after meal times. But the CACFP serves younger children who cannot provide reliable information about their food intakes. In the FITS studies, data on what a child consumed while in care were communicated by the provider either to the parent or to study data collection staff. Theoretically, this approach could work in a child care setting. However, Fox questioned whether it would be realistic to expect a provider to report on multiple children.

The second challenge identified by Fox was collecting data on out-of-care intakes for infants and toddlers. Portion sizes for infants and toddlers are a unique challenge because of spillage, under- or overestimating amounts, and other factors. For example, portion sizes were overreported in the 2002 FITS, primarily as a result of overreporting of beverage portion sizes. Before the 2008 FITS was initiated, great effort was spent on investigating and revising visual aids for estimating portion sizes (i.e., researchers developed visual aids that included age-appropriate measuring cups and bowls; see Figure 2-1). The data collection protocol also needs to include procedures for probing respondents about spillage and waste when estimating the amounts that children actually consumed. Fox also commented that

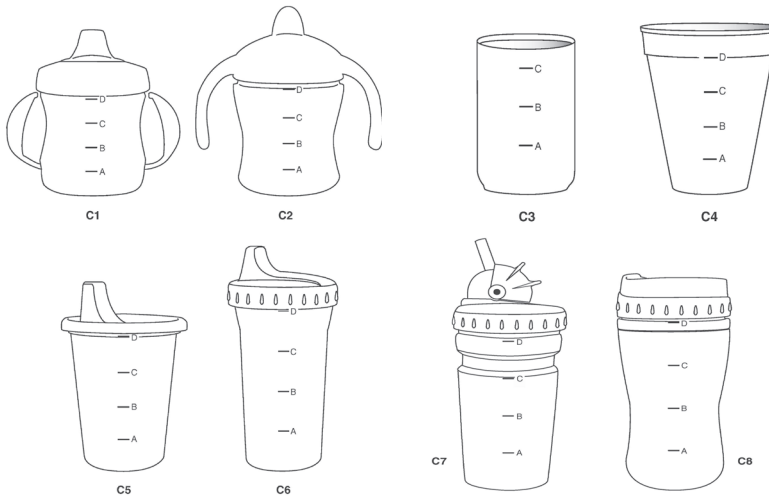

FIGURE 2-1 Age-appropriate measuring cups used to measure portion size in the 2008 FITS.
SOURCE: Nestlé, 2011.

because of the number of different age groups served in the CACFP, total sample sizes for the dietary intake component of the study may need to be quite large if the goal is to assess usual nutrient intakes for each age group.

HOW TO ASSESS FOOD SERVED IN CHILD CARE SETTINGS[5]

The published literature describes several methodologies for assessing foods served in child care or similar settings: plate waste, direct observation, provider self-report, child care menu analysis, and food purchase receipts. Dianne Ward provided an overview of each methodology and discussed the strengths and limitations of each. To ensure accurate data collection, Ward urged the use of multiple methods (e.g., validating menu analysis with actual observation data; validating self-report with direct observation data; and using a combination of self-report, menu, and direct observation data to get a full picture of types and amounts of foods and beverages served). Regardless of the method(s), she urged that protocols be tested and results verified before large-scale implementation.

[5]This section summarizes the presentation of Dianne Ward from the University of North Carolina.

Plate Waste Studies

Plate waste studies involve weighing portions provided at a meal or snack prior to service; weighing waste after eating; and then, using a database and software program, translating specific foods and amounts consumed into macro- and micronutrients (e.g., Buzby and Guthrie, 2002; Graves and Shannon, 1983). Plate waste studies have two major strengths, according to Ward. First, they provide a precise estimate of food served and consumed. Second, foods served and consumed can easily be translated into nutrients using the appropriate database or software program. They are limited by the fact that they work better with plated meals (if not plated, the researcher must take self-served meals from the children, then weigh and return them); they require handling foods, which may not be permitted in some settings; and they are very labor intensive and costly.

Diet (Direct) Observation

Diet, or direct, observation is a visual estimation of the types and amounts of foods and beverages served. There is considerable variability in methodology among published studies with respect to specific protocol, amount of training required, and precision obtained. Most published observational studies are based on relatively small numbers of centers or homes, with the number of days of intakes observed varying from half a day to multiple days (e.g., half-days at 40 centers, Erinosho et al., 2011; 2 consecutive days at 20 centers, Ball et al., 2008; 3 consecutive days at 12 centers, Briley et al., 1999; 14 days, 7 in the fall and 7 in the spring, at two centers, Bruening et al. 1999).

Ball et al. (2007) developed the first published protocol for using direct observation to assess dietary intake among young children in child care. The goal was to train five observers to visually estimate at a predetermined level of precision the amount of food types being served. The training required a total of 56 hours over the course of a month. During the training, after practicing with measuring cups and spoons, the observers were tested in a laboratory setting with 20 common child care foods (e.g., applesauce, animal crackers, spaghetti). The researchers found good agreement between the observer food-quantity estimates and the 20 measured portions of common child care foods (with a mean intraclass correlation coefficient value, or ICC, of 0.99). However, there was considerable variability across foods, with portion sizes of spaghetti being more difficult to estimate than other foods. At the end of the training, the observers were tested again, but in a child care center setting. With foods that were not easy to discern with visual observation, observers were instructed to ask the classroom staff or cook about preparation of the food in question. The child care setting cer-

tification demonstrated good agreement between the observer food-quantity estimates and the 56 foods and beverages tested (ICC = 0.88).

The strengths of direct observation are that it is less intrusive than food weighing and provides a replicable dietary observation approach that is potentially more usable by researchers. However, the methodology is limited by its requirement for extensive training to ensure interrater reliability, the small number of children that can be observed by one observer, and the need for observers to clarify with food service staff portions for foods that are not easy to decipher by vision.

Provider Self-Report

Provider self-report involves asking providers (e.g., directors, teachers, food staff) what foods were served to children and, sometimes, the amount of food served. As part of an effort to develop an effective self-report instrument for assessing comprehensive nutrition and physical activity environments in child care, Ward discussed evaluating the reliability and validity of self-report data collection in child care centers. In 2008 Ward and colleagues used an observational instrument known as the Environmental Policy and Assessment Observation tool, which had been developed for the Nutrition and Physical Activity Self Assessment for Child Care program. She described the methodology as being similar to 24-hour recall except that the assessment was conducted in real time (more like a food diary), with both trained observers and care providers recording food intake (Ward et al., 2008). More recently, trained observers visited 50 centers every day for 4 days and assessed the nutrition environment, including foods served (not portion size, except for juice) in target classrooms. Teachers of the target classrooms (i.e., the "providers") were asked to report on foods and beverages served to the children on each of the same 4 days. The researchers assessed both reliability (i.e., repeatability of the providers' reported food lists from one day to the next) and validity of the provider reports (i.e., how closely the providers' food lists matched the trained observers' food lists). The researchers concluded that providers can report what was served, but multiple days of reporting might yield more accurate reporting of foods served.

Provider self-report is typically used in combination with direct observation on a subsample of centers or homes. For example, both provider self-report and direct observation were used in the two CACFP studies described by Mary Kay Fox, the Early Childhood and Child Care study (Fox et al., 1997) and the Effects of Lower Meal Reimbursement study (Crepinsek et al., 2002) (see the previous section summarizing Fox's presentation). In the 1997 study, which aimed to describe the food and nutrient content of meals and snacks offered by CACFP providers and consumed by par-

ticipating children, the researchers used a provider self-report menu survey of all foods and beverages in all meals and snacks served over a specified 5-day period. Because pretesting showed that most providers were unable to report sufficient detail on portion size, the researchers did not collect portion size data. In addition to provider self-report of the types of foods and beverages offered, trained field staff conducted meal observation in a subset of child care facilities on all meals and snacks consumed by children while in child care on 2 nonconsecutive days. Each observer was responsible for collecting data on six or fewer children. Prior to the meal or snack provision, the observers weighed or measured five reference portions of each food that was going to be offered. During meal time, observers used visual methods to estimate the amount of food received and the amount of food left over by each child. The observation data were used to calculate average portion sizes, which were then used to estimate the nutrient content of the foods offered.

The strengths of provider self-report include its lower cost compared to direct observation and other methodologies; the potential to be implemented in large numbers of centers and homes; and that it can be supplemented with observation. However, the methodology is limited by a risk of misreporting, possible inaccuracies, and the multiple days of reporting required.

Child Care Menus

Child care menu methodology involves assessing detailed lists of foods and beverages served to children for meals and snacks. Such lists are typically offered as a service to parents and, in some states, as a mandate to ensure compliance with program requirements. Ward opined that child care menus could be used to monitor CACFP guidelines. However, foods actually served do not always match planned menus. Fleischhacker et al. (2006) observed and recorded foods served throughout the school day and then compared the food records against monthly menus for 77 days in one Head Start center and found very poor agreement. Of 269 meals and snacks observed, only three breakfast meals and one "ethnic day" matched the menu. Benjamin Neelon et al. (2010), on the other hand, compared 1 day of direct observation with menus at 84 child care centers and found good agreement, with 52 percent of 254 meals and snacks served matching the menu and 87 percent of 710 individual items served matching the menu. Other limitations of child care menus include their lack of detail regarding specific types of foods and beverages provided (e.g., fruit juice versus 100 percent fruit juice), lack of specification about how foods are prepared (e.g., no indication whether the chicken in a sandwich is baked or fried),

the absence of reported condiments used with foods, and difficulty in deciphering specific ingredients in some dishes (e.g., casseroles). A key strength of child care menus is that they provide a quick and easy way of collecting information about foods served to children.

Food Purchase Receipts

Food purchase receipts have been used to evaluate associations between food cost and quality of food served. For example, Monsivais and Johnson (2012) collected receipts and detailed menus from 60 home child care providers and found that greater cost was associated with a higher nutritional quality of foods (based on servings of whole grains, fresh whole fruits, and vegetables; energy density [kJ/g]; and mean nutrient adequacy for seven nutrients of concern for child health). Menu details were obtained from forms given to the providers by the research staff. Food purchase receipts provide a quick, easy, and cheap way to collect data about types of foods and beverages offered to children. The methodology places little to no burden on participants, especially if receipts are collected over only a short period of time. However, they are limited as a methodology by the impact of missing or lost receipts; social desirability bias (i.e., during the period of examination, the providers might change the foods they purchase); and that they provide information only about foods purchased, not foods prepared, served, or consumed.

DIETARY ASSESSMENT IN YOUNG CHILDREN: TOTAL DAILY INTAKE OF FOOD AND NUTRIENTS[6]

Sara Benjamin Neelon described assessing dietary intake as a "daunting task," especially in young children (i.e., children under 5 years of age). She identified several methods for collecting dietary intake data: 24-hour recall (i.e., retrospectively asking someone about everything that the person ate or drank over the previous 24-hour period), food record or diary (i.e., prospectively asking participants to write down everything they consume in a day), food frequency questionnaire (i.e., measuring usual intake over a given amount of time), direct observation (i.e., visually observing what individuals eat), indirect observation (i.e., electronically documenting what individuals eat via videography or photography), and biomarkers (e.g., assessing iron status through a blood test, selenium with a toenail clipping, or

[6]This section summarizes the presentation of Sara Benjamin Neelon from Duke University. It also describes the discussion that occurred at the end of the first session, when audience members asked questions about one of the methods that Benjamin Neelon described (indirect observation via videography or digital photography).

TABLE 2-1 Three Potential Methods for Assessing Dietary Intake of Children in Child Care

Type of Assessment	Assessment Method	Respondents
Direct observation	Researcher observation of child	N/A
Food record or diary	Self-administered by adult	Parent and child care provider
Indirect observation	Photography or videography of child	N/A

SOURCE: Benjamin Neelon, 2012.

carotenoid intake as a proxy for fruit and vegetable intake via a palm scan). She focused on three of these methods: direct observation, food record or diary, and indirect observation (see Table 2-1).

According to Benjamin Neelon, direct observation is the most common method for assessing dietary intake in child care and is likely to provide the most specific information about foods and beverages consumed in child care. Regardless of the method employed, Benjamin Neelon emphasized the importance of consistency in the use of dietary assessment methodology to allow for comparison across studies. For example, Ball et al. (2008) assessed foods served to and consumed by children in 20 child care centers and compared both amounts to CACFP and MyPyramid recommended portion sizes for children. By using the same observation method in a recent study of dietary intake of children in child care in Mexico City, Benjamin Neelon et al. (unpublished) were able to compare the Ball dietary intake data to that of the Mexican children.

Most researchers couple whichever method they use for in-care data collection with a second method for foods consumed outside of child care. Choices for at-home data collection include 24-hour recall by the parent, food record by the parent, direct observation, and indirect observation (e.g., setting up a video camera in the area of the home where meals are typically eaten). Direct observation in a home setting is usually not practical, and indirect observation is limited by the fact that people often eat in multiple areas of the home (e.g., while watching TV or while "grazing"), outside of the range of the video camera. In Benjamin Neelon's opinion, 24-hour recall is likely to provide the most specific information about foods and beverages consumed outside of care.

Direct Observation in Child Care

With direct observation, trained observers are present in the classroom or family child care home for all meals and snacks. Observers document in

detail, often using prepopulated forms, all foods and beverages, including condiments, provided to and consumed by children. Data for both foods and beverages are usually reduced to food groups (e.g., milk) and nutrients (e.g., grams of fat). The preferred ratio is one observer to three children. Benjamin Neelon agreed with Dianne Ward and other workshop participants who emphasized the importance of using well-trained observers, given that effective direct observation requires practice and skill. She also emphasized the importance of collecting data over multiple days, typically 2 or 3.

Limitations of direct observation data collection include the intensive training required of observers, the large amount of time required of observers (both training and observation time), the need for target children to sit near each other (i.e., if an observer is watching multiple children), the small number of children that can be observed (i.e., three per observer in one classroom/area), and the need for some onsite interaction to record specific information about foods and beverages served (e.g., preparation method). Benefits of direct observation in child care include its appropriateness for documenting intake in children of all ages, including infants; its potential to be used in both child care centers and family child care homes; its relatively accurate portrayal of foods and beverages and nutrients consumed, with proper training of observers; and the opportunity to collect detailed information about foods and beverages.

Many researchers have coupled direct observation in child care with a second method to assess dietary intake at home (i.e., in the morning before child care and in the evening after child care). For example, Bruening et al. (1999) combined direct observation in child care with 24-hour recall from parents (i.e., the 24-hour recall excluded time in child care). Briley et al. (1999) combined direct observation in child care with food records from parents (i.e., the food records excluded time in child care). Bollela et al. (1999) combined direct observation with both 24-hour recall and food records.

Food Records in Child Care

Food records in child care involve providers recording the amount of all foods and beverages consumed by children throughout the day. Data are often reduced only to food groups. Estimating nutrient content is more challenging (e.g., if a provider does not record condiment consumption, any estimate of fat or sodium consumption would be inaccurate). While it is possible for providers to record both foods provided and foods consumed, researchers typically ask providers to focus on one or the other. The method requires clear instructions and visual aids to help the provider determine portion sizes and other details (e.g., method of food preparation). Research-

ers have not had enough experience with food records to know how many children a single provider can account for at any given time. As an example of food record data collection, Hoyo et al. (2011) asked child care providers to record foods consumed by specific children in child care and asked parents of those children to conduct a 24-hour recall for foods consumed outside of child care.

Food record data collection is challenging. The method is limited by the small number of children that can be covered by a provider (one or two); its high risk for inaccuracy, which makes it difficult to calculate nutrient intake; the burden it imposes on providers, given that providers must pay attention to all children during meals and snacks; and limited opportunity to correct mistakes at a later time. Its strengths include its relatively low cost and little researcher time; its lesser invasiveness and disruption for both providers and children, compared to direct observation; its appropriateness for documenting intake in children of all ages, including infants (Benjamin Neelon remarked that food records are "probably one of the better ways to report usual intake" for infants); its potential to be used in multiple classrooms; and its appropriateness for both child care centers and homes.

