Preventing Childhood Obesity

Policy and Practice Strategies for North Carolina

North Carolina Family Impact SEMINAR

Center for Child & Family Policy
Duke University

Preventing Childhood Obesity:
Policy and Practice Strategies for North Carolina

This report was prepared for the 2011 North Carolina Family Impact Seminar, held on May 4, 2011, at the North Carolina General Assembly.

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Briefing reports from prior North Carolina Family Impact Seminars and other Center for Child and Family Policy publications are available on the Center's website: www.childandfamilypolicy.duke.edu.

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Background and Purpose

North Carolina Family Impact Seminars (NCFIS) include annual seminars, briefing reports and follow-up activities designed specifically for state policymakers, including legislators and legislative staff, the governor and executive branch staff, and state agency representatives. The Center for Child and Family Policy at Duke University convenes the seminars. With materials made publicly available on the Center's website following each seminar, the reach of NCFIS extends to a wide range of organizations and individuals including state and local government officials, leaders of nonprofit agencies, and scholars from Duke and other institutions of higher education.

The seminars provide objective, nonpartisan, solution-based research on a topic of current concern to state policymakers. The seminars address how policies and practices impact children and families. Each year, topic selection is guided by legislators and legislative staff based on their concerns and those of their colleagues and constituents, as well as their knowledge of what is likely to be addressed during current and future legislative sessions.

Through NCFIS, research, information and insight related to policy, practice and programs are presented in two ways:

1) By experts who present and interact with stakeholders at the seminar; and
2) Through briefing materials produced for the seminar.

What is Family Impact?

Family Impact Seminars encourage policymakers to consider the *family impacts* of policies in the same way they assess the economic and environmental impacts. In doing so, the seminars ask policymakers to consider what effect(s) a proposed policy (or program) will have on families.

The 2011 seminar focuses on childhood obesity, a timely and critical topic considering that health care costs continue to rise in part because of problems stemming from obesity. This has implications for state and federal budget challenges. Because being overweight or obese in early childhood has negative impacts on future life outcomes, the seminar's specific focus is early childhood and related farm to preschool strategies and policy options.

Policymakers make decisions based on information from diverse sources. Family Impact Seminars strive to ground the decision-making process in objective research and in policy options that consider *family impact*.

Past seminar topics include: school suspension, evidence-based policy, dropout prevention, juvenile justice, children's mental health, and Medicaid cost containment. For more information about the Family Impact Seminar series, please visit http://www.childandfamilypolicy.duke.edu/engagement/ncfis.php

Executive Summary

This report, *Preventing Childhood Obesity: Policy and Practice Strategies for North Carolina,* was prepared for the 2011 North Carolina Family Impact Seminar. The report focuses on ways in which farming and early childhood education communities can collaborate to combat obesity among young children. It addresses a number of the issues raised in the 2010 *North Carolina Enhanced Nutrition Standards for Child Care: Final Report to the General Assembly*. http://ncchildcare.dhhs.state.nc.us/pdf_forms/child_nutrition_study.pdf

The childhood obesity problem

More and more people in North Carolina and across the United States are obese. Many of the factors that lead to lifetime obesity start when people are young. Further, childhood obesity leads to negative health outcomes across an individual's lifetime.

The negative health consequences of childhood obesity impact entire communities and society as a whole, through higher health care costs, poorer school performance and lower worker productivity. Overall health is a key component of many indices that rank states and communities as desirable places to live and work.

Why focus on child care and the farming community?

What young children eat has both short- and long-term impacts on obesity. Therefore, given the number of meals that many young children eat in child care, child care settings have the potential for significant positive – and negative – impacts on obesity and other aspects of childhood health.

Research shows that what children eat in preschool matters. Research also shows that children enrolled in child care in North Carolina and most other states do not consume enough fruits and vegetables to optimize good health and minimize the likelihood of becoming obese. Furthermore, in addition to research showing that what children eat when they are young influences what they eat as they get older, gaining excess weight at a young age appears to make it harder for many people to maintain a healthy weight when they are older. Ensuring that preschoolers eat more fresh fruits and vegetables is one strategy to reduce current *and* future obesity.

This report focuses on the youngest children and the role of farming for the following two reasons, among others:

1) North Carolina's strong agriculture sector is well-positioned to have positive impacts not only on young children and their families but also on farmers and their families. With farmers increasingly challenged to sustain their livelihood, creating additional customer bases for locally grown fruits and vegetables by linking farmers

with early childhood programs has the potential for both economic and long-term health benefits.

2) Child care facilities – preschools, child care centers and in-home child care providers – are ripe venues for implementing farm to early childhood initiatives. These facilities often have more flexibility to be innovative than schools, they are located in over 8,500 rural and urban settings across North Carolina, and they serve over 240,000 children across the state annually.

The large number of early childhood settings raises challenges and opportunities for partnerships with the farming community. Experience demonstrates that with the involvement of well-placed intermediaries, many of the challenges are surmountable.

Challenges and possible solutions

Obstacles to increasing the consumption of fruits and vegetables in preschool settings include cost, logistics, administrative and legal issues, and knowledge, attitudes and behaviors. These obstacles can be overcome by using effective strategies and public policies that can encourage farm to preschool programs. The briefing report draws heavily on lessons from existing farm to school policies and programs that are applicable to "farm to preschool," as well as from recent research on farm to preschool programs.

Farm to preschool programs can address early childhood obesity by:

- Increasing the knowledge of educators, parents and children.
- Making fresh produce more desirable to educators, parents and children.
- Making healthier foods more readily available to preschoolers.
- Lowering the cost for child care providers.

The report provides:

- An overview of state and federal policies and programs in the farm to school and farm to preschool arenas.
- Examples of relevant programs in North Carolina and other states.
- Options state policymakers may consider in order to actively support the eradication of early childhood obesity.

The report includes the following briefs:

Brief 1 summarizes research on the growing problem of childhood obesity and early childhood obesity in particular. The brief summarizes key causes and consequences of the problem.

Brief 2 focuses on the problem of childhood obesity in North Carolina with a focus on early childhood years.

Brief 3 is a chart of state and federal programs and policies related to childhood obesity

with an early childhood and farming focus.

Brief 4 highlights six farm to preschool and preschool garden strategies for addressing early childhood obesity and examples of these strategies in North Carolina and other states.

Brief 5 highlights policy approaches that support farm to preschool and preschool garden strategies for preventing early childhood obesity.

Enhancing and complementing the briefs are five appendices:

- A list of **organizations and other resources** to assist policymakers and practitioners in their decision-making.
- A **glossary** of terms relevant to childhood obesity.
- A list of **acronyms** relevant to early childhood obesity.
- **North Carolina Taking Steps to Address Childhood Obesity,** a recent press release from the NC Department of Health and Human Services.
- An **annotated bibliography** of research studies related to childhood obesity with an emphasis on early childhood and farm to school/preschool.

Brief 1

Causes and consequences of childhood obesity: What the research says

Maeve Gearing, MPP

What is childhood obesity?

Obesity is identified by body mass index (BMI). BMI represents the ratio of weight to height adjusted for sex and age. Collecting information about individuals' BMI provides insight about obesity trends in a particular area, such as North Carolina, and how it compares with other states. A child is considered *obese* if his or her BMI is above the 95th percentile for gender, age and height, based on standard child measurements set by the Centers for Disease Control. A child is determined to be *overweight* if his or her BMI is at or above the 85th percentile. BMI is the most widely used measure of obesity and helps identify problems, the first step in looking for solutions.

Causes of childhood obesity

The usual formula for becoming obese is well-known: too many calories taken in and too few calories expended results in weight gain. Genetics, nutrition and physical activity can all impact the way children take in and expend calories. Complicating this picture is the way each factor interacts with the others. Understanding each factor helps identify where policy and practice can make a difference and helps guide the use of resources.

Genetics

There is strong circumstantial evidence that the tendency towards obesity is heritable. This means that children of obese parents are *more likely* to become obese, not that they *will* become obese.[1] Gene studies may also explain why children become obese. These interrelated factors make combating early childhood obesity particularly important. New research into the way genes and the environment interact may help develop ways to address those most at risk of becoming obese.

Recent studies of leptin, a hormone governed by genetic receptors, offer potential explanations for the rapid rise in obesity in recent decades among both adults and children. Leptin controls sensations of hunger, and signals sent between receptors and the brain help people realize they are full after eating. *People with leptin insensitivity may not be able to regulate hunger, leading to overconsumption and obesity.* Because the body stores leptin in fatty tissue, fat mass has a major impact on leptin insensitivity. The result is that individuals who are already overweight are more likely to become insensitive to leptin and become obese.[2] It may be that as people get heavier (either through genetics, poor eating habits or lack of physical activity) they become insensitive to leptin and experience an even greater rise in weight. This may help explain why the most rapid rise in weight has been among the heaviest people.

Leptin insensitivity can start early in life. Research indicates that *fat mass appears to be set in*

the first few years of life and that infants at the highest end of the weight distribution are those most likely to be obese later in life.[3] One implication of this line of research is that preventing young children from becoming overweight and obese may combat the genetic tendency of the most at-risk part of the population to become obese.

Nutrition

Poor nutrition is the most commonly named cause of childhood obesity. For most of human history, lack of nutrition has been a pressing concern and hunger remains an everyday threat in many countries. In the United States, however, overnutrition and malnutrition have supplanted hunger as a public health problem. Children and adults in the United States consume more calories than they used to and the composition of those calories also has changed.[4]

North Americans eat more calorie-dense foods like grains and sugars today than in the past. They also eat more processed foods than in past years and fewer fresh fruits and vegetables. As noted above, there are multiple causes for this shift but the most prominent is likely the change in the price of food. Compared with fresh fruits and vegetables, other foods have become less expensive over time, especially calorie-dense processed foods. New farming, processing and transportation costs have all resulted in making calorie-dense food relatively cheaper than less calorie-dense fresh fruits and vegetables.

At the same time, the demand for processed foods, which have more calories, has also increased. Hours worked have increased and more women, traditionally the cooks in many families, have joined the workforce, leaving less time to prepare food. At the end of a work day, more people reach for the "TV dinner" or eat at a fast food restaurant, resulting in the consumption of more high-calorie, low-nutrient food and fewer fresh fruits and vegetables.

Studies have found an increase in marketing of energy-dense foods to young children and a corresponding rise in their consumption.[5] This is problematic because, as previously noted, childhood eating patterns and taste preferences are set early. Studies have shown that once exposed to certain kinds of calorie-dense foods, people often start to crave them and choose them over healthier options like fresh fruits and vegetables.[6] Studies also indicate that when done properly, exposing children to more fruits and vegetables can increase lifelong preferences for healthier foods.[7] *While young children may be especially quick to develop a taste for calorie -dense foods, there is increasing evidence that exposing children to fresh fruits and vegetables, especially if the children are involved in growing plants or in seeing them grown by farmers, has the potential to alter food preferences and lifetime eating behavior.*[8]

Physical Activity

Physical activity is the second most commonly-cited cause of obesity. Increases in food consumption could be offset with enough exercise but that balance is not being achieved on a large enough scale and among enough people to make a significant difference. Electronic distractions – such as television, video games and computers – are increasingly taking the place of outside play. One study found that children spend approximately 20 hours per week — nearly three hours a day — in front of a screen.[9] Like diet, these activity patterns often begin early in life.

Consequences of childhood obesity

While the causes of childhood obesity are often difficult to untangle, the consequences are often all too clear. Research suggests a host of physical and psychological correlates of being overweight or obese in childhood, all of which may significantly reduce quality of life.[10] Physically, it is important to realize that being overweight is often a lifelong condition; of those who are obese in childhood, approximately half will be obese as adults.[11] Obesity in childhood thus places children at risk for a host of later medical issues, including:

- Heart disease;
- Hypertension;
- High cholesterol;
- Diabetes; and
- Early mortality.

Multiple studies have found that obese adults have a reduced quality of life, mostly due to reduced physical functioning.[12]

Even in childhood, the physical consequences of obesity can be severe. There are higher rates of diabetes, hypertension, sleep apnea, and asthma among obese youth than among non-obese youth. Paralleling increases in childhood obesity, rates of diabetes and pre-diabetes among children have risen alarmingly in the past 20 years, with a particularly rapid rise in the past decade. If left untreated, diabetes can result in kidney damage, loss of vision and later risk of dementia and Alzheimer's disease. While diabetes may be controlled medically, these medications can have unpleasant side effects and may require daily injections of insulin. Hypertension is also on the rise and associated with faintness and shortness of breath. Less common but also increasing are problems like sleep apnea, asthma and other breathing troubles among younger and younger children.[13]

Equally problematic are the psychological consequences of childhood obesity. Several studies have found that overweight and obese children suffer from poor body image, low self-esteem and higher rates of depression and anxiety.[14] Put bluntly, they feel bad about themselves. These beliefs can lead to dangerous behaviors such as eating disorders or self-harm.

The picture that emerges is of a condition with multiple causes and severe consequences. It may be tempting to throw up one's hands, but there are many opportunities to intervene and change the amount and type of food consumption and physical activity environments, especially for young children. Each of these opportunities offers the possibility of reducing childhood obesity and improving child well-being. The rest of this report highlights many of those opportunities.

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Brief 2

The childhood obesity problem in North Carolina and why focusing on the youngest children makes sense

Kelly Evans, MPH and Joel Rosch, PhD

North Carolina's children are much more likely to be overweight or obese today than they were ten years ago. Elsewhere in this report, we explain why this matters for the future health of North Carolina's children and families. We also describe multiple strategies the state can adopt to reverse this trend as well as potential policy action for legislators. This brief describes some of the key childhood obesity issues facing North Carolina and highlights why it is important to address this problem even before children begin school.

Obesity among young children in North Carolina

Like much of the rest of the country, North Carolina is seeing increasing numbers of overweight and obese children. North Carolina has the eleventh-highest rate of childhood obesity in the country, putting hundreds of thousands of future North Carolinians at great risk of the numerous health problems associated with being obese.[1]

In 2009, the last year for which there is reliable information, about 30 percent of North Carolina's children under the age of five were considered either overweight or obese.* About half (14.8 percent) of these children were considered obese. For children under age two, 15.2 percent were classified as obese and another 15.9 percent were considered overweight.[2] In 1990, about 8 percent of North Carolina youth under age five and 9 percent under age two were considered obese.[3] Children who are either obese or overweight at such a young age are more likely to become obese adults.

The chart below shows the dramatic increase in obesity among young children over the past twenty years.

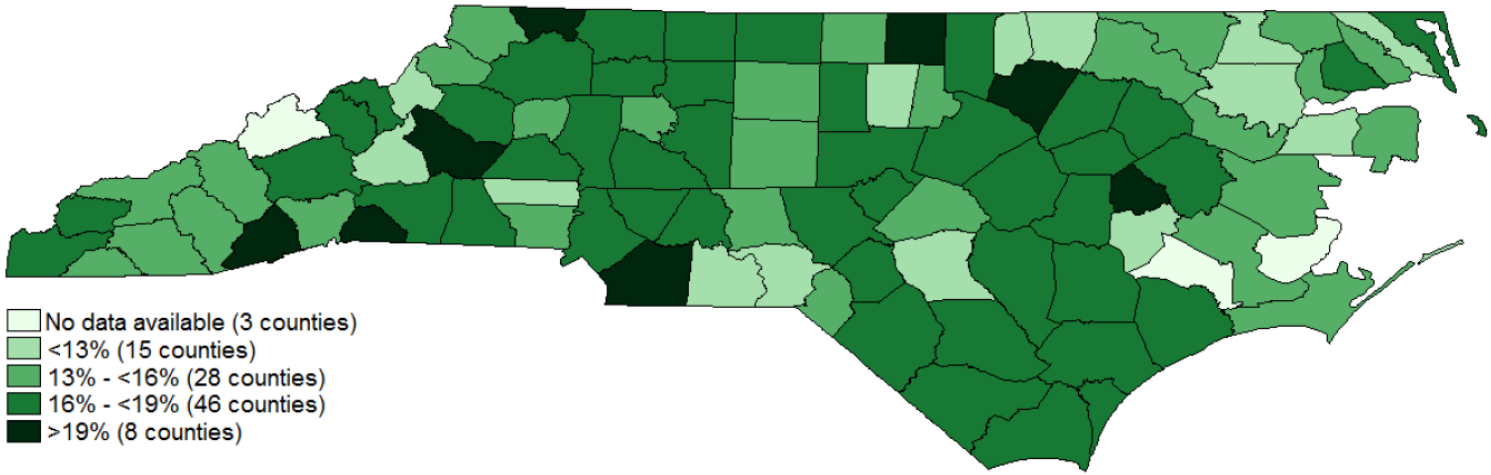
North Carolina and the Childhood Obesity Epidemic

	1990	2000	2009
Obese children under age 5	8.2% 137,305	13.3% 149,911	14.8% 211,827
Obese children under age 2	8.8% 48,665	12.8% 66,317	15.2% 104,323

Early childhood overweight and obesity rates vary across the state. On the next page, the first map shows prevalence of overweight by county. The second map shows prevalence of obesity.

