

FACT SHEET

2-18-
L-936
200

FEEDING THE INFANT

Mary K. Sweeten*

A baby's health is vitally related to diet and food. Your baby's doctor or pediatrician is an important source of information regarding what and how to feed your baby. He or she can provide information on breast feeding, the kind of formula best suited if the baby is not breast fed, the kinds and amounts of vitamin and mineral supplements needed, and when and in what order to add solid foods to baby's diet.

This fact sheet can help you understand the diet information given by your doctor. It includes general infant feeding practices, nutrient needs of babies, and some special infant nutrition problems.

Baby's First Food — Milk

The most perfect food for infants is mother's milk. Infants have special nutritional needs. According to

the Dietary Guidelines, healthy infants should be breastfed unless there are special problems. The nutrients in human breast milk tend to be digested and absorbed more easily than those in cow's milk.

The decision to breast feed or formula feed rests on several factors. Families should try to make this decision long before baby is due. Listed below are some considerations:

NUTRITIONAL

Breast Feeding

Mother's milk is best suited to the growth needs of baby. In addition, some antibodies and immunity factors may be passed on to baby in colostrum (secretion that precedes mature milk) and human milk. These antibodies from the mother do help the baby in preventing colds and illnesses, especially diarrhea.

Bottle Feeding

Many formulas are available which approximate the composition of breast milk. Special formulas that meet baby's nutritional needs may be bottle fed if the mother is in poor health or if the baby is allergic to cow's milk. None provide the immunological benefits of human milk.

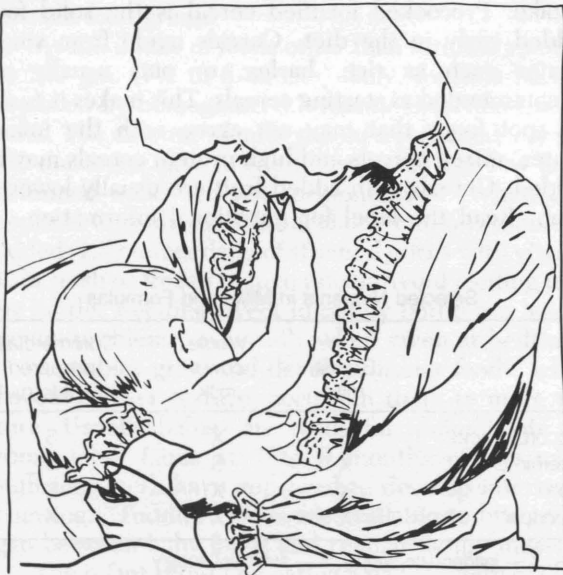
PSYCHOLOGICAL

Breast Feeding

A feeling of intimacy develops when mother nurses her baby. Baby responds to this love and security which develops into a warm relationship between mother and baby.

Bottle Feeding

The same feeling of intimacy can exist when a parent holds the baby and feeds from the bottle. In addition, other family members can share in this experience.



*Extension foods and nutrition specialist, The Texas A&M University System.

ECONOMIC

Breast Feeding

Although the milk itself is virtually "free," the cost of feeding the lactating mother will require consideration. The nursing mother requires more nutrients to make milk for baby and to maintain her health as well. However, with the wide selection of foods available, wise choices can be made to provide needed nutrients at low cost. Breast milk is essentially free from bacteria and requires no special sterilizing equipment when fed directly from the mother.

Bottle Feeding

Although commercially prepared formulas are the most popular type, home-prepared formulas are usually less expensive. Ask the advice of your pediatrician as to the type of formula to feed, and then consider the different forms of milks and sugars or formulas to fit your budget. Be sure to follow your pediatrician's advice for sterilizing so that the bottle formula is safe for baby to eat. Ready-to-feed commercial formulas are most expensive and dried powder commercial formulas are least expensive.

SOCIAL

Breast Feeding

Breast feeding has gained acceptance recently. Since the 1960's breast feeding has become a more common practice among upper middle class women in the United States.

Bottle Feeding

Bottle feeding may offer more flexibility for the professional woman. Bottle feeding may be more desirable if mother must return to work shortly after baby is born. But other arrangements may be made for the nursing mother who returns to work such as hand pressing the breast.

Babies receiving an adequate caloric intake of milk from a healthy, well-nourished mother, from a cow's milk formula, or from a commercially prepared formula will receive an adequate supply of most nutrients. Those nutrients which may deserve special attention include ascorbic acid, vitamin D, iron and fluoride. Depending upon the type of milk your baby receives, your pediatrician will pre-

scribe vitamin and mineral supplements as needed.

