Position of the Academy of Nutrition and Dietetics: Benchmarks for Nutrition in Child Care

ABSTRACT

It is the position of the Academy of Nutrition and Dietetics that early care and education (ECE) programs should achieve recommended benchmarks to meet children's nutrition needs and promote children's optimal growth in safe and healthy environments. Children's dietary intake is influenced by a number of factors within ECE, including the nutritional quality of the foods and beverages served, the mealtime environments, and the interactions that take place between children and their care providers. Other important and related health behaviors that may influence the development of obesity include children's physical activity, sleep, and stress within child care. Recent efforts to promote healthy eating and improve other health behaviors in ECE include national, state, and local policy changes. In addition, a number of interventions have been developed in recent years to encourage healthy eating and help prevent obesity in young children in ECE. Members of the dietetics profession, including registered dietitian nutritionists and nutrition and dietetics technicians, registered, can work in partnership with ECE providers and parents to help promote healthy eating, increase physical activity, and address other important health behaviors of children in care. Providers and parents can serve as role models to support these healthy behaviors. This Position Paper presents current evidence and recommendations for nutrition in ECE and provides guidance for registered dietitian nutritionists; nutrition and dietetics technicians, registered; and other food and nutrition practitioners working with parents and child-care providers. This Position Paper targets children ages 2 to 5 years attending ECE programs and highlights opportunities to improve and enhance children's healthy eating while in care.

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POSITION STATEMENT

It is the position of the Academy of Nutrition and Dietetics that early care and education programs should achieve recommended benchmarks to meet children's nutrition needs and promote children's optimal growth in safe and healthy environments.

CHILD CARE OUTSIDE OF THE home has remained relatively common in the United States.[1,2] A majority of children aged 2 to 5 years attend some form of out-of-home child care and spend approximately 30 hours per week or more in care.[1,2] As a result, parents and early care and education (ECE) providers often share the responsibility of feeding children. To promote healthy eating in ECE, nutrition and dietetics practitioners, including registered dietitian nutritionists (RDNs) and nutrition and dietetics technicians, registered (NDTRs), should work in partnership with both ECE providers and parents to ensure that meals and snacks meet children's nutrition needs, adults model healthy eating behaviors, and child-care environments support optimal growth. The purpose of this Position Paper is to update the 2011 position on benchmarks for nutrition in child care and present a summary of the greatly expanded national recommendations and research literature in this area. This article also reviews recent intervention and policy efforts to improve children's healthy eating in ECE—both of which have increased substantially during the past 6 years.

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BENCHMARKS FOR NUTRITION IN CHILD CARE

This Position Paper identifies 12 core benchmarks for children aged 2 to 5 years in ECE and provides guidance for nutrition and dietetics practitioners, parents, and providers.

1. provide children with a variety of healthy foods and beverages in appropriate portions;
2. limit less-healthy foods that contribute little to meeting children's nutrition needs;
3. be mindful of food safety, foodborne illness, and food allergies;
4. create healthy physical and social eating environments;
5. respect children's hunger and satiety cues;
6. encourage child-care provider role modeling;
7. work with parents to encourage healthy foods brought from home to child care;
8. respect culture and encourage cultural foods;
9. be mindful of food security and family resources;
10. facilitate nutrition education for children and families;
11. consider barriers to serving healthy foods and beverages from the provider perspective; and

12. provide training and technical assistance to child-care providers.

Achieving these benchmarks for nutrition in ECE is an important public health goal and nutrition and dietetics practitioners can help lead the charge.

NUTRITIONAL QUALITY OF FOODS AND BEVERAGES SERVED

Provide Children with a Variety of Healthy Foods and Beverages in Appropriate Portions

Foods and beverages served in ECE should be consistent with the 2015-2020 Dietary Guidelines for Americans (DGA), which are updated every 5 years.[3] The importance of this benchmark is underscored in the Healthy People 2020 objective for all Americans, including children aged 2 years and older, to meet but not exceed their caloric needs in accordance with the DGA. Child-care providers can help ensure that children consume healthy, nutritious foods that promote optimal growth and help prevent the development of obesity. Children in full-day ECE may require one-half or even two-thirds of their daily nutritional requirements while in care. Children in part-time care may require one-quarter to one-third of their daily requirements.[4]