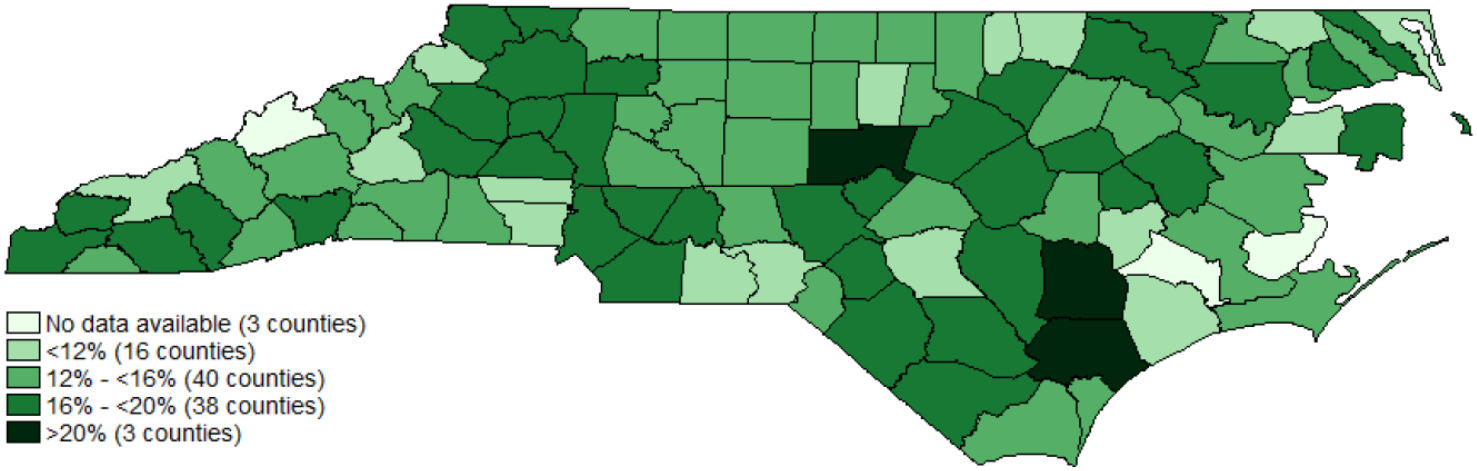
*Nationally, most of the information available about early childhood obesity comes from surveys of children in contact with public assistance programs and public health clinics. While these surveys do not cover all children, they provide a picture of obesity trends n North Carolina and allow comparisons between North Carolina, other states, and the rest of the nation. Once children reach school age, available data from school-based surveys are more representative of the overall child population.

Prevalence of overweight* in children 2 through 5 years of age by county in 2009



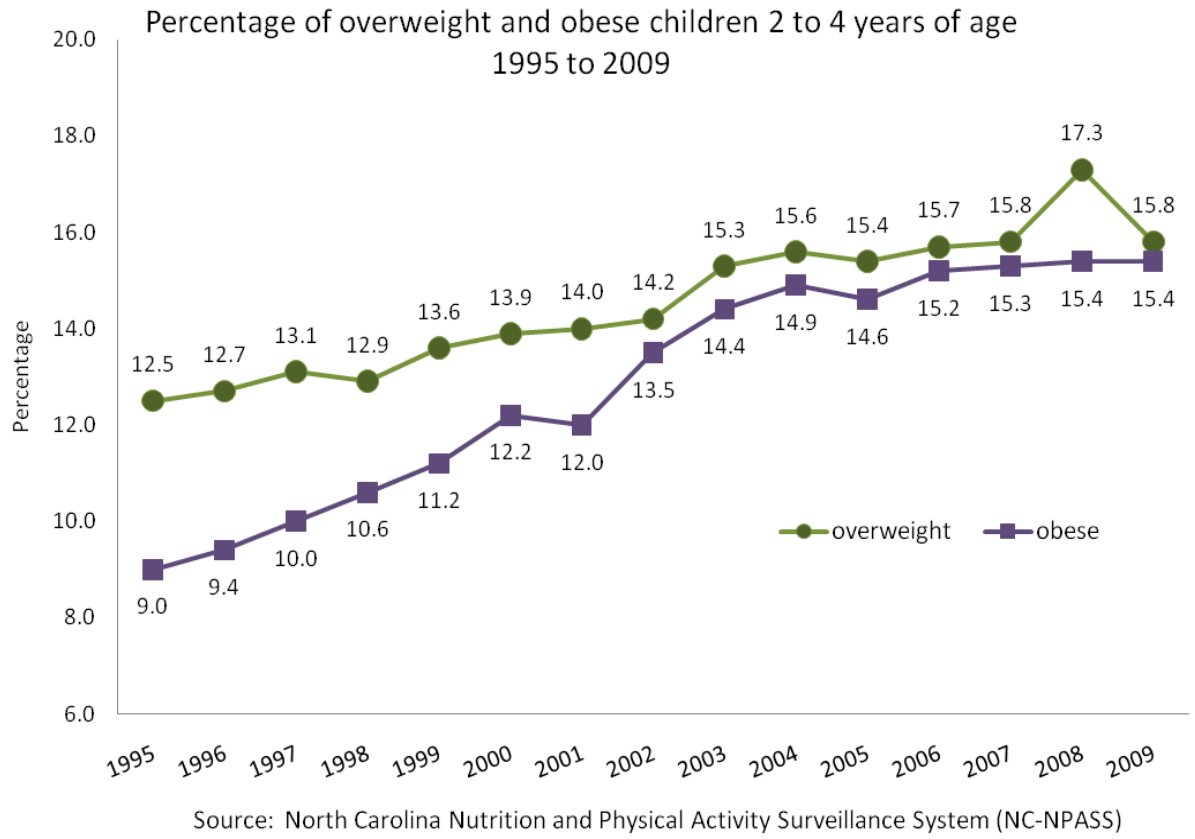
Source: North Carolina Pediatric Nutrition Surveillance System (NCPedNSS)
*Overweight is defined as a Body Mass Index (BMI) at or above the 85th percentile and lower than the 95th percentile for children of the same age and sex using CDC Growth Charts, 2000.

Prevalence of obesity* in children 2 through 5 years of age by county in 2009



Source: North Carolina Pediatric Nutrition Surveillance System (NCPedNSS)
*Obesity is defined as a Body Mass Index (BMI) at or above the 95th percentile for children of the same age and sex using CDC Growth Charts, 2000.

The figure below shows how overweight and obesity rates have increased since 1995. In more concrete terms, about 30,000 young children are at increased risk for heart disease, diabetes and other ailments related to obesity.[4] Rising obesity makes current and future North Carolinians less healthy, resulting in higher health care costs for families, employers and the government. These rising costs, in turn, have the potential to make North Carolina a less attractive place to live and to work.



Opportunities presented by child care

One of the most promising areas for addressing the childhood obesity problem is through child care facilities such as child care centers, home child care providers and preschools. There are about 540,000 children in North Carolina under the age of five. Of those, as of 2010, approximately 240,000 are enrolled in about 8,500 regulated child care centers.[5] Most of these children eat at least two meals a day at the centers, meaning that they may eat as many meals at their child care facility as they eat at home.[6] Therefore, improving the nutrition of the food that children eat in child care facilities presents an opportunity for North Carolina to address its obesity problem.

As discussed elsewhere in this report, eating patterns are established early. What young children eat during their first years of life can alter their preferences for healthy and unhealthy food and even change the physiology of how they approach food when they are older. In addition to the opportunity to serve more healthy food, child care providers have direct access

to parents, providing opportunities to support parents' efforts to serve healthier food to children when they are at home.[7]

The best available information about nutrition in North Carolina's child care facilities shows that most children in child care consume far less than the five to nine servings of fruits and vegetables per day as recommended by health and child nutrition professionals. One study found that these children consumed only 1/3 of a serving of fruit and 1/4 of a serving of vegetables per day in child care.[8] Meals provided at child care facilities appear to be especially low on fresh vegetables, which have numerous health benefits. North Carolina is missing opportunities to help children develop healthy eating habits.[9] Parents agree. When asked, parents have expressed wanting their children to receive more fruits, vegetables and other healthful foods in child care.[10]

Improving the nutrition of foods provided to children in child care, however, cannot be the responsibility of child care providers alone. Providers not only need to be knowledgeable about nutrition, but also need support for implementing strategies and policies that work. The rest of this document provides further detail about potential strategies and policy options for providing healthier food to young children and combating the early childhood obesity problem.

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[1] http://www.nutritionnc.com/pdfPregPed/PedNSS/2009/StateTableInfantsandChildrenUnder5Years.pdf

[2] http://www.eatsmartmovemorenc.com/Data/Texts/Quick%20Facts.pdf

[3] http://ncsustainablefood.wordpress.com/working-issue-groups/public-health-food-access-disparities

[4] http://www.nutritionnc.com/pdfPregPed/PedNSS/2009/StateTableInfantsandChildrenUnder5Years.pdf

[5] http://ncsustainablefood.wordpress.com/working-issue-groups/public-health-food-access-disparities/

[6] http://ncchildcare.dhhs.state.nc.us/general/mb_snapshot.asp#Child Care Highlights

[7] http://hugh.ncsmartstart.org/advancing-child-health/childhood-obesity See also Benjamin, S.E., Ammerman, A., Sommers, J., Dodds, J., Neelon, B., & Ward, D.S. (2007). Nutrition and physical activity self-assessment for child care (NAP SACC): results from a pilot intervention. *Journal of Nutrition Education and Behavior,* 39(3).

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Brief 3

Farm to school and farm to child care: Summary of policies and programs

Jeannine Sato and Jenni Owen, MPA

This compilation of policies and programs has three sections:

Table I. Farm to School/Child Care Policy: State Legislative Action outlines major farm to school policy initiatives in all states. There are no specific farm to preschool policies in place; however, farm to school policies may be adapted to serve the 0-5 child care population.

Table II. Farm to Preschool/Child Care Programs Across States is a compilation of program models around the country that specifically link farms and child care facilities. This is a partial list. More localized programs may exist.

Table III. Federal Policies and Programs provides a synopsis of recent federal farm to school policies and programs.

NOTE: The language reflected in this document pertaining to state and federal legislation is printed here as it appears in the sources listed below.

TABLE I: POLICY
Farm to School/Child Care Policy: State Legislative Action

STATE	POLICY: LEGISLATIVE ACTION
Alaska	**AK HB 93 - Act relating to school, gardens, greenhouses, and farms (2011, proposed)** - Would allow school districts to engage a nonprofit corporation to operate a school garden, greenhouse, or farm. **AK HB 70 Farm To School Program (2010, enacted) -** Establishes a farm to school program in the Department of Natural Resources; with provisions related to school gardens, greenhouses and farms.

California	**CA AB 2084 Healthy Beverages in Childcare (2010, enacted) -** Requires licensed child day care facilities to serve only low-fat (1 percent) milk or nonfat milk to children two years of age or older; to limit juice to not more than one serving per day of 100-percent juice; and to serve no beverages with added sweeteners, either natural or artificial, except for infant formula or complete balanced nutritional products designed for children. Also requires child day care facilities to make clean, safe drinking water readily available throughout the day. **CA SB 1413 Schools: pupil nutrition: availability of tap water (2010, enacted) -** Requires school districts to provide access to free, fresh drinking water during meal times in school food service areas by July 1, 2011. It allows school districts to comply by providing cups and containers of water or soliciting or receiving donated bottled water. It provides a mechanism for a school district to state that it is unable to comply with this requirement due to fiscal constraints or health and safety concerns.
Colorado	**CO SB 81 Farm to school healthy kids act (2010, enacted)** - Promotes consumption of healthy foods at schools and in state-regulated child care programs by encouraging increased use of local farm and ranch products in food service, especially in the school meals program, to improve child nutrition and strengthen local and regional agricultural economies. Establishes a 13-member interagency farm-to-school task force to develop a state farm to school program. **CO SB 33 Early Childhood Ed Services Free Lunch (2009, enacted)** - Expands the list of students who qualify to receive a free lunch to include children enrolled in public school early childhood education programs who are eligible to receive a reduced-cost lunch under the federal National School Lunch Act. The bill eliminates the reduced price that these eligible students would otherwise pay for school lunches. It directs the general assembly to annually appropriate not less than $850,000 and not more than $1.5 million to the Department of Education to provide lunches at no charge.
Connecticut	**CT HB 5360 An Act Concerning Children in the Recession (2010, enacted, Public Act 10-133)** Among other provisions, ensures that federal nutrition programs are as accessible as possible to children during the recession by reducing current response times to clients for safety net programs, including, but not limited to, the federal Supplemental Nutrition Assistance Program, the federal Special Supplemental Food Program for Women, Infants and Children, the National School Lunch Program and other federal child nutrition programs, the temporary family assistance program, the child care subsidy program, heating and rental assistance, eviction prevention services and free and reduced preschool meal programs.

District of Columbia	**DC B 564 The Healthy Schools Act (2010, enacted)** - The Healthy Schools Act creates a comprehensive program to promote healthy eating and active living in schools. Provisions related to school nutrition establish local nutritional standards for school meals, healthy vending, fundraising, marketing and prize requirements in public schools; require public schools to participate in federal meal programs whenever possible; require schools to solicit feedback about healthy meals, provide public disclosure of ingredients, origin of fruits and vegetables, and the nutritional content of school meals; and allow at least 30 minutes to eat lunch. Establishes a farm to school program and creates a preference and a financial incentive to serve locally grown, unprocessed foods in schools and requires an annual report and recommendations on farm to school initiatives. Requires teaching about the benefits of fresh, local foods. Creates a school gardens program to issue grants to support the development of school gardens; requires a report and recommendations about school gardens; and permits the sale and consumption of food grown in school gardens. Funds certain programs and requirements.
Florida	**FL SB 140, FL HB 1619 Florida Farm Fresh Schools Program (2010, enacted) -** Creates a Florida Farm Fresh Schools Program and Service in the state's department of education and requires the department to work with the state's department of agriculture and consumer services to recommend policies and rules for school food services to the State Board of Education to encourage schools and school districts to buy fresh and local food and to provide outreach services regarding the benefits of fresh food products.
Georgia	**GA HB 367 - Encourage use of Georgia-grown farm products (2011, proposed)** Facilitate the purchase of Georgia-grown food by state agencies and institutions, provide for the operation of school gardens and farms, and provide for a farm to school program to promote the sale of Georgia-grown farm products to county and independent school districts.
Hawaii	**HI SB 1451 - Designate October as "Farm to School Month" (2011, proposed) -** Would designate October as "Farm to School Month." **HI HB 1380 - Establishes farm-to-school program (2011, proposed)** - Would establish a farm to school program to increase procurement of locally grown fruits and vegetables. **HI HRes 113 - Task force to expand school garden program (2011, proposed)** - Would convene a task force to explore ways to expand the school garden program statewide. **HI HRes 223 - Expand use of school gardens (2011, proposed)** - Would request the Department of Education to convene a task force to determine how best to expand and strengthen the use of school gardens statewide.

Illinois	**IL SB 615 The Farm to School Electronic Database (2010, enacted) -** Requires the Department of Agriculture to establish, and make available on its website, a geo-coded electronic database to facilitate the purchase of fresh produce and food products by schools. The database must contain information necessary for schools to identify and contact agricultural producers that are interested in supplying schools with fresh produce and food products.
Indiana	**IN HB 1305 - Farm to school plan (2011, proposed)** - Would require the department of education to develop a "farm to school" plan for the purpose of providing children with locally produced foods in school breakfast, lunch, and snack programs.
Louisiana	**LA HB 452 Child care physical activity (2011, proposed)** - Relative to licensed child day care facilities; to provide for a minimum standard for child physical activity; to provide for a limitation on child sedentary activity; to provide for certain duties of the Louisiana Advisory Council on Child Care and Early Education; to provide relative to definitions, standards, and guidelines for physical activity programs.
Maine	**ME HB 1060 - Establish Maine Farm and Fish to School Program (2011, proposed) -** The Maine Farm and Fish to School Program is established within the department to promote, market and facilitate the sale of food grown or raised and fish raised or caught by Maine food producers to primary and secondary schools and post-secondary educational institutions. The commissioner shall administer the program in consultation with the Department of Education and the Department of Health and Human Services, Maine Center for Disease Control and Prevention.
Maryland	**MD HB 528 - Planting and Maintaining School Gardens (2011, proposed) -** Would permit the use of open space for the planting of school gardens, the incorporation of curriculum with the gardens, and the use of the produce in school cafeterias. **MD HB 751 - Reporting on Farm to School (2011, proposed) -** Would require schools participating in Farm to School to report annually the types and amounts of farm products purchased from farms in the state.

