

# Promoting Healthy Children & Families in Connecticut

## Part 2: Child Nutrition

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By: Rafael Pérez-Escamilla, Ph.D.

College of Agriculture and  
Natural Resources

University of Connecticut  
Storrs, Connecticut

Prepared with funding from the  
Children's Fund of Connecticut, Inc.



# IMPACT

Ideas and Information  
to Promote the Health of  
Connecticut's Children

**CHDI** The Child Health and  
Development Institute  
of Connecticut, Inc.



## Introduction

A lifetime of healthy eating begins with good nutritional habits in pregnancy, infancy, and childhood. The last twenty years, however, have seen a rapid increase in the consumption of fast food meals that prioritize convenience over nutritional value. At the same time, there has been a marked decrease in physical activity both in children and their adult caregivers. Given this environment of excess calories without increases in physical activity, it is not surprising that we have witnessed an unprecedented increase in obesity among young children and adolescents. This epidemic-like increase in obesity has led nutritional and public health proponents to rethink the causes of obesity--shifting from a medical model focused on the individual child and family, to a public health and social policy approach, targeting the present environment of heavily advertised snack foods and an increasingly sedentary, convenience-oriented lifestyle.<sup>1</sup>

Because food preferences and feeding patterns are established early in life, childhood is the optimal time to establish the nutritional habits and exercise patterns to prevent obesity and other nutrition-related conditions. Therefore, this issue of IMPACT focuses on early childhood nutrition and complications of poor nutrition in infancy and childhood.

The report describes:

- ❖ Optimal nutrition and feeding practices in infancy and early childhood;
- ❖ The problem of childhood obesity and the environmental factors contributing to the epidemic of obesity among children and adolescents;
- ❖ The role of iron in normal health and development and the prevention of iron deficiency anemia;
- ❖ The implications of early feeding practices for the development of childhood dental problems.

The report includes specific recommendations based on current knowledge in each of these areas. Taken together, these recommendations call for the following actions:

- ❖ Educate children, families and other caregivers on the implications of early childhood nutrition for health and development;
- ❖ Ensure children at risk for poor nutrition and its complications have access to appropriate screening, assessment, and treatment;

Breast milk contains the calories and nutrients (including water) that healthy babies need to develop optimally.

### This four-part Impact series on early childhood health will describe:

- ❖ Significant health problems that affect young children;
  - ❖ Effect of nutrition on early childhood health;
  - ❖ Effect of women's health before, during, and after pregnancy on the health of infants and young children;
  - ❖ Strategies for improving children's health and development by increasing access to health care and integrating health promotion into early childhood programs that serve young children and their families.
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- ❖ Provide access to safety net programs for children and families who need assistance in securing appropriate nutrition;
  - ❖ Establish an infrastructure and policy framework that supports families, health care providers, educators, and other early childhood professionals to promote good nutrition and exercise patterns.

## Part #2:

# Child Nutrition

## Infant and Child Nutrition

The World Health Organization and the American Academy of Pediatrics advocate breastfeeding in the first one to two years of life. Breastfeeding benefits both infants and their mothers. Breast milk contains the calories and nutrients (including water) that healthy babies need to develop optimally. Studies done in the U.S. and other industrialized nations show that breastfed infants (or those receiving expressed human milk) have:

- ❖ Lower rates of childhood illnesses such as diarrhea, ear infections, respiratory infections, insulin-dependent diabetes, and certain cancers;<sup>2</sup>
- ❖ More rapidly developed brains and higher intelligence scores later in life, particularly among babies born prematurely;<sup>3</sup> and
- ❖ Decreased risks for later obesity.<sup>4</sup>

Mothers who breastfeed their children have a decreased risk of developing breast cancer.<sup>5</sup>

Despite the many positive attributes of breastfeeding, fewer than two-thirds (64%) of U.S. newborns in 1998 were breastfed at birth, most by higher educated mothers in higher income families. By 6 months of age, fewer than one in three infants (29%) were breastfed (See Table 1). Over three-quarters (78%) of college educated women breastfeed their infants compared to half (48%) of women who did not complete high school.<sup>6</sup> As Table 1 indicates, breastfeeding is significantly lower among African-American mothers. Studies conducted in Hartford have shown that only half of low-income Puerto Rican women ever breastfeed their babies.<sup>7</sup>

In light of the advantages of breastfeeding for infants and their mothers, it is worrisome that a relatively low number of infants are breastfed. Some potential explanations include:

- ❖ Mothers often lack access to qualified breastfeeding support and information;
- ❖ Some mothers may feel uncomfortable, especially when breastfeeding in front of other family or in public;
- ❖ The reality of the rapid return to the workplace discourages women from initiating breastfeeding, given brief, often unpaid maternity leaves.