Nutrient Supplements

The American Board of Pediatrics gives the following recommendations for infant feeding. Research reveals that about 50 percent of the iron in human milk is absorbed. The iron in human milk is better absorbed than from other formulas as a result of the lower content of lactose (milk sugar) and vitamin C.

The first 6 months the infant should be breast fed or bottle fed. Consult the pediatrician concerning vitamin and mineral supplements while breastfeeding the infant.

Bottle-fed infants should be given commercially prepared, iron-fortified formulas. These require no supplements except fluoride if the local drinking water contains none.

Adding Solid Foods

Follow your pediatrician's advice on when to add solid foods. However, the Nutrition Committee of the American Board of pediatrics recommends no foods other than milk or formula until the infant is 5 to 6 months of age. More frequent feedings (up to 32 ounces in 24 hours) of formula as the infant requires more calories should be used instead of introducing cereal or other foods to help the infant sleep through the night. Allergic disorders have been linked to introducing foods too early in an infant's diet.

During the fifth or sixth months, iron-fortified dry cereals should be introduced and fed until the child is consuming enough foods to assure adequate iron intake. Precooked fortified cereal is the solid food added early in the diet. Cereals made from single grains such as rice, barley, or oats usually are recommended as starting cereals. This makes it easier to spot foods that may not agree with the infant. Later, mixed cereals and high protein cereals may be added. Cereals with added fruit are usually lower in iron. Read the label for nutritional information.

Selected Nutrients in Milks and Formulas

	Breast milk	Whole cow's milk	Commercially prepared infant formula
Ascorbic acid	S	X	S
Vitamin D	X	S	S
Iron	X	X	S*
Fluoride**	X	X	X

Key: X — inadequate supply; S — sufficient supply

*Provided it is iron-fortified infant formula.

**The amount of fluoride in the water supply and how much the infant consumes will determine whether a supplement should be given.

When solid foods are introduced to a baby for the first time, he may have some difficulty in moving the food to the back of his mouth and swallowing it. For this reason the cereal should be fairly fluid (1 teaspoon cereal to 2 to 3 teaspoons milk or formula). Soon the baby will learn how to manipulate and swallow solid food. The addition of cereals should be gradual and in small amounts. For example, the mother may begin by feeding only $\frac{1}{4}$ to $\frac{1}{2}$ teaspoon cereal.

After cereal is well accepted, then other foods, including commercially or home prepared, should be introduced one at a time. Introduce only one or two foods in the same week. Pureed fruits or vegetables can be introduced interchangeably in small amounts. Serve a variety of fruits and vegetables to introduce the baby to new flavors and textures. If he refuses to eat some fruit or vegetable, substitute others. Fruits and vegetables are important for the variety of vitamins and minerals they contribute.

Strained meats and egg yolks usually are added to the diet after fruits and vegetables have been well established. However, some pediatricians recommend that strained meats be added at the same time as cereals. Meats and egg yolks are a good source of iron, a mineral that becomes increasingly necessary in the diet after 5 or 6 months. Meats usually are strained or pureed. Egg whites often are withheld from the diet for the first year because infants are sometimes allergic to them.

Unsalted crackers and toast train babies to chew food. These finger foods are easy for the baby to manage when he begins to want to feed himself, and often are used as snacks between meals.

Breast feeding may be continued as long as 9 to 12 months, but other foods should be included by 5 or 6 months. Partially breast fed or formula fed infants need some foods high in protein from the meat group or milk food group.

As the intake of foods other than formula amounts to 200 gm. ($7\frac{1}{2}$ to 8 ounces) daily, formula may be replaced by homogenized, vitamin D fortified whole milk. The amount of milk should not exceed 900 gm. (30 ounces) a day. In the first year of life, low fat or skimmed milks are not recommended. When milk replaces formula, ascorbic acid or vitamin C should be added (1.5 ounces daily of strained juices with vitamin C or fresh or frozen orange juice). Avoid feeding juice by bottle. Feeding sweet juices by bottle can lead to dental problems, especially when given at bedtime.

As babies grow and develop, junior foods, which have a coarser texture, accustom them to more texture. Usually babies are ready for junior foods and some table foods at 7 to 9 months of age when sufficient teeth have appeared to develop interest in chewing. "Toddler" foods are available to bridge the gap between baby foods and regular family meals.