Massachusetts	**MA HB 4459, MA SB 2322 (2010, enacted)** - Directs the state's department of public health to establish healthy standards for snacks and beverages sold in school vending machines, school stores, and cafeteria à la carte lines. These standards must be in accord with scientific guidelines that encourage greater consumption of water, low- and non-fat milk, and juice; reduced fat and sugar in snacks; and increased consumption of fresh fruits and vegetables. By the 2012 – 2013 school year, the law requires schools to offer drinking water, fruits and vegetables wherever food is being sold on school campuses. Makes it easier for schools to purchase directly from Massachusetts farmers in order to support the state's agricultural economy and help schools access local healthy produce. Establishes a Commission on Childhood Obesity to develop a coordinated statewide plan to implement the program. **HB 4568 Establishing the Massachusetts food policy council (2010, enacted) -** Establishes a food policy council to develop recommendations to increase local food production and state acquisition of local products for school, summer meals and child care programs.
Mississippi	**MS HB 1078 Healthier School Initiative (2010, enacted) -** Requires the State Department of Education, as part of the state's Healthier Schools Initiative, to provide financial incentives to schools receiving recognition through the program for promotion of good nutrition and physical activity. Requires local school districts to include relevant information on their web sites and to provide technical assistance. Requires review of program applications by the state's department of agriculture. **MS HB 1079 Dept of Ed. Food Service Training (2010, enacted)** - Requires the Office of Healthy Schools in the Department of Education to provide comprehensive training on food service practices to specified personnel in local school districts. **MS SB 2678 - Enact Sweetened Beverages and Syrups Tax Law (2011, proposed)** -Would impose an excise tax of $.02 per ounce on certain sweetened beverages, with 20% going to a Children's Health Promotion Fund.
Missouri	**MO HB 344 - Create the Farm to Table Advisory Board (2011, proposed)** Assist schools and other entities with education campaigns that teach children and the general public about the concepts of food production and consumption; the interrelationships between nutrition, food choices, obesity, & health; and the value of having an accessible supply of locally grown food.
Montana	**MT HB 267 - Revise day-care licensing requirements to promote early childhood health (2011, proposed) -** Would revise day-care licensing requirements to include implementation of nutrition guidelines for snacks and meals, support of nursing mothers, opportunities for physical activity, and limitation of television viewing.

Nevada	**NV SB27 Child care health and wellness (2011, proposed)** - Requires employees of certain child care facilities to complete training each year relating to the lifelong wellness, health and safety of children.
New Mexico	**NM SB 123 - Establish farm to school program (2011, proposed) -** Would establish a farm-to-school program to supply school lunches with locally grown produce. **NM SB 63 - Procurement of locally grown produce by state agencies (2011, proposed) -** Establish a requirement ensuring that: food purchased by state agencies and local public bodies is produced in New Mexico; the total dollar amount of food purchased meets minimal percentage requirements, as follows: 2.0 percent by July 1, 2012; 5.0 percent by July 1, 2014; and 10.0 percent by July 1, 2016; and the requirement is binding on all competitive bids submitted.
New Jersey	**NJ HB 2854 Establishes the "Jersey Fresh Farm to School Week" (2011, proposed) -** Would establish a yearly week-long celebration of events that highlight and promote the value and importance of New Jersey agriculture and fresh foods produced in NJ, and the value and importance of fresh farm foods for children.

North Carolina	**NC HB 1726 Improve child care nutrition and activity standards. Companion bill is SB 1287 (2009, proposed)** - Would require the Child Care Commission to develop improved nutrition standards for child care facilities, and to direct the Div. of Child Development to study and recommend guidelines for increased levels of physical activity in child care facilities, as recommended by the Legislative Task Force on Childhood Obesity. **NC HB 1777 Study Child Nutrition Program. Companion bill is SB 1152 (2009, proposed)** - Would authorize a study of the indirect costs of the child nutrition programs, as recommended by the Legislative Task Force on Childhood Obesity. **NC HB 1726 (2010, enacted)** - Requires the state's Child Care Commission to consult with the state's Division of Child Development in the Department of Health and Human Services, to develop improved nutrition standards for child care facilities. Directs the Division to study and recommend guidelines for increased levels of physical activity in child care facilities. Directs the Division of Public Health to work with other entities to examine and make recommendations for improving nutrition standards in child care facilities, all as recommended by the Legislative Task Force on Childhood Obesity. **NC SB 1152, HB 1777 Study Child Nutrition Program (2010, enacted)** - Authorizes the state's Joint Legislative Program Evaluation Oversight Committee to direct the Program Evaluation Division to study indirect costs under child nutrition programs, as recommended by the Legislative Task Force on Childhood Obesity. **NC HB 1832 Improve Child Nutrition and Activity Standards (2010, enacted)** - Establishes a position in the North Carolina Department of Agriculture to facilitate the farm to school program to provide technical assistance to increase the amount of North Carolina produce purchased by schools.
Ohio	**OH SB 210 Healthy Choices for Healthy Children (2010, enacted) -** Among other provisions related to school nutrition and health, requires each school district board of education and each chartered non-public school governing authority to adopt nutrition standards for school foods and beverages. Each board and governing authority must consult a licensed dietician and dietary guidelines established by the U.S. Department of Agriculture and the U.S. Department of Health and Human Services in establishing the standards. The standards must comply with minimum criteria set in statute for à la carte food items and beverages.

Oklahoma	**OK HB 2774 Clean Air in Restaurants Act of 2012 (2010, enacted) -** Requires the Department of Health to create a program to certify communities and schools that promote wellness, encourage adoption of healthy behaviors, and establish safe and supportive environments. It establishes a Healthy Communities Advisory Committee and a Healthy Schools Advisory Committee to help the department develop criteria for certification. Certified communities and schools are eligible for grant awards ranging from $2,500 to $10,000 for use in achieving the act's objectives.
Oregon	**OR HB 2800 Relating to Oregon Farm to School and School Garden Program (2011, proposed)** - Would direct Dept. of Education to provide reimbursements to school districts that serve Oregon food products as part of National School Lunch or Breakfast Program, and to award grants for food-based and garden-based educational activities.
South Carolina	**SC SB 812 Create and maintain a program to encourage use of farm products in schools (2011, proposed) -** Would require all snacks, meals, and beverages sold in schools to follow nutritional standards.
Texas	**TX SB 395 and HB 4629 Creation of the Early Childhood Health and Nutrition Interagency Council (2009, enacted) -** Creates the Early Childhood Health and Nutrition Interagency Council to assess the health of children, the significance of nutrition and physical activity in the development of children, and the existence of nutrition and physical activity requirements and practices in early childhood care settings. The council membership includes a representative of the Health and Human Services Commission; the Department of State Health Services; the Texas Workforce Commission; the Department of Agriculture; the Texas Education Agency; the Department of Family and Protective Services; and the Texas AgriLife Extension Service. The bills require the council to develop an early childhood nutrition and physical activity plan with a recommended timeline for implementation over a six-year period. The plan must include measures to increase fruit and vegetable consumption among children under the age of six; increase daily physical activity in early childhood care settings; increase awareness among parents of the benefits of breast-feeding, healthy eating and physical activity in children under the age of six; facilitate the consumption of breast milk in early childhood care settings; decrease malnutrition and undernourishment among children under the age of six; and educate parents and caretakers about the need for proper nutrition.

Virginia	**VA HB 1549 - Purchase of Virginia-grown food products by state agencies and institutions and local school divisions (2011, proposed) -** provides for the Department of General Services to establish procurement procedures to facilitate the purchase of Virginia-grown food products by state agencies and institutions and local public school divisions to the maximum extent possible. The bill also provides local school divisions with an exemption from competitive sealed bidding under certain circumstances when procuring Virginia-grown food products for student consumption. **VA HB 1607 and SB 414 School Nutrition Improvement (2010, enacted) -** Require the State Board of Education, in cooperation with the Department of Health, to create and periodically update regulations setting nutritional guidelines for all competitive foods sold or served to students during regular school hours. The standards must be adopted as the initial statewide standards for competitive foods from either the Alliance for a Healthier Generation's guidelines or those of the Institute of Medicine.
Wisconsin	**WI AB 746, SB 536 Act to promote the use of locally grown food in school meals and snacks (2010, enacted) -** Promotes use of locally grown food in school meals and snacks and creates a Farm to School Council in the state's Department of Agriculture, Trade and Consumer Protection to administer a Farm to School Program and allocate program grants to school districts, nonprofit organizations, farmers, and any other entities for the creation and expansion of farm to school programs. Grants rule-making authority for the administration of these programs.

TABLE II: PROGRAMS
Farm to Child Care Programs Across States

STATE	EXISTING PROGRAMS
California	**Occidental College Farm to Preschool Program** Two-year pilot began in 2009 to link preschools with childcare centers in underserved areas of LA and San Bernardino. http://departments.oxy.edu/uepi/cfj/farmtopreschool.htm
Colorado	**The Garden to Cafeteria Program** There are 50 Denver Public Schools (DPS) school gardens. The Garden to Cafeteria Program (GTC) allows students to grow fresh vegetables in their school gardens with the aim of supplying some of their harvest to the cafeterias. The first season will begin at the start of the 2010-2011 school year. Colorado Farm to School just released a packet of case studies, now available at www.coloradofarmtoschool.org.

Delaware	**Healthy Foods for Healthy Kids** Program began in 2004 as a pilot. In 2008 it became a non-profit organization that began working with Child Nutrition Services (CNS) of the Christina School District to build school gardens and design and implement garden programs aimed at encouraging students to eat more fresh vegetables. They now work with 11 elementary and middle schools in 3 different School Districts (Appendix C). The student-grown vegetables are served in the school cafeterias or in the classrooms during Harvest Celebrations each semester. All students K-5 are involved in at least one garden activity per year that ties in with their curriculum. They plant and harvest each semester crops that grow quickly. They have 2-3 Harvest Celebrations per semester. The cafeteria managers do not rely on the food from the garden. They try to predict what will be ready, when to adjust orders, etc. http://healthyfoodsforhealthykids.giving.officelive.com/default.aspx
Florida	**The New North Florida Cooperative Farm to School Program** A group of innovative African-American farmers formed the New North Florida Cooperative Association Inc. in 1995. Started with USDA grant seed money, now 90 percent sustainable through sales.
Maryland	**Great Kids Farm** Great Kids Farm is a living, working farm that educates children about healthy eating, organic farming and the natural sciences. It is operated by Baltimore City Public Schools. The 33-acre Catonsville farm is integral to the school system's efforts to improve school food and educate children and families about how nutritious foods form the foundation for healthy people and a sound environment. http://www.bcf.org/tabid/168/default.aspx?c=FARM
Massachusetts	**Live Well Springfield** A system where preschools can purchase fresh produce from a local farmer in Hadley, MA. Because the program is a cooperative, preschool centers receive bulk pricing, which actually saves organizations money. http://springfieldhealthdisparitiesproject.pbworks.com/w/page/17864196/Live-Well-Springfield
Missouri	**Farm to Childcare – St. Louis** The Farm to Childcare Program allows child care centers to place an order with Sappington Farmers Market for grocery delivery. Food is used throughout the week for all meals. Parents can also spend $15 to get a bag of fresh, local, seasonal produce with recipes for using fruits and vegetables. Program serves 20 childcare centers.

North Carolina	**Growing Minds** Growing Minds is the Appalachian Sustainable Agriculture Project's Farm to School program. The Growing Minds program works with K-12 schools and preschools to source and promote local food, but it also helps build positive experiences with local food and farms through education components including cooking, school gardens and farm field trips. The program focuses on building capacity within existing systems, including resource development, training, and technical assistance. http://growing-minds.org/ **Watch Me Grow** Watch Me Grow (WMG) is a child care gardening program through Duke University. WMG is a multi-component intervention that includes nutritional counseling to child care providers on low-cost ways to increase fruits and vegetables on the menu, delivery of a curriculum promoting fruits and vegetables to providers and children, and assistance establishing child care center gardens to get providers and children excited about growing their own fruits and vegetables.
Oregon	**Farm to Head Start pilot program** Started in 2008 at three sites. Activities included facilitating farm to school program design, helping childcare facilities to make connections with local food producers and processors to begin purchasing more local products, and promoting complementary food and garden-based education by identifying existing resources and curricular activities to support the inclusion of garden-based education into Head Start program areas. Utilizes the *Early Sprouts: Gardening and Nutrition Experiences for the Young Child curriculum.* http://www.ecotrust.org/farmtoschool/

TABLE III: FEDERAL
Federal Policies and Programs

FEDERAL	POLICIES	PROGRAMS
	FD SB 294 - To enhance early care and education Would provide grants to states to establish a State Early Care and Education System with elements that are informed by data and recommendations from, among others, Preventing Childhood Obesity in Early Care and Education Programs and include the provision of comprehensive services that include health and nutrition. In addition, the programs would provide ongoing promotion of proper nutrition and their evaluation would include the use of health specialists or nutritionist to train or mentor staff.	**Kindergarten Initiative (Food Trust)** http://www.thefoodtrust.org/php/programs/kindergarten.initiative.php The Kindergarten Initiative of the Food Trust promotes healthy communities by teaching young children and their parents about food, farms and nutrition.
	Healthy, Hunger-Free Kids Act of 2010 Allows only lower-fat milk options to be served to children over age two, as recommended in the Dietary Guidelines. Creates nutrition and wellness goals for meals served through the child and adult care food program. Creates Interagency coordination to promote health and wellness in child care licensing. Commissions study on nutrition and wellness quality of child care settings.	

Sources:

Farm to School Programs by state (http://www.farmtoschool.org/states.php)

National Conference of State Legislatures 2010 Update of Legislative Policy Options (http://www.ncsl.org/default.aspx?TabId=22156)

Public Health Law Center (http://publichealthlawcenter.org/news/2010-12-03/congress-passes-important-child-nutrition-bill)

Robert Wood Johnson, States Took Targeted Legislative Action to Prevent Childhood Obesity in 2010 Report: http://www.rwjf.org/childhoodobesity/

Rudd Center for Food Policy and Obesity Research Legislative Database (http://www.yaleruddcenter.org/legislation/)

Brief 4

Farm to preschool and preschool garden strategies to combat early childhood obesity

Sara Benjamin Neelon, PhD, MPH, RD and Kelly Evans, MPH

I. Introduction

Not enough fruits and vegetables

Fruit and vegetable consumption is a key factor in reducing the incidence of obesity and preventing future chronic illnesses such as cardiovascular diseases and certain cancers.[1] Despite recommendations to consume five to nine servings of fruits and vegetables per day, most adults and children consume far less.[2] Young children in North Carolina are consuming fewer fruits and vegetables than recommended.[3] One study found that North Carolina children consumed only 1/3 of a serving of fruit and 1/4 of a serving of vegetables per day in child care.[4] Surveys show, however, that parents clearly want their children to eat more healthy foods.[5]

Too much juice

Another problem is that child care centers often serve juice instead of fresh fruits and vegetables. The Child and Adult Care Food Program (CACFP, described in the next brief in this report and in the glossary) is a federal program that provides reimbursement for eligible meals and snacks to participating child care facilities and sets minimal nutrition standards, including meal patterns and portion sizes.[6] Since CACFP reimburses equally for 100 percent juice or fruit and vegetables, child care programs are more likely to serve juice. Juice is cheaper, easier to serve and has a longer shelf life – but is much less healthy than fruits and vegetables. Juice has been linked to greater risk for obesity. It is not a healthy substitute for fresh fruit or vegetables.[7]

Availability, accessibility and quantity

Availability and accessibility are key determinants in fruit and vegetable consumption by children. Providing more fruits and vegetables to children, especially those that are home grown, increases intake.[8] Serving fruits and vegetables before serving other foods also increases consumption of fruits and vegetables.[9] It appears that garden-based interventions are an especially effective way to increase fruit and vegetable consumption; children enjoy eating what they have grown.[10]

Researchers have found that increasing the amount of vegetables served to preschool children results in greater consumption of healthy food and less consumption of unhealthy food. One study doubled the portion of carrots from 75g to 150g (equivalent to increasing from approximately 2.5 to 5 ounces or from one to two carrots of average size) served to four- to six-year-old children and found that intake increased by 70 percent and 38 percent, respectively, without an increase in total calories.[11] The implication is that these healthy foods were replacing less healthy foods. Experts recommend garden-based interventions to encourage children to eat more fruits and vegetables.[12]

II. Farm to preschool and preschool garden strategies

Farm to preschool and preschool garden strategies are especially promising, given the relatively high cost of fruits and vegetables and lack of availability in some areas in North Carolina. Such strategies not only support local farmers but also are effective at generating interest in fresh produce among young children.

There are a number of strategies that can effectively promote farm to preschool initiatives in North Carolina, a state in which fresh produce grows year-round. North Carolina's climate offers viable growing conditions, ample precipitation and fertile soil. Readers of the online Farmer's Almanac 2008 voted North Carolina the best gardening state.[13]

This brief highlights six strategies for making fresh fruits and vegetables available to children in child care:

- Gardens at child care facilities;
- Community gardens;
- Community supported agriculture;
- Mobile farmers' markets;
- Field gleaning; and
- Buying and selling surplus crops.

Each strategy can increase the availability of fruits and vegetables to child care facilities and provide children, and in many cases their families, access to healthier foods. Moreover, while these strategies are unlikely to be the sole source of a farmer's income, they have a positive economic development component as well.

Gardens at child care facilities

Gardens at child care facilities not only yield locally grown fruits and vegetables, they also provide children with a source of activities that involve movement, educational concepts and creativity. Preschool years are ideal for engaging children in experiential learning activities such as gardening. Young children enjoy playing in the soil and are interested in learning about food and how it grows. Gardening and gardens provide opportunities for physical activity and for illustrating educational concepts in reading, math, art and science. Less tangible benefits from gardening activities include character-building skills and increased self-efficacy. These benefits stem from children's involvement with planting, tending and harvesting their own fruits and vegetables.