Consistent with the DGA, children should consume five to nine servings of fruits and vegetables daily—especially dark green, red, and yellow vegetables. Children also need adequate servings of vitamin A–rich foods (vegetables in particular) at least three times per week. Emphasis should be placed on minimally processed fruits and vegetables or those low in added salt and sugar. Frozen varieties are good options when fresh produce is not available or is too costly. Fruits packed in water instead of syrup and vegetables low in sodium are also the preferred options. Providers can rinse fruits and vegetables to remove some of the sugar and sodium. Numerous national organizations recommend limiting juice for young children, including the American Academy of Pediatrics, the National Academy of Medicine (formerly the Institute of Medicine), and the National Resource Center for Health and Safety in Child Care and Early Education. The American Academy of Pediatrics suggests no more than 4 to 6 oz (120 to 180 mL) juice each day. However, this should be less (or even none) in child care, because children may consume juice at home.[5]

Children should also consume a variety of other healthy foods, including whole grains. Whole-grain foods, such as brown rice and oatmeal, provide children with much-needed dietary fiber compared with processed grains. Children also need a healthy mix of legumes, lean proteins, and low- or fat-free dairy each day in ECE. However, numerous studies suggest that ECE programs fall short in providing children adequate vitamins and minerals like vitamin E, zinc, and iron.[6-8] Children in child care also consume inadequate amounts of fruits, vegetables, and fiber.[8-12] In response, this Position Paper includes a new section on farm-to-preschool and farm-to-child care efforts designed to facilitate produce intake in children in ECE.

Limit Less-Healthy Foods that Contribute Little to Meeting Children's Nutrition Needs

Child-care programs have become targets for the prevention of obesity and other chronic diseases[13] because recent studies highlight the nutritional inadequacy of foods and beverages commonly served to children in ECE. Specifically, evidence suggests that meals and snacks include excessive saturated fat, sodium, and sugar.[8,9,14,15] Whole or full-fat milk is still relatively common in ECE,[6,15] despite recommendations to serve low- or fat-free milk to children aged 2 years and older,[4] sugar-sweetened beverages, including sugar-sweetened carbonated beverages and flavored milk, remain relatively uncommon in ECE.[6,11,15]

Be Mindful of Food Safety, Foodborne Illness, and Food Allergies

Child-care providers should serve food that is stored, prepared, and presented to children in a safe and sanitary manner. Foodborne illness remains a concern in ECE settings and nutrition and dietetics practitioners can help raise awareness about issues of food safety. The challenges of foodborne illness continue to evolve as new pathogens, modes of transmission, and multidrug-resistant strains of pathogens emerge.[16] Proper food management practices can help protect children from foodborne illness. Providing safe and sanitary food preparation space is critical. Food preparers require training on food handling, preparation, and management, and adequate and regular hand washing remains among the most effective strategies for prevention. Children and providers must wash their hands; all plates, bowls, and serving equipment must be disinfected; and single-serving items such as paper napkins must be discarded after use.

Food allergies and the risk of serious adverse reactions are another major threat to children's health and safety in ECE.[4] Although allergic reactions to insect stings, latex, and medication can be life-threatening to children, severe food allergies remain of utmost concern. Preventing severe allergic reactions to food requires accurate information and good communication with parents and other caregivers, recognition of the risk, and careful planning for potential adverse and unexpected events.[17] Eggs, milk, peanuts, and tree nuts are the most common food allergies in children. Each child with a food allergy in ECE should have a care plan prepared by the child's parent or caregiver that includes information about the allergy, steps to avoid the allergen, a specific treatment plan in the event of a reaction, and a description of the symptoms that may necessitate medical attention.[4] In addition, child-care providers should receive training on recognizing these symptoms and acting accordingly. Nutrition and dietetics practitioners can help provide trainings to ECE programs and providers on appropriate prevention and treatment of food allergies in children.