Indirect Observation in Child Care

Benjamin Neelon described indirect observation as an "interesting alternative" to assessing dietary intake in child care. She was unable to find any published studies that rely on the method but described work that she and her colleagues have been conducting. The staff member places a video camera in the classroom to record all meals and snacks; the camera must be positioned properly; otherwise, some consumption can be missed (e.g., if children move around while eating or drinking). Once the data are collected, trained observers view the videotapes and, as with direct observation, document all foods and beverages provided to and consumed by children. The data are then reduced to foods and beverages by food groups (e.g., milk) and nutrients (e.g., grams of fat).

The limitations of indirect observation in child care include the need for target children to sit in a specified location and not move; the inability to adapt to changes in the setting unless the observer stays with the video camera; limited opportunity to correct mistakes; its requirement for some onsite interaction to record certain types of information about foods and beverages (e.g., preparation method); and its limitations for documenting intake in infants (unless the video camera scans the entire room). Benefits of the methodology are the ability to assess multiple children at once; its relatively low cost and little researcher time; its lesser invasiveness and disruption compared to direct observation (i.e., children typically become adapted to the presence of video cameras and eventually ignore them); the potential

for multiple observers to review and record dietary intake at a later time, building some quality control into the method; the potential for data to be collected in multiple classrooms (i.e., using multiple video cameras); and its applicability in both child care centers and family child care homes.

The question-and-answer period at the end of the first session included some discussion about indirect observation. First, Joanne Guthrie asked about the use of digital photography as a data collection method. Benjamin Neelon replied that food consumption in child care is a dynamic process, with children moving, trading food, throwing food, etc., which can be difficult for a still photo to capture. Dixon mentioned a colleague who worked on a large school food project in New York City that involved photography. In addition to trying to capture what is a dynamic process, it was difficult to get detailed information about type and amount of food. For example, one may see juice but not know whether it is 100 percent juice. With respect to amounts, it was difficult to get the camera angled properly. The researchers eventually abandoned the effort. Moderator Karen Cullen added that it would be very difficult to capture in a photograph the amount of trading that goes on with elementary children. Second, Jay Hirschman asked about the types of clearances and consents required for videography data collection, as it is not a method that FNS has used in any of its studies. Benjamin Neelon responded that, in her work, she and colleagues ask parents to sign a video consent release form in addition to the standard consent form. So far, they have not received any resistance from parents.

ANALYSIS OF DIETARY DATA COLLECTED FROM CHILD CARE SETTINGS[7]

Beth Dixon elaborated on what emerged as a major overarching theme of the workshop: the choice of method depends on the level of detailed information and outcome(s) desired. She said, "You have to begin with the end in mind." She identified two sets of "big picture" questions:

1. What do you want to measure? Is the goal of the study to measure what is served, what the children are eating, or both?
2. How much detail do you want to measure? For example, do you want to know "generic" types of foods being served or consumed (e.g., that a child is drinking milk) or do you want to know "specific" types and amounts of foods being served or consumed (e.g., that a child is drinking 1/2 cup of 1 percent milk)?

[7]This section summarizes the presentation of Beth Dixon, from New York University.

TABLE 2-2 Suitability of Different Types of Data for Collecting Generic Versus Specific Information About Foods and Beverages, as Well as Amounts

Data Collection Method	Generic Information (e.g., "milk")	Specific Information (e.g., "1% milk")	Amounts
Receipts	Yes	Yes	No
Menus	Yes	Possibly	Possibly
Staff reports	Yes	Possibly	Likely
Direct observation	Yes	Likely	Yes

SOURCE: Dixon, 2012.

The more detailed the information, the greater the accuracy when comparing data to quantitative dietary recommendations and assessing overall quality of foods served or consumed. While there are a variety of sources of dietary data (see Table 2-2), Dixon said that direct observation provides the greatest level of detail about types and amounts of foods either served or consumed, with menu and staff-reported data being helpful for confirmation.

The Challenge of Data Variability

Regardless of the source of data, Dixon cautioned that there is considerable cross-center variability in the level of detail recorded. This is especially true of menu data collection. For example, a menu from one center may simply list "milk" or "peaches," while another may list "one-half cup of 1 percent milk" or "4 ounces of canned peaches in light syrup." Sometimes there is considerable cross-center variability in detail even with the more detailed data collection methods, including direct observation.

Dixon described two "tiers" of variability in direct observation data collection. First is the actual visual estimate of the type and amount of food being served or consumed, with details varying not just from study to study (e.g., depending on how much instruction is provided), but also from observer to observer. With respect to amount, one of the challenges with direct observation is that most estimates of amounts of foods served or consumed are visual "guesstimates" based on observations or staff reports. Most observers are trained to look at foods from a distance and count pieces or mounds of something, which is very difficult given how much activity goes on around food (e.g., children drop food; they share food; sometimes they eat very quickly).

The second source of variability in direct observation data collection is data entry into a dietary assessment software system. Researchers rely on

both public and private dietary assessment software systems for estimating food group and nutrient composition of foods served or consumed. Dixon mentioned the National Cancer Institute Automated Self-Administered 24-hour Dietary Recall, which is based on the USDA Automated Multiple Pass Method, the USDA Food and Nutrient Database for Dietary Studies, and the USDA MyPyramid Equivalents Database; the University of Minnesota's Nutrition Data System for Research; and the Elizabeth Stewart Hands and Associates Food Processor. Irrespective of the software system used, when data are entered in real time, questions about types and amounts of foods recorded on forms can be clarified as necessary. But when entered later, and particularly if they are entered by someone other than the observer, it becomes more difficult to confirm the information. When information is not clear, data enterers have to use their best judgment, rely on defaults in the software system, and, when possible, confirm information with staff at the centers.

Scope of the Study Versus Detail of the Data

The best-quality data will be those that can be reduced to a level of detail that allows for comparison with both CACFP-recommended meal patterns and Dietary Reference Intakes (i.e., either Recommended Dietary Allowance or Adequate Intake, depending on nutrient). This is true regardless of whether data are collected only while the child is in child care (and regardless of type of child care facility) or both in care and out of care (i.e., total dietary intake over the course of an entire day), and regardless of whether one is seeking information on what is being served or consumed. Additionally, it would be helpful to collect age-dependent data so that comparisons can be made to age-based recommendations, as both meal pattern and nutrient intake recommendations are different for different age groups. One of the challenges for the child care setting is that children are often observed randomly and their exact ages are unknown.

In addition to detail, an accurate comparison to CACFP-recommended meal patterns and Dietary Reference Intakes requires accurate collection of both types and amounts of foods. Reiterating what previous speakers said, Dixon emphasized the importance of observer training. Research staff members need to be trained to observe consistently, record consistently (e.g., "cookie" versus "chocolate chip cookie" versus "Chips Ahoy chocolate chip cookie"), accurately estimate common portion sizes, and enter data into the data assessment software system consistently. To improve identification of foods, observers can confirm with teachers or food service staff and check the kitchen. To improve estimation of amounts, researchers should provide observers with visual aids of portion sizes and list options for proportions of portion sizes on forms (e.g., 1/4 cup, 1/2 cup, 3/4 cup).

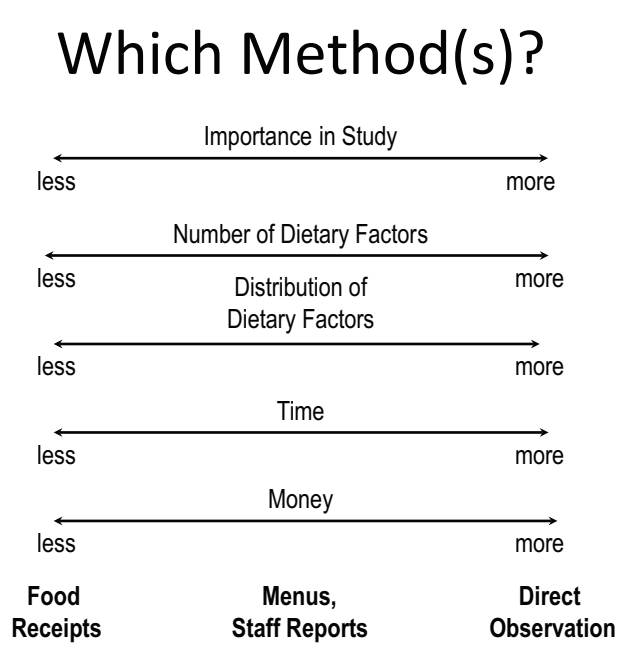

FIGURE 2-2 Different dietary data collection methods provide varying levels of detailed information and require varying amounts of time and money.
SOURCE: Dixon, 2012.

Because the collection of high-quality comprehensive dietary information takes time and money (see Figure 2-2), Dixon cautioned that a nationally representative survey will need to be either small(er) in scope and focus on detailed dietary data collection from all centers *or* large(r) in scope with a subsample that includes detailed dietary data collection.

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3

Barriers and Facilitators to Providing Meals and Snacks that Align with the Current Dietary Guidance

Recommended revisions to the Child and Adult Care Food Program (CACFP) meal requirements laid out in the CACFP report were designed to come as close as possible to the *Dietary Guidelines* (USDA and HHS, 2010), while still being practical for the CACFP setting (IOM, 2011). Likewise, the Healthy, Hunger-Free Kids Act of 2010 (P.L. 111-296) requires for the first time that CACFP meal patterns align with current dietary guidance. Workshop participants considered how to measure factors that serve as barriers and facilitators to implementing a new CACFP meal pattern in alignment with current dietary guidelines.

Data on the barriers and facilitators to changing meal requirements in a child care setting, CACFP or otherwise, are even sparser than data on food group and nutrient intake in the same setting(s). In fact, as presenter Lorrene Ritchie pointed out, data on barriers and facilitators to any kind of change in the meal and food environment in a child care setting are lacking. Ritchie reviewed the few methodologies that have been used to evaluate changes in the meal and food environment in child care centers and, to a lesser extent, in day care homes, with the expectation that one or more might be useful for systematically studying barriers and facilitators to meal pattern compliance in CACFP at a national level.

Acknowledging that day care home providers differ significantly from child care center staff in the way that they plan menus and purchase, prepare, and serve meals, with much more limited data available for day care homes, presenter Angela Odoms-Young suggested that studies of the home meal and food environment might be a reasonable proxy for studying food

and mealtime practices in family day care settings. She reviewed several methodologies for assessing barriers and facilitators in both the home food "microenvironment" (i.e., the environment inside the home) and the "macroenvironment" (i.e., the social and environmental context of the home itself). The same methodologies could be adapted for use in identifying factors that operate as barriers or facilitators to implementing the CACFP meal requirement changes.

EVALUATING BARRIERS AND FACILITATORS TO CHANGE IN CHILD CARE CENTERS[1]

Lorrene Ritchie identified two major elements of organizational change: factors external to the organization (e.g., how the change is communicated, external resources available to an organization to implement the change, and perceived value of the change) and factors internal to the organization (e.g., existing factors that influence reaction to the change or willingness to change, steps for putting the change into practice, and how the change is made permanent). Both external and internal change are part of the "Model of Diffusion of Innovations in Organizations" (Greenhalgh et al., 2004; Olstad et al., 2011), which Ritchie pointed to as a good theoretical framework for building research questions on barriers and facilitators to organizational change in child care settings. In her opinion, having a theoretical framework in hand is helpful, as researchers have only just begun to touch the surface of this topic in child care settings. There are many questions that have not even been asked yet. Ritchie highlighted three types of child care sites where more studies are especially needed: sites with younger children, family child care homes, and license-exempt care sites (a child care home that can operate legally without a license; e.g., a provider who cares only for his or her relatives may be exempt).

Ritchie identified four "to whom" types of barriers and facilitators, that is, "to whom" the factor is a barrier or facilitator: (1) centers (e.g., costs, access, staffing, facilities, policy, and experience); (2) providers (e.g., time, training, support, priorities, and health concerns); (3) children (e.g., preferences and knowledge); and (4) parents (e.g., preferences, support, and knowledge). The methodologies she discussed addressed a mix of "to whom" types of barriers and facilitators.

[1]This section summarizes the presentation of Lorrene Ritchie from the University of California, Berkeley.

Measuring Barriers to Change in Child Care Settings

Most of the methodologies that Ritchie identified for use in measuring barriers to change in child care settings were built upon the Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC) questionnaire (Benjamin et al., 2007).[2] Although NAP SACC itself did not contain any barrier questions, researchers have adapted the questionnaire for use in measuring barriers. For example, in ongoing work, Dianne Ward and colleagues added self-efficacy questions aimed at understanding individual behavior change within the context of organization behavior change (e.g., How confident do you feel about improving the quality of food that you serve? How confident do you feel about making menu changes?) (Personal communication, D. Stanton Ward, University of North Carolina at Chapel Hill, January 2012). The Yale Rudd Center also used a NAP SACC–like questionnaire in its Child Care Nutrition & Physical Activity Assessment survey (Henderson et al., 2011). The survey included a checklist of barriers to promoting a healthy environment (e.g., lack of support, sale of unhealthy foods at fundraisers, serving unhealthy foods at social events, insufficient funds, inadequate food preparation or storage facilities, limitations of food service providers or vendors, lack of policies, and lack of training for food service staff).

As yet another example of a NAP SACC–like tool being used to assess barriers to change in child care, the Survey of Healthy Activity and Eating Practices in Environments in Head Start (SHAPES) includes a question on challenges to providing healthier foods in child care (Whitaker et al., 2009). Ritchie noted that the questions are more theoretical than those on the Yale Rudd Center's Child Care Nutrition & Physical Activity Assessment survey. Rather than asking the provider about current challenges, the tool asks the provider about anticipated challenges *if* they were to serve healthier foods. The tool acknowledges some of the same challenges as the Yale Rudd Center survey (e.g., funds, control over food service provider, and knowledge) but also includes some additional challenges (e.g., time, child preferences, and parent support).

Finally, the Statewide Assessment of California tool administered by Ritchie and colleagues (2012) also included some barrier questions. Based on results of the survey, major challenges to providing healthier foods among both CACFP and non-CACFP providers were no CACFP reimbursement (4 percent), parents not wanting healthier foods (7 percent), not enough information (8 percent), not enough room for food preparation or

[2]NAP SACC is an intervention designed to improve the nutrition and physical activity environment, policies, and practices of child care centers through self-assessment and technical assistance. For more information, visit http://www.napsacc.org.

storage (15 percent), lack of control over food provider (18 percent), children not liking (48 percent), and high food costs (57 percent).

Cost as a Potential Barrier

With respect to measuring food costs as a barrier, rather than asking if food costs were a barrier, Monsivais and Johnson (2012) attempted to quantify food costs by matching menus and grocery receipts.

Assessing Facilitators to Change in Child Care

Gathering information on facilitators is more difficult than gathering information on barriers, according to Ritchie. Many people are unable to articulate why things are "easy." When asked, a typical response is, "I don't know. I just do it." So rather than asking why certain things are easy or not, Ritchie suggested that a more useful approach is to ask about characteristics of the organization or population being served that researchers think might contribute to making something "easy."

As an example of using indirect questioning to gather facilitator information, in a study of Head Start, state preschools, and other CACFP centers, Hecht et al. (2009) asked, "Where is food prepared?" The survey showed that food for Head Start programs is typically prepared in a central kitchen, while State Preschools typically obtain food from school food service, and other CACFP centers prepare food on site. These are very different situations, with variations in provider control over food preparation, relationships providers have with their food preparers, and other similar factors. Any of these factors could be facilitators to change, depending on the situation. In the same study, another question was, "Who does the menu planning?" Again, the responses varied, with some menu planning being done by the caregivers themselves, some by the director or supervisor, some by the cook or chef, and some by a dietitian. Access to a dietitian would presumably be a facilitator to making certain changes, in Ritchie's opinion. If that is the case, Head Start would have a "leg up" on making some of the suggested changes recommended in the CACFP report (IOM, 2011), given that, according to the Hecht et al. (2009) study, 62 percent of Head Starts have a dietitian available for menu planning (compared to 19 percent of state preschools, 7 percent of CACFP centers, and 0 percent of family child care homes). Finally, providers were asked about major factors used when considering what foods to offer children. The number one factor across all types of providers was nutritional content (81 percent), followed by cost (20 percent), child preferences (14 percent), availability (13 percent), and convenience (9 percent). Thus, the indirect questioning used in the Hecht

et al. (2009) survey led to the nutritional content of healthy foods being identified as yet another facilitator to change.

