

ENSURING OPTIMAL INFANT NUTRITION

**ACHIEVING BALANCE FOR
HEALTHY OUTCOMES**

ABBOTT IS COMMITTED TO THE NUTRITIONAL HEALTH AND WELL-BEING OF INFANTS. WE AGREE WITH THE AMERICAN ACADEMY OF PEDIATRICS (AAP) AND OTHER LEADING MEDICAL AND HEALTH ORGANIZATIONS THAT BREASTFEEDING IS THE BEST FORM OF INFANT NUTRITION AND SHOULD BE THE FIRST CHOICE FOR BABIES.

We also endorse the AAP recommendation that infants weaned before 12 months of age should receive an iron-fortified infant formula. Our infant formula products meet the highest scientific and dietary standards, and help infants grow and develop when breast milk is not available or not chosen. Through parent education materials we offer to health care professionals, mailings to millions of moms and dads across the U.S., and our Web site www.welcomeaddition.com, we provide parents and caregivers with helpful, practical information on good prenatal and infant nutrition and emphasize the important connection between balanced nutrition and healthy outcomes.

Introduction and Overview

Good nutrition, beginning in utero and extending throughout the first year of life, is critical to the healthy growth and development of a baby. Abbott supports optimal infant nutrition. We believe that improving the general understanding of infant nutrition and putting into place policies and programs that support it are fundamental steps toward improving the health of Americans.

Increasing awareness of infant nutrition basics is especially critical now, as the U.S. faces escalating rates of overweight and obesity across all segments of the population. Yet the public debate over obesity often ignores the importance of infant nutrition in the first year of life or simply considers only one aspect of it — breastfeeding. Breastfeeding is recommended and provides many health benefits to babies and mothers. A focus on just breastfeeding alone, however, will not prevent obesity or ensure health. During the first year of life, an infant is exposed to many foods and eating experiences that lay the foundation for a child's lifelong habits. Thus a broader public policy approach to infant nutrition, going beyond breastfeeding, is essential to help ensure that those habits are healthy.

While parents are ultimately responsible for decisions about infant feeding, there is a role for others in raising awareness of good infant nutrition practices and providing education and support to help parents make the best choices for their babies. Health care providers, governmental agencies, childcare professionals and their accrediting agencies, and the food and nutrition industries all play an important part in working with parents to establish the nutrition fundamentals — including a balanced combination of the right foods and appropriate levels of daily activity — during an infant's first year.

This review provides a perspective on infant nutrition as a public health priority and recommends ways to strengthen policies and programs to better achieve healthy outcomes.

Infant Nutrition as a Public Health Priority

While much attention has focused on preventing obesity among children and adults, relatively little attention has been paid to the role of prevention prenatally and in the first year of life. Many infants are at a disadvantage in the fight to prevent obesity — before birth and possibly even before conception. A child is more likely to be overweight if the mother was overweight or obese before becoming pregnant, according to a 2005 study in the journal *Pediatrics*. The study also indicates that other prenatal characteristics, particularly race, ethnicity and maternal smoking during pregnancy, place a child at greater risk of becoming overweight.¹

Good nutrition must continue during the prenatal period. Women with poor nutritional habits during this critical time may be increasing their children's risk of future health problems. A recent study from Harvard Medical School found that women who have excessive weight gain during pregnancy have children who are particularly prone to obesity.² The way in which a pregnant mother eats could affect the way in which her baby's metabolism develops. The Harvard team found that the relationship between pregnancy weight gain and childhood obesity remained strong even after allowing for factors such as race, smoking, income, and fetal growth.²

Babies born today in the U.S. have higher birth weights than in the past. The mean birth weight has increased during the past decade, as has the percentage of babies born large for their gestational age (LGA).³ These trends may be due primarily to increases in the average weight of women prior to pregnancy⁴ and the average amount of weight gained during pregnancy.⁴

After birth, many additional factors come into play. Research indicates a significant “nutrition gap” exists between recommended infant feeding practices and the average baby's diet. Infants are currently being fed too much too soon of the wrong kinds of foods. U.S. infants, on average, are consuming about 20 percent more calories than necessary.⁵ A study of more than 3,000 infants published in the *Journal of the American Dietetic Association* in 2004 found that 29 percent of infants are eating solid food before reaching 4 months of age — the minimum age recommended for the introduction of solid foods. Seventeen percent of infants drink juice before six months, and a full 20 percent drink cow's milk before 12 months,⁶ contrary to the recommendation of leading medical and health organizations, including the American Academy of Pediatrics and the American Dietetic Association.