MEALTIME ENVIRONMENTS

Create Healthy Physical and Social Eating Environments

Although few additional studies have been published in recent years, this remains an important area in promoting healthy eating among children in ECE. Chairs, tables, plates, bowls, and eating utensils should be suitable in size and shape for children to manipulate based on their fine motor skill development.[4] Children should be able

to sit comfortably with their feet on the floor or a foot rest to minimize the risk of falls. Accommodations should be made for children with disabilities.[4] In addition, posters, pictures, and other tangible messages within the eating environment can help communicate age appropriate, visually appealing messages about healthy eating to children during meals and snacks.

Respect Children's Hunger and Satiety Cues

Young children may begin to override their internal cues for both hunger and satiety well before age 5 years. Thus, there is a critical window for child-care providers to help encourage children's self-regulation in ECE. Ellen Satter's division of responsibility[18] is a well-established and long-standing approach to feeding and interacting with children during mealtimes. This approach helps children regulate their food and beverage intake—to eat when they are hungry and stop when they are full. Based on this approach, adults determine the specific foods and beverages offered to children but their responsibility ends there. Children decide whether to eat, what to eat, and how much to consume. This method is consistent with other feeding recommendations for young children in ECE, including adult role modeling, repeated exposure to new or less familiar foods, and family style meal service.[4]

INTERACTIONS BETWEEN CHILDREN, FAMILIES, AND CARE PROVIDERS

Encourage Child-Care Provider Role Modeling

A systematic review highlighted the need for additional, high quality studies examining the influence of child-care provider role modeling within ECE.[19] Based on this review,[19] evidence from a small number of studies suggests that providers play a key role in influencing young children's eating behavior. However, the extent to which they engage in these behaviors is not clear. In a recent study of 124 child-care providers from 50 child-care centers in North Carolina, Erinosho and colleagues[9] found that 90% of providers reported modeling healthy eating behaviors to children and researchers observed this behavior at 80% of the centers. However, the researcher also observed providers modeling less healthy behaviors as well, such as consuming fast food and sugar-sweetened beverages in front of children. They did not observe an association between provider role modeling practices and the quality of center policies related to healthy eating. In another study, Sission and colleagues[20] conducted a mailed survey of 314 centers across Oklahoma. They found that most providers (more than 80%) reported joining children at the table for meals and snacks and nearly three-quarters said that they rarely consumed outside foods in front of children.[20]

Work with Parents to Encourage Healthy Foods Brought from Home to Child Care

Some evidence suggests that foods brought from home to child-care centers fail to meet nutrition standards. In a recent study of 30 child-care centers in Texas, researchers found that packed lunches lacked vegetables, plant-based proteins, and whole grains.[21] The Lunch is in the Bag intervention was designed to help improve the nutritional quality of foods provided by parents through sack lunches. After the 5-week intervention and a 1-week booster training, parents increased the number of whole grains and decreased the number of sweet foods in sack lunches provided to children.[22] Nutrition and dietetics practitioners can help providers communicate with parents about healthy and appropriate foods to provide in packed lunches.

Respect Culture and Encourage Culturally Appropriate Foods

Nutrition and dietetics practitioners can work with both families and providers to ensure that children are served a variety of healthy foods that reflect their cultural and family preferences. This may require offering sources of nutritious foods that are less familiar to other children in care. By learning about new foods, children can enhance their knowledge of food and expand their palates.[4] Some children may also require dietary modifications for certain cultural or religious preferences, including vegetarian diets,[4] which may also have added benefits. A recent study of one child-care center in South Carolina found that adding vegetarian meals to the menu improved the nutrient content of foods provided while keeping total energy, saturated fat, sodium, and cholesterol relatively low.[11]

Be Mindful of Food Security and Family Resources

Food insecurity, characterized by the "limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways,"[23] remains a significant public health problem in the United States. Nearly 16 million children lived in households that were food insecure in 2012.[24] A systematic review reported that food insecurity was associated with poor overall dietary quality in adults and lower intake of fruits, vegetables, and dairy products and to a lesser extent associated with lower diet quality in children.[25] The 2014 Academy of Nutrition and Dietetics Position Paper on nutrition guidance for healthy children ages 2 to 11 years[26] highlights the importance of federal nutrition assistance programs administered in ECE, such as the Child and Adult Care Food Program (CACFP), to help address issues of food insecurity in children. It may also be appropriate for nutrition and dietetics practitioners to refer families or provide information to child-care providers on federal food assistance programs like the Supplemental Nutrition Assistance Program or the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Federal nutrition assistance programs like the Supplemental Nutrition Assistance Program and WIC provide supplemental food and other resources to help alleviate food insecurity and promote the health of the women and young children who participate in the programs. Previous research has demonstrated the effectiveness of these programs at reducing food insecurity among families, although some studies have shown that food insecurity remains relatively high among WIC participants.[27-29]