A Farm to School report, "Fresh Healthy and Safe Food: Best Practices for Using Produce From School Gardens" (http://www.farmtoschool.org/files/publications_188.pdf), highlights several considerations for growing fruits and vegetables at schools or child care facilities:

- Monitoring compost and manure to ensure quality and safety;
- Using safe and potable water;

- Ensuring soil quality;
- Planting seeds that have not been genetically modified;
- Avoiding the use of synthetic herbicides or pesticides; and
- Avoidance of toxic chemicals in the gardening process.

Examples

Watch Me Grow
The goal of the Watch Me Grow (WMG) program is to increase fruit and vegetable consumption among children attending child care. WMG is a multi-component, six-month-long intervention that includes:

- Providing nutritional counseling to child care providers on low-cost ways to increase fruits and vegetables on the child care menu;
- Delivery of a multi-disciplinary curriculum promoting consumption of fruits and vegetables to providers and children; and
- Providing assistance with establishing child care center gardens to get providers and children excited about growing their own fruits and vegetables.

Child care centers work with a nutritionist who provides consultation to child care facilities on increasing the amount of fruits and vegetables served to children. The companion curriculum, delivered by nutritionists to each participating center, promotes fruit and vegetable consumption through a series of books and activities. Concurrently, the program establishes gardens at child care centers to provide sustainable access to produce that is likely lower cost than elsewhere, while also offering children positive, hands-on experiences with fruits and vegetables.

While garden programs have upfront costs, they also can be undertaken in cooperation with parent groups, religious congregations and civic organizations. Garden projects offer child care centers opportunities not only to secure more fruits and vegetables, but also to form partnerships with community organizations.

Growing Minds
Growing Minds is the Appalachian Sustainable Agriculture Project's Farm to School program. It works with K-12 schools and preschools to source and promote local food, but it also helps build positive experiences with local food and farms through educational components including cooking, school gardens and farm field trips. The program focuses on building capacity within existing systems, including resource development, training and technical assistance.
http://growing-minds.org/

Ecotrust
Ecotrust, a non-profit organization in Oregon, piloted one of the first farm to preschool programs in the country in 2008-2009. Ecotrust partnered with the Oregon Child Development Coalition (OCDC) to connect children in child care with local produce. Ecotrust worked with OCDC to establish pilot farm to school programs at three OCDC child care sites. This initiative helped connect child care facilities to local food producers and processors to encourage

purchasing of local products. One of the primary activities was to install gardens at Head Start program sites.

To complement the garden activities, Head Start programs used the *Early Sprouts: Gardening and Nutrition Experiences for the Young Child* curriculum. *Early Sprouts* addresses young children's inherent fear of new foods through multiple exposures to fruits and vegetables in activities such as sensory exploration, tasting sessions, cooking activities and family recipe kits. OCDC constructed raised beds at each pilot site to support garden-based education and increase the ability of children, providers and parents to make the connection between the food they eat and the land it comes from. OCDC has installed more gardens and is working to establish a statewide farm to preschool program in Oregon. http://www.ecotrust.org/farmtoschool/

Community gardens

A community garden is an alternative to gardens located onsite at child care facilities. It is a plot of land gardened by a group of people that can be found in urban, suburban, or rural locations. Some are single, large community plots; others consist of multiple individual plots.[14] Child care facilities can partner with other community groups to create a community garden, or facilities may procure a plot in an existing community garden. The American Community Garden Association and Child Care Resource and Referral agencies are likely sources of assistance for child care facilities that want to pursue the community garden option independently or in partnerships with other facilities.

For child care facilities that do not have the space or resources for a garden, participating in a community garden exposes young children to gardening and most of the related benefits described in the previous section. Depending on their structure and the types of partners involved, community gardens, like onsite gardens, have the potential to reduce the cost of fruits and vegetables, while children at the child care facilities get to eat the produce they grow.[15] Community gardens also benefit communities broadly, often turning neglected areas into used, green spaces.

Examples

Carrboro Community Garden Project
The Carrboro Community Garden Project is part of the Orange County Partnership for Young Children's Healthy Kids Campaign to address childhood obesity. The Garden Project focuses on families with young children and works with pre-kindergarten classes at an elementary school. Working with community partners including the Orange County Cooperative Extension and the Town of Carrboro, the project provides opportunities for families with young children to grow their own fruits and vegetables and to learn the value of fresh produce and good nutrition. The project was established in 2007 through a two-year grant from the Health and Wellness Trust Fund of North Carolina/Fit Communities Initiative with continuation funding from a Robert Wood Johnson Foundation grant.

Three community gardens have been created, offering space for about 45 families who receive guidance on how to grow fruits and vegetables. Families may also participate in activities such

as cooking classes, gardening workshops and potluck dinners to support their gardening experience and enhance their education. Over 50 families and 100 children have participated in the gardens since the first seeds were planted.
http://www.orangesmartstart.org/page.php?mode=privateview&pageID=61&navID=40

Mebane Community Garden
The Mebane Woman's Club launched the Mebane Community Garden in 2007, enabling local citizens to rent plots to grow their own produce on land that is on loan from the city of Mebane, North Carolina. The fee, which covers maintenance and insurance, is $25 annually for a small plot and $40 for a large plot. The majority of garden members are families with small children. Every eight weeks there is a community work day where families are encouraged to garden together. Many groups of children (4-H, Girl Scouts and others) have leased plots from the garden. To date, child care centers have not leased plots in the garden but that is a possibility for the future. The Mebane Woman's Club has helped to install a vegetable garden at a local elementary school. www.mebanegarden.org

Community Supported Agriculture

Community Supported Agriculture (CSA) is an increasingly popular approach to food distribution that links farmers with residents of their local community who wish to purchase locally grown food. Typically, farms that provide CSA shares are small, independent, family farms. Generally, either prior to or at the beginning of the growing season, individuals pre-order a small share of crops, usually delivered to a central location or picked up weekly from a local farm. In this arrangement, farmers and consumers share the benefits as well as the uncertainties of growing local foods. Since participants pay up front, CSAs provide farmers with a guaranteed amount of funding to support their work throughout the growing season. In addition to what they receive from pre-orders, CSAs may sell their surplus directly to their customers. Fruits and vegetables are the most common crops provided through CSAs.

In the context of child care, farmers involved with CSAs often seek additional distribution outlets and new customers. Child care facilities are promising partners. Farmers can supply local produce directly to the child care facility or use an intermediary to facilitate the arrangement. Facility staff and children's parents may also benefit through arrangements that let them purchase the food for home use. Child care settings also offer a potential market for farmers to sell additional CSA shares or surplus produce to parents when they pick up or drop off their children. Multiple child care providers may be able to pool their resources to purchase a larger CSA share of produce at a reduced cost. Through CSAs, money spent on fruits and vegetables stays within the region or state and supports the local economy. As a result, CSAs can provide healthy foods to young children and support local and regional farmers.

A few states have enacted legislative and policy changes to facilitate farm to school programs such as CSAs. Although much of the current legislation focuses on K-12, child care facilities can also benefit from farm to preschool efforts.

Examples

Live Well Springfield Farm to Preschool project
The Live Well Springfield Farm to Preschool project aims to provide local fruits and vegetables to children in child care. Local preschool organizations in the Springfield, Massachusetts area and the Food Bank of Western Massachusetts joined forces to create a system that allowed preschool programs to purchase fresh produce directly from a local farmer in Hadley, Massachusetts. Providing fresh local produce to children supports the local economy, enhances the local food system and enables child care programs to serve nutritious foods at a reduced cost. Because the model is cooperative in nature, the participating child care programs receive bulk prices even though the deliveries and billing are done individually.
http://springfieldhealthdisparitiesproject.pbworks.com/w/page/17864196/Live-Well-Springfield

Britt Farms and Coon Rock Farms
Britt Farms in Mount Olive, NC, and Coon Rock Farms in Hillsborough, NC, offer CSA shares to schools at a reduced cost and have said they could do the same for child care facilities. Unlike schools, most child care programs operate year-round, allowing CSAs to provide fruits and vegetables to children for much of the year and an ongoing source of income for the farmers. http://www.brittfarms.net/ and http://www.coonrockfarm.com/

Mobile farmers' markets

Mobile farmers' markets are small markets that travel to designated sites at specific times. They typically consist of a vehicle, often a bus or large truck, filled with produce from one or more farms that travels to various sites to sell produce. A mobile market may also be an individual or individuals who gather in a designated location to sell produce. The distinguishing characteristic of a mobile famers' market is the lack of a permanent space or structure where the market is held. Mobile farmers' markets usually have set schedules for when and where they will be.

Mobile farmers' markets could provide convenient access to fresh fruits and vegetables for child care facilities and the families who use them. Traditional farmers' markets are open a limited number of days for set hours, making it difficult for many potential consumers, including child care staff, to attend. Child care facilities can coordinate with local farmers' markets associations, cooperative extension programs or local farmers to establish mobile markets at the facilities, both as a means of purchasing food for use by the preschool food service and by providing parents and staff locally grown, accessible, fresh produce. Doing so at convenient locations and times — for example when parents are picking up children from child care — may encourage families to buy fruits and vegetables.

Including parents is critical, as they can reinforce the healthy eating concepts children learn at preschool. Children imitate the behavior of parents and, if the family is consuming fresh produce, the child is likely to as well. In fact, studies suggest there is a positive association between a mother's consumption of fruit and children's intake of fruit.[18] Many mobile farmers' markets also provide education about what the food is and how to cook it. Increasing parents' understanding of what constitutes healthy food and why healthy eating is important is a critical

step in preventing childhood obesity.

Mobile farmers' markets are especially valuable as a means of providing access to fresh fruits and vegetables in locations where fresh produce is scarce or completely inaccessible. These areas are often referred to as food deserts, which, according to the Centers for Disease Control and Prevention, are "areas that lack access to affordable fruits, vegetables, whole grains, low-fat milk and other foods that make up the full range of a healthy diet."[17] Food deserts can exist in both urban and rural communities. North Carolina is home to many such areas. Mobile famers' markets not only increase access but can also reduce the overall costs of purchasing fresh fruits and vegetables.

Mobile farmers' markets are not only beneficial to the families and children of child care facilities, but like other strategies highlighted in this report, they can support local farmers and the local economy.[18] The Institute of Medicine supports mobile markets as a strategy to improve access to and consumption of fresh fruits and vegetables.[19] Mobile farmers' markets make fresh produce even more accessible when they accept payment through the Supplemental Nutrition Program for Women, Infants, and Children (WIC) and the Supplement Nutrition Assistance Program (SNAP).

Examples

Healthy Kids Collaborative, Rocky Mount, NC
Starting in summer of 2011, the Healthy Kids Collaborative in Rocky Mount, NC, will increase access to fresh fruits and vegetables in child care facilities by introducing mobile farmers' markets at the facilities. Initially, one child care facility will have one or two farmers selling their produce once a week throughout the summer months. As the program expands, it will add facilities. The Healthy Kids Collaborative is funded by the Kate B. Reynolds Charitable Trust, the Robert Wood Johnson Foundation and the North Carolina Partnership for Children through the Down East Partnership for Children. The Healthy Kids Collaborative is also supporting community gardens and community supported agriculture, and it is increasing fruit and vegetable offerings at local "corner" stores.
http://www.depc.org/Pages/Comm-HealthyKidsCollaborative.html

San Joaquin County mobile market
In 2006, the Food Bank in San Joaquin County, California, (with more than 30 partners) initiated a Mobile Farmers' Market that visits 54 sites per month in low-income communities. The Mobile Farmers' Market makes regular monthly stops at senior centers, churches and other community and faith organizations.
http://www.healthyeatingactivecommunities.org/communications3_15.php

Farm to Family
Farm to Family is a local mobile food distribution business that started in 2009 and connects local farms to communities in central Virginia. The effort uses a converted school bus to distribute fresh produce from multiple farmers to many locations in the community, including: schools, senior homes, hospitals, neighborhoods, churches, universities, special events, conferences and corporate offices. Farm to Family connects local farms with communities in

the hope of establishing personal relationships between consumers and local farmers to encourage a local diet that includes fresh, locally grown products.
http://www.farmtofamilyonline.com/default.html

Open Door food pantry
In Gloucester, MA, The Open Door food pantry operates a mobile market that provides access to free produce on a weekly basis at six different locations, including an elementary school where 50 families participate in the program.
http://www.foodpantry.org/02_Our_Services/Mobile_Market.html

Gleaning

Gleaning is the "collection of crops from farmers' fields that have already been mechanically harvested or on fields where it is not economically profitable to harvest."[20] Gleaning is historically used to collect and redistribute food to low-income people and those who don't have enough food for their households. Gleaning is typically a volunteer-driven activity where an organization coordinates with local farmers to salvage fresh produce. Volunteers enter fields after farmers have finished harvesting and collect the remaining good produce. Child care facilities partner with existing gleaning networks to receive gleaned produce. Alternatively, child care facilities could partner with local farmers and recruit volunteers for gleaning.

Gleaning helps reduce the costs of obtaining fresh fruits and vegetables. Typically, produce collected by organizations that coordinate field gleaning is then donated to organizations in the community. In addition, gleaned produce can be distributed to families that are identified as in need, thus providing food at both the child care facility and at home.

Society for St. Andrew (NC and national)
An organization that organizes gleaning efforts in many states is the Society for St. Andrew, which opened a North Carolina regional office in 1992. Since then, gleaners working with the Society have collected nearly 100 million pounds of fresh produce for North Carolinians in need. While direct work with child care entities is not currently part of the Society's efforts, the Gleaning Network that coordinates with local farmers might be a model worth exploring for the child care domain. http://www.endhunger.org/north_carolina.htm

Farm to Pantry
In Sonoma County, CA, the organization Farm to Pantry delivers gleaned produce to an elementary school classroom, where nutrition education is also provided.
http://www.chefnews.com/what-to-do-with-surplus-fruits-and-veggies.html

Buying and selling surplus crops

The final strategy for childhood obesity prevention featured in this report is buying and selling surplus crops by connecting child care facilities with farms that have a surplus. Surplus is the result of farmers producing more than they can sell through traditional avenues. One strategy for reducing the cost of providing fresh, highly nutritious produce to children in child care facilities is for the facility to purchase the surplus at a lower cost than would be required in a

standard grocery outlet. Purchasing surplus crops is beneficial to child care facilities in that it can help reduce the cost of procuring fresh produce. Child care providers can purchase the surplus at a reduced price. They can also collaborate and pool their financial resources, thereby increasing their purchasing power.[21] They can buy directly from the farmer, or from a distributor acting as an intermediary. In addition, purchasing food locally contributes to the local economy.

Resources for identifying farmers interested in participating in a surplus program include the Farmers Market Association of North Carolina, local farmers' markets, sustainable agriculture organizations and the North Carolina Cooperative Extension. A few states have enacted legislative and policy changes to facilitate farm to school programs that involve purchasing surplus crops. Some organizations help find available local produce. For example, MarketMaker, a national partnership of land grant institutions and State Departments of Agriculture, has developed an interactive database of food industry marketing and business data (http://national.marketmaker.uiuc.edu/).

For programs and state agencies purchasing for the Child and Adult Care Food Program (CACFP) (see the next section of this brief), U.S. Department of Agriculture regulations allow for geographic preference when procuring unprocessed, locally grown or locally raised agricultural products (USDA Memo SP 30-2008). The regulations apply to foods which have not been cooked, seasoned, frozen, canned or combined with any other products.

Examples

Willamette Farm and Food Coalition
In Oregon, Willamette Farm and Food Coalition's Farm to School Program encourages local farmers to consider selling surplus crops to schools and provides support by connecting farmers to distributors, and by connecting farmers to schools and to other information and resources. Ecotrust, located in Oregon, has an online marketplace called FoodHub to connect wholesale buyers and sellers (http://food-hub.org), making connections to produce easier. While these are examples of Farm to School programs, they could be used in early child care settings as well. All of these programs highlight options for increasing the consumption and reducing the cost of fresh produce, either through collaboration to negotiate lower prices or by working with farmers to purchase surplus crops.

To illustrate, a farmer in Oregon had extra produce and contacted the Willamette Farm and Food Coalition's Farm to School program coordinator to see if there was a school that would like to purchase the surplus crop. The coordinator identified a school and helped facilitate the purchase of the surplus. If the farmer had not sold the produce, the surplus would have gone to waste or been used for compost. By selling the surplus, the farmer made a profit and the school bought fresh produce at a reduced price. http://www.lanefood.org/pdf/Hello_Farmers.pdf

Conclusion

Increasing the intake of fresh fruits and vegetables in child care settings would improve the health of North Carolina's children by potentially reducing obesity, promoting general good health, and reducing chronic disease. In 2010, the North Carolina General Assembly directed the North Carolina Child Care Commission, in consultation with the Division of Child Development, to develop enhanced nutrition standards for child care facilities.[22] This brief describes six strategies to make healthy, reasonably priced food (especially fresh fruits and vegetables) more available in child care settings. Each strategy links child care facilities with local farmers. All the options described here have been tried successfully either in North Carolina or in other states. Each has been successful for farmers and child care facilities. Many of these programs have been recommended by research-based entities seeking solutions to the growing problem of childhood obesity, including agricultural experts who work directly with farmers.