Research also indicates that up to a third of babies consume no fruits or vegetables on any given day — and among those who do eat vegetables, french fries are the most common choice.⁷ In fact, nearly 10 percent of infants 9 months to 11 months old eat french fries every day. And more than 60 percent of infants are eating dessert or candy at least once a day by the time they reach 12 months of age.⁷

Clearly, the U.S. needs to do more to improve prenatal and infant nutrition. The poor nutritional habits seen in infants — too many calories, too many foods high in fat and sugar and too few fruits and vegetables — are startlingly similar to the ones plaguing U.S. adults.

Unless more is done to help parents improve their own diets and those of their infants and children, the obesity epidemic is unlikely to recede. Sixteen percent of U.S. children are classified as obese — three times as many as in 1980. For children born in the U.S. in 2000, the risk of being diagnosed with type 2 diabetes in their lifetime is 30 percent for boys and 40 percent for girls. Among adults, obesity rates are as high as 30 percent, putting these adults at

an increased risk of heart disease, diabetes, stroke and a host of other health problems.⁷ And the economical costs are alarming as well — in 2002, U.S. health care expenditures related to obesity were estimated to reach \$92.6 billion.⁸

Establishing a Balance of Food and Activity

The energy equation states that energy intake must equal energy expenditure (including that needed for growth) to prevent unhealthy weight change. Across all segments of the U.S. population, energy intake is increasing as energy expenditure is decreasing.^{9, 10} While infants require a proportionately greater intake of energy than children and adults, balance is still essential. Research indicates that infants as young as four months have a daily energy intake that exceeds the recommended level.⁶

For new parents, whether breastfeeding or formula feeding is chosen, the basic equation of energy in and energy out must be balanced for their infants to establish and maintain a healthy weight gain. While breastfeeding may help limit overfeeding in early infancy, the energy balance can be quickly upset if solid foods and juices are introduced too soon and in too great a quantity.

Breastfeeding and its effect on weight

Breastfeeding should be encouraged and supported as a key component of optimal infant nutrition. It provides many important health benefits to babies and mothers. Research indicates breastfed infants are leaner during the first year of life,¹¹ but the data are inconclusive as to the effects of this difference later in life.¹² Several observational studies suggest that breastfed infants have lower rates of obesity into childhood and adolescence,^{13, 14} leading some to propose that breastfeeding has a protective effect against obesity. Others propose the discrepancy between breastfed and formula-fed infants has to do with the actions and habits of the mother. For example, mothers who breastfeed their infants through the first year show tighter control over their children's food intake overall than those who formula feed or breastfeed for less than a year.¹⁵

Infant Nutrition Fundamentals for Parents and Caregivers

Parents, the extended family, and caregivers play a critical role in establishing nutrition fundamentals. Their choices and parenting styles will shape the long-term nutrition and health habits of their children. Doctors, nurses, and educators must work with parents and caregivers to improve their understanding of the broad set of issues surrounding good infant nutrition including:



OBESITY RATES ARE EXPLODING. ALTHOUGH BREASTFEEDING RATES ARE STEADILY INCREASING ACROSS THE U.S. POPULATION, IT IS BECOMING MORE APPARENT THAT MANY OTHER FACTORS ARE INVOLVED IN ESTABLISHING AND MAINTAINING A HEALTHY WEIGHT. WHILE BREASTFEEDING MAY HELP, RESEARCH INDICATES A WHOLE ARRAY OF PREVENTATIVE INFANT NUTRITION MEASURES IS NECESSARY TO ADDRESS THE PROBLEMS OF OVERWEIGHT AND OBESITY.

- ✿ **Healthy Pre-pregnancy Weight.** The pre-pregnancy weight of the mother is an important factor in the health of infants. Women who enter pregnancy with their weight at or near the normal range tend to have easier pregnancies and healthier babies. Women should be educated on the importance of achieving a healthy body weight prior to pregnancy. Having healthy eating behaviors in place before conception helps to assure that key nutrients are available as soon as an infant is conceived.
- ✿ **Prenatal Nutrition.** More attention should be paid to helping women understand appropriate pregnancy weight gain. Early medical care and routine check-ups throughout pregnancy are critical to the health of mothers and babies — and proper prenatal nutrition must be emphasized during these visits. In addition to the mother's weight before and during pregnancy, many other factors during the prenatal period play a role in a baby's growth and development. The length of gestation, the mother's diet, and exposure to substances such as alcohol, caffeine, and tobacco can all affect an infant's health and weight at birth.
- ✿ **Infant Feeding Perceptions.** Many parents need to change the way they think about infant feeding. While the primary function of infant feeding is to provide calories and nutrients for growth, parents and caregivers often mistakenly believe this to be the *only* purpose. Infant feeding is also about building feeding skills as it is a means to enhance an infant's development, sensory exploration, coordination and emotional bonding. Additionally, there is often a public perception that “overweight indicates nourished” when it comes to infants — yet, from a health standpoint, overweight and obesity are often symptoms of poor nutrition choices.
- ✿ **Infant Feeding Best Practices.** Parents and caregivers must learn how to feed a baby and how to avoid overfeeding. This includes how to assess infant hunger cues in order to respond promptly and how to identify satiety cues to allow the baby to be more in control of the quantity of food consumed. Studies show that infants can regulate their own energy intake by the age of 6–8 weeks, though this self-regulation may not be as developed in formula-fed infants, whose energy intake is more easily regulated by the caregiver.¹⁶
 - ✿ Most babies are full after 20 minutes of mealtime including, for older infants, several minutes of exploring their food. Parents should learn to follow their babies' lead, and never try to force additional food.
 - ✿ Parents and caregivers need to learn methods other than feeding to soothe or comfort an infant to ensure that feeding does not become the sole automatic response to a crying baby.