Facilitate Nutrition Education for Children and Families

Nutrition education of children and their families is an important

component of ECE but is not sufficient to facilitate behavior change. Coupled with environmental support as outlined in this Position Paper, nutrition education can help children and families understand the origins of food, create or choose healthy meals and snacks, and learn about optimal nutrition for growth and development. There are numerous curricula available for use in ECE.[30-32] Nutrition education can be both formal and informal and include games, activities, posters, books, hands-on experiences, and conversations with child-care providers. Nutrition education for families will help reinforce messages delivered to children while in care and should be offered to parents on a regular basis.[4] Nutrition and dietetics practitioners could work with child-care providers and ECE programs to offer nutrition education for children and their families.

PARTNERING WITH CHILD-CARE PROVIDERS

Consider Barriers to Serving Healthy Foods and Beverages from the Provider Perspective

Child-care providers cite costs as a major barrier to serving healthier foods in ECE[33] and some evidence supports this claim. In one study of 60 child-care providers in Washington State, Monsivais and colleagues[34] found that higher daily food expenditures were associated with greater nutritional quality of menus. After controlling for energy and other covariates, higher food expenditures were strongly and positively associated with the number of whole grains and fresh fruits and vegetables served to children in care.[34] Thus, the authors[34] concluded that improving the nutritional quality of foods in ECE may require additional spending. In a second study by Monsivais and colleagues,[35] the authors estimated the nutritional and economic influence of substituting fruit for juice in children's diets. The authors found that serving whole fruit instead of juice, a practice often recommended by nutrition and dietetics practitioners, would reduce energy and increase fiber intake, but likely result in higher costs unless more processed fruits were served.[35] Providers cite additional barriers, such as problems communicating with parents,[36] but there is less information available in the research literature.

Although food costs and communications with parents are likely barriers, child-care provider burnout and turnover also present as roadblocks to serving healthier foods to children. Child-care providers receive relatively modest pay and are exposed to a number of workplace health and safety risks. In addition, many hold positions without benefits such as paid sick and vacation time.[37,38] As a result, absenteeism and turnover rates of child-care workers are high.[37] These barriers may affect their willingness to participate in programs or interventions designed to improve healthy eating for children in care. When partnering with child-care providers or asking for their assistance with a program and project, nutrition and dietetics practitioners should consider additional incentives to help ease the burden of additional workplace responsibilities. One possibility is to offer contact hour or continuing education credits from the state, CACFP sponsoring agency, cooperative extension agency, or child care resource and referral agency because child-care providers are often required by states to maintain their early childhood education credentials. Although this may require an application to the state for prior approval, these credits are a valued incentive and may help facilitate child-care provider participation and collaboration.

Provide Training and Technical Assistance to Child-Care Providers

Child-care providers should be knowledgeable about the basic principles of child nutrition and healthy eating, strategies for creating positive mealtime environments, and the benchmarks included in this Position Paper. Nutrition and dietetics practitioners are available at the local, state, and national levels to assist child-care providers. A number of state initiatives focus on improving training and technical assistance for providers in ECE.[39,40] Many of these trainings are designed to promote healthy eating in children, but some also focus on the health of the provider. The Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC)[41] and Keys to Healthy Family Child Care Homes[42] are two examples of ECE interventions that include a provider wellness component. Nutrition and dietetics practitioners can provide training to ECE programs on these benchmarks to help promote healthy eating and improve the health of both children and providers. Having a regular schedule for training providers is important and recommended due to the high rates of staff turnover within ECE.[4,37,43]

RECENT EFFORTS TO PROMOTE HEALTHY EATING IN CHILD CARE: NATIONAL RECOMMENDATIONS, PROMISING INTERVENTIONS, AND EMERGING LITERATURE

The following sections of this Position Paper are included to help provide an overview of recent efforts to promote healthy eating in child care for nutrition and dietetics practitioners working with ECE programs. The first section presents information on federal, state, and local efforts to promote healthy eating in ECE. The next section provides a brief summary of national standards, recommendations, and resources related to nutrition in child care. This is followed by an overview of promising interventions to promote healthy eating in young children in child care. Finally, the last section describes emerging research literature in obesity prevention in ECE beyond healthy eating.