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Brief 5
Policy approaches that support farm to preschool and preschool garden strategies for preventing early childhood obesity

Sara Benjamin Neelon, PhD, MPH, RD and Joel Rosch, PhD

Introduction

Children in child care in North Carolina are not getting enough fruits and vegetables to promote general health and help reduce obesity. The previous section of this report highlights six strategies for farm to preschool partnerships that can both increase the amount of reasonably priced fresh fruits and vegetables that child care facilities can provide to children and create new markets for North Carolina farmers. This brief describes policies North Carolina could adopt to encourage development and implementation of these farm to preschool strategies.

There are three sets of policies: 1) regulations that create incentives for the development of farm to preschool partnerships; 2) action related to the Child and Adult Care Food Program standards; and 3) ways to lessen potential legal and administrative barriers to developing such partnerships. The policies include the adoption of nutrition standards recommended by the United States Department of Agriculture and other national organizations. These policies may also increase the income of farmers. Many states already have some or all of these policies in place. If adopted in North Carolina, they would promote improved child health with minimal budgetary impact, while simultaneously supporting farmers' livelihoods.

Child care licensing and regulations

Licensing is authorization from the state to operate a child care facility. All child care programs that are not legally exempt from licensing are required to meet specific minimum standards for operation. These include nutrition standards for meals served (see Child and Adult Care Food Program – CACFP – standards below). Regulation and licensing of child care facilities is a state responsibility. In North Carolina, that responsibility falls to the Division of Child Development and the Child Care Commission.

Because child care is governed primarily by states and not the federal government, regulations across states vary considerably. Several recent reviews have found that most states lack strong regulations related to obesity prevention, and that family child care homes had the fewest and most general regulations.[1] State regulations can help ensure that minimum standards for obesity prevention are required in most child care programs.

Research shows that outdoor time and physical activity, limited screen time, healthy eating and breastfeeding all may prevent childhood obesity. Only two states require that child care facilities serve meals and snacks that follow the Dietary Guidelines for Americans established by the Center for Nutrition Policy and Promotion within the US Department of Agriculture. Twenty-nine states require that facilities meet Child and Adult Care Food Program (CACFP) standards, regardless of participation in the program.[2] CACFP is described in the next section of

this brief and in the glossary of this report. All child care centers in North Carolina are required to meet CACFP standards, a subset of which are meal pattern requirements (see p. 41). A small number of states include a statement of support for breastfeeding in their regulations, but only a few, including North Carolina, require facilities to provide a quiet and private place for mothers to breastfeed their infants in child care.[3] Approximately three-quarters of states require daily outdoor time in licensed care, and about one-third regulate the use of screen time, the amount of time children are watching or exposed to television, videos and so on.[4] North Carolina requires daily outdoor time and limits screen time.

Some local jurisdictions have the authority to regulate child care facilities within their boundaries and can pass more stringent standards than what their state requires related to nutrition and obesity. *There are differing interpretations about whether local governments in North Carolina can adopt additional nutrition standards for child care facilities within their jurisdictions. The North Carolina General Assembly may wish to consider explicitly granting this power to local governments.*

There are a number of ways to support farm to preschool efforts through state action. If North Carolina were to require child care facilities to serve more fruits and vegetables or specify that programs must limit the amount of juice served, farm to preschool efforts could help fill the increased need for fruits and vegetables. Instead of serving juice, programs could serve additional servings of fruits and vegetables. Some states have regulations in place to encourage child care providers to serve fruits and vegetables instead of juice. Following are examples of regulations promoting fruit and vegetable intake and limiting juice. All go further than North Carolina in promoting healthful eating at child care facilities.

[Note: The language in the following examples is that used in the actual regulations.]

Delaware: The licensee shall provide age-appropriate food based on the basic food groups as follows: include a variety of fresh vegetables and fruits. (See more on Delaware in CACFP section, following.)

Texas: Offer a variety of fresh or frozen fruits and vegetables. You may serve fruit or vegetable juices if you only serve up to four ounces for children ages 12 months through five years of age.

> The American Academy of Pediatrics (AAP) recommends that children drink no more than four to six ounces of fruit juice a day. Overconsumption of 100 percent fruit juice can contribute to overweight and obesity.
>
> Children under the age of 12 months should not be served juice at all. Whole fruit, mashed or pureed, is recommended for infants seven months up to one year of age.

New York City: Juice shall only be provided to children over eight (8) months of age, and only 100 percent juice shall be permitted. Children shall receive no more than six (6) ounces of 100 percent juice per day. New York City also implemented new regulations for licensed group daycare centers, including:

a) 60 minutes of physical activity time provided per day;

b) Viewing of television, videos, and other visual recordings limited to no more than 60 minutes per day of educational programs or programs that actively engage child movement; and
c) Food supplied to children should be wholesome, of good quality, and properly prepared in accordance with nutritional guidelines.

Caring for Our Children resource guide (see overview below): To ensure programs are offering a variety of foods, selections should be made from these groups of food:

Vegetables - dark, green leafy and deep yellow;
Fruits - deep orange, yellow, and red whole fruits; and
100 percent fruit juices - limited to no more than four to six ounces per day for children one year of age and over.

Caring for Our Children is a resource guide for both policy and practice in child care. Its full title is Caring for Our Children–National Health and Safety Performance Standards: Guidelines for Out-of-Home Child Care Programs.[5] It is a collaborative effort by the American Academy of Pediatrics, the American Public Health Association and the United States Department of Health and Human Services to identify nutrition standards for children in child care. Child care providers often consult the guide for information about serving healthy foods and beverages to children, and many states use the guide's language when creating new regulations. Until recently, Caring for Our Children standards focused more on food safety and sanitation and meeting children's basic nutritional needs than on obesity. The most recent edition includes standards focused on obesity prevention.

Child and Adult Care Food Program (CACFP) standards

The Child and Adult Care Food Program (CACFP) is a federal nutrition program organized under the National School Lunch Act and administered by the United States Department of Agriculture and designated state agencies (http://www.fns.usda.gov/cnd/care/).

CACFP provides more than $2 billion annually in reimbursement for meals and snacks served to over 3.2 million children in child care and after school programs. Child care programs are eligible to participate if they serve children from low-income families or children with a specified disability or chronic health condition. Child care centers and family child care homes are both eligible to participate, but homes must work with a sponsoring agency. All Head Start programs not participating in the National School Lunch and Breakfast Program must participate in CACFP.

For children enrolled in participating child care programs, CACFP provides reimbursement to the program for two meals and one snack or one meal and two snacks daily. Reimbursement rates are based on the type of meal served (i.e., breakfast, lunch or dinner) and whether the child pays for meals and snacks or is eligible for a free or reduced price. Similarly, meals and snacks served to children in family child care homes are reimbursed based on two tiers of eligibility. Tier I reimbursement rates support family child care homes located in low-income areas and for low-income child care providers. Tier II rates apply to all other participating family child care homes. CACFP also reimburses child care programs for exclusively breastfed infants. Thus,

child care programs can receive funding through this program and still support breastfeeding mothers with children in child care. In addition to reimbursement for meals and snacks, CACFP provides nutrition education for child care providers, regulates meal patterns and portion sizes and offers sample menus to help child care programs comply with nutrition standards.

Child care programs not eligible to participate in CACFP are still encouraged to follow CACFP guidelines for healthy meals and snacks because CACFP plays an important role in efforts to combat childhood obesity and has demonstrated a positive impact on diet quality of children from participating programs.

There is, however, room for improvement. In the only national study of CACFP and family child care homes, researchers found that one-third of breakfasts and snacks did not include a fruit or vegetable. Moreover, most meals and snacks provided excessive amounts of saturated fat.[6] Other studies, such as one examining family child care homes in Kansas, found that only 14 percent of facilities served low-fat or non-fat milk to children over two years old.[7] A study of CACFP and child care centers in Virginia found that meals and snacks provided adequate amounts of vitamin A, vitamin C and calcium, but not iron.[8] Another in North Carolina found that half of the milk consumed by preschool-aged children in child care (mostly CACFP centers) was whole milk, which has a higher fat and calorie content than low- or reduced-fat milk.[9]

North Carolina requires all child care programs to meet federal CACFP meal pattern requirements — a subset of CACFP standards set by the USDA — whether or not the program formally participates in CACFP. The following language regarding nutrition requirements for child care centers is in North Carolina's General Statute.

The following chart summarizes these meal pattern requirements. They require child care providers to serve a specified amount of fruits, vegetables or juice to children for meals or snacks.

SECTION .0900 - NUTRITION STANDARDS
10A NCAC 09 .0901 GENERAL NUTRITION REQUIREMENTS

Meals and snacks served to children in a child care center shall comply with the Meal Patterns for Children in Child Care Programs from the United States Department of Agriculture (USDA) which are based on the recommended nutrient intake judged by the National Research Council to be adequate for maintaining good nutrition.

Meal/ Snack	**Age of Child**				
	0-3 months	*4-7 months*	*8-11 months*	*1-2 years*	*3-5 years*
Breakfast	No require-ments	No require-ments	1-4 tablespoons of fruit or vegetable or both	¼ cup fruit/ vegetable juice, fruit and/or vegetable	½ cup fruit/ vegetable juice, fruit and/or vegetable
Lunch or supper	No require-ments	0-3 table-spoons of fruit or vegetable or both	1-4 tablespoons of fruit or vegetable or both	¼ cup fruit/ vegetable juice, fruit and/or vegetable	½ cup fruit/ vegetable juice, fruit and/ or vegetable
Snack	No require-ments	No require-ments	No require-ments	½ cup fruit/ vegetable juice, fruit and/ or vegetable	½ cup fruit/ vegetable juice, fruit and/ or vegetable
http://www.fns.usda.gov/cnd/care/programbasics/meals/meal_patterns.htm					

In some states, including North Carolina and Delaware, all child care programs must follow CACFP meal pattern requirements mandated through state licensing and administrative regulations. Some states go further. Delaware enhanced its CACFP requirements so the requirements are now more stringent than federal standards. Child care programs must limit juice to one serving of 100 percent juice per day or less and not serve juice to infants. Delaware also specifies that child care programs must limit pre-fried and fried food, processed meats and sugar in cereals; use only real cheese; serve whole grains daily; serve low-fat milk to children over two years of age; and restrict screen time.

North Carolina could enhance its CACFP standards through the CACFP program directly (as Delaware has done) and through state licensing and regulation. In 2010, the North Carolina General Assembly directed the North Carolina Child Care Commission in consultation with the Division of Child Development to develop enhanced nutrition standards for child care facilities.[10] North Carolina could specify that all programs within the state must comply with the enhanced CACFP standards.

Removing barriers to farm to preschool programs: Clarifying liability issues and developing joint use agreements

Clarifying liability issues

Liability concerns are often obstacles to cooperation between organizations. While the federal *Good Samaritan Food Donation Act*, (Pub.L. 104-210) was enacted in 1996 to encourage food donations by minimizing liability for those who donate food, state officials often enact additional legislation to clarify liability issues related to donating food to schools and child care facilities. North Carolina has legislation that clarifies liability issues in educational and recreational programs (N.C. Gen. Stat. §38A-1 through §38A-4). It is not clear to what extent these laws apply to farm to preschool efforts, particularly in the realm of food safety. Clarifying

food liability issues, therefore, is one way that policymakers could support the growth of farm to preschool programs.

Technical assistance on legal issues, especially food liability issues, is available for policymakers through the National Policy and Legal Analysis Network to Prevent Childhood Obesity (NPLAN) at http://www.nplanonline.org. NPLAN advises state and local agencies about how to use the Good Samaritan Food Donation Act and adapt state law, administrative rules and regulations to facilitate the development of farm to preschool programs (see http://www.nplanonline.org/nplan/products/community-use-charts).

Promoting cooperation

Facilitating partnerships between organizations as different from each other as child care facilities and farms can be challenging. A lack of familiarity creates obstacles including concerns about expectations, authority and responsibility. One successful strategy for removing these barriers has been the use of *joint use agreements.*[11] These agreements can also address liability issues.

The goal of a joint use agreement is to provide a way for organizations to share resources. The agreements often include the following components:

- Operational logistics: Who will open and close the facility/space?
- Liability: Who is responsible if someone gets hurt?
- Maintenance: Who pays for upkeep and repair?
- Decision: Who makes decisions regarding the facility/space?
- Cost: How are expenses divided among partners?

Joint use agreements also inform each party about rules and regulations that govern their partner's facilities and lay out expectations both sides have about how and when they will work with each other. Joint use agreements come in a number of forms and require effort and cooperation. The process of establishing these agreements can be helpful in building the kinds of partnerships that promote farm to preschool initiatives.

State agencies can help communities by disseminating and encouraging the adoption of model joint use documents consistent with state laws that make it easier for parties to establish terms and conditions for shared use of property or facilities and the exchange of resources. The website www.jointuse.org has information about existing joint use agreements, some of which include farm to preschool programs.

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Appendix I:
Organizational Resources

The following list of organizations and other resources may be useful to policymakers, researchers and practitioners looking for more information on childhood obesity and Farm to School programs. Many of the organization descriptions come directly from the organizations' websites. This list is not exhaustive and the authors of this report do not necessarily support the views presented in the organizations' materials. There are three sections: North Carolina resources, federal resources and "other" resources.

NORTH CAROLINA

10% campaign
Led by the NC Center for Environmental Farming Systems (CEFS), this campaign's goal is to encourage consumers to commit 10 percent of their existing food dollars to support local food producers, related businesses and communities. http://www.nc10percent.com

Appalachian Sustainable Agriculture Project (ASAP)
ASAP is a regional organization based in North Carolina devoted to strengthening local farms and the connections between farms and communities. ASAP encourages consumption of local food and organizes Farm to School programs in the Southeast. ASAP's website provides information for educators on farming as well as guidelines for policymakers on best practices related to farm and community development. Growing Minds, described elsewhere in this document, is a project of ASAP. http://www.asapconnections.org

Eat Smart, Move More
Eat Smart, Move More is a North Carolina anti-obesity initiative. Comprising multiple programs and guided by leaders in health, education, policy and philanthropy, Eat Smart, Move More is dedicated to reducing rates of childhood obesity statewide. The initiative website presents details on Eat Smart, Move More partners, programs and evaluations of current efforts. Products include publications of an annual report card on obesity efforts in North Carolina and resources for families, communities, schools and legislators. http://eatsmartmovemorenc.com

Farm to Fork initiative
The NC Center for Environmental Farming Systems (CEFS) led a 2009 summit that brought together approximately 400 stakeholders from across North Carolina to develop a Statewide Action Plan. Several ideas grew out of the Farm to Fork summit, including the 10% campaign, development of community gardens in every county, and the creation of a statewide food safety and security commission to help small farmers understand regulatory complexities.[1]
http://www.cefs.ncsu.edu/cefsfarmtofork/home.html

Growing Minds
Growing Minds is the Appalachian Sustainable Agriculture Project's Farm to School program. The Growing Minds program works with K-12 schools and preschools to source and promote

local food, but it also helps build positive experiences with local food and farms through education components including cooking, school gardens and farm field trips. The program focuses on building capacity within existing systems, including resource development, training and technical assistance. http://growing-minds.org/

North Carolina Child Nutrition Procurement Alliance (NCCN)
NCCN's mission statement is "to work as a partnership to procure high quality, reasonably priced foods and supplies."[2] It establishes "bid specifications for products to utilize the leveraged purchasing power of member school districts for measurable, cost-effective results." A board of directors, with one representative committee chairperson per participating region, runs the program. The alliance has helped to bring down the percentage of revenue that member school districts spend on food and supplies.
http://www.ncpublicschools.org/childnutrition/alliance/

North Carolina Farm to School Program
The North Carolina Farm to School Program, led by the North Carolina Department of Agriculture and Consumer Services, has been in operation since 1998. The program's website provides information on local farms, produce and nutrition, as well as incentives created to promote and fund Farm to School Programs. http://www.ncfarmtoschool.com

North Carolina Legislative Task Force On Childhood Obesity
As stated in legislation introduced in March 2011 to reestablish the North Carolina Legislative Task Force on Childhood Obesity, the Task Force "shall include, but should not be limited to, study of issues relating to childhood obesity. In the course of the study, the Task Force shall consider and recommend to the General Assembly strategies for addressing the problem of childhood obesity and encouraging healthy eating and increasing physical activity among children.[3] http://www.ncleg.net/Sessions/2011/Bills/House/PDF/H218v1.pdf

School Nutrition Association of North Carolina (SNA-NC)
SNA-NC is a non-profit organization dedicated to improving the quality of school lunches in North Carolina. A branch of the national School Nutrition Association, SNA-NC acts as a clearinghouse of information on school nutrition policies and programs in the state. In addition to a yearly conference, member training and education, as well as a biannual newsletter, SNA-NC provides contacts related to school nutrition to relevant constituencies and interested parties in the state. http://sna-nc.org/index.html; National: http://schoolnutrition.org

South Eastern Efforts Developing Sustainable Spaces (SEEDS)
SEEDS is a non-profit community garden based in Durham, North Carolina, whose goal is to teach people to care for the earth, themselves and each other through a variety of garden-based programs.[4] SEEDS' programs and resources include a community garden, a youth gardening and farmers' market program and a young children's component. http://www.seedsnc.org/

Shape NC
Shape NC is a partnership launched in 2010 between the North Carolina Partnership for Children and Blue Cross Blue Shield of North Carolina. Dedicated to reducing childhood obesity, Shape NC approaches the problem through an emphasis on early nutrition. The

program aims to improve the quality of meals served in child care centers, increase the amount of physical activity at child care centers and instruct child care providers on nutrition and physical health. http://hugh.ncsmartstart.org/category/shape-nc/shape-nc-background

FEDERAL GOVERNMENT

Centers for Disease Control

The Centers for Disease Control (CDC) is primarily responsible for research (and research funding) examining the causes and consequences of obesity in children and adults. The CDC website presents facts about the prevalence and growth of obesity in children as well as discussion of factors contributing to the epidemic. Of particular interest to policymakers may be the listing of state-based programs. http://www.cdc.gov/obesity/childhood/index.html
The CDC has also compiled a list of quality nutrition education programs, which can be found at: www.cdc.gov/nutrition/professionals/programs/index.html.