The infant should be eating a wide variety of foods by 1 year of age. The amount and variety of foods will increase throughout the year. Foods should be select-

ed from the Daily Food Guide which includes servings from the milk, meat, vegetable-fruit, bread-cereal and other groups (fats, sweets or oils). Check with the doctor for specific amounts of food from these food groups to be given during the first year since the baby is growing rapidly.

Nutrition-Related Problems During Infancy

Obesity

There is increasing evidence that overfeeding during infancy may be related to obesity later in life. During the early years, fat cells divide in number as well as increase in size. Therefore, overfeeding may cause the baby to have more fat cells than normal. These often remain throughout life.

Whether bottle or breast feeding contributes to the problem of obesity is yet to be determined. However, most studies indicate bottle-fed babies gain more rapidly in weight and length during the first 3 or 4 months than breast-fed babies. A breast-fed baby stops feeding when he is full. On the other hand, bottle-fed babies often are encouraged to drain the last drop from the bottle, thus establishing an artificial endpoint. In this way, bottle feeding may lead to overfeeding.

If families are concerned about overfeeding a baby, they should check with the doctor. He or she can make recommendations to prevent this problem.

Skim milk generally is not recommended for infant feeding. Although it may be good in the prevention of obesity, infants may not be getting enough calories for energy. Skim milk would provide a high-protein, low-fat beverage that might be inadequate in essential fatty acids.

Nursing bottle syndrome

The nursing bottle syndrome is caused by direct and prolonged contact of the teeth with sugar, syrup or honey-sweetened water, milk or fruit juice drunk from a nursing bottle when sucking and swallowing are infrequent and salivary flow is diminished. It occurs most frequently when nursing bottles are used as pacifiers at bedtime by children who are much beyond the bottle feeding age. This dental condition of young children is characterized by extensive decay of all the upper teeth and, in some instances, some of the lower back teeth.

To prevent this condition, doctors usually recommend that children not be put to bed with bottles, but rather with a pacifier. In the event a bottle is necessary, the beverage should be plain milk or fluoridated water.

Summary

Remember that infants do have special nutritional needs. During the first year of life, the growth rate is rapid. Breast feeding will help give your baby a good start nutritionally. Select foods from the Daily Food Guide and avoid adding extra salt or sugar to baby's food.

References

- American Academy of Pediatrics. "A Commentary on Breast Feeding," *Pediatrics*, Vol. 62, No. 4, October 1978.
- Dietary Guidelines for Americans, USDA and HEW, 1980.
- Fomon, S. J. *Infant Nutrition*, Second Edition, W. B. Saunders Company, 1974.
- Fomon, S. J., L. J. Filer, Jr., T. A. Anderson and E. K. Ziegler, "Recommendations for Feeding Normal Infants," *Pediatrics*, 63:52. 1979.

Guthrie, H. A. *Introductory Nutrition*, Fourth Edition. C. V. Mosby Company, St. Louis, 1979.

Maternal and Child Health Service. "Nutrition and Feeding of Infants and Children Under Three in Group Day Care." U.S. Department of Health, Education and Welfare, Rockville, Maryland, 1971.

McMillian, J. A., S. A. Landaw, and F. Oski. "Iron Sufficiency in Breast Fed Infants and the Availability of Iron from Human Milk," *Pediatrics*, Vol. 58, No. 5, November 1976.

Nezil, A. E. "'Nursing Bottle Syndrome' Rampant Dental Caries in Young Children," *Nutrition News* 38:1, 1975.

Welsh, J. K. and J. T. May. "Anti-infective Properties of Breast Milk," *The Journal of Pediatrics*, Vol. 94, No. 1, January 1979.

Winick, M. "Childhood Obesity," *Nutrition Today*, Vol. 9, No. 3:6, 1974.

Acknowledgment

The author acknowledges the assistance of Marilyn Haggard and V. Cass Crowe, Extension foods and nutrition specialists, The Texas A&M University System, in the preparation of this publication. Special appreciation is expressed to John Asbury, M.D., General Pediatrics, Scott and White Clinic, for his assistance with this publication.

Educational programs conducted by the Texas Agricultural Extension Service serve people of all ages regardless of socioeconomic level, race, color, sex, religion, or national origin.

Cooperative Extension Work in Agriculture and Home Economics, The Texas A&M University System and the United States Department of Agriculture cooperating. Distributed in furtherance of the Acts of Congress of May 8, 1914, as amended, and June 30, 1914.
20M — 9-80, Revision