Federal, State, and Local Policy Efforts to Promote Healthy Eating in Child Care

Healthy, Hunger-Free Kids Act. Enacted in 2010, the Healthy, Hunger-Free Kids Act allocates funding and sets policy priorities for the US Department of Agriculture (USDA) child nutrition programs, including the National School Lunch Program, the School Breakfast Program, WIC, the Summer Food Service Program, and CACFP, which is discussed in more detail next. The Healthy, Hunger-Free Kids Act authorizes USDA to set standards for healthier food options in ECE.

CACFP. A number of studies report higher nutritional quality of foods and beverages served to children in child-care programs participating in CACFP, although participation in this child

nutrition program alone does not always ensure nutritional adequacy of meals and snacks.[12,44] The CACFP is administered by the USDA and provides reimbursement for eligible meals and snacks served to qualifying children in participating child-care and other programs. CACFP rules are updated every 10 years, but minor modifications are made regularly, as needed. The USDA recently released a revised rule that includes a number of updates to CACFP to help improve children's nutritional intake without increasing costs to participating ECE programs.[45] This rule updates the meal pattern requirements for CACFP to better align with the DGA, as required by the Healthy, Hunger-Free Kids Act of 2010.[46] Specifically, ECE programs participating in CACFP are required to serve a greater variety of fruits and vegetables, more whole grains, and make water available.[45] Participating ECE programs must also decrease the amount of added sugars, prefried foods, processed meats, sweet crackers, and grain-based desserts in meals and snacks served to children.[45] The rule also aligns CACFP meal pattern more closely with food requirements in WIC. States will continue to have the option of making additional changes, with prior USDA approval, that include more stringent nutrition rules for CACFP beyond those of the federal government.

Head Start Program. The national Head Start Program has been a leader in promoting healthy eating for young children in ECE, including the I Am Moving, I am Learning intervention to enhance dietary intake and gross motor skills among children in care. In addition, Head Start centers have been the subject of numerous research studies and interventions to promote healthy eating.[29,47,48] Dev and colleagues[47] compared child-care provider feeding practices to the benchmarks put forth in the prior 2011 Position Paper[49] and assessed whether consistency with these benchmarks varied across child-care contexts, including Head Start, CACFP, and non-CACFP centers. The researchers found that Head Start programs met these benchmarks and provided healthy foods more often than non–Head Start programs. Head Start providers sat with children during meals, consumed the same foods as children, and served meals family style more often than non-Head Start programs.[47] Head Start providers, children, and their families also received more training in nutrition compared with other types of centers. The authors concluded that Head Start programs could serve as models for implementing these benchmarks partly because they align closely with the Head Start Program Performance Standards. Additional information about promising new interventions within Head Start is presented later in this Position Paper.

Healthy Kids, Healthy Future. Healthy Kids, Healthy Future (formerly Let's Move! Child Care) was initiated by former First Lady Michelle Obama and is now operated through the Nemours Foundation. The goal of Healthy Kids, Healthy Future is to assist ECE providers in promoting healthy environments and encouraging positive changes among children in care. The program focuses on five goals, including nurture healthy eaters, provide healthy beverages, get kids moving, reduce screen time, and support breastfeeding.[50]

Centers for Disease Control and Prevention. The Centers for Disease Control and Prevention (CDC) engages in a number of activities to prevent obesity in ECE programs across the country. Specifically, the CDC supports a variety of state initiatives to improve policies and practices in ECE, including those related to healthy eating. The goal of these initiatives is to help states and communities implement obesity prevention standards into components of their ECE systems using the Spectrum of Opportunities framework (eg, licensing and administrative regulations, quality rating and improvement systems, Child Care Subsidy, and CACFP).[51] In addition, the CDC encourages states and communities to monitor and track these efforts and assess their influence at the ECE program level. The CDC provides ongoing training and technical assistance to states, supports stakeholder meetings, and provides a monthly forum for peer mentoring and discussion. The CDC also supports the ECE State Indicator Report—a 50-state assessment of how states have embedded obesity prevention into their ECE systems based on the Spectrum of Opportunities framework.