Implementing Enhanced Nutrition Standards in Delaware: Lessons Learned

In a focus group study on child care providers' and parents' perception of Delaware's enhanced nutrition standards, Gabor et al. (2010) found that the potential for promoting health was definitely a facilitator to adopting the new nutrition standards. Ritchie suggested that providers with less exposure to policies to promote healthy foods would likely face a steeper learning curve when the new CACFP guidelines are implemented. Gabor et al. (2010) also identified some negative perceptions that might act as barriers to changes associated with the new CACFP guidelines (e.g., concerns about children not getting enough fat or whole milk after age 2 years when low-fat or nonfat milk is recommended, children not eating nutritious foods and therefore going hungry, and meals served being inconsistent with school meal standards). With respect to meal planning and food preparation, Gabor et al. (2010) identified the challenge of making meals appealing and providing variety as the greatest concerns among providers. Cooking from scratch and modifying recipes were also barriers.

With respect to facilitators, Gabor et al. (2010) identified several factors related to meal planning and food preparation changes: advanced menu planning, advanced meal preparation, providing kid-friendly foods, making the transition to healthier foods and beverages gradually, and sharing menus and recipes among providers.

Ritchie noted that one of the interesting features of the Gabor et al. (2010) study on barriers and facilitators to implementing new enhanced nutrition standards in Delaware was its reliance on focus groups, a methodology that no other speakers during the workshop addressed.

What Are the Best Methods for Assessment of Barriers and Facilitators to Organizational Change?

To assess child care nutrition and physical activity in child care settings, the previously mentioned Yale Rudd Center Validity Study (Henderson et al., 2011) compared interview, observation, and self-report methodologies and evaluated the strengths and limitations of each in terms of cost, feasibility, and data quality. They concluded that the best method depends on what one wants to know. Interviews are very good for assessing complicated factors, such as staff training (e.g., Who is being trained? How often? On what topics?), and for very sensitive questions (e.g., information that people may not want to share, such as whether a provider is really doing

what is best for the children). Interviews during which the interviewer is able to develop a rapport with the provider may generate more accurate information than other methods. Observation is good for assessing routine child feeding practices. Surveys are good for assessing most other types of measures, including policies.

EVALUATING BARRIERS AND FACILITATORS TO MAKING HEALTHY FOOD CHOICES IN THE HOME ENVIRONMENT[3]

Information on barriers and facilitators to change is especially lacking for family child care homes. Because family child care homes operate more like a home environment than a child care center, with providers operating more like parents than child care center staff, Angela Odoms-Young suggested that research on barriers and facilitators in the home food environment provides a framework for understanding barriers and facilitators to change in CACFP day care homes. The findings—and methodologies employed—may be adaptable to a study of CACFP day care homes.

The home food environment is complex. Several studies have shown that the social and environmental context of family settings, both inside the home (the microenvironment) and outside the home (the macroenvironment), impacts provision of food, intake of food, and the link between intake and health outcomes. For example, with respect to the microenvironment, women living in food-insecure households are more likely to consume high-calorie but nutritionally poor food to avoid feelings of hunger; to eat irregular meals; to skip breakfast; and to consume less milk and fewer fruits and vegetables (Martin and Lippert, 2012). Other studies have shown that short sleep duration is a risk factor for consumption of energy-dense foods; television viewing is associated with increased caloric consumption; and stress increases energy intake for energy-dense foods and shifts food choices from lower- to higher-fat foods.

The Chicago Family Food Survey

As an example of relevant research on the home food environment, Odoms-Young highlighted the Chicago Family Food Survey (CFFS) (Kong et al., in press; Odoms-Young et al., unpublished). CFFS is a study of about 300 participants of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) between the ages of 2 and 3 years and their parents and/or primary caregivers. Parents or caregivers were surveyed both before the new food package was introduced and then 6, 12, and 18

[3]This section is based on the presentation of Angela Odoms-Young from the University of Illinois, Chicago.

BOX 3-1
Measures Used in the Chicago Family Food Survey

- Child Feeding Questionnaire (CFQ) (Birch et al., 2001)
- Food Availability/Accessibility Measure (Cullen et al., 2003)
- USDA Short Household Food Security Survey[a]
- Environmental Confusion in Household (CHAOS) (Matheny et al., 1995)
- Contemporary Life Stressors (CRISYS) (Shalowitz et al., 1998)
- Perceived Neighborhood Availability (Moore et al., 2008)
- Southwest Chicago Food Store Audit Instrument (Zenk et al., 2006)

[a]www.ers.usda.gov/briefing/foodsecurity/surveytools.htm.

months afterward.[4] The survey assessed several microenvironmental factors that could potentially influence what foods are provided, which foods are consumed, and how nutrient intake impacts health outcome(s). These factors include child feeding practices, parent or caregiver nutrition knowledge and food preferences, shopping patterns, home food availability, household food security or insecurity, children's sleeping routines, television viewing and computer use, level of stability within the home, and stressful life events. The researchers explored aspects of the macroenvironment as well, including perceived availability of healthy versus unhealthy food options and cost of healthy versus unhealthy food.

Odoms-Young indicated that measures used in CFFS may be relevant when identifying contextual factors and child care provider practices that influence children's dietary intake in child care homes (see Box 3-1). For example, to assess child feeding practices, the survey utilized the Child Feeding Questionnaire (CFQ). The CFQ was originally designed to assess parents' perceptions and concerns regarding childhood obesity, as well as parents' child-feeding attitudes and practices (Birch et al., 2001). Specifically, in the Chicago survey, it was used to assess

- Measures of parental perception of child and parent weight and concern about weight:
  - Responsibility (e.g., "When your child is at home, how often are you responsible for feeding her/him?");

[4]In 2009 the U.S. Department of Agriculture (USDA) made major revisions to food packages provided by WIC. For more information on the new food packages, visit http://www.fns.usda.gov/wic/benefitsandservices/foodpkg.htm.

  - Parent weight status (parents who have heard a lot about obesity may change their feeding based on perceived weight status of either themselves or their children); and
  - Child weight status; and parents' concerns about child weight (e.g., "How concerned are you about your child becoming overweight?").
- Measures of parents' attitudes and practices regarding their use of controlled child-feeding practices included
  - monitoring (e.g., "How much do you keep track of the high-fat foods that your child eats?");
  - restriction (e.g., "I intentionally keep some food out of my child's reach"); and
  - pressure to eat (e.g., "My child should always eat the food on her plate").

Odoms-Young remarked that some of these same questions would be appropriate to ask of child care providers as well. In addition, CFFS measures used to assess parent or primary caregiver perceptions of the macroenvironment may be particularly relevant for CACFP given that child care homes may be located in residential communities where limited availability or high cost of healthy food options, particularly in Latino, African American, and rural communities, may shape what is provided.

Additionally, the researchers added questions about child-feeding practices that were not included in the CFQ. Specifically, they asked how often children eat while watching television, videos, or DVDs; how often children eat meals at a regular time; how often children share their food with adults or eat food from their parents' plates; and how often children eat food from a fast food restaurant.

To assess shopping patterns, the researchers asked respondents to provide the names and addresses of two stores where the main shopper in the household normally purchases food (e.g., supermarkets, grocery stores, corner or convenience stores, dollar stores, drug stores, liquor stores, gas stations), and how often the person in charge of groceries and food shops at those stores. Later, the researchers assessed those stores.

To assess home food availability, the researchers used a measure developed by Cullen et al. (2003) to assess availability (in the home in the last 7 days) and accessibility of fruit, juice, and vegetables (fresh, frozen, or canned), as well as availability (in the home in the last 7 days) and accessibility of low- and high-fat dairy products and grain products. All of these measures were self-report measures. To account for cultural modifications, the survey added some foods that are traditionally available in the Latino culture (e.g., mangoes, avocados, nopales/nopalitos [cactus], jicamas).

To assess household food security or insecurity, the researchers used the USDA Short Household Food Security Survey.[5] Items included the following: "The food that we bought just didn't last, and we didn't have money to get more," "We couldn't afford to eat balanced meals," "Did you or other adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?," "Did you ever eat less than you felt you should because there wasn't enough money for food?," and "Were you ever hungry but didn't eat because there wasn't enough money for food?"

To assess the level of stability within the home, the researchers used the Environmental Confusion in Household (CHAOS) measure (Matheny et al., 1995). Items included the following: "There is very little commotion in our home," "We can usually find things when we need them," "We almost always seem to be rushed," "We are usually able to stay on top of things," "No matter how hard we try, we always seem to be running late," "It's a real zoo in our home," "At home we can talk to each other without being interrupted," "There is often a fuss going on at our home," "No matter what our family plans, it usually doesn't seem to work out," "You can't hear yourself think in our home," "I often get drawn into other people's arguments at home," "Our home is a good place to relax," "The telephone takes up a lot of our time at home," "The atmosphere in our home is calm," and "First thing in the day, we have a regular routine at home."

To assess stressful life events, the researchers used the Contemporary Life Stressors (CRISYS) measure (Shalowitz et al., 1998). CRISYS measures 63 items pertaining to potentially stressful life events during the past 6 months. Items include

- Financial issues (e.g., "Did you go deeply in debt?," "Did your income decrease by a lot?," "Did you miss a rent or mortgage payment because you couldn't pay for it?," "Was your telephone, electricity, or gas turned off?")
- Legal issues (e.g., "Did anyone in your family get arrested?")
- Career issues (e.g., "Did you begin a new job or get promoted?," "Did you get laid off?")
- Relationships (e.g., "Did you get a divorce or break up with a partner?," "Did your regular child care arrangements change in any way?")
- Safety in the home (e.g., "Did you feel emotionally or physically abused?")
- Safety in the community (e.g., "Did you hear violence outside your home?," "Did you see drug dealing in your building or neighbor-

[5]For details, see www.ers.usda.gov/briefing/foodsecurity/surveytools.htm.

hood?," "Were you a victim of a crime while you were outside or away from your home?")
- Medical issues (e.g., "Did you/your partner have a baby?," "Did you become ill or did you have a flare-up of a chronic illness?," "Did your children become ill or did your children have a flare-up of a chronic illness?," "Did another family member become ill?")
- Home issues (e.g., "Did a relative or friend move into your home?", "Did you move?," "Did rats, mice, or insects bother you in your home?")
- Authority issues (e.g., "Did you have trouble with social service agencies?," "Did you have trouble with medical or health professionals?")
- Prejudice (e.g., "Did someone treat you unfairly because of your race?," "Did someone treat you unfairly because you didn't have a lot of money?")
- Other items (e.g., "Did you ever use alcohol or drugs to get through a day?," "Did you have trouble reading or understanding something that was important to you?")

Odoms-Young suggested that stressors and financial strains experienced by family day care providers could potentially impact their ability to plan and purchase healthy meals and, consequently, to implement the new CACFP guidelines.

Finally, the CFFS used two macroenvironmental measures: (1) perceived neighborhood availability (e.g., "a large selection of fresh fruits and vegetables is available in my neighborhood") (Moore et al., 2008) and (2) availability, selection, and cost at specific stores where the respondents said they shopped, using the Southwest Chicago Food Store Audit instrument (Zenk et al., 2006).

DISCUSSION

Following Ritchie and Odoms-Young's presentations, workshop participants engaged in an open discussion on methodologies for assessing barriers and facilitators to implementing the recommended CACFP meal pattern requirements. Major topics of discussion were state-level "preliminary" data, cost as a potential barrier, food insecurity as a potential barrier, and other macroenvironmental barriers. Each of these is discussed in more detail below.

State-Level "Preliminary" Data

There were several comments about the possibility of preliminary data on barriers and facilitators being collected in states that have been implementing new state nutrition guidelines for child care (e.g., California, Delaware, New York, and West Virginia). States often have a wealth of raw data but insufficient resources to analyze those data. If such data exist, they could help frame questions for a nationally representative study of child care. For example, one audience member remarked that, in New York, registered dietitians are entering homes to assist providers with implementing new state guidelines and there might be data available in the future on the ease, or difficulty, of making the required changes. Ritchie noted that the California state legislature passed a law regulating beverages in all child care centers and homes and that a statewide survey which is about to be launched will be providing data not just on how well the facilities conform to the new standards but also on barriers and facilitators to making the necessary changes. She said, "Some of those natural experiments and the lessons that we have learned from them will be very informative" and will "help frame how we ask questions for the national study."

Cost as a Potential Barrier

Cost is often perceived as a significant barrier to implementing change in child care settings, yet many unanswered questions remain. A few audience members listed some of those questions. For example, what does it mean when providers say that certain foods cost "too much"? What are provider expectations around cost? How much do providers in family day care homes think about what food costs should be? Odoms-Young agreed that these are important questions to consider and suggested that some providers may be experiencing economic constraints similar to what the children's families are experiencing.

Fred Glantz emphasized the importance of looking at the entire cost of an operation, not just the cost of the actual purchased food; for example, the cost of labor should be considered as well. If a home or center buys more prepared foods, the food cost will be higher than for a site that relies on raw ingredients because the cost of the processed food embodies the labor that went into the product(s). However, the total cost (food plus labor to prepare the food) for a home or center that buys raw ingredients may be similar.

Quantitative data on cost are especially lacking. This raises the question, how can cost data be collected in a family day care setting? If families are shopping for foods for their child day care programs while shopping for household foods, how are the costs separated? Ritchie identified two

studies that have quantified costs in family child care homes (Monsivais and Johnson, 2012; Monsivais et al., 2011). Glantz noted that there is some very early research on family child care cost that could be useful. In 1976, Abt Associates was contracted by the Administration for Children and Families to do a national survey of family child care. Part of that study was an intensive examination of what it costs to run a family child care home, as opposed to a center. It was a very detailed study. While outdated, he said that it has the best data currently available and that the methodology is relevant.

The Impact of Food Insecurity on Implementing Organizational Change

Previous CACFP research done by Madeleine Sigman-Grant and colleagues (2006) has shown that staff in CACFP sites respond differently to children from food-insecure households. It was suggested that this would be an interesting issue to explore further. For example, do providers serve more of some things? Do they refer parents to another resource? How often do they face this situation? Food insecurity may also influence parents' expectations of what their children are going to be served. While some parents may be more concerned with nutrition, others may be more concerned with whether their children are getting enough of any food. Again, this would be an interesting issue to explore further. For example, are parents satisfied with what their children are being served?

Other Macroenvironmental Barriers

It was suggested that variation in licensing exemption standards is another "external" factor that may impact how providers practice. Exemption rules vary across states, as do requirements for licensing. One audience member observed that license-exempt providers typically have fewer resources at their disposal and are often less skilled in preparing foods than other types of child care settings.

Finally, several participants agreed that another important measure to consider is where home day care providers purchase their foods. Glantz remarked that in some places, like New Mexico, where the population density is not great enough to support many child care centers, most child care facilities are family day care homes. Many of those homes are located in rural food deserts where the choices for food purchasing are highly restricted. In some places, the only source for food is the local gas station. Another participant pointed out that food deserts exist in urban areas as well.