✦ Infants are not ready for solid foods during the first four months of life and introducing them too early may lead to choking, allergies, or overfeeding with excess calories. With regard to juice, the AAP recommends limited quantities — and only when the baby is able to hold and drink from a cup. Infants should receive only 100 percent juice and in small quantities — no more than 4 to 6 ounces a day total.

✦ When solid foods are introduced (after 4 to 6 months of age), parents should focus on including nutrient-dense foods such as fresh fruits and vegetables, whole grains, and a variety of healthy food choices. Providing structured meal and snack times for older infants is also important for developing healthy eating habits.

Physical Activity. Parents and caregivers should provide appropriate levels of physical activity for infants. Infants need the opportunity to move from the time they are born. It is important that parents and caregivers encourage exploration through play and provide opportunities for infants to move freely by avoiding excess time in car seats, strollers, or swings.

Physical Activity Guidelines for Infants


In 2002, the U.S.-based National Association for Sport and Physical Education (NASPE) released a set of physical activity guidelines for infants and toddlers. Becoming physically active early in life increases the likelihood of healthy infant development and lessens the chance of developing sedentary habits and childhood obesity.¹⁷ The NASPE Infant Guidelines are as follows:

- Infants should interact with parents and/or caregivers in daily physical activities that are dedicated to promoting the exploration of their environment.
- Infants should be placed for prolonged periods of time in safe settings that facilitate physical activity and do not restrict movement.
- Infants' physical activity should promote the development of movement skills.
- Infants should have an environment that meets or exceeds recommended safety standards for performing large muscle activities.
- Individuals responsible for the well-being of infants should be aware of the importance of physical activity and facilitate the child's movement skills.

Promoting Optimal Infant Nutrition

While parents play the most important role when it comes to improving their infant's nutrition, other influential organizations and resources are essential to raise awareness of infant nutrition best practices and provide support for parents. In the U.S., public, private, and non-profit organizations are taking an active role in nutrition education by forming expert panels to turn the latest research into practical guidelines for consumers, commissioning studies, sponsoring conferences and forums for public debate and more. These efforts should be encouraged and expanded to include more of a focus on infants. The following are a few U.S. examples:

- ✿ The March of Dimes offers extensive information on proper prenatal nutrition to help ensure a healthy pregnancy through its publications, member newsletter, and Pregnancy & Newborn Health Education CenterSM on its Web site. Resources include information on appropriate pregnancy weight gain, ways to incorporate healthy foods and key nutrients during pregnancy, as well as foods to avoid. The Pregnancy & Newborn Health Education CenterSM offers a real-time, interactive dialogue with a health information specialist daily.
- ✿ The American Academy of Pediatrics (AAP) provides parents with a variety of books, brochures, and videos covering a range of topics on infant health. The *AAP Guide to Your Child's Nutrition* is a complete home reference guide. It offers information and strategies to help parents manage the dietary requirements of children from newborns through adolescents, including information on introducing complimentary foods, food safety, allergies, additives, important nutrients, dealing with outside influences, and alternative diets.
- ✿ The Ohio Department of Health's program, *An Ounce of Prevention is Worth a Pound: Preventing Childhood Overweight*, provides physicians with nutrition and activity advice to use with parents of infants and young children. The materials are structured around well-baby and child visits and include anticipatory guidance and serving size suggestions.
- ✿ Abbott's *Parents' Survival Guide to Transitional Feeding* and *Parents' Guide to Feeding Your Preterm Infant*, developed by an independent panel of experts, offer parents comprehensive nutrition resources. The guides focus on the proper introduction and role of complimentary foods such as cereal, fruit, vegetables, and juice. Abbott also offers parents information to help them incorporate good infant nutrition and physical activity into their babies' lives as part of the Welcome Addition Club's *Baby's First Year Month-by-Month Guide*.