Child and Adult Care Food Program

This program of the U.S. Department of Agriculture reimburses participating programs for eligible meals and snacks provided to young children and the elderly. The program's website provides state agency contacts, information on regulations and current efforts to improve nutrition across the population. http://www.fns.usda.gov/cnd/care

Food and Nutrition Service Farm to School

This program of the U.S. Department of Agriculture's Food and Nutrition Service highlights current Farm to School programs. The website provides connections to current cities and school districts with such programs, federal regulations governing Farm to School programs, as well as grants available to finance these interventions. http://www.fns.usda.gov/cnd/f2s

HealthierUS School Challenge

The HealthierUS School Challenge was created by USDA Food and Nutrition Service in 2004 to publicly recognize schools that are making their school lunches more nutritious and promoting physical activity. In partnership with Let's Move!, an initiative of First Lady Michelle Obama, HealthierUS is now offering financial awards to schools who are certified through their program. http://teamnutrition.usda.gov/healthierUS/index.html

Team Nutrition

Run by the USDA, Team Nutrition is a nutrition education program for schools, parents and communities. Schools involved in the Team Nutrition program receive training and technical assistance from the USDA to plan and prepare healthy meals, provide nutrition education to all students and help the community become involved. The USDA provides grants to schools that wish to join the program. http://www.fns.usda.gov/TN/

We Can!

We Can!, a national childhood obesity prevention program spearheaded by the National Institutes of Health, presents information on how to improve child nutrition, physical activity and the built environment. The We Can! website is primarily geared toward parents and caregivers but also gives a list of local programs and partners and presents a strategic

research plan for obesity prevention. http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan/index.htm

White House Task Force on Childhood Obesity & Let's Move!
Unveiled in early 2010, Let's Move! is First Lady Michelle Obama's childhood obesity initiative. In tandem with the White House Task Force on Childhood Obesity, Let's Move! promotes evidence-based obesity treatment and prevention programs including community and school farms, changes to the built environment and public-private partnerships to reduce the cost of nutritious meals for children. The programs aim to bring together legislators, schools, families and local communities to make healthy eating and physical activity a national priority, starting with basic, small steps to improve child well-being. The Task Force also provides funding and assessment of obesity initiatives and coordinates federal grant programs across agencies. http://www.letsmove.gov

NATIONAL, NON-GOVERNMENTAL

Action for Healthy Kids
Action for Healthy Kids is a nonprofit organization that works with schools across the country to improve student health. It provides information to its members about effective nutrition education programs and helps schools implement the programs. Action for Healthy Kids works with schools that lack the facilities, resources or expertise to properly provide students with the opportunity to eat well and learn about the importance of physical exercise and nutrition.
http://www.actionforhealthykids.org/

Healthy States Initiative
Formed by the Council of State Governments, the National Black Caucus of State Legislators and the National Hispanic Caucus of State Legislators, the Healthy States Initiatives is a nonprofit venture designed to bring information about public health to state governments. The initiative provides statistics on obesity by state as well as an overview of issues relevant to policymakers including the costs of obesity, what programs are being created to address the problem and evidence of success.
http://www.healthystates.csg.org/Public+Health+Issues/Obesity

National Center for Health and Safety in Child Care and Early Education
In 2010, the National Center for Health and Safety in Child Care and Early Education, in cooperation with the American Academy of Pediatrics and the American Public Health Association, released a report on standards and best practices for preventing the development of obesity in child care and early care programs. This document details nutritional and physical educational requirements in great detail and explains how these standards may be used to prevent obesity; for example, caregivers can encourage drinking water by having pitchers and small cups available near where children play.
http://nrckids.org/CFOC3/PDFVersion/preventing_obesity.pdf

National Conference of State Legislatures
The National Conference of State Legislatures is, like the National Council of State Governments, a bipartisan organization providing support to state legislatures. Its website

provides detailed information on the status of childhood obesity legislation in each state, including particular bills and their status. http://www.ncsl.org/default.aspx?tabid=22156

National Farm to School Network
The National Farm to School Network is an organization dedicated to connecting local schools to farms in order to improve nutrition in schools and support local agriculture. A joint effort of the Urban and Environmental Policy Institute (at Occidental College) and the Community Food Security Coalition, the network provides information on how to create local Farm to School programs and evaluate the impact of these policies on child nutrition. The Network's website features brochures on organizing a Farm to School movement, listings of existing programs across the nation and information on funding opportunities. http://www.farmtoschool.org

Robert Wood Johnson Foundation
The Robert Wood Johnson Foundation is a national philanthropic organization devoted to improving the health of all Americans. Although they address multiple health issues, childhood obesity is one of their funding priorities. They have publicly declared it their mission to reverse the childhood obesity epidemic by 2015, through both large and small grants to researchers, community organizations, and public-private partnerships to increase nutrition and physical activity. The foundation's website details current programs being funded and open funding opportunities. http://www.rwjf.org/childhoodobesity/index.jsp

School Nutrition Association
The School Nutrition Association works to provide healthy meals and nutrition education to all children. It has researched school nutrition programs and provides resources, curricula and educational materials on its website free of charge to help schools effectively promote healthy eating. Resources include information on how to prepare school meals including menu planning and recipes. The website also provides templates for handouts and newsletters about nutrition that can be customized to fit a school's needs. The organization also provides information on nutrition programs that have been shown to be effective. http://www.schoolnutrition.org/

OTHER

Canadian and American Children's Food and Beverage Advertising Initiatives (CFBAIs)
CFBAI is a voluntary initiative involving 19 of Canada's leading food and beverage companies pledging to use their marketing activities to promote and support healthy dietary choices and healthy lifestyles to children under 12 years of age. Through the Children's Advertising Initiative, participants are shifting their advertising and marketing emphasis to foods and beverages that are consistent with the principles of sound nutrition guidance, including those that are lower in total calories, fats, salts and added sugars, and higher in nutrients that are significant to public health. CFBAI is administered by Advertising Standards Canada, the industry's independent self-regulatory body.
http://www.adstandards.com/en/childrensinitiative/default.htm

Farm to Preschool Program
Created by the Urban and Environmental Policy Institute at Occidental College (also a co-creator of the National Farm to School Network), the Farm to Preschool Program is a two-year

pilot program testing how Farm to School Programs may be expanded to address preschool nutritional needs. Current efforts are focused on areas of Los Angeles and San Bernardino counties. The program's website gives further information on the pilot program and contact information for the program manager. http://departments.oxy.edu/uepi/cfj/farmtopreschool.htm

Obesity Society

The Obesity Society identifies itself as the leading scientific society dedicated to the study of obesity. In addition to publishing a journal and hosting annual conferences covering every aspect of obesity, the Obesity Society also publishes resource guides for policymakers at the local, state and national level about initiatives designed to reduce obesity levels in multiple populations. Their media library also presents useful resources for consumers and legislators about obesity science and policy. http://www.obesity.org

Yale Rudd Center for Food Policy and Obesity

The Rudd Center studies obesity from multiple perspectives, including nutrition, marketing, weight stigma and the law. Researchers at the Rudd Center present evidence on programs to reduce obesity, use experiments to examine the causes and consequences of obesity and present results to policymakers nationwide. The Rudd Center's website gives information on current projects and priorities (including sweetened beverage taxes and food insecurity) in a form easily accessible to multiple audiences, from policy briefs to social media. It also maintains a legislation database on obesity policy. http://www.yaleruddcenter.org

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[1] http://www.cefs.ncsu.edu/whatwedo/foodsystems/f2fstatewideinitiative.html

[2] "The Bylaws of the NC Child Nutrition Procurement Alliance." Revised and Approved by the Board of Directors, 10/2009. Accessed October 27, 2010. http://www.ncpublicschools.org/childnutrition/alliance/

[3] http://www.ncleg.net/documentsites/committees/LTFCO/2010%20Task%20Force%20on%20Childhood%20Obesity%20Final%20Report%20.pdf

Appendix II:
Glossary of Relevant Terms

This glossary includes definitions of terms related to childhood obesity and terms used in this briefing report. This list has been developed for the 2011 Family Impact Seminar and is not comprehensive.

Balanced diet
A diet characterized by having the essential nutrients in the appropriate amounts to support life processes, such as growth in children, without promoting excess weight gain.

Calorie-dense, nutrient-poor foods
Food and beverages containing few vitamins and minerals but substantial amounts of fat and/or sugar and calories. Examples include sugar-sweetened beverages, candy and chips. They contribute to excess calorie intake and weight gain in children.

Caring for Our Children: Preventing Childhood Obesity in Early Care and Education Programs
A set of national standards describing evidence-based best practices in nutrition, physical activity and screen time for early care and education programs. The standards are for all types of early care and education settings – centers and family child care homes.
http://nrckids.org/CFOC3/PREVENTING_OBESITY/index.htm

Child and Adult Care Food Program (CACFP)
A federally-funded program administered by the United States Department of Agriculture and Food and Nutrition Service (FNS). CACFP strives to ensure that eligible children receive nutritious meals. Reimbursement is given to qualified caregivers for eligible meals and snacks served to participants. While the FNS develops the standards and policies for the program, state agencies are responsible for administering it on the state level and for assisting sponsors on the local level. In North Carolina, the CACFP is administered by the Special Nutrition Programs Unit in the North Carolina Department of Health and Human Services' Division of Public Health. http://www.nutritionnc.com/snp/cacfp.htm

Child Nutrition Program (CNP)
Provides healthy, nutritious meals and snacks to children. Through the National School Lunch Program and School Breakfast Program, school children can access healthy meals. Through the Special Milk Program, children who do not have access to other meal programs can supplement their daily food intake with a serving of milk.
http://www.fns.usda.gov/cnd/About/AboutCNP.htm

Community Food Projects
A federal program administered by providing one-time grants to private non-profits to establish projects designed to increase food security on a local, community-based level. These projects should meet the needs of low-income families by increasing their access to fresher, more

nutritious food supplies; to increase the self-reliance of communities in providing for their own food needs; and to promote comprehensive responses to local food, farm and nutrition issues. Congress has provided from $1 million to $2.5 million annually for the program in recent years, which the United States Department of Agriculture has used to make grants ranging from $10,000 to $250,000. http://ncseonline.org/nle/crsreports/05jun/97-905.pdf

Competitive foods
The United States Department of Agriculture (USDA) defines competitive foods as those foods and beverages, regardless of nutritional value, sold at a school separate from the USDA school meals program. Competitive foods do not qualify as part of the Child Nutrition Program and, therefore, are not held to any nutritional standards.

Farm to preschool
Farm to preschool efforts connect individuals and organizations that provide care to children who are not yet school age (typically children ages 0-5). As with farm to school efforts, these programs and initiatives focus on the production and serving of healthy meals; improving nutrition; providing educational opportunities in agriculture, health and nutrition; and supporting local and regional farmers. Farm to preschool efforts take place in a range of settings that serve young children, including child care centers, preschools and family child care homes.

Farm to school (FTS)
Farm to school efforts connect schools (K-12) and local farms with the objectives of serving healthy meals in school cafeterias; improving student nutrition; providing agriculture, health and nutrition education opportunities; and supporting local and regional farmers. There is a national organization called Farm to School: www.farmtoschool.org

Farmers' markets
Farmers' markets are facilities or sites where multiple producers gather on a regular basis to sell various fresh meats, fruits, vegetables and other food products directly to consumers. The market may be incorporated; sponsored by a municipality, business or community-based organization; or an informal gathering place for growers and customers. Regardless of its organizational structure, farmers' markets allow growers an opportunity to sell their produce directly to consumers, while providing consumers access to a variety of local produce in one location.

Food access
Communities with poor food access lack the resources necessary to supply people with the food needed for a healthy lifestyle. Availability of high-quality, affordable food and close proximity to food stores increase food access.

Food and Nutrition Service (FNS)
The Food and Nutrition Service (FNS), formerly known as the Food and Consumer Service, administers the nutrition assistance programs of the U.S. Department of Agriculture. The mission of FNS is to provide children and needy families better access to food and a more healthful diet through its food assistance programs and comprehensive nutrition education

efforts. Core programs of the FNS include the Supplemental Nutrition Assistance Program (formerly the Food Stamp Program) and the National School Lunch Program.

Healthy eating environment
An environment that not only provides access to, but also encourages, the consumption of healthy foods defined by the USDA Dietary Guidelines.

Healthy weight
In children, a healthy weight consists of a level of body fat where diseases/disorders, such as Type 2 diabetes, that are associated with overweight are *not* observed.

Mini mobile markets
Smaller versions of farmers' markets. Examples include the mini markets supported by the North Carolina Department of Agriculture and Consumer Services (DOA). DOA assists businesses or organizations in setting up a market day on their property that brings nutritious state-grown food to the worksite or community group. It is a way to provide busy people convenient access to healthy food.

National Health and Nutritional Examination Survey (NHANES)
A program of studies designed to assess the health and nutritional status of adults and children in the U.S. and to examine the effect of the availability of free or reduced-price lunch. The survey incorporates interviews and physical examinations. http://www.cdc.gov/nchs/nhanes.htm

National School Lunch Program (NSLP)
Provides low-cost or free school lunch meals to qualified students through school subsidies. The program was established to prop up food prices by absorbing farm surpluses, while simultaneously providing food to school children. The majority of support comes from cash reimbursement for each meal served. Schools are also entitled to receive additional commodities as they become available from surplus agricultural stocks. Most participants are also eligible for the Summer Food Service Program. http://www.nutritionnc.com/snp/cacfp.htm

Nutrient density
The amount of nutrients in a food, per unit volume or mass.

Obese
A child is considered obese if his/her BMI is above the 95th percentile plotted on the CDC BMI growth charts.

Overhead-type expenses
The United States Department of Agriculture defines indirect costs as "overhead-type expenses; expenses incurred by the school district…not practical to identify with specific functions or activities (such as food service), but are necessary for the general operation of the organization and the conduct of activities it performs." Examples include rent and utility costs.

Overweight
A child is considered overweight if his/her BMI is at or above the 85th percentile for his/her age

and height when plotted on the CDC BMI growth charts. Overweight adolescents have an increased chance of being overweight or obese adults.

Saturated fat
A fat mainly found in animal food products. Examples include butter, shortening, palm oil and coconut oil. These fats raise cholesterol levels in individuals' blood.

School breakfast program
Provides federally subsidized breakfasts to children in schools and child care facilities in the form of cash reimbursements for each breakfast served. Reimbursements vary depending on the family income of the participating child. Free meals must be offered to children from families with incomes below 130 percent of the federal poverty income level. Reduced-price meals must be provided to those with family incomes between 130 percent and 185 percent of the poverty level. The program is administered by the Food and Nutrition Service and funded by annual agricultural appropriations. http://www.fns.usda.gov/cnd/breakfast/

School food authorities (SFAs)
SFAs prepare and serve school meals. State governments allocate funds to SFAs, which exist within each school district.

Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)
A federal non-entitlement program for low-income pregnant, postpartum and breast-feeding women, as well as infants and children under age five years. Families eligible must have income below 185 percent of the poverty line and must meet additional health risk criteria for participation. WIC currently serves 45 percent of all infants born in the U.S. WIC provides support for purchases of specific foods and beverages. Also includes the WIC Farmers' Market Nutrition program. http://www.fns.usda.gov/wic/

Sugar-sweetened beverages
Beverages that contain added caloric sweeteners, primarily high-fructose corn syrup. Includes non-diet carbonated soft drinks, flavored milks, fruit drinks, teas and sports drinks.

Summer Food Service Program
Operates in low-income areas during summer months to provide meals and snacks to children in summer day camps. Federal support consists of cash and commodity assistance, as well as support for administration and operating expenses. It is authorized under the National School Lunch Act and administered by the Food and Nutrition Service.