State and Local Policy Efforts. Policy-based approaches to promoting healthy eating in ECE are becoming more common in the United States. A number of states and cities have made licensing and administrative regulatory changes targeting child-care programs.[52,53] Previous cross-sectional studies have evaluated the presence of healthy eating regulations targeting ECE through legal research methods[54] and found wide variation among states.[52,53] However, because causality cannot be determined in these regulatory reviews, additional studies are needed. State and local regulatory changes represent opportunities for nutrition and dietetics practitioners and researchers to prospectively evaluate the effectiveness of policy changes, and a handful have done so.

In one study, researchers evaluated compliance with nutrition regulations in a sample of New York City child-care centers.[55] They found that more than 80% of centers were compliant with the regulations governing the type of milk and juice served and limiting sugar-sweetened beverages in the center. In addition, about half of centers were consistent with the regulation restricting the amount of juice served to children and requiring the availability of water. In a second study, researchers evaluated new mandatory nutrition standards governing child-care centers serving low-income children in South Carolina, and they used North Carolina—a state not making policy changes—as the comparison.[56] The policy was implemented in April 2012 and included 13 standards governing the nutritional quality of foods and beverages served to children and staff behaviors related to feeding children in care. They found that the new standards modestly improved nutrition practices in South Carolina child-care centers postpolicy, especially for three of the 13 standards. However, additional support from the state would likely be needed to bring all centers into compliance. In a third study,[39] Delaware implemented new child-care licensing rules related to healthy eating, and researchers evaluated

changes in child-care provider knowledge. The researchers for that study found that providers were more knowledgeable about the rules after a 1-day training. The number of providers who correctly identified the rules increased after the training.

National Standards, Recommendations, and Resources

National Resource Center for Health and Safety in Child Care and Early Education. The National Resource Center for Health and Safety in Child Care and Early Education, in collaboration with the National Center on Early Childhood Health and Wellness, administered by the American Academy of Pediatrics, published *Caring for Our Children: National Health and Safety Performance Standards—Guidelines for Early Care and Education Programs*.[4] *Caring for Our Children*[4] includes 686 national standards for quality health and safety practices and policies for ECE programs. A number of these standards focus on improving the nutritional quality of foods and beverages served to children, mealtime interactions that take place between children and their care providers, and creating ECE environments that promote healthy eating. *Caring for Our Children*[4] also provides a number of resources and puts forth standards related to food safety and protection from foodborne illness in ECE.

Institute of Child Nutrition. The mission of the Institute of Child Nutrition is to promote continuous improvement in child nutrition programs like CACFP. There are a number of resources available for ECE providers that would also be of interest to nutrition and dietetics practitioners working to support healthy meals and snacks in ECE settings. Resources for ECE programs include fact sheets, example newsletters for parents on healthy foods, food purchasing suggestions, and sample healthy menus and menu templates.[57]

National Academy of Medicine. In 2011, the National Academy of Medicice (formerly the Institute of Medicine) put forth recommendations for policy-based initiatives and actions to help prevent obesity in early childhood, emphasizing the promotion of healthy eating in ECE in the report, *Early Childhood Obesity Prevention Policies*.[43] These policy-based obesity prevention efforts targeting young children appear promising, and a number of recent studies have compared current state regulations to these recommendations for action.[58,59] In addition to healthy eating, the recommendations also target physical activity, sedentary time, and sleep to help prevent obesity in young children.

Child Care Aware. Child Care Aware is a program within Child Care Aware of America, funded by the Office of Child Care, Administrative for Children and Families within the US Department of Health and Human Services. Child Care Aware offers a national database that enables parents and ECE providers to obtain information about quality child care and to locate resources in their local communities.[60] Child Care Aware partners with more than 400 Child Care Resource and Referral Agencies from across the country to provide this information.