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4

Evaluating Program Access and Participation Trends

In addition to evaluating food and nutrient intake and the barriers and facilitators to providing nutritious meals and snacks, another key research recommendation in the Child and Adult Care Food Program (CACFP) report (IOM, 2011) was to gather more information on program access and participation trends. For example, how many providers and participants are in CACFP? What is the demand from eligible providers to participate? What are the barriers and facilitators to program access (for both providers and participants)? Workshop participants explored methods for evaluating program access and participation trends, beginning with a general examination of the use of administrative data and then proceeding to more detailed examinations of methodological approaches to assessing program access (both providers and participants). This chapter summarizes that exploration. Major overarching themes of the discussion included the wealth of relevant data that already exist in administrative and other databases, with Rupa Datta describing those data as a "gold mine to be tapped"; lessons learned from previous studies about how to collect and analyze program access and participation trend data; and the significance and challenge of defining and identifying comparison groups (i.e., eligible but nonparticipating providers and children) to include in analyses.

Although most of the discussion focused on the actual child care providers and participating children, Fred Glantz reminded the workshop audience that there are several levels of CACFP participation: children, outlets (the child care centers and homes), sponsors, state agencies, and the U.S. Department of Agriculture (USDA). He described how raw child-level data (who is participating, meals eaten during child care, etc.) aggregates after

outlets send their monthly reports to sponsors (or directly to state agencies in the case of self-sponsored centers), after sponsors send their reports to state agencies, and then again after stage agencies send their report to USDA, making it difficult to analyze anything but state-level national trends. Glantz opined that it would be tremendously helpful if a nationally representative study of CACFP could access some of those raw child-level, outlet-level, and sponsor-level administrative data.

Drawing on lessons learned from a series of studies on the Child Care Development Fund (CCDF) voucher program, Gina Adams and Monica Rohacek discussed key factors likely to shape provider participation (e.g., various provider individual characteristics, and CACFP policies and implementation practices) and ways to measure those factors. Past research by the Urban Institute on the child care voucher system has shown that a similar set of factors impacts both participation ("Are you in?") and the quality of participation ("If you are in, can you do what you are supposed to be doing?"). As many speakers did throughout the day, Rohacek emphasized the importance of keeping the end in mind, that is, knowing the outcome(s) of interest. For example, is the goal to simply measure participation rates or the quality of participation? Other things to keep in mind are the value of quantitative and qualitative methodology (i.e., they both serve important roles), the importance of knowing whom to survey (i.e., the respondent population), and the reality of heterogeneity (i.e., that there is no single child care system, rather a range of diverse systems).

Arguably one of the most important factors to consider when designing a national study of CACFP is the comparison group, that is, the group of eligible but nonparticipating providers (or participants) to whom the CACFP representative sample of providers (or participants) will be compared. Rupa Datta explained the important role that comparison group data serve in two key quantitative measures of program access and participation: saturation and participation rates. Based on work she has done with the National Survey of Early Care and Education (NSECE), she discussed the anticipated challenge of collecting data not just for the comparison group, but also for CACFP providers. Because of the variable nature of child care providers (centers, licensed homes, unlicensed homes, etc.) and state variability in licensing regulations, the greatest challenge for NSECE has been building a database of providers.

Again, a major theme of not just this session but also the workshop at large was the potential relevance of existing data. Susan Jekielek discussed the relevancy of existing data for two Administration for Children and Families (ACF) early childhood programs that overlap with CACFP: Head Start (and Early Head Start) and the Child Care Subsidy Program. Neither program collects CACFP-specific data, but both collect data that might inform a nationally representative study of CACFP.

USE OF CACFP ADMINISTRATIVE DATA[1]

Administrative data collected and accumulated by CACFP providers can be very useful for understanding the effects of public policy on dietary intake. The challenge is access to those data. Fred Glantz described how raw child-level data collected by CACFP providers accumulates as it moves up from the provider level. There are several levels of CACFP participation. At the top is USDA, which sets rules based on legislation. Next is the state, usually the state department of education, which administers the program and monitors compliance with federal regulations. Below the state are the nonprofit agencies that sponsor centers and homes. It is the sponsor, not the home or center, that enters into an agreement with the state government and that is legally and fiscally responsible for providers below them. Family day care homes must be sponsored; child care centers must either be sponsored by another agency or self-sponsored. Below the sponsors are the "outlets," that is, the child care centers and homes where served meals are reimbursed by CACFP. Finally, at the "bottom" are the children. Glantz remarked that all children attending a CACFP center or home participate in CACFP regardless of family income and whether they or their parents know that they are participating.

As the Data Flow Up, They Aggregate

Outlets collect raw child-level data, such as who is participating, the hours and days of the week that they participate, meals that the children eat while in child care, and what those meals contain. Glantz said, "At that bottom level there is a wealth of information if you can get access to it. And right now, you can't." Those data are aggregated as soon as the outlets submit their monthly reimbursement claim forms to either the sponsor or the state agency (in the case of self-sponsored child care centers) (see Figure 4-1). Then, sponsors aggregate information received from providers before submitting it to their state agencies. State agencies, in turn, aggregate information they receive before submitting their reports to USDA. Because of the cumulate aggregation, not only are child-level data unidentifiable at the agency levels, so are outlet and sponsor-level data, making it impossible to conduct analyses with children, outlets, or sponsors as the unit of analysis.

The Unreliability of Monthly Data

The challenge of data analysis is compounded by the fact that reimbursement claim forms are submitted on a monthly basis. Many programs

[1]This section summarizes the presentation of Fred Glantz from Kokopelli Associates.

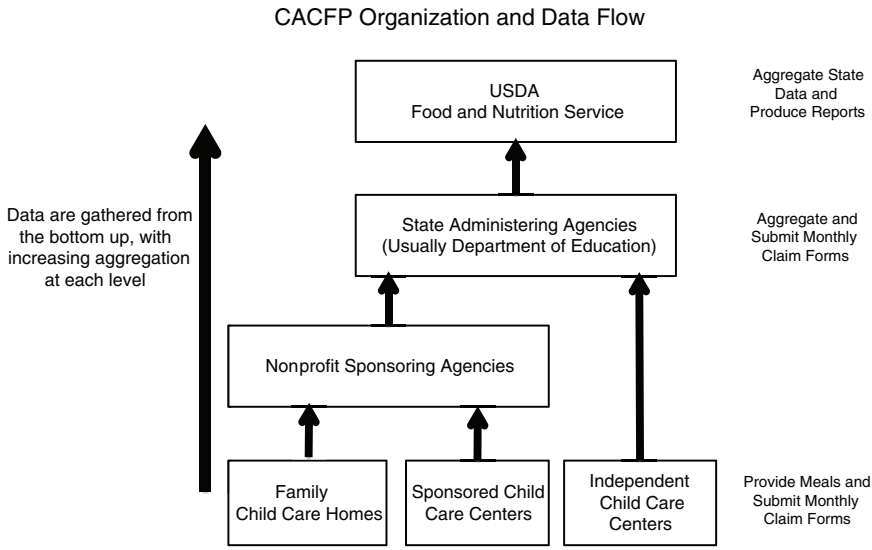

FIGURE 4-1 CACFP data (e.g., meals eaten during child care, what those meals contain) flows up, aggregating at every level, with child-, outlet-, and sponsor-level data not accessible to researchers.
SOURCE: Glantz, 2012.

do not operate every month, for example, during the summer months, and therefore do not submit claim forms every month. Plus, programs sometimes submit late claim forms or revise their claim forms later. So data collected during any given month are not reliable, according to Glantz, and not necessarily representative of what a program looks like over the course of the year. USDA uses October and March monthly data submissions in their analyses, with the understanding that months serve only as proxies for the entire year. Although one could aggregate monthly data into annual data, estimates of year-to-year changes in participation are sometimes confounded by state-level changes in eligibility or registration requirements for subsidized child care.

The Challenge of Defining a Comparison Group

More important than the lack of reliable monthly data is the challenge of defining a comparison group for use in an analysis of participation. For example, with respect to outlet participation, comparison groups vary from state to state and can vary even within a state. For example, in New

Mexico, a home does not need to be licensed unless it provides care for five or more children. If it serves fewer than five children, it has an option to register, and then must participate in CACFP. So countless family day care homes in New Mexico (i.e., those with fewer than five children) are not listed anywhere. Because no data are available on a regular basis for the universe of eligible nonparticipating sponsors or outlets, one cannot do any comparative analyses of participating versus nonparticipating eligible providers.

National Data

In Glantz's opinion, the best available administrative data are national trend data, such as the number of child care centers participating in CACFP and the proportion of participating centers that are for-profit versus nonprofit or sponsored versus independent. National trend data can show the impact that policy change can have on provider participation. For example, there were virtually no for-profit centers participating in CACFP in the 1970s and 1980s. But when welfare reform went into effect in 1997, the number of participating for-profit centers increased. Glantz's interpretation of the shift is that welfare reform not only dramatically increased parent co-payments but, as a result of the two-tier payment system that went into effect that same year,[2] also led to lower reimbursement rates for a large segment of the CACFP population, forcing providers to raise their care rates. As a result, parents started looking for more affordable care from other sources. After tiering was initiated, the number of family day care homes that participated in CACFP dropped precipitously, from 190,000 in 1997 to 132,000 in 2011 (see Figure 4-2). Of those initial 190,000, about 111,000 were classified at that time as Tier 1 homes, 80,000 as Tier 2. The number of Tier 1 homes remained relatively constant between 1997 and 2011, but the number of Tier 2 homes dropped 25,000 over the same time period. Also shown in Figure 4-3, the number of children participating in Tier 1 homes stayed fairly constant between 1997 and 2011, while the number of children participating in Tier 2 homes decreased.

[2]For a description of the two-tier payment system, see Chapter 2, Footnote 4.

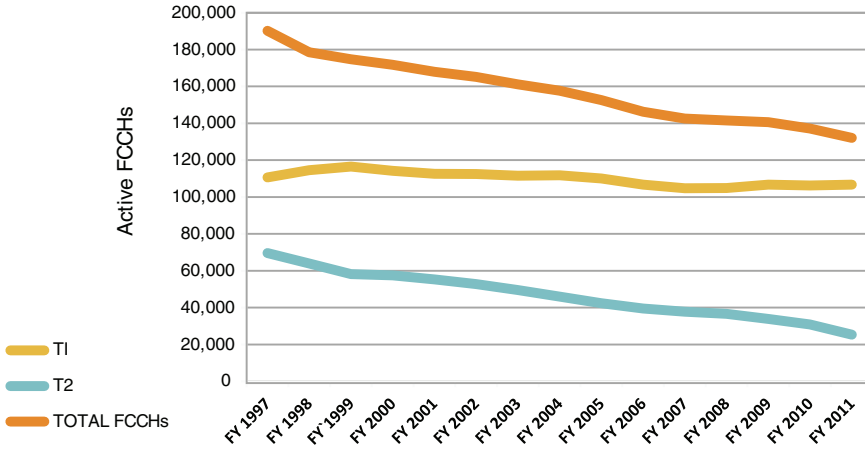

FIGURE 4-2 Number of active family child care homes by tier level, fiscal years 1997–2001. After tiering, FCCHs serving middle-income children dropped out of CACFP but were not replaced by FCCHs serving low-income children.
NOTES: FCCH, family child care home; FY, fiscal year; T1, Tier 1; T2, Tier 2.
SOURCE: Glantz, 2012.

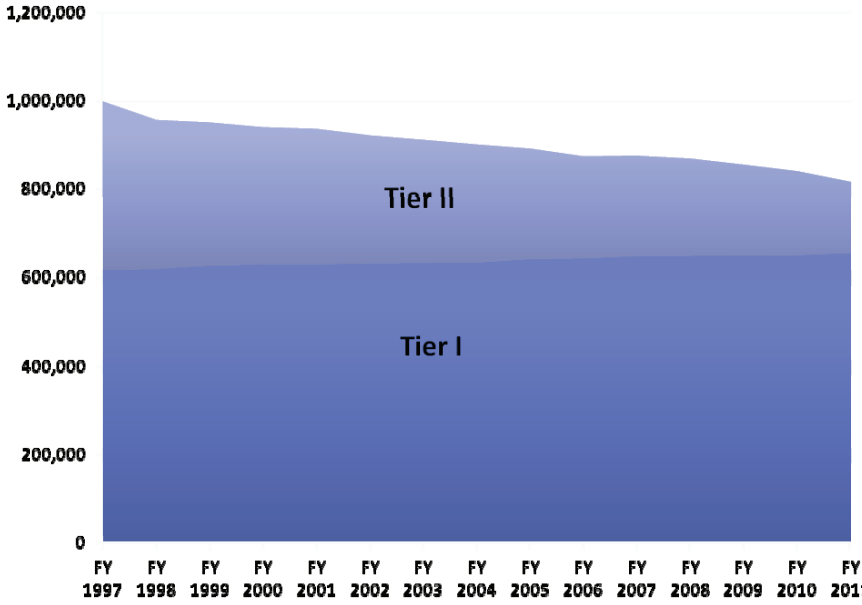

FIGURE 4-3 Average daily attendance in Tier I and Tier II family child care homes, fiscal years 1997–2011.
SOURCE: Glantz, 2012.

LESSONS LEARNED: FACTORS SHAPING PROVIDER PARTICIPATION IN CACFP AND METHODOLOGICAL CONSIDERATIONS[3]

Many lessons on provider participation can be drawn from previous work conducted by the Urban Institute. Gina Adams remarked that the same lessons could be applied to research on sponsor participation. She referred to three studies in particular, all on the CCDF voucher program.[4] The first was a 1999 qualitative study on provider involvement with CCDF during welfare reform, based on focus group and interview data collected on providers, parents, subsidy workers, administrators, and experts at 17 sites across 12 states (Adams et al., 2003). The second study was a 2003–2004 mixed method study that involved a representative survey of centers and family child care homes in five counties across four states, and a qualitative study involving focus groups and interviews with providers, subsidy staff, administrators, and experts (Adams et al., 2008; Rohacek et al., 2008; Snyder et al., 2008). Both studies were designed to flesh out provider participation and experiences and participation with the voucher system. The third study involved in-depth interviews with center directors about factors shaping their ability to provide high-quality care (Rohacek et al., 2010).

Based on these three studies, Urban Institute researchers have identified five clusters of factors that shape provider participation. The same set of factors impact both participation ("Are you in?") and the quality of participation ("If you are in, can you do what you are supposed to be doing?"). Depending on the research question and the study population, Adams noted that some factors or clusters may be more relevant than others:

1. Provider individual characteristics (i.e., the person making decisions)
   a. Motivation (Why are they doing this?)
   b. Personality (Are they flexible? Do they like change?)
   c. Skills/capacity (Are they literate? Do they speak English? Do they have any business capacity? Do they know how to fill out paperwork?)
   d. Beliefs/values (What are their beliefs and values? Are they mission-driven? Do they believe that the government has a role? Do they believe that agency people should be coming into their homes?)

[3]This section summarizes the joint presentation by Gina Adams and Monica Rohacek from the Urban Institute.