 The National WIC Association* is working to generate awareness about the importance of good nutrition beginning in infancy through a new outreach campaign of public service announcements aimed at parents. Key messages address overfeeding and excess calories (“Well-fed does not mean fed well”) and the benefits of establishing healthy nutritional habits early in life (“Proper nutrition can increase brain power for the rest of his life”).


Infant Nutrition Public Policy Objectives

Public policy plays a vital role in addressing public health issues. To achieve healthy outcomes, infant nutrition must be viewed as an integral component of comprehensive nutrition and related public policy health objectives.

Obesity Prevention. Public policies to combat overweight and obesity should include components that address proper preconception and prenatal nutrition as well as good infant nutrition through the first year of life. The adoption in the U.S. of policies by state and local governments that incorporate the fundamentals of proper prenatal and infant nutrition will help to ensure that obesity prevention begins at the earliest possible stage.

WIC Food Packages. Since the federally funded Special Supplemental Nutrition Program for Women, Infants and Children (WIC)† was created in 1972, the environment affecting Americans’ eating habits and physical activity levels has changed dramatically, and the body of knowledge on health and nutrition has grown and improved. Yet changes to the WIC food package have been minimal. Today, more than half the infants born in the U.S. participate in WIC. The program was intended to *supplement* participants’ dietary needs — but some current WIC food packages currently *exceed* the caloric and nutrient needs for infants in certain age groups. In August 2006, the United States’ Department of Agriculture’s Food & Nutrition Services proposed significant changes to the WIC food package. The proposed changes are the most significant since the program’s creation and aim to bring the WIC food packages into alignment with current recommended dietary and infant feeding guidelines. The revisions largely reflect recommendations made by the Institute of Medicine (IOM) in its report *WIC Food Packages: Time for a Change*.¹⁸

Child Care Provider Training and Certification. With more than 50 percent of U.S. infants in some type of regular child care arrangement,¹⁹ child care professionals have a significant

 **BASED ON A REPORT BY THE IOM, USDA HAS PROPOSED THE FOLLOWING CHANGES TO THE WIC FOOD PACKAGES FOR INFANTS:¹⁸**

- **ELIMINATING JUICE FOR ALL INFANTS, SUBSTITUTING BABY FOOD FRUITS AND VEGETABLES IN ITS PLACE.**
- **REDUCING THE QUANTITY OF INFANT FORMULA PROVIDED FOR PARTIALLY BREASTFED INFANTS AND FORMULA-FED INFANTS WHO ARE BETWEEN 6–11 MONTHS OF AGE.**
- **ADDING FRUITS AND VEGETABLES FOR ALL INFANTS WHO ARE 6–11 MONTHS OF AGE AND ADDING ADDITIONAL FOODS, INCLUDING MEATS, FOR FULLY BREASTFED INFANTS.**

* The National WIC Association (NWA) is a voluntary, non-profit membership organization in the U.S., which represents state and local agencies that provide nutrition education, breastfeeding support, health care and other referral services to women, infants and children in over 10,000 WIC clinics.

† WIC is a part of the Food and Nutrition Service (FNS), a Federal agency of the U.S. Department of Agriculture.

role to play in improving infant nutrition. Training programs and certifying entities for those caring for infants should require infant nutrition training in their curricula and examinations.

Infant Nutrition Continuing Education for Health Care Professionals. Health care professionals must have a clear understanding of how diet and nutrition relate to healthy outcomes. Training programs and certifying entities should make prenatal and infant nutrition part of their continuing education curricula for pediatricians and family physicians. Tracking nutritional milestones should be included as a standard part of preventative health measures at infant medical check-ups in the same way that developmental milestones are monitored.

Conclusion

Nutritional habits established in the first year of life affect us over our entire lives. It is during this most critical time that eating patterns are established. Parents, health care providers, industry, governmental agencies, and communities must work together to expand access to nutrition education and create policies that foster optimal nutrition in all settings.

Abbott is committed to:

- Advocating for the nutritional health and well-being of babies and mothers.
- Supporting infant nutrition education for parents, health care providers and child care professionals.
- Expanding awareness of the spectrum of infant feeding behaviors and health outcomes included in good infant nutrition.
- Working with legislators and policymakers to improve infant nutrition in government programs such as WIC; expanding programs proven to show success.
- Maintaining and improving the contribution of infant formulas to nutritional health, including helping babies grow and develop into healthy children.

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