**Table 1:**  
Breastfeeding of U.S. Infants by Mother's Race/Ethnicity, 1998

Ethnicity/Race	Baby breastfed at:	
	Birth	6 Months
White, Non-Hispanic	68%	31%
Hispanic	66%	28%
African-American	45%	19%
Total	64%	29%

Source: Department of Health and Human Services (HHS). HHS blueprint for action on breastfeeding, Washington DC: HHS Office on Women's Health, 2000.

In order to actively encourage breastfeeding, community groups, hospitals, and academic institutions have joined forces in several Connecticut initiatives. For example, a partnership among The Hispanic Health Council, Hartford Hospital, and the University of Connecticut Family Nutrition Program resulted in a social marketing campaign, "Breastfeed with Pride At All Times, In All Places," and a peer counseling program, "Breastfeeding Heritage and Pride" that promote breastfeeding.<sup>8</sup>

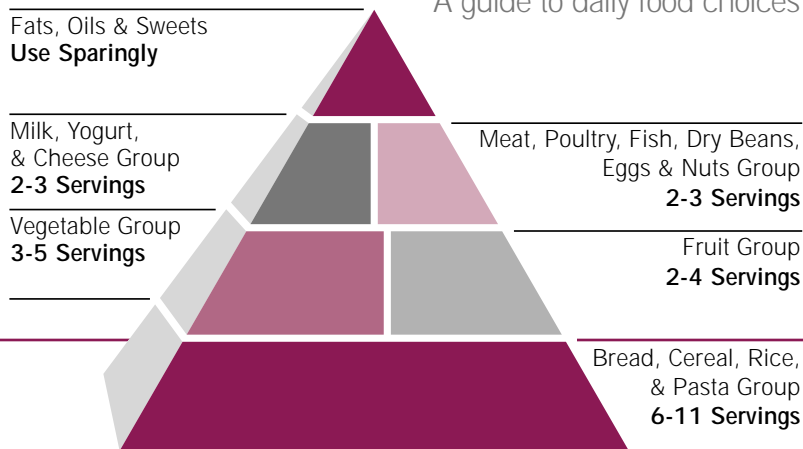
After six months of age, foods rich in iron and other essential nutrients whose requirements can no longer be met only by breast milk should be introduced. These so called "weaning" or "complementary" foods must be nutritious and prepared appropriately for young infants. Unfortunately, some babies may receive sweetened drinks and cereals mixed with milk as early as two months. These early habits, particularly if associated with placing an infant to sleep with a bottle of sweetened juices, set the stage for poor dental health in children, even in the first year of life.

To promote optimal nutrition, health, and development, young children should consume a nutritious diet that includes:

- ❖ Recommended portion sizes from each group following the Food Guide Pyramid and the Dietary Guidelines for Americans;<sup>9</sup>

# Food Guide Pyramid

A guide to daily food choices



Source: U.S. Department of Agriculture/U.S. Department of Health & Human Services

- ❖ Three meals daily and age-appropriate nutritious snacks as frequently as needed by young children;
- ❖ Limited consumption of high calorie “junk” food;
- ❖ Limited consumption of soft drinks and other artificially flavored beverages, foods high in saturated fat and trans fatty acids, and fast/processed foods high in sodium;
- ❖ Appropriate choices for the child’s developmental stage, oral, and fine motor capabilities.

It is also crucial that low-income children have access to the safety net of federal, state, and local food assistance programs. These programs include the following:

- ❖ Supplemental Food Program for Women, Infants, and Children (WIC)
- ❖ Food Stamp Program
- ❖ National School Breakfast Program
- ❖ National School Lunch Program
- ❖ Summer Food Service Program

In Connecticut, WIC provides basic nutrition for more than 60,000 pregnant women, infants, and preschool children annually. In 2000, 45% of women using WIC initiated breastfeeding, a 50% increase since 1990.<sup>10</sup> These vital safety net programs increase access to appropriate nutrition for low-income children and families throughout the year.