[4]For more information on CCDF, visit http://www.casyonline.org/CCDF.html.

   e. Beliefs about CACFP (What are their perceptions of or experiences with CACFP?)
2. Provider program characteristics
   a. Type (Is it a center or family child care?)
   b. Funding/resource supports (Who supports the program? Parents? Public sources? Philanthropy? Religious affiliate?)
   c. Clientele (What proportion of clientele is eligible for free or reduced price meals and snacks or Tier 1 reimbursements?)
   d. Auspice (What is the profit status? Is it public/private/school-based?)
   e. Decision-making structure (Who is making decisions? A board? A church? A chain?)
   f. Size/staffing (What is the administrative capacity?)
3. Community characteristics
   a. Client demand (What do clients care about? Level of resources? Sense of other options? Nutritional preferences?)
   b. Supply of care (What is going on with competitors? Are competitors lowering their prices such that you have to lower your prices and seek CACFP assistance?)
   c. Resources (Who in the community is supporting the program beyond parent fees? Parents? Public sources? Philanthropy? Religious affiliate?)
4. Policy/services context
   a. Federal/state/local early care and education policies, programs and requirements (How do other policies, programs, and requirements, such as CCDF or kindergarten programs, impact participation?)
   b. Licensing (What are the state licensing exemptions, enforcement patterns, nutrition standards, etc.?)
   c. Childcare resource and referral functions (What other levels and kinds of support are being provided? How does that support intersect with CACFP?)
   d. Quality supports (What kind of support is being provided for training and technical assistance? How does CACFP interact with the Quality Rating and Improvement System initiatives [QRIS]?)
   e. Tax policy (Are there tax disincentives? For example, is it easier to deduct food costs than participate in CACFP?)
5. CACFP policies and implementation practices
   a. Outreach (Do providers know about the program? Is what they know accurate or word of mouth from how the program used to be?)

b. Actual reimbursement (What do providers actually receive in payment [as contrasted with what they are supposed to receive]?)
c. Paperwork, both enrollment and reimbursement forms (Do they do the paperwork correctly? Is it done on time? How difficult is it and how long does it take?)
d. Ease of working with funding entity (How much time do you spend on the phone? Can you resolve payment disputes? Can you get help? How are you treated?)
e. Nutrition requirements (How easy or difficult is it to comply? How similar or different are requirements compared to what providers believe are appropriate or what their clients want?)
f. Monitoring/support (How much monitoring support is "carrot" and how much "stick"? What is the relationship between the provider and the individual who enters the home to do the monitoring?)
g. Role/nature of sponsor

Adams emphasized the importance of the fifth cluster of factors, especially those related to implementation. She said, "The real effect of a program is how it is experienced by the provider." The greater the understanding about how the provider experiences a program, the more clarity about which pieces of policy need to be adjusted. Yet, she cautioned that all five clusters play important roles. Which factors are most important and how the factors interact with each other are highly individual. A benefit for one provider could be a cost to another. Also, for any given provider, the benefit-cost relationships among the various factors can change over time.

Methodological Considerations

Lessons learned from Urban Institute research extend beyond what types of factors to consider when evaluating provider participation in CACFP. They also offer valuable methodological lessons about how to collect those data. Monica Rohacek identified four main methodological issues to consider when designing a national study of CACFP provider participation:

(1) *What is the outcome of interest? What is the question?* Which aspects of participation are important? For example, one outcome is simply participation; that is, whether the provider is participating in the program or not. But there are variations in the extent of involvement. For example, what percentage of children in a program is income-eligible for CACFP reimbursement? What percentage of meals served in a program are reimbursed by CACFP? What is the quality of participation (e.g., quality of nutritional offerings, child nutrition outcomes)?

(2) *Is a quantitative survey sufficient?* Rohacek remarked that many research questions listed in the CACFP report (IOM, 2011) could be addressed with a quantitative survey (e.g., Does the program improve participants' daily or weekly nutrient intake?). But the "why" questions (e.g., Why does the program improve nutrient intake?) are probably better served by a mixed-methods approach (i.e., mixed qualitative and quantitative). For example, the first Urban Institute study of provider involvement in CCDF took a qualitative approach, with focus groups identifying some key challenges and facilitators that providers face when working with voucher programs (Adams et al., 2003). Information from those focus groups was used to design the quantitative survey used in a second, mixed-methods study of provider involvement in CCDF (Adams et al., 2008; Rohacek et al., 2008; Snyder et al., 2008). In addition to the quantitative survey, the second study followed up with focus groups to gather additional details about what the quantitative data revealed.

(3) *Which respondents are relevant?* Rohacek agreed with Adams that the whole effect of a program should consider the providers' experiences. How do providers experience the program? What does the program look like to nonparticipants (both past and never participants)? Additionally, other people who might be useful to speak with in terms of understanding what CACFP looks like on the ground include staff at state CACFP agencies and sponsoring organizations, parents, and other key informants.

(4) *Accounting for heterogeneity in the field*. Although the term "child care system" is common, Rohacek remarked that in fact there is no single child care system. Rather, there is a range of "systems" (e.g., centers versus homes), as well as differences in local implementation practices. When designing a study on provider participation, it is important to keep this heterogeneity in mind.

Rohacek concluded with what she called "stray" thoughts. First, she emphasized the importance of asking effective questions when designing "satisfaction" surveys (i.e., surveys designed to determine program satisfaction). For example, she came across a study conducted in Oregon in which 97 percent of respondents said that they would recommend CACFP to others. While such a high response may indicate that CACFP is working very well, it might not reveal the extent of any problems. Second, she emphasized the value of building on work in related fields. For example, there has been considerable work done in the early childhood field at large that might provide some insights into understanding provider participation in CACFP. Finally, she emphasized the challenge of engaging providers in this type of research. Engaging family child care home providers can be especially challenging. Urban Institute researchers have found it useful to explain to providers that implementation research is very different than compliance monitoring and that the ultimate goal is to help providers.

DESIGNING SURVEY QUESTIONS FOR ESTIMATING TWO KEY CACFP RATES: PARTICIPATION AND SATURATION[5]

Rupa Datta echoed Fred Glantz's remarks about the challenge of defining comparison groups for analyzing participation in CACFP. With respect to provider participation, not only do state licensing requirements vary tremendously for center-based care, and even more so for family-based care, but the quality of lists (of licensed facilities) also varies. In some states, unlicensed providers may not be on any list at all. These uncertainties raise several questions about eligibility. What defines an eligible provider? Is it any licensed provider or all providers? Defining participant eligibility is equally difficult. One important factor of eligibility is income, but what other factors need to be considered? Are eligible children only those in licensed care, or are all children in any kind of care considered eligible? By limiting the universe of eligible children to those participating in licensed care, one misses the largest source of nonparental care, that is, family, friends, and neighbors. This is especially true of the youngest age groups (i.e., 0–2 years). Also, because many unlisted providers serve low-income families, one would be missing a large source of data on child care for children from low-income families. For both providers and participants, added to the challenge of defining who is eligible is the challenge of actually finding those outlets and people for data collection.

Comparison group data are useful for calculating two key CACFP rates: saturation and participation. Saturation rate is the number of providers participating in CACFP, divided by the number of eligible providers (i.e., the number of participating providers plus the number of eligible nonparticipating providers). Participation rate is the number of children receiving meals through CACFP (i.e., the number of participants) divided by the total number of eligible children (i.e., the number of participants plus the number of eligible nonparticipants).

National Survey of Early Care and Education

A national study of CACFP could draw on information gathered and lessons learned from the NSECE, a study funded by the Office of Planning, Research and Evaluation (OPRE) in ACF. The goal of NSECE is to document the national supply of nonparental care and the needs, constraints, and preferences of families as they seek and use nonparental care for their children. Datta described it as an "enormous data collection effort." Data are being collected on (1) center-based providers (Head Start, school- and

[5]This section summarizes the presentation of Rupa Datta from NORC at the University of Chicago.

community-based prekindergarten programs, and other community-based centers); (2) home-based providers from state lists; (3) workforce members (home-based providers or center-based staff who are working directly with children); (4) households with children under the age of 13 years; and (5) informal home-based providers (providers not on any state list). Datta remarked that the proportion of informal home-based providers that are not on any list varies by state, with some states having virtually no nonlicensed care.

The greatest challenge for the NSECE has been in constructing a database of existing child care. Datta said that, prior to the study, "Nobody really even knew beyond an order of magnitude how many centers there might be in this country." The researchers collected child care provider lists from every state and every state department with such lists (usually licensing agencies, but also education and other departments). They used information on the lists to construct a universe of "listable" providers, identified the exact location of those providers, and segmented providers into low-income versus non-low-income areas. Then they selected a set of respondents for interviewing. At the time of the workshop, the survey had sampled 22,000 providers, including both center-based and licensed home-based (i.e., excluding informal home-based providers who were sampled from another source). Even with that number, Datta said that they expect to generate information about infant care only at the national level because of sample size problems. She cautioned that a nationally representative study of CACFP might come up against the same challenge, especially for the 0- to 5-month and 6- to 11-month age groups.

The NSECE captures CACFP participation only in combination with other government programs, so there is no single measure of CACFP participation (although CACFP participation is the largest factor in an "other" category). Still, Datta opined that the NSECE could generate valuable information for a national study. Notably, providers can be matched with child enrollment numbers to generate estimates of the children that are being reached through CACFP. Providers can also be matched with income level of location and household data on usage of care. Together, the provider and household data could be used to identify potential participants and whether those children are within or outside the reach of CACFP.

In conclusion, Datta suggested that a national study of CACFP do something similar to what the NSECE did with respect to linking provider location data with demographic data (e.g., census data) as well as with food availability and other relevant data. She also suggested exploring child care usage data from some of the ongoing national household studies such as the Survey of Income and Program Participation (SIPP), conducted by the Census Bureau, and the National Household Education Surveys, conducted by the National Center for Education Statistics.

USING DATA COLLECTED BY THE ADMINISTRATION FOR CHILDREN AND FAMILIES TO INFORM CACFP PARTICIPATION AND SATURATION RATES[6]

ACF, in the Department of Health and Human Services, manages two early childhood programs that overlap with CACFP: Head Start (and Early Head Start) and the Child Care Subsidy Program. Head Start provides grants to local public and private for-profit and nonprofit agencies and provides comprehensive child development services to economically disadvantaged children and families. Unlike Head Start, the Child Care Subsidy Program, also known as CCDF, does not directly make child care available. Rather, it provides subsidies to help low-income families afford child care while the parents are working or engaged in work-related activities. An important characteristic of CCDF is its emphasis on parents being permitted to choose their own type of child care providers (e.g., center-based care, family day care home). Susan Jekielek explored administrative and other data available for each program and their potential relevance to a national study of child care. While neither Head Start nor CCDF collect CACFP-specific data, both programs collect data that might be informative.

Also of potential value to a national study, the ACF Office of Child Care will soon be collecting quality of care and other data on providers (e.g., asking providers whether they participate in their state's QRIS). Finally, other possible sources of relevant data include the ACF Children's Bureau (which serves adoption and foster care), the ACF Family and Youth Services Bureau (which serves runaway and homeless youth), and QRIS.

Relevant Data from Head Start

Even though Head Start grantees are encouraged to use the CACFP program, there is no systematic collection of data on CACFP participation among those grantees. Most Head Start data are administrative Program Information Report (PIR) data, which are collected from the grantees annually. Data include the number of children enrolled (in 2009, 904,153 children, with approximately 44,000 enrolled in family-based programs), some age categories (in 2009, the number of children under 3, the number of 3-year-olds, the number of 4-year-olds, and the number of children 5 years and older), the number of grantees (in 2009, 1,591 grantees), and the number of classrooms (in 2009, 49,200 classrooms). Jekielek pointed out that nutritional intake and other dietary data are difficult to collect at the grantee level and that PIR data are extensive enough without those types

[6]This section summarizes the presentation of Susan Jekielek from the OPRE in ACF.

of additional questions (although grantees are asked about Supplemental Nutrition Program for Women, Infants, and Children participation).

Head Start has other, nonadministrative data that may be of interest. Jekielek mentioned two datasets in particular. First, the Family and Child Experiences Survey is a nationally representative survey of grantees (n = 60). Data have been collected on multiple cohorts, with each cohort being followed for 3 years. The survey includes questions about family dietary practices, but not classroom dietary practices. Some of those data may be of interest. Jekielek noted that the survey was undergoing a redesign and engaging an expert panel to provide advice. Second, Head Start has engaged ACF in a representative study of Head Start health managers that will involve interviewing health managers at the grantee and lower levels.

The Child Care Subsidy Program

The Child Care Subsidy Program, again also known as CCDF, does not collect CACFP participation data. However, as with Head Start, they do collect some information that may be of interest. For example, they collect data on enrollment (in 2009, 1,629,300 children were enrolled); type of setting (in 2009, 63 percent of the children were enrolled in a center, 26 percent in a family home, 5 percent in a child's home, 5 percent in a group home, and 1 percent unreported); and licensing (in 2009, 78 percent of providers were licensed, 21 percent legal but unregulated). Jekielek noted that a large percentage of children receive care in settings that are difficult to track (e.g., an unregulated family home) and that many of those difficult-to-track settings probably overlap with CACFP. The states themselves may have more information about CCDF providers (e.g., whether they participate in CACFP), but those data are not available at the federal level.

DISCUSSION

During the question-and-answer period at the end of this session, the main topic of discussion was the challenge of defining and identifying comparison groups. Fred Glantz described the challenge as "the 800-pound gorilla that is sitting on the table." The believability of a study depends on the validity of the comparison group. The situation in New Mexico described above illustrates the challenge. An audience member urged CACFP researchers to look to the states for relevant state-level data on eligible nonparticipants. Many states have data that could be useful and which are not reported to USDA. The challenge, of course, is that state-level data look very different state to state. (A more in-depth discussion of the value of state-level data took place later during the workshop. A summary of that discussion is included in Chapter 5.)

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5

Moving Forward

The broad range of research areas laid out in the Child and Adult Care Food Program (CACFP) report (IOM, 2011), from program participation to program quality, calls for an equally broad range of methodologies for designing a nationally representative study to assess dietary intake and program participation in child day care. As elaborated throughout this summary, many lessons have been learned from past experience about what data to collect and how to collect and interpret those data. Still, there are many unanswered questions about how to move forward. For example, what kind of baseline data should be collected, before CACFP meal pattern recommendations are implemented? How should the broad range of research areas be prioritized? Which data are the most important to collect as part of an ongoing program evaluation of CACFP? What are the values of a longitudinal survey versus a set of cross-sectional surveys? How can state-level data be used? Given that there is no single child care system, rather a variety of types of child care systems (e.g., center versus home-based settings), will researchers need to employ different methodologies for those different settings? Finally, are there any additional research areas not covered during the workshop that should be included in a nationally representative study? These questions were explored further in the final session of the workshop, an open discussion among all participants moderated by Suzanne Murphy (see Box 5-1 for the actual list of questions that was used to guide the discussion). This chapter summarizes that discussion.

Some questions were prepared by committee members of the CACFP study (IOM, 2011) and some by the U.S. Department of Agriculture (USDA) Food and Nutrition Service (FNS). As previously explained, the legislative

BOX 5-1
Questions Addressed During the Closing Open Discussion

1. What baseline measures are particularly needed to track the impact of change to CACFP, such as those that were recommended in the recent Institute of Medicine report?
2. Since funding will be unavailable to do all of the proposed research at one time, what is a reasonable ordered approach for assessing these topics? Prioritize the research needs, including the importance of data collection at the individual (child) level, the provider level, and the state or national level.
3. What are the best survey designs to gather nationally representative data, and to allow an evaluation of trends?
4. Are data collected by states able to be used to compile nationally representative data, replacing the need to conduct a survey? What types?
5. Are there different evaluation measures that should be considered for CACFP family day care homes versus child care centers?
6. Are there measures that have not been discussed today that should be considered in evaluating CACFP (other than physical activity measures)?

language in the Healthy, Hunger-Free Kids Act of 2010 very closely aligns with some of the research recommendations laid out in the CACFP report. The act authorizes funding for a study of the nutrition and wellness quality in all child care settings, including but not limited to CACFP programs, and provides USDA with $5 million for conducting such research. According to Jay Hirschman, USDA will give precedence to research proposals that address items in the act on which FNS must report back to Congress. It is discretionary as to how far and in depth they will delve into each of the areas mandated by the legislation and how far and in depth they will go into other areas not explicitly included in the legislative directive.