The Emergency Food Assistance Program (TEFAP)
A federal program that supplements the diets of low-income Americans, providing them with emergency food and nutrition assistance at no cost.
http://www.fns.usda.gov/fdd/programs/tefap/pfs-tefap.pdf

Type 2 diabetes
Type 2 diabetes is a chronic disease characterized by high levels of sugar (glucose) in the blood. Previously considered an adult disease, it has increased dramatically in children and adolescents. Overweight and obesity are closely linked to type 2 diabetes.
http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001356/

Appendix III:
Relevant Acronyms

AAP	American Academy of Pediatrics
ASAP	Appalachian Sustainable Agriculture Project
BMI	Body Mass Index
CACFP	Child and Adult Care Food Program (federal)
CFBAI	Canadian and American Children's Food and Beverage Advertising Initiatives
CHD	Coronary Heart Disease
CND/CNP	Child Nutrition Director/Child Nutrition Program
CSA	Community Supported Agriculture
CSFP	Commodity Supplemental Food Program (federal)
DHHS	Department of Health and Human Services
EWG	Excessive Weight Gain
FTS/FTPS	Farm to School/Farm to Preschool
IOM/ NCIOM	Institute of Medicine (federal) NCIOM (North Carolina Institute of Medicine)
NCCN	North Carolina Child Nutrition Procurement Alliance
NCDOA	North Carolina Department of Agriculture and Consumer Services
NCDPI	North Carolina Department of Public Instruction
NHANES	National Health and Nutrition Examination Survey
NSLP	National School Lunch Program
RBA	Results-Based Accountability
SBP	School Breakfast Program
SFA	School Food Authorities
SNA-NC	School Nutrition Association of North Carolina
SNAP	Supplemental Nutrition Assistance Program (federal – formerly the Food Stamp Program)
TEFAP	The Emergency Food Assistance Program (federal)
WIC	Special Supplemental Nutrition Program for Women, Infants, and Children (federal)

Appendix IV:
North Carolina DHHS Press Release

North Carolina Department of Health and Human Services
Office of Public Affairs
2001 Mail Service Center • Raleigh, North Carolina 27699-2001
Tel 919-733-9190 • Fax 919-733-7447

Beverly Eaves Perdue, Governor — Lanier M. Cansler, Secretary

For release: Immediate — Date: April 26, 2011
Contact: Julie Henry, 919-707-5053

North Carolina Taking Steps to Address Childhood Obesity

RALEIGH — Information released today from the U.S. Centers for Disease Control and Prevention (CDC) urges states to make healthier choices easier for kids and more accessible and affordable for parents. To that end, the N.C. Divisions of Public Health and Child Development have been working together to improve child care nutrition and physical activity as part of the state's efforts to reduce childhood obesity rates, which rank among the highest in the nation.

Using data from 2008, the CDC's Children's Food Environment State Indicator Report points to the need for licensure regulations for child care centers to promote healthy behaviors. North Carolina currently meets all the CDC recommendations, including those that require that children have access to drinking water throughout the day, limits sugary drinks to special occasions, and limit TV and other screen time in child care settings.

Recently enacted child care rules from the N.C. Division of Child Development, effective August 1, 2010, require a minimum of one hour daily of outdoor time, daily gross motor activities, and the provision of space for breastfeeding mothers to nurse their children, as well as limiting TV and other screen time to 2 ½ hours per week for children in child care settings. A new report released in January 2011 by the National Resource Center for Health and Safety in Child Care ranked North Carolina 8th in the country for child care rules related to infant feeding, general nutrition and physical activity.

"Promoting physical activity, limiting time spent in front of TV and computers, and making healthy nutrition choices a priority in our child care centers and schools, where many children eat one to two of their meals each day, is an important step in helping families improve their quality of life," said Dr. Deborah Cassidy, director of the Division of Child Development.

In addition to these positive steps, the N.C. Division of Public Health this year received a Child Care Wellness Grant from the U.S. Department of Agriculture to support a new Kids Eat Smart, Move More program for child care providers that participate in the state's Child and Adult Care Food Program (CACFP). Roughly 185 CACFP sponsors will receive training in improving menus for children, educating parents about nutrition and physical activity, and supporting breastfeeding mothers.

"In order to make the kinds of changes needed to prevent disease and reduce the epidemic of overweight and obesity, especially in young children, both nutrition and physical activity must be addressed," said Dr. Jeff Engel, state health director.

CACFP plays a vital role in improving the quality of child care for children by making care more affordable for many low-income families. Each day, more than 155,719 children receive meals and snacks through the North Carolina's CACFP.

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Location: 101 Blair Drive • Adams Building • Raleigh, N.C. 27603
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Appendix V:
Annotated Bibliography
Liz Friedland and Anne Fletcher, MLIS

This annotated bibliography summarizes over 30 scholarly articles related to childhood obesity. It includes numerous articles specific to early childhood and farm to school or farm to preschool research. The bibliography is not comprehensive and does not reflect the opinions of those who compiled it but strives to highlight the most relevant research available. The bibliography has four main sections, each of which features scholarly work focusing on key aspects of childhood obesity research:

- Farm to (Pre)School
- Child Care and Obesity Prevention
- Importance of Fruits and Vegetables for Children
- Childhood Obesity General Information and Statistics

The language in the abstracts listed below is taken directly from the article abstracts or summaries. In many cases, however, this document does not include the full abstract.

FARM TO (PRE)SCHOOL

Cason, K. (1999). Children are 'Growing Healthy' in South Carolina. *Journal of Nutrition Education*, 31, 235A.
According to surveys of children's eating habits, a mere 9 percent of 6 to 11 year olds eat the recommended five servings of fruits and vegetables each day. A survey of elementary school-aged children have found that on a typical day, 15 percent of the children ate no vegetables and 20 percent ate no fruit. Getting children and their families excited about eating fruits and vegetables can be a challenge for nutrition educators, but South Carolina dietitians and elementary school teachers have found a fun way to do just that through a KinderGarden.

Hedberg, A., et al. (2009). PLANT Gardens: Preschoolers Learn about Nutrition through Gardens Curriculum Development and Pre-Testing. *Journal of the American Dietetic Association*, A-47.
The serious effects of childhood obesity will impact the quality of life and productivity of our future generations if not immediately addressed. The purpose of this project was to address the need identified to increase fruit and vegetable acceptability in the 1,170 low-income preschoolers enrolled in Harris County Department of Education (HCDE) Head Start….This intervention aimed to promote healthy eating behaviors for young children at risk for overweight by implementing a garden-enhanced nutrition curriculum, which may reduce the burden of obesity on the community….Applications of this garden-based curriculum include incorporation of indoor and outdoor gardening activities into preschool education programs.

Heim, S., Stang, J., & Ireland, M. (2009). A Garden Pilot Project Enhances Fruit and Vegetable Consumption among Children. *Journal of the American Dietetic Association*, 109, 1220-1226.

Garden-based nutrition education programs may offer a strategy for increasing fruit and vegetable intake in children. A 12-week pilot intervention was designed to promote fruit and vegetable intake among 4th to 6th grade children (n=93) attending a YMCA summer camp.… Garden-based nutrition education programs can increase fruit and vegetable exposure and improve predictors of fruit and vegetable intake through experiential learning activities. Participation in the "seed to table" experience of eating may help promote healthful eating behaviors among youth. Food and nutrition professionals should consider garden-based nutrition education programs that connect children with healthful foods through fun, hands-on activities.

Hermann, J.R., Parker, S.P., et al. (2006). After-School Gardening Improves Children's Reported Vegetable Intake and Physical Activity. *Journal of Nutrition and Education Behavior*, 38, 201-202.
The USDA MyPyramid recommends increased amounts of fruits, vegetables, low-fat milk, whole grains and physical activity for children. After-school programs incorporating gardening provide opportunities for hands-on food, nutrition and physical activity education for children. In-school gardens have been utilized to enhance children's eating habits….The purpose of this study was to evaluate the impact of an Oklahoma Cooperative Extension Service (OCES) after-school education and gardening program on reported vegetable intake and physical activity among children in 3rd through 8th grade.

Izumi, B., Wright, D., et al. (2010). Farm to school programs: exploring the role of regionally-based food distributors in alternative agrifood networks. *Agriculture and Human Values,* 27(3), 335-350.
Regionally-based, mid-tier food distributors may play an important role in harnessing the potential of farm to school programs to create viable market opportunities for small- and mid-size family farmers, while bringing more locally grown fresh food to school cafeterias….Our findings suggest that the food distributors profiled have the potential to help institutionalize farm to school programs. Notably, their relationships with farmers may be a critical element in expanding the scale and scope of local school food procurement….As farm to school programs continue to gain support, regionally-based food distributors that have the meaningful relationships necessary to re-embed the school food service market back into the larger society may be critical to enabling advocates to achieve their goals.

Kalich, K. (2008). Early Sprouts: Gardening and Nutrition Experience for the Young Child. *Journal of the American Dietetic Association*, A-53.
Because children establish lifelong food preferences between the ages of 3-5 years, the preschool years represent an opportune time for behavioral-based nutrition programming. Early Sprouts, designed by nutrition and early education professionals, is a 24-week preschool curriculum focused on providing multiple exposures to six target vegetables. This Social Ecological-based program decreases food neophobia, increases children's and families' consumption of healthy foods and ultimately helps combat obesity….Pilot data reports a significant increase in children's preference for and willingness to taste vegetables; families report significant food-based changes. As educators face increased pressure to provide nutritionally sound curriculum, developmentally appropriate programs such as Early Sprouts are needed.

Kirby, L. (2006). Defining Success in the Farm-to-School Arena. Prepared for the Appalachian Sustainable Agriculture Project.
Farm-to-school programming is on the national agenda. In March of last year the House of Representatives passed a bill authorizing federal grants to help schools cover the initial costs of bringing locally-grown foods into school meals. School districts nationwide and right here in North Carolina are reporting success with this type of farm-to-school programming….The Appalachian Sustainable Agriculture Project (ASAP) looked to regional farm-to-school success stories, the districts in Western North Carolina where locally-grown foods are being incorporated into school lunches and connections are being made in the classroom between food students eat and how it is grown. Child Nutrition Directors…shared insights about working with local farmers and offered advice for overcoming obstacles.

Morris, J., Neustadter, A., & Zidenberg-Cherr, S. (2001). First-grade gardeners more likely to taste vegetables. *California Agriculture*, 55(1), 43-46.
To encourage first-graders to increase their consumption of fruits and vegetables, a garden-enhanced nutrition education program was developed and taught. The study was a pilot to assess the feasibility of garden-based education programs for elementary-school students. The first-grade children learned about nutrition in the classroom while growing vegetables outdoors in their own gardens. This experience resulted in the children's increased willingness to taste those vegetables grown in the gardens. Improving children's desire to taste vegetables is thought to be the first step in developing healthier consumption patterns.

Nanney, M.S., Sheldon, J., Elliot, M., & Haire-Joshu, D. (2007). Frequency of Eating Homegrown Produce Is Associated with Higher Intake among Parents and Their Preschool-Aged Children in Rural Missouri. *Journal of American Dietetic Association*, 107(4), 577-84.
The purpose of this study was to identify whether or not there are associations between frequency of eating homegrown produce among rural parents and their preschool children and overall intake….Our findings suggest that educational programs promoting awareness of local produce sources and facilitating the development of gardening programs may be a worthwhile investment.

Parmer, S.M., Salisbury-Glennon, J., Shannon, D., & Stuempler, B. (2009). School gardens: An experiential learning approach for a nutrition education program to increase fruit and vegetable knowledge, preference, and consumption among second-grade students. *Journal of Nutrition Education and Behavior*, 41, 212-217.
The purpose of this study was to examine the effects of a school garden on children's fruit and vegetable knowledge, preference, and consumption….School gardens as a component of nutrition education can increase fruit and vegetable knowledge and cause behavior change among children. These findings suggest that school administrators, classroom teachers, and nutrition educators should implement school gardens as a way to positively influence dietary habits at an early age.

CHILD CARE AND OBESITY PREVENTION

Ball, S., Benjamin, S.E., & Ward, D. (2007). Development and Reliability of an

Observation Method to Assess Food Intake of Young Children in Child Care. *Journal of the American Dietetic Association*, 107, 656-661.
This article reviews the development and testing of a diet observation system for child care facilities that occurred during a larger intervention trial. This structured observation system shows promise as a valid and reliable approach for assessing dietary intake of children in child care and makes a valuable contribution to the growing body of literature on the dietary assessment of young children.

Benjamin, S.E., Ammerman, A., Sommers, J., et al. (2007). Nutrition and Physical Activity Self-assessment for Child Care (NAP SACC): Results from a Pilot Intervention. *Journal of Nutrition and Education Behavior*, 39, 142-149.
This study aimed to determine the feasibility, acceptability, and reported impact of a nutrition and physical activity environmental intervention in child care….Intervention centers rated themselves higher at follow-up than at baseline, and relative to comparison centers, reported a variety of environmental nutrition and physical activity improvements confirmed by research staff….The NAP SACC pilot intervention shows promise as an approach to promote healthy weight environments in preschool settings. Additional evaluation of the project is needed using a greater number of centers and a more objective outcome measure.

Benjamin, S.E., Cradock, A., Walker, E.M., Slining, M., & Gillman, M.W. (2008). Obesity prevention in child care: A review of U.S. state regulations. *BMC Public Health,* 8, 188.
The objective of this study was to describe and contrast individual state nutrition and physical activity regulations related to childhood obesity for child care centers and family child care homes in the United States….Considerable variation exists among state nutrition and physical activity regulations related to obesity….Many states lack specific nutrition and physical activity regulations related to childhood obesity for child care facilities. If widely implemented, enhancing state regulations could help address the obesity epidemic in young children in the United States.

Benjamin, S.E., Haines, J., Ball, S.C., & Ward, D.S. (2008). Improving Nutrition and Physical Activity in Child Care: What Parents Recommend. *Journal of the American Dietetic Association*, 108, 1907-1911.
As rates of obesity continue to rise, especially among young children, child care has become a focus for nutrition and physical activity intervention. Parental involvement is an important component of these efforts. During summer 2006, parents of children in child care were surveyed to better understand their perceived quality of meals, snacks, and physical activity at the child-care center, and their recommendations for improvement….Findings from this study provide insight into key areas of concern for parents regarding the nutrition and activity environment of child-care centers. This information may be used to create or modify interventions or policies and to help motivate parents to become advocates for change.

Benjamin, S.E., Neelon, B., Ball, S.C., et al. (2007). Reliability and validity of a nutrition and physical activity environmental self-assessment for child care. *International Journal of Behavioral Nutrition and Physical Activity, 4,* 29.
Few assessment instruments have examined the nutrition and physical activity environments in child care, and none are self-administered. Given the emerging focus on child care settings as a

target for intervention, a valid and reliable measure of the nutrition and physical activity environment is needed….This study provides estimates of criterion validity, inter-rater reliability and test-retest reliability for an environmental nutrition and physical activity self-assessment instrument for child care. Results indicate that the self-assessment is a stable and reasonably accurate instrument for use with child care interventions. We recommend the Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC) instrument to researchers and practitioners interested in conducting healthy weight intervention in child care. However, a more robust, less subjective measure would be more appropriate for researchers seeking an outcome measure to assess intervention impact.

Benjamin, S.E., Rifas-Shiman, S.L., et al. (2009). Early Child Care and Adiposity at Ages 1 and 3 Years. *Pediatrics*, 124(2), 555-562.
The majority of infants in the United States are in nonparental child care, yet little is known about the effect of child care on development of obesity. The objective of this study was to examine the relationship between child care attendance from birth to 6 months and adiposity at 1 and 3 years of age….Child care in the first 6 months of life, especially in someone else's home, was associated with an increased weight-for-length (WFL) z-score at 1 year and BMI z-score at 3 years of age.

Benjamin, S.E., Tate, D.F., Bangdiwala, S.I., et al. (2007). Preparing Child Care Health Consultants to Address Childhood Overweight: A Randomized Controlled Trial Comparing Web to In-Person Training. *Maternal and Child Health Journal,* 12(5), 662-669.
Child Care Health Consultants (CCHCs) who provide consultation receive little training on the basic nutrition and physical activity principles important for the promotion of child healthy weight. Traditional approaches, such as in-person training, are limited in their ability to disseminate health information to a geographically diverse population of health professionals. The purpose of this study was to determine if web-based training is as effective as in-person training….The results in this study demonstrate that web-based instruction is as effective as in-person training on improving basic nutrition and physical activity knowledge for promoting healthy weight in preschool children.

Benjamin, S.E., Taveras, E.M., Cradock, A.L., et al. (2009). State and regional variation in regulations related to feeding infants in child care. *Pediatrics,* 124(1), e104-111.
The purpose of this study was to compare state and regional variation in infant feeding regulations for child care facilities and to compare these regulations to national standards….Many states lacked infant feeding regulations. Encouraging states to meet best-practice national standards helps ensure that all child care facilities engage in appropriate and healthful infant feeding practices.

Benjamin Neelon, S.E., & Briley, M.E. (2011). Position of the American Dietetic Association: Benchmarks for Nutrition in Child Care. *Journal of the American Dietetic Association,* 111(4), 607-615.
This Position Paper provides guidance for food and nutrition practitioners, health professionals, and child-care providers regarding recommendations for nutritional quality of foods and beverages served; menus, meal patterns, and portion sizes; food preparation and service;

physical and social environment; nutrition training; nutrition consultation; physical activity and active play; and working with families. This Position Paper targets children aged 2 to 5 years attending child-care programs and highlights opportunities for food and nutrition practitioners to promote healthful eating in child care through both intervention and policy-based initiatives.