The nutrition and growth of Connecticut’s young children, especially those low-income children at greatest risk for the complications of poor nutrition will be enhanced by:

- ❖ Policies that promote breastfeeding and remove barriers to breastfeeding in the workplace;
- ❖ Access to qualified community-based breastfeeding peer counseling programs;
- ❖ Education of families, health care providers, early childhood professionals, and educators in the principles of sound nutrition;
- ❖ Education of caregivers to read food labels;
- ❖ Continued support for vital safety net food programs.

## Childhood Obesity

Obesity is an excessive percentage of body fat. It is assessed by comparing a child's body mass index (BMI) against appropriate age- and sex-specific growth standards. Despite the variability in their ultimate growth potentials, populations of children under five years old, throughout the world, have remarkably similar growth patterns. All children are expected to grow following a standard pattern, based upon their size at birth. The constancy of growth patterns allows professionals throughout the world to utilize the same growth charts for young children.

The Body Mass Index (BMI) is the current indicator of choice to diagnose obesity and is obtained by dividing the weight of the child (in kilograms) by the height of the child (in meters squared). By comparing the results to that of other children of the same age and gender, a child's obesity risk is assessed using the BMI percentile in which the child falls.<sup>11</sup>

Recently, new growth charts for children from birth through eighteen years old were released by the National Center for Health Statistics. These revised growth charts should be used by health care providers and nutritionists to assess children's growth and current obesity risk status. For a comprehensive evaluation of the nutritional status of children, it is critical to assess their growth trends as well as their current risk for underweight, and obesity (Table 2). For example, the child whose

**Table 2:**  
Underweight and Obesity Risk  
Classifications in Childhood

Indicator	Body Mass Index (BMI)
Underweight	≤ 5th %tile
Normal	> 5th & < 85th %tile
At risk for obesity	≥ 85th & < 95th %tile
Obese	≥ 95th %tile

length growth and weight gain have been average in the past, but whose BMI begins shifting toward progressively higher percentile values may be showing an obesity trend that deserves close monitoring and potentially, intervention.

Childhood obesity has reached epidemic proportions in the United States. Between the 1960's and early 1990's, the rate of obese children and adolescents (6 to 17 years old) in the United States tripled from 4% to almost 12%.<sup>12</sup> Several studies demonstrate that African-American and Hispanic children are more likely to be obese than White, non-Hispanic children. Similar tendencies are also found among African-American or Hispanic infants and preschool children.<sup>13</sup> A study of health records for Hartford adolescents who used school health clinics in the late 1990's showed that 13% had been obese as kindergarteners; 26% as sixth graders, and 21% as 10th graders.<sup>14</sup>

An increasingly sedentary, convenience oriented life-style places many children at risk for obesity. In 1995, almost half (42%) of U.S. children had daily physical education classes. By 1999, that number decreased to less than one-third (29%).<sup>15</sup>

**Table 3:**  
Performance on National  
Physical Fitness Examination  
by Connecticut Children

Region	% Passing all four components	
	Boys	Girls
Connecticut	39%	39%
Bridgeport	54%	51%
Hartford	27%	18%
New Haven	31%	24%

Source: Connecticut State Department of Education in Sampson, AE, Osuch, D, and Bongard, E. An Odyssey of Connecticut's Children. 2001 KIDS COUNT Data Book. Hartford CT: Connecticut Association for Human Services, Inc, 2001.

In 1999-2000, only 39% of participating Connecticut girls and boys passed all four components of the national physical fitness examinations, given in 4th, 6th, 8th, and 10th grades. Table 3 shows physical fitness performance data for children from three Connecticut urban areas.<sup>16</sup>

These concerns led to a recent study of childhood obesity among Puerto Rican children in inner city Hartford.<sup>17</sup> This population was chosen because it has been seriously under represented in health and nutrition research; it is highly affected by the problem of childhood obesity and is one of the poorest mid-sized urban communities in the nation. Fifty-three pre-adolescent children (7 to 11 years old) living in Hartford with Puerto Rican caregivers participated. This study identified maternal body mass index, television viewing, fruit juice, and low dairy consumption as independent risk factors for childhood obesity. Television viewing was associated

with lower levels of physical activity among girls and higher levels of high calorie snack food consumption among boys.