PUBLIC COMMENTS

Before the open discussion began, Jennifer Weber of Nemours, a foundation that operates a children's health system, offered some public comments based on the population-based prevention component of their mission. (As part of its prevention mission, Nemours worked with CACFP

in Delaware to adopt new state best practice standards and policies.) First, maintaining and investing in regular assessments of the population is important so that population-level changes can be monitored. In the case of CACFP, ongoing assessment will be critical to evaluating the role that CACFP participation plays in children's dietary intake. According to Weber, Nemours encourages the collection of baseline data before the recommended CACFP meal standards are implemented. Second, certainly there is a need for data on the food and nutrient content of meals and snacks served in CACFP homes and centers, as well as participants' overall food and nutrient intakes and their alignment with current dietary guidance. In addition, Nemours also encourages the collection of information on provider characteristics and other factors that might influence the impact of CACFP on children's nutritional well-being. As examples, Weber listed caregivers' knowledge, awareness, attitudes, beliefs about changes to the nutrition standards, and beliefs about nutrition standards overall. Third, Nemours encourages the collection of data that can assess systems-level changes (i.e., policy, program, and practice changes) that, in turn, could lead to changes in population health outcomes. As examples of this type of data, Weber listed the number of child care providers who implement new standards and the speed at which they do so.

QUESTION 1

What baseline measures are particularly needed to track the impact of change to CACFP, such as those that were recommended in the recent Institute of Medicine (IOM) report?

The CACFP report (IOM, 2011) recommended substantial changes to CACFP meal requirements in an effort to bring the requirements into alignment with the best available dietary guidance and to improve consistency with the requirements of other USDA food assistance programs. The report also recommended steps for ongoing evaluation and periodic reassessment to determine the impact of the meal requirement changes on participants' nutritional well-being. As part of that process, the report recommended that "USDA should take appropriate actions to establish the current baselines prior to implementation of the new Meal Requirements for comparison purposes" (Program Evaluation Recommendation 2, IOM, 2011). Thus, the question was raised: Which of the measures discussed throughout the course of the workshop would be especially informative to collect before the meal requirement changes are implemented?

General Observations

Participants made some general observations and suggestions for moving forward on gathering baseline information. One participant suggested that one way to "organize thoughts about these issues" is, first, to categorize the issues as pertaining to either provider characteristics, provider measures (i.e., what providers are offering to the children), children's experiences (i.e., what the children actually eat), or parents' expectations, and then to decide the minimum amount of data needed for each category in order to assess the impact of the meal requirement changes. Following discussion, others seemed to be of the same mind on the need for provider data (both provider characteristics and measures) and children's experience data (i.e., what children are actually eating) in particular, not just at baseline but also as part of any ongoing assessment of CACFP. Another participant added that another category of data to consider is that at the state level (e.g., data from state agencies involved with CACFP), especially with respect to the cost of the changes (e.g., how many additional staff and resources are redirected toward CACFP activities).

Gina Adams touched on what emerged as a major overarching theme of the workshop discussion: the importance of keeping the end in mind and collecting data based on desired outcomes. According to Adams, researchers have conducted good qualitative work in the past on many relevant issues. Adams reminded the workshop audience of this work and suggested studying it to get a better sense of the types of effects to expect (i.e., after the changes are implemented) and the type of data to collect in anticipation of those effects.

Measuring Cost

Fred Glantz emphasized that, at a minimum, baseline data should be collected on foods being served to children. Next would be data on what children are actually eating and whether consumption is in care or outside of care. Next would be data on cost and participation. On cost, he said, "Providers have long argued that it costs more to serve high-quality meals. There is no information on that one way or the other. And if costs go up, and if a school district or child care provider has to raise rates, what does that do to participation?" Glantz's remarks led to a more in-depth discussion of cost (not just to the provider but also to the family and the state) and how to measure the cost of implementing the recommended changes, with several participants suggesting that cost is an important measure to track over time but that it is not an easy measure to track.

Suzanne Murphy identified fluctuating food prices as one challenge to measuring cost. Throughout any evaluation, food prices would need

to be adjusted back to baseline. An unidentified audience member mentioned aggregated data as another challenge. When new nutrition standards went into effect in Delaware, aggregated state-level data from participating providers indicated that overall cost went up. However, even then, the estimate was based on "rough numbers" from the providers, with no child-level data available. Yet another challenge is "hidden" costs, such as donated space and services. Glantz mentioned that the National Day Care study conducted in the mid-1970s found that donated services and, more importantly, donated space and how that space was valued were huge issues. Many church-based centers used their basements and therefore had far more space available for child care services. How does one value that space? If the centers had to purchase the donated space, how much would it cost? The same is true of donated labor. How does one value it? Another audience member remarked that donated labor will be particularly important to track when the CACFP meal requirement changes go into effect, given that implementing the recommended changes will probably require additional labor.

The recommended CACFP meal requirement changes are expected to impact not just the cost to providers but also the cost to states in the form of training and other activities that will need to be implemented in order to oversee the requested changes. One audience member urged, therefore, that baseline data also be collected on all costs.

With respect to existing methodologies for measuring cost, Murphy referred to the Monsivais and Johnson (2012) study, which Lorrene Ritchie mentioned during her presentation, where investigators calculated food expenditures by matching food receipts with menus. Murphy asked, is it possible to do what Monsivais and Johnson (2012) did on a national level? Are there other methods? Monica Rohacek mentioned that the Study of Cost, Quality and Child Outcomes in Child Care Centers, a cost-quality child outcome study from the mid-1990s, collected and compiled cost data (Helburn, 1995).

QUESTION 2

Since funding will be unavailable to do all of the proposed research at one time, what is a reasonable ordered approach for assessing these topics? Prioritize the research needs, including the importance of data collection at the individual (child) level, the provider level, and the state or national level.

During its deliberations, the expert committee that prepared the CACFP report identified several significant gaps in knowledge about CACFP (IOM, 2011). Thus, they recommended steps for targeted research along with an assessment of the impact of the recommended meal requirement changes.

Together, the research and evaluation recommendations make for a very ambitious agenda. Yet, the Healthy, Hunger-Free Kids Act of 2010 authorizes only $5 million for FNS-supported research on child care. This raises the question: How should the very ambitious research agenda laid out in the CACFP report and explored in detail during this workshop be prioritized?

Suzanne Murphy questioned whether data should be collected only during day care (the "provider day") or throughout the day ("full day"). Her interpretation of the legislative language is that the Healthy, Hunger-Free Kids Act of 2010 calls for an evaluation of the quality of foods being served, possibly consumed, during the provider day. However, the CACFP report is more expansive in its scope (IOM, 2011). According to Murphy, one of the greater goals of the recommended changes in the report is to create a healthier food environment during the provider day that would carry over into the full day. That is, children would become accustomed to eating fruits, vegetables, and whole grains and would continue to eat those foods after leaving child care. She said, "I would be sad not to see that somehow measured." But with respect to using the $5 million in research funds being provided by Congress as part of the Healthy, Hunger-Free Kids Act of 2010, Murphy said that collecting data on the full day is "probably not the top priority."

Others concurred that gathering child-level data on foods served and/or consumed both in and outside of care would be ideal but that $5 million will not cover such an ambitious research agenda. Lynne Oudekerk remarked that, from a state agency perspective, while it would be interesting to know whether and how the changes impact what happens outside of CACFP, it will be much more important to know whether and how the changes impact the food environment inside CACFP. Are the changes making a difference in what is served in CACFP? She asked, "Are we creating a positive food environment so that those 3.4 million children, and the few adults as well, are actually being exposed to healthier foods?" Another audience member predicted that it would be too challenging to correlate changes in CACFP meal requirements with such a distal outcome (i.e., creation of a healthier eating environment for the full day) and agreed that a better use of funds would be to focus on more proximal outcomes (e.g., creation of healthier eating environment during the provider day).

Yet another decision that needs to be made is whether data are to be collected on foods served, foods consumed, or both. Workshop participants expressed varying opinions. Oudekerk remarked that while it would be interesting to know what is consumed, the more relevant data from a state agency perspective would be foods served. Beth Dixon agreed that assessing what is served is an important component of evaluating the impact of the proposed changes on CACFP itself, but asserted that consumption data

are critical if the goal is to assess not just the health of the program but also the health of the children in that program. Based on a study of 110 child care centers in New York City, she and colleagues have shown that children eat only about two-thirds of what is served to them, and even less than two-thirds of the "difficult foods" (i.e., whole grains and vegetables). Dixon noted that, from a cost perspective, even an expensive method like direct observation could be used at marginal cost to collect additional consumption data if observers are already in the setting collecting data on foods served.

While most of the discussion was focused on measuring foods either served or consumed by children already participating in CACFP, Gina Adams reflected on the value of also measuring participation in CACFP itself. If the ultimate public health goal is to improve the overall nutrition of low-income children, then participation matters.

Regardless of the type of data collected (e.g., provider day versus full day, foods served versus foods consumed, and participation), Fred Glantz suggested that one of the first decisions to be made is whether the research will be a descriptive study of CACFP programs or a comparative study between CACFP and eligible but nonparticipating child care programs.

QUESTION 3

What are the best study designs to gather nationally representative data, and to allow an evaluation of trends?

The Healthy, Hunger-Free Kids Act of 2010 calls for a "nationally representative study of child care centers and family or group day care homes." But what type of study? Can researchers use multiple cross-sectional surveys to measure trends, or can (should) they track the same set of children over time via one large longitudinal study?

Fred Glantz remarked that it was not clear how one could track the same set of children over time, given that children eat differently as they age. He suggested multiple cross-sectional studies across similar age distributions. Rupa Datta agreed that a longitudinal methodology would not be helpful for evaluating child-level changes but might be helpful for assessing provider-level changes. For example, which providers are implementing the new standards? How quickly are they implementing them? How many providers leave or enter the program after changes are put into place?

In addition to discussing the advantages and disadvantages of a longitudinal versus cross-sectional survey design, participants also discussed the practicality of nationally representative data. With respect to provider-level data, Datta wondered if a nationally representative sample would be too limiting. Specifically, she questioned whether there might be a way to focus

on providers that serve low-income children (or providers located in low-income areas) rather than on providers that serve the general population at large. Not using a nationally representative sample of the entire general population would, in her words, "really free up money" for collecting data on segments of the population that would be more "analytically useful." When asked to clarify what she meant by "analytically useful," Datta explained that National Survey of Early Childhood Care and Education (NSECE) is much more interested in children from low-income households than children from households at other income levels. Yet, when conducting their nationally representative study, they are collecting data on about two and a half times as many non-low-income children as low-income children. The money spent on data collection among so many non-low-income children prohibits doing additional analyses on low-income children (e.g., examining differences between rural and urban populations, between two household earners and households with only one earner, or between blacks and Latinos). When Jay Hirschman expressed concern that CACFP is an entitlement program for any child in the United States who participates in a CACFP site and that the ultimate goal is to improve the diets of children in general, Datta replied that sampling from a nationally representative pool will present a challenge to getting enough CACFP providers and participants for a meaningful analysis.

QUESTION 4

Are data collected by states able to be used to compile nationally representative data, replacing the need to conduct a survey? What types?

A recurrent theme throughout the day was the availability of state-level data on CACFP. For example, during the second session on barriers and facilitators to providing meals and snacks that align with current dietary guidelines, it was suggested that some of the states currently implementing new nutrition guidelines are also collecting preliminary data on barriers and facilitators that could help frame questions for a nationwide study. The idea that state-level data could inform a nationally representative study of CACFP was revisited here. Lynne Oudekerk suggested that USDA query states to find out what data are being collected and what analyses have been conducted. She noted that state agencies accumulate a great deal of unpublished data, some of which might be of merit. As one example, New York has been collecting breast-feeding data that might be helpful when developing survey questions aimed at evaluating CACFP practices around breast feeding. But could state-level data be used to do more than help guide design of a national study? Could they actually replace nationally representative data?

Those who spoke expressed a similar view that state data cannot replace nationally representative data. However, state data could supplement national data. Joanne Guthrie commented that state-level CACFP data might enable in-depth investigations not possible with national data because of the way data are aggregated after they are submitted to USDA (e.g., rural versus urban trends). Another audience member suggested leveraging non-CACFP state databases. For example, there might be opportunities to link CACFP data with Supplemental Nutrition Program for Women, Infants, and Children (WIC) data. Virginia Stallings wondered whether any states collect data on service delivery or good business practices. Oudekerk replied that yes, some states collect those types of data. For example, New York researchers are collecting data that will help them address reimbursement bottlenecks (e.g., payment processing). She said that different states are probably approaching the research in different ways.

Several participants commented on the fact that, regardless of the type of data, a key challenge with state data is that each state collects, stores, and analyzes data differently. Guthrie said, accessing state data is "not as easy as it sounds." This is especially true of data on eligible nonparticipants. Glantz remarked that, while state-level data may be obtainable on CACFP participants, data on nonparticipants is not.

Finally, Oudekerk wondered whether a nationally representative study of CACFP would prompt USDA to collect more raw data from states in the future. She opined that, with advances in information technology, there is no reason for states to continue aggregating data before submission.

QUESTION 5

Are there different evaluation measures that should be considered for CACFP family day care homes versus child care centers?

As Virginia Stallings pointed out in her keynote address, a major challenge to gathering and analyzing CACFP data is variation in setting (e.g., child care center versus family day care home). Variation in setting raises the question: Do different settings require different evaluation measures? Several participants voiced a similar opinion that different settings do require different evaluation measures. The goal should be the same (e.g., assessing the impact of the meal requirement changes), but reaching that goal requires different strategies in different settings.

With some issues, variation in setting requires asking different types of questions. For example, one workshop participant commented that the cost (and labor) associated with purchasing meals from a third-party source, which is often how Head Start and other child care centers get their meals, is "more straightforward" than the cost (and labor) of making meals in

house, which is what family day homes typically do. Understanding the latter requires asking different questions. As another example, with respect to participation trends, Monica Rohacek pointed out that different factors affect both the desire to participate and the nature of participation. For example, family day care homes and child care centers may have different training mechanisms or administrative structures that impact participation. Those "different contextual factors" need to be accounted for in a questionnaire.

Gina Adams observed that the respondent pool is different in the different settings and that the questions need to be "oriented" accordingly. For example, a child care center may have one person responsible for money, another person responsible for nutrition, and so on, whereas in a family day care home usually only one person (i.e., the provider) is responsible for everything.

In addition to asking different types of questions, many questions need to be worded differently. One audience member commented on the greater difficulty associated with gathering information from family day care homes operated by non-English-speaking providers with low English literacy skills. The provider may understand "play," but not "active play" or "structured play." During development of a California statewide survey, Lorrene Ritchie and colleagues hired a child care consultant to reword some of the questions so that their survey tool, which had been developed for use in child care centers, could be used in family day care homes. The redesigned questionnaire was much longer than the original because it included more definitions and examples. The investigators piloted the survey in day care homes to make sure that it had been reworded appropriately.

Finally, Angela Odoms-Young pointed out that with some measures, such as barriers and facilitators to implementation, there have not even been enough data collected yet to know whether measures used to assess barriers to implementation in one setting are relevant to another setting. She encouraged more in-depth case studies of family day care homes, perhaps using state-level data, as a way to gather some of those data.

Variation in setting calls not only for different types of survey tools, but also for different comparison groups. One workshop participant opined that the comparison group for use in a survey of child care centers (i.e., eligible but nonparticipating child care centers) would be different than a comparison group for use in a survey of family day care homes (i.e., eligible but nonparticipating family day care homes). The latter would probably contain more unlicensed providers, creating more challenges. Lorrene Ritchie cautioned that, with both settings, the comparison group will probably need to be oversampled. Her experience has shown that response rates are very similar for CACFP child care centers and family day care

homes and that the lowest response rates were among nonparticipating centers and homes.

QUESTION 6

Are there measures that have not been discussed today that should be considered in evaluating CACFP (other than physical activity measures)?

Participants listed four additional measures: (1) food environment, such as the physical structure of the kitchen (e.g., What is in the kitchen? What is the water availability?), staff behavior (e.g., Are the staff eating with the children? Are they encouraging vegetables?), and the appropriateness of the facilities for children (e.g., Are the table and utensils appropriate sizes for children?); (2) purchasing of food (e.g., Are providers buying prepared food? Where are they shopping?); (3) Cost to sponsors and states (i.e., What is the cost of implementing the recommended meal requirement changes?); and (4) providers' experiences with implementation (e.g., How much paperwork is required? What other "burdens" does implementation impose?).