Crepinsek, M.K., Burstein, N.R., Lee, E.B., & Hamilton, W.L. (2002). Meals Offered by Tier 2 CACFP Family Child Care Providers: Effects of Lower Meal Reimbursements. ***USDA Economic Research Service, Electronic Publications from the Food Assistance and Nutrition Research Program, E-FAN.***
The introduction of tiered reimbursement rates in 1997 did not substantially affect the food and nutrient composition of meals offered by Tier 2 providers in the Child and Adult Care Food Program (CACFP). The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 mandated a tiered reimbursement structure designed to target benefits more narrowly to low-income children and called for a study of its effects on program participation and child nutrition. PRWORA reduced reimbursement rates for Tier 2 providers (providers who are not low-income themselves and do not live in low-income areas). According to our 1999 study, Tier 2 providers neither cut back on meals and snacks served nor offered less nutritious foods, despite initial concerns about how Tier 2 providers would react to the reduced rates. Tier 2 meals have not compromised the overall goal of the CACFP meal component requirements to provide a mix of foods that make an important contribution to a child's major nutritional needs.

Dodson, E.A., Fleming, C., et al. (2009). Preventing Childhood Obesity through State Policy: Qualitative Assessment of Enablers and Barriers. ***Journal of Public Health Policy*****, 30, S161-S176.**
Recently, many state laws and regulations addressing childhood obesity have been introduced and enacted. Understanding determinants of such legislation may inform the development and passage of future policies. For this study, key-informant interviews were conducted with 16 legislators and staffers from 11 states in 2005-2006 to examine qualitative factors that enable and impede state-level childhood obesity prevention legislation….Although the total number of informants was modest, their valuable insights provide policymakers and practitioners with a set of enablers and barriers to be considered when pursuing state-level policy.

Fees, B., Trost, S., Bopp, M., & Dzewaltowski, D.A. (2009). Physical Activity Programming in Family Child Care Homes: Providers' Perceptions of Practices and Barriers. ***Journal of Nutrition and Educational Behavior*****, 41, 268-273.**
The purpose of this study was to examine family child care home (FCCH) providers' perceptions of appropriate physical activity (PA), current practices, and perceived barriers to inclusion of PA within their programs….Type, frequency, consistency, and duration of PA among FCCH homes vary widely. Implications include training on PA and resources tailored to the unique characteristics of family child care homes.

Kaphingst, K.M., & Story, M. (2009). Child care as an untapped setting for obesity prevention: state child care licensing regulations related to nutrition, physical activity, and media use for preschool-aged children in the United States. ***Preventing Chronic Disease*****, 6(1).**

Child care is a potential setting for obesity prevention….Each US state creates and enforces its own child care licensing regulations. We analyzed obesity-related child care licensing regulations of US states…and found variability among and within states….Opportunities exist for strengthening state licensing regulations to prevent childhood obesity. The increasing prevalence of childhood obesity underscores the urgency for state policy efforts to create child care environments that foster healthful eating and participation in physical activity.

Olstad, D.L., & McCargar, L. (2009). Prevention of overweight and obesity in children under the age of 6 years. ***Applied Physiology Nutrition and Metabolism*****, 34(4), 551-570.**
Intrauterine life, infancy, and the preschool years may all include critical periods that program the long-term regulation of energy balance, and, therefore, obesity-prevention strategies should be initiated in utero and continue throughout childhood and adolescence. Although single-strategy obesity-prevention initiatives have had limited success, programs that target multiple behaviours may help reduce body weight and body fat among young children. Parental involvement is key to the success of obesity-prevention programs at a young age, as parents have primary control over their children's food and activity environments….Health professionals can also…help curb the rise in overweight and obesity among young children.

Story, M., Kaphingst, K.M., & French, S. (2006). The role of child care settings in obesity prevention. ***Childhood Obesity,*** **16(1), 143-168**.
Researchers know relatively little about either the nutrition or the physical activity environment in the nation's child care facilities….The authors argue that weak state standards governing physical activity and nutrition represent a missed opportunity to combat obesity, and argue for toughening regulations so that meals and snacks meet specific nutrient-based standards… Although many child care settings fall short in their nutritional and physical activity offerings, they offer untapped opportunities for developing and evaluating effective obesity-prevention strategies to reach both children and their parents.

Trost, S.G., Messner, L., Fitzgerald, K., & Roths, B. (2009). Nutrition and Physical Activity Policies and Practices in Family Child Care Homes. ***American Journal of Preventative Medicine*****, 37(6), 537-540.**
Family child care homes (FCCHs) are the second-largest provider of nonrelative care in the U.S. However…little is known about the nutrition and physical activity practices of FCCHs. To address this gap, this study aims to describe policies and practices related to nutrition and physical activity in a representative sample of FCCHs….Some strengths were exhibited by FCCHs, but substantial weaknesses were shown with respect to meeting established child care standards for nutrition and physical activity. Interventions to promote healthy eating and regular physical activity in FCCHs are thus warranted.

Ward, D.S., Benjamin, S.E., Ammerman, A.S., et al. (2008). Nutrition and physical activity in child care: results from an environmental intervention. ***American Journal of Preventive Medicine,*** **35(4), 352-356.**
With evidence of increased levels of obesity in younger children, the child-care setting is an important intervention target. Few environmental interventions exist, and none target both diet and physical activity. The Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC) intervention was developed to fill this research and practice gap. Exploratory

analyses using only centers that completed most of the NAP SACC program suggest an intervention effect. Factors in the intervention design, the fidelity of implementation, the selection of outcome measure, or a combination of these may have contributed to the lack of intervention effect observed. Because of this study's use of existing public health infrastructure and its potential for implementation, future studies should address strategies for improving effectiveness.

IMPORTANCE OF FRUIT AND VEGETABLES FOR CHILDREN

Ball, S., Benjamin, S.E., Ward, D.S. (2008). Dietary Intakes in North Carolina Child-Care Centers: Are Children Meeting Current Recommendations? *Journal of the American Dietetic Association*, 108, 718-721.
The purpose of this study was to determine whether food consumed by children while in center-based child care meets the new MyPyramid food group recommendations for children 2 to 5 years of age….Overall, our data suggest that children are not consuming recommended amounts of whole grains, fruits (excluding 100 percent fruit juice), or vegetables while attending full-time child care, and are consuming excess amounts of saturated fat and added sugar.

Benjamin Neelon, S.E., Copeland, K., Ball, C. et al. (2010). Comparison of Menus to Actual Foods and Beverages Served in North Carolina Child-Care Centers. *Journal of the American Dietetic Association*, 110, 1890-1895.
Menus from child-care centers are an important source of information for parents, researchers, and child-care regulators, but previous research suggests that menus do not accurately represent foods served. The purpose of this study was to compare menus with actual foods and beverages served to children in child-care centers….Overall, just over half of all meals and snacks matched menus, and nearly 90 percent of individual foods and beverages served matched those stated on menus. Parents of children in child care and dietetics practitioners providing consultation to child-care centers can encourage not only provision of healthy foods and beverages, but also accurate menus in child care.

Blanchette L., & Brug J. (2005). Determinants of fruit and vegetable consumption among 6-12-year-old children and effective interventions to increase consumption. *Journal of Human Nutrition & Dietetics*, 18(6), 431-443.
The purpose of the study was to review the current literature about potential determinants of fruit and vegetable intakes and effective intervention strategies to increase the consumption of fruits and vegetables among 6-12-year-old children….Interventions should improve the availability and accessibility of fruit and vegetables to children and should aim to improve their taste preferences for them. Such interventions should be of a multi-component nature, school-based or use other social channels and may include multi-media channels.

Dennison, B., Rockwell, H.L., & Baker, S.L. (1998). Fruit and Vegetable Intake in Young Children. *Journal of the American College of Nutrition*, 17(4), 371-378.
This study aimed to determine, in a sample of healthy children, the extent to which young children's daily diets include the recommended numbers of fruit and vegetable servings….In this study, preschool-aged children consumed, on average, about 80 percent of the

recommended fruit servings/day, but only 25 percent of the recommended vegetable servings/ day. Low intakes of fruits and vegetables were associated with inadequate intakes of vitamin A, vitamin C, and dietary fiber, in addition to high intakes of total fat and saturated fat.

Dubois, L. Farmer, A., Girard, M., & Peterson, K. (2007). Regular Sugar-Sweetened Beverage Consumption between Meals Increases Risk of Overweight among Preschool-Aged Children. *Journal of the American Dietetic Association*, 107, 924-934.
Objective: To examine the relationship between consumption of sugar-sweetened beverages (e.g., nondiet carbonated drinks and fruit drinks) and the prevalence of overweight among preschool-aged children living in Canada….Conclusions: Regular sugar-sweetened beverage consumption between meals may put some young children at a greater risk for overweight. Parents should limit the quantity of sweetened beverages consumed during preschool years because it may increase propensity to gain weight.

Faith, M.S., Dennison, B.A., Edmunds, L.S., & Stratton, H.H. (2006). Fruit juice intake predicts increased adiposity gain in children from low-income families: weight status-by-environment interaction. (Clinical report). *Pediatrics*, 118(5), 2066(10).
Our goal was to test the hypothesis that increased fruit juice intake and parental restriction of children's eating are associated with increased adiposity gain and whether exposure to nutritional counseling predicted reduced adiposity gain among children….Controlling for gender and ethnicity, the relationship between juice intake and adiposity gain depended on children's initial overweight status….This study supports the Institute of Medicine recommendations to reduce fruit juice intake as a strategy for overweight prevention in high-risk children.

Krebs-Smith, S., Cook, A., Subar, A., et al. (1996) Fruit and Vegetable Intakes of Children and Adolescents in the United States. *Archives of Pediatric and Adolescent Medicine*, 150, 81-86.
The objectives of this study were to identify the ways in which fruits and vegetables are consumed by children, to provide estimates of their intakes compared with recommendations, and to estimate the percentage of children meeting those recommendations….Nearly one quarter of all vegetables consumed by children and adolescents were french fries. Their intakes of all fruits and of dark green and/or deep yellow vegetables were very low compared with recommendations. Only one in five children consumed five or more servings of fruits and vegetables per day….Pediatricians should encourage the consumption of fruits and vegetables.

Nicklas, T.A., Baranowski, T., et al. (2001). Family and Child-care Provider Influences on Preschool Children's Fruit, Juice, and Vegetable Consumption. *Nutrition Reviews,* 59(7), 224-235.
Families and child-care settings are important social environments within which food-related behaviors among young children are developed. FJV preferences, the primary predictor of FJV consumption in children, are influenced by availability, variety and repeated exposure. Care-givers (parents and child-care providers) can influence children's eating practices by controlling availability and accessibility of foods, meal structure, food modeling, food socialization practices, and food-related parenting style. Much remains to be learned about how these influences and practices affect the development of FJV preferences and consumption early in life.

CHILDHOOD OBESITY GENERAL INFORMATION AND STATISTICS

Anderson S.E., & Whitaker, R.C. (2009). Prevalence of obesity among US preschool children in different racial and ethnic groups. ***Archives of Pediatrics & Adolescent Medicine,*** **163(4), 344-348.**
This study aimed to estimate the prevalence of obesity in 5 major racial/ethnic groups in 4-year-old US children. The authors found that racial/ethnic disparities in obesity are apparent in 4-year-old US children. The highest prevalence is in American Indian/Native Alaskan children, in whom obesity is twice as common as in non-Hispanic white or Asian children.

Birch, L.L. (1999). Development of food preferences. ***Annual Review of Nutrition*****, 19, 41-6.**
This review focuses on how genetic predispositions interact with aspects of the eating environment to produce phenotypic food preferences….Whether genetic predispositions are manifested in food preferences that foster healthy diets depends on the eating environment, including food availability and child-feeding practices of the adults. Unfortunately, in the United States today, the ready availability of energy-dense foods, high in sugar, fat, and salt provides an eating environment that fosters food preferences inconsistent with dietary guidelines, which can promote excess weight gain and obesity.

Dietz, W.H. (1998). Health consequences of obesity in youth: childhood predictors of adult disease. ***Pediatrics,*** **101(3 Pt 2), 518-525.**
Obesity is now the most prevalent nutritional disease of children and adolescents in the United States. Although obesity-associated morbidities occur more frequently in adults, significant consequences of obesity as well as the antecedents of adult disease occur in obese children and adolescents. In this review, this study considers the adverse effects of obesity in children and adolescents and attempts to outline areas for future research.

Institute of Medicine (IOM), National Research Council. (2009). Local Government Actions to Prevent Childhood Obesity. Washington, DC: The National Academies Press.
This report is the first in a series of publications dedicated to providing brief, succinct information on childhood obesity prevention specifically for policy makers. Funded by The Robert Wood Johnson Foundation and the Centers for Disease Control and Prevention, the report focuses on one of the major recommendations in two previous Institute of Medicine (IOM) reports on obesity (Preventing Childhood Obesity: Health in the Balance and Progress in Preventing Childhood Obesity: How Do We Measure Up?) regarding the vital role of local governments in helping to prevent childhood obesity.

LaRowe, T., Moeller, S., & Adams, A. (2007) Beverage Patterns, Diet Quality, and Body Mass Index of US Preschool and School-Aged Children. ***Journal of the American Dietetic Association*****, 107, 1124-1133.**
Objective: To evaluate diet quality and body mass index (BMI) by beverage patterns in children aged 2 to 11 years. Conclusions: Beverage patterns were related to diet quality among preschool and school-aged children but were only related to BMI in school-aged children. Children from all clusters could benefit by consuming fewer calorically sweetened beverages and increasing micronutrient-dense foods.

Mei, Z., Scanlon, K.S., Grummer-Strawn, L.M., et al. (1998). Increasing prevalence of overweight among US low-income preschool children: the Centers for Disease Control and Prevention pediatric nutrition surveillance, 1983 to 1995. *Pediatrics,* 101(1), E12.
The purpose of this study was to determine whether the prevalence of overweight in preschool children has increased among the US low-income population….Overweight is an increasing public health problem among preschool children in the US low-income population. Additional research is needed to explore the cause of the trend observed and to find effective strategies for overweight prevention beginning in the preschool years.

Ogden, C.L., Carroll, M.D., Curtin, L.R., et al. (2006). Prevalence of Overweight and Obesity in the United States, 1999-2004. *Journal of the American Medical Association (JAMA),* 295(13), 1549-1555.
This study aimed to provide current estimates of the prevalence and trends of overweight in children and adolescents and obesity in adults, using NHANES data….The prevalence of overweight among children and adolescents and obesity among men increased significantly during the 6-year period from 1999 to 2004; among women, no overall increases in the prevalence of obesity were observed. These estimates were based on a 6-year period and suggest that the increases in body weight are continuing in men and in children and adolescents while they may be leveling off in women.

Ogden, C.L., Troiano, R.P., Briefel, R.R., et al. (1997). Prevalence of overweight among preschool children in the United States, 1971 through 1994. *Pediatrics*, 99(4), E1.
This study aimed to examine the prevalence of overweight among US preschool children 2 months through 5 years of age between the years 1971 through 1974 and 1988 through 1994… These results show that in the last 20 years the prevalence of overweight has increased among 4- and 5-year-old children but not among younger children. These findings suggest that efforts to prevent overweight, including encouragement of physical activity and improved diets should begin in early childhood.

Overweight and Obesity in America's Children: Causes, Consequences, Solutions
The Annals of the American Academy of Political and Social Science, January 2008.
This special issue of *The Annals* is dedicated to exploring the topic of childhood overweight and obesity. It brings together researchers, practitioners, and policy makers in a forum designed to identify the contexts of a child's life that help to determine weight status, including the home, the community, and the school, as well as the larger contexts of children's development influenced by media and culture.

Story, M., Kaphingst, K.M., Robinson-O'Brien, R., & Glanz, K. (2008). Creating Healthy Food and Eating Environments: Policy and Environmental Approaches. *Annual Review of Public Health,* 29(1), 253-272.
Food and eating environments likely contribute to the increasing epidemic of obesity and chronic diseases….Environmental and policy interventions may be among the most effective strategies for creating population-wide improvements in eating. This review describes an ecological framework for conceptualizing the many food environments and conditions that influence food choices, with an emphasis on current knowledge regarding the home, child care, school, work site, retail store, and restaurant settings. Important issues of disparities in food

access for low-income and minority groups and macro level issues are also reviewed. The status of measurement and evaluation of nutrition environments and the need for action to improve health are highlighted.

Wang, Y., & Beydoun, M.A. (2007). The Obesity Epidemic in the United States—Gender, Age, Socioeconomic, Racial/Ethnic, and Geographic Characteristics: A Systematic Review and Meta-Regression Analysis. ***Epidemiologic Reviews,*** **29(1), 6-28.**
This review of the obesity epidemic provides a comprehensive description of the current situation, time trends, and disparities across gender, age, socioeconomic status, racial/ethnic groups, and geographic regions in the United States based on national data….The study found that obesity has increased at an alarming rate in the United States over the past three decades. The associations of obesity with gender, age, ethnicity, and socioeconomic status are complex and dynamic. Related population-based programs and policies are needed.

Whitaker, R.C., & Orzol, S.M. (2006). Obesity Among US Urban Preschool Children: Relationships to Race, Ethnicity, and Socioeconomic Status. ***Archives Pediatrics & Adolescent Medicine,*** **160(6), 578-584.**
Objective: To describe obesity prevention practices and environments in Head Start, the largest federally funded early childhood education program in the United States. Conclusion: Most Head Start programs report doing more to support healthy eating and gross motor activity than required by federal performance standards in these areas.

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