Overweight adolescents have increased rates of high blood pressure, elevated blood lipids, and obesity-associated diabetes.<sup>18</sup> They are also more likely to become overweight adults with a higher percentage of preventable "early" deaths. Not surprisingly, this epidemic of childhood and adolescent obesity has led nutritional and public health proponents to propose re-thinking the causes of obesity and approaches to the prevention and treatment of obesity. What was once only the focus of medical journals has now taken center-stage among families, health care providers, educators, and policymakers alike. Although individual genetic susceptibilities and behavioral factors are important, increasingly, the milieu or environment is targeted to explain this surge in obesity and to develop an effective system of preventing obesity.<sup>19</sup>

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Key recommendations of a comprehensive approach to preventing and controlling obesity should include:

■ **Sound nutritional habits in schools, neighborhoods, and churches;**

Practicing good nutrition should not rest solely on the shoulders of parents or health care providers.

■ **Regular visits to a primary health care provider;**

Ironically, children see the least of their health care providers during the preadolescent and adolescent years—a crucial time in determining whether children will become obese adults.

■ **Enhanced school nutrition programs, especially those in urban or low-income areas;**

Ensure that children receiving subsidized breakfast and lunches receive appropriate nutrition. Restrict the presence of fast food outlets and vending machines with sodas and unhealthy snacks.

■ **Increased opportunities for physical activity in schools and neighborhoods;**

If space is limited, be creative. Climbing steps and walking are beneficial. Increase access to safe outdoor and indoor areas in neighborhoods where children are at risk for obesity and decreased exercise.

■ **Decreased television viewing time.**

## Iron Deficiency Anemia

Anemia occurs when there are too few circulating red blood cells in the body. Although there are many causes, the major cause of anemia in childhood is iron deficiency. Iron is necessary to produce the red blood cells that carry oxygen to the tissues, including the brain, and is crucial for the production of brain chemicals that facilitate information transfer among nerve cells. As a consequence, infants and children with iron deficiency score lower on mental and motor development skills.<sup>20</sup>

Iron deficiency anemia affects approximately one in ten (9%) 1 to 2 year old children and one in twenty (4%) 3 to 4 year olds.<sup>21</sup> Low income children are more likely to be anemic—nearly one in ten (9.2%) Connecticut children from 1 to 5 years old who participate in the WIC program are anemic.<sup>22</sup>

Iron deficiency anemia may be caused by insufficient stores of iron present at birth, a condition common in premature infants; insufficient intake of iron in infancy and early childhood, and illness or chronic inflammation. To avoid anemia and facilitate iron absorption, infants and children should:

- ❖ Be introduced to nutritious weaning foods rich in iron (e.g., iron fortified baby cereals) and vitamin C (e.g., orange juice) to enhance iron absorption beyond 6 months of age. The total amount of iron in breast milk is insufficient to meet the high needs of infants beyond this age.





- ❖ Be fed iron-rich foods like meat, fish, and other animal products;
- ❖ Be provided a supplementation of iron in the diet if necessary in children with iron deficiency anemia.

Decreasing the frequency of iron deficiency anemia is critical to enhancing the health, development, and well-being of young children. Prevention of significant iron deficiency anemia requires:

- ❖ Appropriate nutrition for all pregnant women, infants, and young children;
- ❖ Support for nutrition supplementation programs for low-income pregnant women, infants, and young children;
- ❖ Screening and follow-up of at-risk infants and children during well child care to identify and treat effectively iron deficiency anemia.