FINAL REMARKS

This 1-day workshop was a continuation of the review of the CACFP meal requirements carried out by an IOM expert committee, which released the consensus report *Child and Adult Care Food Program: Aligning Dietary Guidance for All* in October 2010 (IOM, 2011). The workshop agenda was based on the research recommendations in that report. Specifically, workshop participants addressed how to assess (1) the alignment of young children's dietary intake with current dietary guidance, (2) barriers and facilitators to providing foods that align with dietary guidance, and (3) program access and participation trends. Workshop participants covered a very broad range of topics within each of these categories. Drawing on lessons learned from past research experience, participants explored both what types of data to collect and how to collect those data.

Overarching Themes of the Workshop Discussion

Workshop participants revisited several major, cross-cutting themes over the course of the day's various discussions:

- *Gaps in knowledge.* As Virginia Stallings made clear in her keynote address and as elaborated in the CACFP report (IOM 2011), there is a considerable lack of up-to-date data on food and nutrient

intake among children attending CACFP sites, how intake from foods and meals served in CACFP settings contributes to overall dietary intake, and how both in-care and overall dietary intakes align with current dietary guidance. As Lorrene Ritchie remarked, even less is known about the barriers and facilitators to providing meals and snacks that align with current dietary guidance. Equally important are gaps in knowledge about participation in CACFP and incentives (and disincentives) for providers to become involved in the program (e.g., the cost of participation). Indeed, a major reason for holding this workshop was to explore these many gaps in knowledge and identify which gaps need to be filled first.

- *The need to be very clear about the key research question(s) being asked and the type of answer(s) being sought.* Regardless of whether the issue is dietary intake, barriers and facilitators to providing healthy foods, or program participation, Beth Dixon, along with speakers from all three sessions, emphasized clearly that identifying the question(s) being asked and the desired outcome(s) is key to adapting existing methodologies for use in studying CACFP. For example, with respect to dietary intake, is the goal to assess whether the implemented changes are having the desired effect (i.e., aligning foods served with current dietary guidance)? Or, is the goal to examine the contribution of CACFP meals and snacks to overall nutrient intake? Or, is the goal to compare nutrient intake among CACFP participants versus non-CACFP participants? Different questions require different types of data and different methodologies for collecting and analyzing those data. As Sara Benjamin Neelon and others explained, while direct observation may be the preferred method for collecting data during child care (because it provides the most specific and accurate information), the 24-hour dietary recall is widely considered the "gold standard" for collecting data outside of child care.
- *Existing methodologies used in past studies may be relevant, although the methodologies need to be adapted for CACFP setting(s).* Again, all speakers in all three sessions touched on this major theme. For example, Mary Kay Fox discussed the potential relevancy of dietary intake methodologies used in two previous large national studies, the School Nutrition Dietary Assessment and Feeding Infants and Toddlers Studies. The tools employed in both of those studies could be used in a study of CACFP, but they would need to be "translated." Dianne Ward explored methodologies described in various published studies for assessing foods served in child care settings. She concluded that there is no single best methodology and suggested that protocols be tested before wide-scale

implementation. In their exploration of factors that shape provider participation, Gina Adams and Monica Rohacek drew on lessons learned by Urban Institute researchers about what kind of data to collect and how to collect it (e.g., the value of qualitative versus quantitative experimental designs). As a final example, Rupa Datta considered how methodologies employed in the NSECE might be useful in a nationally representative study of CACFP.

- *There is no single child care system.* As Jay Hirschman pointed out, CACFP serves various types of child care centers and family day care homes. Stallings identified variation in setting as a major challenge to collecting and analyzing CACFP data. Differences between child care centers and family day care homes, not to mention differences between licensed and unlicensed family day care homes, cut across the three main areas of research addressed by the workshop (i.e., food and nutrient intake, barriers and facilitators to providing healthy meals and snacks, program access and participation trends). Based on the discussion that took place in response to Question 5 (see previous section), the differences impact not just the type of questions that need to be asked, but also how those questions are asked and of whom they are asked. Angela Odoms-Young remarked that with some issues, for example, barriers and facilitators to implementing programmatic change, there is such a lack of data for family day care homes in particular that it is not clear whether and how the questions need to be adjusted for the different settings. She encouraged more in-depth studies of family day care homes.
- *Existing databases are a "gold mine" of information.* Workshop participants laid out what amounts to a very ambitious research agenda. Rupa Datta suggested that one way to tackle the agenda is to exploit as much as possible existing administrative and household data before deciding what type of original data to collect. For example, Fred Glantz elaborated on the wealth of administrative CACFP data that is collected at the provider level but becomes inaccessible to researchers because of the way those data are aggregated after providers send in their monthly reimbursement claim forms. If those data could be accessed, they would be very informative. As another example, Susan Jekielek discussed the potential relevance of other early childhood program administrative data collected by the Administration for Children and Families (e.g., Head Start and Child Care Subsidy Program data). Plus, there were many calls throughout the workshop for a greater consideration of state data (e.g., see Question 4 above). State data cannot replace nationally representative data, but they might inform design of a

nationally representative survey (e.g., how to frame questions) and could supplement such a survey.

Next Steps for the FNS: How Can We Do a Better Job Feeding Our Nation's Children?

USDA will be issuing a Request for Proposals (RFP) in order to carry out the research commissioned by the Healthy, Hunger-Free Kids Act of 2010. The agency will use the information presented during this workshop to guide its development of the RFP and decision making about which questions to address first and which methodologies might be helpful for addressing those questions.

Hirschman encouraged workshop participants and other experts in the field to become involved, if not by way of proposal submission then perhaps by helping contractors prepare their proposals, serving on an advisory panel to the contractor (FNS studies have advisory panels that provide advice to the researchers throughout the course of the study), or serving as a reviewer of interim deliverables (e.g., reviewing survey questionnaires before they are distributed). Improving child nutrition, while also combating overweight and obesity, poor nutritional habits, and the high levels of food insecurity and hunger in America, is, in Hirschman's words, "something that we all have to work on."

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Helburn, S. W. 1995. *Cost, quality and child outcomes in child care centers*. Denver: University of Colorado.

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A

Workshop Agenda

REVIEW OF THE CHILD AND ADULT CARE FOOD PROGRAM: FUTURE RESEARCH NEEDS

February 7, 2012
20F Street Conference Center
20 F Street, NW, Washington, DC 20001

WORKSHOP PURPOSE

To explore methodologies to design a nationally representative survey assessing children's dietary intake data and participation rates related to the Child and Adult Care Food Program.

8:00 am	**Registration**
	INTRODUCTION AND KEYNOTE
8:30 – 8:35	**Welcome, Introductions, and Purpose** *Suzanne Murphy* *Workshop Moderator and Planning Committee Chair* *University of Hawaii*
8:35 – 8:45	**Introductory Remarks: The Importance of Data in Setting Policy** *Jay Hirschman, Office of Research and Analysis* *USDA Food and Nutrition Service*
8:45 – 9:05	**Keynote Address** **Data Needs for the Child and Adult Care Food Program** *Virginia A. Stallings, Children's Hospital of Philadelphia*

SESSION 1

9:05 – 9:10 am	**Alignment of Young Children's Dietary Intake with Current Dietary Guidance** *Karen Weber Cullen, Baylor College of Medicine, Moderator*
9:10 – 9:30	**Adapting Methodology from SNDA and FITS Studies to CACFP** *Mary Kay Fox, Mathematica Policy Research*
9:30 – 9:45	**Food and Nutrient Content of Meals and Snacks Offered at Child Care Providers** *Dianne Ward, University of North Carolina*
9:45 – 10:00	**Dietary Assessment in Young Children: Total Daily Intake of Food and Nutrients** *Sara Benjamin Neelon, Duke University*
10:00 – 10:15	**Analysis of Dietary Data Collected from Child Care Settings** *Beth Dixon, New York University*
10:15 – 10:30	Break
10:30 – 10:50	Panel Discussion: Session 1

SESSION 2

10:50 – 10:55	**Barriers and Facilitators to Providing Meals and Snacks That Align with the Current Dietary Guidance** *Lynne Oudekerk, New York State Department of Health (Retired), Moderator*
10:55 – 11:10	**Evaluating Barriers and Facilitators to Change in Child Care Centers** *Lorrene Ritchie, University of California, Berkeley*
11:10 – 11:25	**Evaluating Barriers and Facilitators to Making Healthy Food Choices in the Home Environment** *Angela Odoms-Young, University of Illinois, Chicago*

11:25 – 11:45 Panel Discussion: Session 2

11:45 – 1:00 pm Lunch

SESSION 3

1:00 – 1:05 pm **Evaluating Program Access and Participation Trends**
Ann Yaktine, Institute of Medicine, Moderator

1:05 – 1:20 **Understanding and Using CACFP Administrative Data**
Frederic Glantz, Kokopelli Associates

1:20 – 1:40 **Lessons Learned: Factors Shaping Provider Participation and Methodological Considerations**
Gina Adams and Monica Rohacek, Urban Institute

1:40 – 1:55 **Designing a Nationally Representative Survey of Providers for Estimation of Key CACFP Rates**
Rupa Datta, NORC at the University of Chicago

1:55 – 2:10 **Using Data Collected by the Administration for Children and Families to Inform CACFP Participation and Saturation Rates**
Susan M. Jekielek, Administration for Children and Families, Department of Health and Human Services

2:10 – 2:30 **Panel Discussion: Session 3**

2:30 – 2:45 **Break**

CLOSING SESSION

2:45 – 3:15 pm **Public Comments**

3:15 – 4:15 **Open Discussion to Address Questions Posed by the Food and Nutrition Service**
Suzanne Murphy, Moderator

4:15 – 4:30 **Closing Remarks and Adjourn**
Suzanne Murphy

B

Biographical Sketches of Moderators and Speakers

GINA ADAMS, M.A., is a Senior Fellow at the Urban Institute focusing on policies and programs affecting the affordability, quality, and supply of child care and early care and education, and the ability of low-income and at-risk families to use these services. Her interests include efforts to integrate work benefit systems with the Child Care and Development Fund, child care and family stability patterns, contextual factors affecting the quality of child care providers, barriers to prekindergarten for non-Latino-immigrant and English-language-learner families, child care providers and the subsidy system, policies to support access to and retention of subsidies for low-income families, and Temporary Assistance for Needy Families–child care interconnections. She has worked on numerous other projects, including the National Head Start Impact Study, an evaluation of the Enhanced Home Visiting Project of Early Head Start, and analyses of child care data from the National Survey of America's Families. Earlier positions include Assistant Director of the Child Care and Development Division at the Children's Defense Fund, policy analyst at the Congressional Budget Office, and working directly with low-income children and families. She has an M.A. in public policy from Duke University.

SARA BENJAMIN NEELON, Ph.D., M.P.H., R.D., is an Assistant Professor in the Department of Community and Family Medicine at Duke University Medical Center, with secondary appointments in Global Health and Pediatrics. She is also a Faculty Fellow in the Center for Child and Family Policy at Duke University and a Senior Visiting Fellow at the Centre for

Diet and Activity Research at the University of Cambridge in England. Her research interests include nutrition and physical activity as they relate to obesity prevention in young children. Her current research focuses on environmental- and policy-based approaches to obesity prevention in a number of settings where young children spend time. In addition to a number of domestic studies, she is engaged in observational and intervention research on childhood obesity in Mexico and England. She is also in the process of developing a fruit- and vegetable-garden-based intervention study in Kenya. She completed her doctoral degree at the University of North Carolina at Chapel Hill and postdoctoral training at Harvard Medical School.

A. RUPA DATTA, Ph.D., is a Vice President and Senior Fellow at NORC at the University of Chicago. For nearly 20 years, Datta has held leadership roles on a wide variety of projects, such as the National Survey of Early Care and Education (NSECE), the Census Integrated Communications Program Evaluation, the Qatar National Education Data Systems project, and the National Longitudinal Survey of Youth 1997 (NLSY97) cohort. Datta is currently Project Director for the NSECE, a multimode survey that employs both address-based sampling and a sampling frame built from administrative data; earlier, she served as Project Director for its design phase. The NSECE samples 100,000 households and 30,000 providers of various types for five different questionnaire and sample types. Datta has also served as Deputy Project Director on the 2010 Census Integrated Communications Program Evaluation, the official federal evaluation of the communication and partnership efforts to improve cooperation with the 2010 Decennial Census. Datta's longest-running contribution to human capital research is through the NLSY97 cohort, a 9,000-person annual survey of school-to-work transition sponsored by the Bureau of Labor Statistics, U.S. Department of Labor. Since 1999, she has served as Project Director, Acting Principal Investigator, and Co-Principal Investigator of NLSY97.

BETH DIXON, Ph.D., M.P.H., is an Associate Professor of Public Health Nutrition in the Department of Nutrition, Food Studies and Public Health at New York University (NYU). As a nutritional epidemiologist, Dr. Dixon studies the dietary patterns and health of different populations, including children and immigrants. Her research studies involve the use of quantitative methods to assess diet in relation to chronic diseases like cardiovascular disease, cancer, and osteoporosis. She also evaluates health and nutrition policy, especially to improve maternal and child nutrition. She completed two Robert Wood Johnson Foundation grants to evaluate the nutrition and physical activity policies of New York City (NYC) child care centers in an effort to reduce obesity and improve the lifestyles of young children and is currently working with the Centers for Disease Control and Prevention

(CDC), NYC Department of Health and Mental Hygiene, and ICF Macro to conduct a similar evaluation in a larger sample of centers. She is also working with colleagues to evaluate the NYC calorie-labeling policy in fast food restaurants, tax incentives for introducing supermarkets in high-need areas, and school food policies in relation to child obesity, and is part of the CDC-funded Nutrition and Obesity Prevention Policy Research and Evaluation Network. At NYU, Dr. Dixon directs the MPH public health nutrition concentration. At the national level, she is a past chair of the Food and Nutrition Section of American Public Health Association and a past chair of the Association of Graduate Programs in Public Health Nutrition.

MARY KAY FOX, M.Ed., is Senior Fellow and area leader for nutrition policy research at Mathematica Policy Research, Inc. Ms. Fox has more than 25 years of research experience with child nutrition and food assistance programs. She has conducted research on the adequacy and quality of diets consumed by children from birth through adolescence, and has examined the contributions of school- and child care–based meal programs to children's dietary intakes and obesity risk. Ms. Fox led the nutrition components of two comprehensive national studies of the Child and Adult Care Food Program and served as a Co-Principal Investigator on the 2002 and 2008 Feeding Infants and Toddlers Studies. She also assessed the implementation of an obesity prevention initiative in Head Start centers, including assessments of the types and quality of foods offered and opportunities for physical activity. Currently, Ms. Fox is directing the fourth School Nutrition Dietary Assessment study. This study, which included a nationally representative sample of almost 900 schools, will provide a comprehensive picture of the nutritional quality of the meals offered and served in the nation's schools as well as schools' food and physical activity environments. Ms. Fox served on the Institute of Medicine Committee to Review Child and Adult Care Food Program Meal Requirements, as well as the Committee on Nutrition Standards for the National School Lunch and Breakfast Programs. Ms. Fox has a B.S. in nutrition and dietetics from Mundelein College of Loyola University and an M.Ed. in nutrition from Tufts University.

FREDERIC GLANTZ, Ph.D., is president of Kokopelli Associates LLC, a social policy research firm located in Santa Fe, New Mexico. Prior to forming his own firm in 2006, he was a Vice President and Principal Associate at Abt Associates. He has been involved in numerous child care studies dating back to the 1974–1979 National Day Care Study and the 1976–1980 National Family Day Care Home Study. He also directed the 1980 National Child Care Survey. Dr. Glantz directed the three National Studies of CACFP and participated in the Assessment of the Effects of Tiering on CACFP. He

is currently the Principal Investigator on the ongoing Program Assessment of CACFP Sponsor Tiering Determinations.