Interventions to Promote Healthy Eating in ECE Settings

Recent Systematic Reviews Summarizing Interventions. A number of systematic reviews of obesity prevention interventions among preschoolers have been published in recent years. Of those, four focused on children in ECE settings.[61-64] These reviews highlight the general success of interventions to promote healthy eating and increase active play in early care and education settings. In addition, a recent article presented lessons learned from two ongoing obesity prevention interventions—one in family child-care homes and the other in centers.[65] The authors put forth the following recommendations:

- interventions should have a firm basis in behavior change theory;
- an advisory group should help evaluate intervention materials and plan for delivery; and
- realistic recruitment goals should recognize economic challenges of the business of child care.[65]

Not surprisingly, an intervention that is relatively easy to implement is more likely to appeal to a wide variety of ECE providers.

Farm-to-Preschool and Farm-to-Child Care Interventions. A number of state initiatives aim to expose children to fresh fruits and vegetables and link them with local farmers. These initiatives include preschool gardens, community-supported agriculture, and farmers' markets. These strategies also promote economic development and support local agriculture. A recent systematic review of the literature from 1994-2015 found that 14 studies evaluated farm-to-ECE programs or interventions, with 13 of them published during the past 5 years.[66] Notably, the majority of the 14 studies engaged community stakeholders in research activities that focused on process outcomes to evaluate the intervention. Few studies employed a control or comparison group. The authors highlight the growing interest in farm-to-ECE and report that, given the relatively small number of published studies, the research has not kept pace with the national movement. Additional funding for farm-to-ECE efforts will help bolster the evidence base and highlight successful interventions to help increase fruit and vegetable intake in children in ECE.

In 2012, the National Farm to School Network conducted its first survey of farm-to-preschool programs across the United States and results are summarized in Hoffman and colleagues'[66] farm-to-preschool review article mentioned previously. Five hundred twelve respondents from 39 states and Puerto Rico completed the survey. Nearly half (42%) were from child-care centers, 28% were from family child-care homes, and 20% were from Head Start or Early Head Start Programs. The most common approach was to incorporate locally grown fruits and vegetables into lessons, meals, and snacks. Nearly 90% of programs taught children about locally grown food and just more than 80% had some sort of edible garden. Few programs used an established curriculum. Taken together, the farm-to-preschool survey of activities and the systematic review of the literature highlight opportunities for RDNs, NDTRs, and other nutrition and dietetics practitioners to work with child-care providers to promote and

evaluate farm-to-preschool activities in ECE.

NAP SACC Intervention. NAP SACC is an intervention for ECE settings that targets the care environment and interactions that take place between children and their child-care providers.[41] The NAP SACC intervention has shown favorable results in improving the nutrition environments of child-care centers[67] as well as decreasing the risk of obesity for children in care.[68] In addition, a recent study evaluated NAP SACC in rural North Carolina and found that centers strengthened their nutrition and physical activity policies and practices as a result of the intervention.[69] Two recent case studies in Arizona and Maine have described state-level experiences of implementing the NAP SACC intervention.[70,71] These studies highlight the success of the NAP SACC intervention in reaching diverse populations of children.

Recent Promising Interventions. Recently, a number of promising interventions have been developed and evaluated within the Head Start Program. Harvest for Healthy Kids is a farm-to-preschool intervention that aligns with the Head Start Child Development and Learning Framework.[30] The intervention includes foodservice, classroom education, and family engagement components.[30] The pilot study was conducted in five Head Start centers in Oregon. At the end of the intervention, children were more likely to taste and report liking new and less familiar vegetables such as rutabaga and turnips vs children in the comparison centers. In addition, Head Start teachers found the curriculum to be acceptable, feasible, and easy to understand. In a second study, Natale and colleagues[72] evaluated their Hi-Ho curriculum via a randomized controlled trial in a sample of eight child-care centers in Florida. The intervention included lesson plans, menu review and improvement, health and wellness lessons, and education for parents and other caregivers. At the end of the intervention, children in intervention centers consumed more fruits and vegetables, drank less juice, and increased their consumption of low-fat milk compared with children in control centers. This ongoing work highlights a growing interest in promoting healthy eating in ECE and solidifies its current role as a vibrant area of intervention research.