## Poor Dental Health

Tooth decay is the most common chronic disease in children, occurring five to eight times more frequently than asthma. Low-income children are disproportionately affected. More than 80% of all childhood cavities are found in a small number of children.<sup>23</sup> Early childhood cavities affect nearly one in five (18%) 2 to 4 year old

children and more than one in four (29%) 6 to 8 year olds. Mexican-American and African-American children experience significantly more early childhood cavities than White, non-Hispanic children.<sup>24</sup>

Teeth are formed and maintained by essential nutrients such as calcium and phosphorus that are present in a healthy diet. Early childhood cavities result from both infectious and nutritional problems. Caregivers of young infants, often mothers, transmit bacteria to the infant when they share drinks or utensils. Bacteria react with sugars to form acids that break down tooth enamel. Fluoride supplementation decreases tooth enamel breakdown and assists in laying down new tooth enamel. Certain habits that set the stage for the development of early childhood cavities should be avoided:

- ❖ Feeding babies as early as 2 months of age sweetened drinks;
- ❖ Placing infants and toddlers to sleep with a bottle;
- ❖ Feeding sodas that contain refined sugars, providing food for bacteria and acid that breaks down tooth enamel.

Early feeding of sweetened drinks and placing infants or toddlers to sleep with bottles may lead to cavities, even as the teeth are first

erupting. This "baby bottle tooth decay" shown in Figure 1 is painful and expensive to treat – often requiring an inpatient hospitalization and general anesthesia.

Untreated tooth decay in children living in Connecticut is often exacerbated by a severe shortage of dentists willing to treat children insured by Medicaid. Only 10% of Connecticut's dentists care for Medicaid-insured children.<sup>25</sup>

Improvements in dental health for Connecticut's young children require:

- ❖ Education on nutrition and oral hygiene for all families in convenient locations including daycare, preschools, and elementary schools;
- ❖ Legislative support for community measures such as water fluoridation;
- ❖ Increases in the pool of dentists serving low-income children and their families.

**Figure 1:**  
Baby bottle tooth decay



Photo shows young child with advanced tooth decay.  
Photo courtesy of Joanna Douglass, B.D.S./D.D.S.

## Conclusions

Good nutrition, beginning in pregnancy and extending into infancy and early childhood is critical to optimal health, growth, and well-being of infants and children. The food preferences, eating habits, and exercise patterns developed in early childhood set the stage for health, learning, and productivity in later childhood, adolescence, and adulthood. The nutrition-associated health problems described in this report may be associated with diminished physical health and intellectual development, long-term health care costs, and decreased productivity in school and eventually the workplace. In 2000, the total annual cost of obesity in the United States was estimated at \$117 billion.<sup>26</sup>

The combined efforts of families, health care providers, educators, nutritionists, scientists, community groups, state agencies, and policy makers will be necessary to understand and

## Good nutrition, beginning in pregnancy and extending into infancy and early childhood is critical to optimal health

address all the cultural beliefs, dietary practices, and physical activity patterns that frame our current situation. Collaborations such as the Connecticut Department of Public Health's Obesity Prevention Program, that include the development of a comprehensive statewide infrastructure for obesity prevention and control and a system to track environmental and policy changes and outcomes related to sound nutrition and increased physical activity, will be key to achieving sustained improvements in good health.

Public understanding and support as well as policy changes are vital to ensuring the action steps necessary to guarantee all children reach adolescence and adulthood in optimal "nutritional" health.

- ❖ Good nutrition must be viewed equivalent to other critical strategies of early childhood to improve health, well-being, and readiness for school.
- ❖ Optimal nutrition, encouragement of physical activity, and prevention of obesity and other complications should be discussed in meetings between early childhood professionals, health care providers, and families.
- ❖ Policy and legislative support is essential to addressing the nutritional concerns of early and later childhood.

Key areas for action and improvement include:

- ❖ **Funding for breastfeeding promotion initiatives;**
- ❖ **Ensuring sound nutrition at school by restricting access to high energy, low nutrition foods including sodas, candy, and non-nutritious snack foods;**
- ❖ **Protecting and enhancing opportunities for physical activity during school;**
- ❖ **Funding evaluation studies of the programs serving the food and nutrition needs of Connecticut's children;**
- ❖ **Supporting and enhancing the availability of safety net food programs such as WIC, Food Stamps, the National School Breakfast and Lunch programs, and the Summer Food Service Program;**
- ❖ **Enhancing reimbursements and incentives to dental health professionals in order to increase their availability to low-income children and families.**

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The Child Health and  
Development Institute  
of Connecticut, Inc.

270 Farmington Avenue  
Suite 325  
Farmington, CT 06032

860.679.1519 office  
CHDI@adp.uhc.edu  
www.chdi.org