JAY HIRSCHMAN, M.P.H., C.N.S., has worked in public health nutrition at the local, state, and federal levels, including 25 years at the U.S. Department of Agriculture (USDA) Food and Nutrition Service. He served as a State Supplemental Nutrition Program for Women, Infants, and Children (WIC) Supervisor and as the first Director for the Nutrition Policy and Analysis Staff at the then–newly formed USDA Center for Nutrition Policy and Promotion. In his current position of Staff Director, he is responsible for managing the staff conducting the evaluation studies and policy analysis for all domestic Special Nutrition Programs, including WIC, the National School Lunch Program, the School Breakfast Program, CACFP and the other Child Nutrition Programs, and the Food Distribution Programs. Mr. Hirschman is an American College of Nutrition board-certified nutrition specialist and served as elected chair of the American Public Health Association Food and Nutrition Section (APHA/FN) in 2003–2004. In 2009 he received the APHA/FN Mary C. Egan award, which "goes to those public health nutritionists who pioneer fresh approaches to public health nutrition, nutrition education, and those groups with special dietary needs."

SUSAN JEKIELEK, Ph.D., is a Researcher in the Division of Child and Family Development of the Office of Planning, Research, and Evaluation in the Administration for Children and Families (ACF). In this role, Dr. Jekielek oversees numerous research grants examining child care issues in low-income families and develops funding priorities for research that can inform ACF programs. She collaborates across agencies on multiple projects, including the Interagency Forum for Child and Family Statistics America's Children report. In addition, she reviews survey measures, instruments, and research designs related to child care and other federal programs (e.g., the National Child Care Supply and Demand Study and the Supporting Healthy Marriage Intervention). Dr. Jekielek's own research addresses issues related to family structure and child development, indicators of child well-being, work-family issues, and the measurement of family processes and child well-being in large national data sets.

SUZANNE P. MURPHY, Ph.D., R.D., is Professor Emeritus at the Cancer Research Center of Hawaii at the University of Hawaii, Honolulu. Previously, Dr. Murphy was State Director of the California Expanded Food and Nutrition Education Program at the University of California, Davis. Dr. Murphy's research interests include dietary assessment methodology, development of food and supplement composition databases, and nutritional epidemiology of chronic diseases (with emphasis on cancer and obesity).

Dr. Murphy has served as a member of the National Nutrition Monitoring Advisory Council and the year 2000 Dietary Guidelines Advisory Committee. Currently, she serves on editorial boards for the *Journal of Food Composition and Analysis* and *Nutrition Today* and serves as contributing editor for *Nutrition Reviews*. Dr. Murphy has served on several IOM panels, including the Subcommittee on Interpretation and Uses of Dietary Reference Intakes (as chair, then member), the Subcommittee on Upper Safe Reference Levels of Nutrients (as member), and the Panel on Calcium and Related Nutrients (as member). She chaired the Committee to Review the WIC Food Packages and the Committee to Review Child and Adult Care Food Program Meal Requirements and is a former member of the Food and Nutrition Board. Dr. Murphy earned an M.S. in molecular biology from San Francisco State University and a Ph.D. in nutrition from the University of California, Berkeley.

ANGELA M. ODOMS-YOUNG, M.S., Ph.D., is an Assistant Professor in kinesiology and nutrition in the College of Applied Health Sciences at the University of Illinois at Chicago. Prior to her current position, she served on the faculty at Northern Illinois University in Public Health and Health Education. Dr. Odoms-Young's research is focused on understanding social, cultural, and environmental determinants of dietary behaviors and diet-related diseases in low-income and minority populations. Her current projects include studies to evaluate the impact of the new WIC food package on dietary intake, weight status, and chronic disease risk in 2- to 3-year-old low-income children; examine relationships between neighborhood food availability, eating behaviors, and weight status in Latino families; and understand the influence of marketing on food consumption in African American families. Dr. Odoms-Young completed a Family Research Consortium Postdoctoral Fellowship examining family processes in diverse populations at the Pennsylvania State University and University of Illinois at Urbana and a Community Health Scholars Fellowship in community-based participatory research at the University of Michigan School of Public Health. Dr. Odoms-Young earned a B.S. in food and nutrition from the University of Illinois-Urbana/Champaign and an M.S. and a Ph.D. from Cornell University in human nutrition and community nutrition, respectively.

LYNNE OUDEKERK, M.A., R.D., C.D.N., is recently retired as Acting Director of CACFP at the New York State Department of Health. Ms. Oudekerk served as Principal Investigator for USDA-funded Team Nutrition Training Grants that provide funding for innovative obesity prevention programming for youth attending child care centers and organized after-school programs. She also served as a member of the IOM Committee on Obesity Prevention Policies for Young Children. As part of her former

position, Ms. Oudekerk directed the New York Supplemental Nutrition Assistance Program Education–funded *Eat Well Play Hard in Child Care Settings* (EWPHCCS) initiative. EWPHCCS provides funding to government and nonprofit agencies in the state to implement nutrition education and physical activity interventions in low-income child care centers. The intervention targets preschool children, their families, and their caregivers with obesity prevention messages. She oversaw program evaluation activities for CACFP obesity prevention projects by collecting, analyzing, and disseminating data and reports on the success of nutrition and physical activity interventions on the rates of obesity in New York communities. She also directed outreach activities designed to increase participation of underserved day care centers and family day care homes. She received a B.S. in nutritional science from Cornell University and an M.A. in human nutrition from Syracuse University.

LORRENE RITCHIE, Ph.D., R.D., is Director of Research at the University of California, Berkeley, Atkins Center for Weight and Health, where she has conducted research on child nutrition and child obesity prevention for over a decade. Current research projects include evaluation of nutrition environments in child care in California; dietary patterns, timing of eating, and sleep duration in relation to obesity development in adolescent girls; changes in dietary behaviors and satisfaction among WIC participants in response to food package changes; the impact of the Fresh Fruit and Vegetable Program on the dietary intakes of elementary school students; the impact of the Network for a Healthy California's *Power Play!* program on students' intake of fruits and vegetable and physical activity level; the relationship of community programs and policies on child nutrition and weight status; and WIC infant and toddler feeding practices and weight.

MONICA ROHACEK, M.P.P., is a Research Associate in the Urban Institute's Center on Labor, Human Services, and Population. Her main areas of interest include the supply, demand, and costs of early care and education, workforce issues, the child care subsidy system, supports for child care providers, and the evaluation of related public policies. Ms. Rohacek has extensive experience with all aspects of quantitative and qualitative field research, including instrument design, sampling and sample recruitment, data collection through interviews and focus groups, qualitative and quantitative data management and analysis, and reporting research findings. Past fieldwork included projects involving focus groups with low-income mothers on the topic of maternal depression, in-depth interviews with child care center directors about factors supporting and inhibiting the production of good quality care, telephone interviews with parents receiving child care subsidies, individual interviews with child care subsidy administrators and

case workers, and focus groups with child care providers. Ms. Rohacek received her degree from the University of California, Berkeley.

CHARLENE RUSSELL-TUCKER, M.S.M., R.D., is Associate Commissioner for the Connecticut State Department of Education. In this role she is responsible for the administration of the Division of Family and Student Support Services, which comprises three bureaus: the Bureau of Choice Programs; the Bureau of Health/Nutrition, Family Services and Adult Education; and the Bureau of Special Education. She provides leadership and support in developing and implementing effective family and student support programs and services to assist schools and other educational partners in improving student performance. Prior to her appointment as Associate Commissioner, Ms. Russell-Tucker was Chief of the Bureau of Health and Nutrition Services and Child/Family/School Partnerships at the Connecticut State Department of Education. The Bureau was strategically positioned within the department to support the social, emotional, physical, and mental health of students and families in order to achieve success in school and in life. Its initiatives and services include School-Family-Community Partnerships, Child Nutrition Programs, School Health Promotion/Mental Health Services/School Nurses, Nutrition Education, the Safe and Drug Free Schools Program, 21st Century Community Learning Centers/After-School programs, Family Resource Centers, the Young Parents Program, and Education of Homeless Children and Youth. Ms. Russell-Tucker is past president of the Connecticut Dietetic Association and of the CACFP National Professional Association. She is also an adjunct faculty member at a local college where she teaches business management courses in the program for nontraditional students. She received her master of science in management from Albertus Magnus College–New Dimensions in New Haven, Connecticut, and is a registered dietitian.

VIRGINIA A. STALLINGS, M.D., is a Professor of Pediatrics at the University of Pennsylvania School of Medicine, Director of the Nutrition Center at The Children's Hospital of Philadelphia, and holds the Jean A. Cortner Chair in Gastroenterology and Nutrition. She is a pediatrician and a specialist in nutrition and growth in children with chronic illness. Her research interests are in areas of nutrition-related growth and body composition in healthy children and those with chronic disease (including obesity, sickle cell disease, osteoporosis, cystic fibrosis, cerebral palsy, Crohn disease, HIV, and congenital heart disease). She has been extensively involved in pediatric nutrition clinical care and research for more than 25 years. Dr. Stallings plays a broader role in the community of nutrition scientists and physicians as a past or current member of the IOM, the Food and Nutrition Board of the IOM, and the council of the American Society for Nutrition. She was

the chair of the committee that produced the 2007 IOM report *Nutrition Standards for Foods in Schools: Leading the Way Towards Healthier Youth*. She chaired the IOM committee which made the 2010 recommendations to revise the school lunch and breakfast programs in the report, *School Meals: Building Blocks for Healthy Children*. She has received research and teaching awards from the American Society of Nutrition, the American Academy of Pediatrics and the Institute of Medicine, National Academies.

DIANNE STANTON WARD, Ph.D., is Professor and Director of the Intervention and Policy Division in the Department of Nutrition at the University of North Carolina (UNC) Gillings School of Global Public Health. She is a Fellow of the UNC Highway Safety Research Center, the UNC Center for Health Promotion and Disease Prevention, and the American College of Sport Medicine. Dr. Ward has more than 20 years of experience implementing obesity prevention interventions. Her work has focused on preschool-aged children in child care settings and the prevention of obesity through multicomponent school and community interventions that promote physical activity and healthy eating. She led the team that developed the Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC), a highly regarded program that is now utilized by many states. Results from the evaluation of the NAP SACC program were published in 2008 and the program was selected for inclusion in the Center for Training and Research Translation sponsored by CDC. The NAP SACC program has been widely disseminated and aspects of the program were recently included in the First Lady's Let's Move Child Care initiative. She also published the first paper presenting comprehensive best practice physical activity guidelines for child care in 2009. Along with her research team, she developed the first assessment tool designed to evaluate the nutrition and physical activity characteristics at child care setting, and this instrument is among the most widely used to assess child care healthy weight environments. Dr. Ward holds a doctorate in physical education from the University of North Carolina at Greensboro. In 2001 she received the Distinguished Alumni Award from the School of Health and Human Performance at the University of North Carolina at Greensboro.

ANN L. YAKTINE, Ph.D., is a Senior Program Officer and Study Director at the Food and Nutrition Board (FNB) in the IOM of the National Academies. Prior to joining the FNB she was an instructor at the University of Nebraska, Lincoln, and the Virginia Polytechnic Institute and State University. Since joining the IOM in 2001, she has directed several studies, including Dioxins and Dioxin-Like Compounds in the Food Supply, Safety of Genetically Engineered Foods, Integrating Employee Health, Nutrient Relationships in Seafood, Nutrition Standards for Foods in Schools, Preg-

nancy Weight Guidelines, and a Review of the Child and Adult Care Food Program. Dr. Yaktine has also coordinated workshops on nutrition and genomics and nanotechnology in foods. Dr. Yaktine received her Ph.D. in biochemistry and molecular biology from the Eppley Institute for Research in Cancer and Allied Diseases at the University of Nebraska Medical Center. She has co-authored a chapter on chemoprevention of cancer for the nutrition text *Modern Nutrition in Health and Disease*, was lead author of a chapter on integrated employee health management in the American College of Sports Medicine's *Worksite Health Handbook*, and is author of a chapter on environmental contaminants in foods in the *Encyclopedia of Lifestyle Medicine*. She has also published journal reports on dietary effects on molecular pathways involved in cancer, and nutritional toxicology. Dr. Yaktine has been an invited speaker at the National Press Foundation annual meeting, the Alaska Forum on the Environment, the National Forum on Contaminants in Fish, the Federation of Experimental Biology, the Korean Academy of Sciences and Technology, and the Harvard School of Public Health.

C

Workshop Attendees

Anna Arrowsmith
USDA Food and Nutrition Service

Norma Birckhead
DC Office of the State Superintendent of Education

Donna Blum-Kemelor
USDA Center for Nutrition Policy and Promotion

Julie Brewer
USDA Food and Nutrition Service Child Nutrition Division

Robin Brocato
HHS/Office of Head Start

Patty Connor
Abt Associates Inc.

Lynn Edmunds
New York State Department of Health

Vivian Gabor
Gabor Consulting

Summer Gill
American Public Human Services Association

Teresa Green
National Consumers League

Joanne Guthrie
USDA Economic Research Service

Geraldine Henchy
Food Research and Action Center

Katherine Hohman
YMCA of the USA

Art Jaeger
Watson/Mulhern LLC

Neal Kumar
Nemours

Kelly Lawrence
Abt Associates Inc.

Alexandra Lewin-Zwerdling
Powell Tate DC

Sarah Lifsey
Altarum Institute

Grant Lovellette
USDA Food and Nutrition Service

Patricia MacNeil
USDA Center for Nutrition Policy and Promotion

David Marker
Westat

Traci Mouw
USDA Food and Nutrition Service Child Nutrition Division

Tina Namian
USDA Food and Nutrition Service Child Nutrition Division

Sandra Rhoades
New York State Department of Health

Jane Schulman
Westat

Kate Sims
USDA Food and Nutrition Service

Kam Sripada
HHS Administration for Children and Families, Office of Child Care

Jennifer Weber
Nemours

D

Abbreviations and Acronyms

ACF	Administration for Children and Families
AI	Adequate Intake
AMPM	USDA Automated Multiple Pass Method
ASA	NCI Automated Self-administered 24-hour Dietary Recall
BMI	body mass index
CACFP	Child and Adult Care Food Program
CCDF	Child Care Development Fund
CFFS	Chicago Family Food Survey
CFQ	Child Feeding Questionnaire
CHAOS	Environmental Confusion in Household measure
CRISYS	Contemporary Life Stressors measure
DRI	Dietary Reference Intakes
EPAO	Environmental Policy and Assessment Observation
ERS	Economic Research Service
ESHA	Elizabeth Stewart Hands and Associates
FACES	Family and Child Experiences Survey
FCS	Food and Consumer Service
FITS	Feeding Infants and Toddlers Studies
FNB	Food and Nutrition Board (Institute of Medicine, National Academies)

FNDDS	Food and Nutrient Database for Dietary Surveys (USDA)
FNS	Food and Nutrition Service (USDA)
FY	fiscal year
HHS	Department of Health and Human Services
ICC	intraclass correlation coefficient
IOM	Institute of Medicine (The National Academies)
MPED	MyPyramid Equivalents Database (USDA)
NAP SACC	Nutrition and Physical Activity Self Assessment for Child Care
NCI	National Cancer Institute
NDSR	Nutrition Data System for Research (University of Minnesota)
NCES	National Center for Education Statistics
NIH	National Institutes of Health
NSECE	National Survey of Early Care and Education
OPRE	Office of Planning, Research and Evaluation
PIR	Program Information Report
P.L.	Public Law
QRIS	Quality Rating and Improvement System
RDA	Recommended Dietary Allowance
RFP	Request for Proposals
SFPS	School Food Purchase Studies
SHAPES	Survey of Healthy Activity and Eating Practices in Environments
SIPP	Survey of Income and Program Participation
SNAP	Supplemental Nutrition Assistance Program
SNDA	School Nutrition Dietary Assessment
USDA	U.S. Department of Agriculture
WIC	Supplemental Nutrition Program for Women, Infants, and Children