Emerging Evidence in Childhood Obesity Prevention beyond Healthy Eating

Physical Activity and Sedentary Time. Active play is an important part of quality child care.[73] Regular physical activity promotes a healthy weight, enhances motor skill development, and improves cardiovascular function. Numerous previous studies and literature reviews show that children are largely inactive and engage in insufficient physical activity in ECE.[74,75] Media use and screen time are also excessive in child care—especially in the less formal types of care.[76] The 2011 Institute of Medicine report, *Early Childhood Obesity Prevention Policies,*[43] suggests that children should be provided with opportunities for 15 minutes per hour of light, moderate, and vigorous physical activity each day. This is equivalent to 120 minutes of physical activity provided over an 8-hour day of care. A study of children in South Carolina found that about half of child-care centers met this recommendation.[77] There are a large number of interventions and programs designed to increase physical activity and promote active play in young children within ECE.[78,79]

Sleep and Stress. Some emerging evidence suggests that child-care attendance may also influence children's risk of poor dietary intake and obesity risk through additional pathways such as inadequate sleep, chronic stress, and psychological and emotional distress.[80,81] Short sleep duration has been associated with obesity in children in numerous studies[82] and napping during the day in child care may delay sleep onset[83] and decrease the duration and quality of sleep at night.[84] Stress may also influence dietary intake and obesity in children, although the potential mechanisms linked to child care are less clear. Previous studies link elevated cortisol and obesity risk,[85] and ECE attendance has been associated with higher cortisol levels in children.[86,87]

ROLES AND RESPONSIBILITIES OF RDNs AND NDTRs

- Provide consultation and expertise to ECE programs, including assessment of the nutritional quality of foods and beverages served, evaluation of the eating environment, assistance with menu planning, and training and guidance for providers who interact with children.
- Encourage parents to advocate for healthy and culturally appropriate meals and snacks in their children's ECE program, promote parent role modeling of healthy behaviors, and help facilitate communication between providers and parents.
- Be aware of federal, state, and local nutrition policies, regulations, statutes, and executive orders that govern or affect healthy eating in ECE programs.
- Review national guidelines and recommendations and assist with the dissemination of nutrition-related best practices in ECE programs.
- Participate in research activities, review emerging research, and assist with the dissemination of research findings related to healthy eating interventions for children.
- Support adoption of evidence-based policies, guidelines, and interventions to help promote children's healthy eating and other health behaviors in ECE programs.

CONCLUSIONS

These roles and responsibilities encourage RDNs and NDTRs to engage in a number of important activities related to nutrition in ECE. RDNs and NDTRs need to stay abreast of new nutrition-related programs and policies targeting ECE. Federal, state, and local program and policy efforts to promote healthy eating in ECE have risen substantially in recent years. Substantial improvements have been made to CACFP and other federal programs and future research will likely provide insight into the effectiveness of these changes in ECE settings. These efforts have helped to advance the field and bolster the evidence base. RDNs and NDTRs should also keep informed

about recent publications in the research literature. A number of new studies highlight the need for continued improvement to the nutritional quality of meals and snacks in ECE. Other studies support the call for increased physical activity and decreased sedentary time for young children spending time in ECE settings. Recent systematic reviews demonstrate the number of new intervention studies conducted in ECE settings. Since the last Position Paper, there have been a number of novel applications of the NAP SACC intervention and new interventions have emerged that appear promising.

Finally, RDNs and NDTRs can use this information to provide consultation and expertise to child-care providers and parents and help encourage and support changes in the ECE environment related to nutrition. Given the scope of the research, policies, and programs described above, this Position Paper should be viewed as an introduction to nutrition and healthy eating in ECE. Readers are encouraged to consult the references cited herein for further discussions of various efforts and their ongoing application to nutrition in child care. The benchmarks outlined in this Position Paper focus on meeting children's nutrition needs and providing a safe environment that promotes healthy eating in young children. The Academy of Nutrition and Dietetics supports their achievement in ECE, and nutrition and dietetics practitioners can play a primary role in advocating for and implementing these benchmarks.

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