



U. S. Food and Drug Administration
FDA Consumer
September 1990
Updated: March 1991
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FEEDING BABY NATURE AND NURTURE

Parents of a new baby have a million things to do, but menu-planning isn't one of them. Until a baby is 4 to 6 months old, for breakfast, lunch, and dinner--and of course, the infamous middle-of-the-night feeding--the only items on the menu are either breast milk or infant formula.

BREAST MILK IS BEST

Usually a manufacturer won't announce that the competition's product is a better choice. But when the competition is breast milk, infant formula manufacturers concede--right on the label--that breast milk is best.

Human breast milk is the ideal nourishment for human babies. Its protein content particularly suited for a baby's metabolism, and the fat content is more easily absorbed and digested than the fats in cow's milk.

Breast milk also protects the infants against certain diseases, infections and allergies. A mother's milk contain cells from her immune system and antibodies against diseases to which she has been exposed. Antibodies she develops after the baby is born are also passed to the baby through the breast milk.

For example, if Mom catches the flu, she develops antibodies to that strain of flu virus. Richard Schanler, M.D., associate professor of pediatrics at Baylor College of Medicine, Houston, explains, "The baby will get some protection. The baby might not get the flu at all, or the case may be milder...than if he or she wasn't breast-fed to begin with."

However, risks of breast milk may outweigh advantages if a nursing mother takes certain medications or abuses drugs. The quality and quantity of the mother's diet may affect the quality and quantity of breast milk. (see "Good Nutrition for Breast-Feeding Mothers" in the December 1986-January 1987 FDA Consumer.)

BREAST-FEEDING SUCCESS

"Learn about breast-feeding before the baby is born," says Julie Stock of the La Leche League, an international breast-feeding support and educational organization. "If you know a lot beforehand, you start to build a sense of confidence. Many attempts at breast-feeding fail because of wrong information."

Once the baby is born, breast-feeding as soon as possible after delivery and often is the first of three essential keys for success, says Stock.

The second key is no artificial nipples--that includes pacifiers as well as bottles of water or formula--during the first few weeks. Stock explains that some babies can become very confused by the different feel and different way of sucking needed with a bottle or pacifier, and they may not be able to switch back to the breast.

Finally, it is important to make sure that the baby "latches on" to the mother's nipple correctly. "If a mother has those three things going for her, in general that will eliminate about 90 percent of the common problems that mothers have," says Stock.

The La Leche League has local chapter meetings throughout the country where expectant and new mothers can learn about breast-feeding, nutrition, and other aspects of child care. For the number of your local chapter, call the La Leche League at 1-708-455-7730 or write to La Leche League International, 9616 Minneapolis Avenue, P.O. Box 1209, Franklin Park, Illinois, 60131-8209.

SECOND BEST

The composition of infant formula is similar to breast milk, but it isn't a perfect match. Further, the exact chemical makeup of breast milk is still unknown. "We're always discovering things in human milk that are there in small quantities that hadn't been looked at before," says John C. Wallingford, Ph.D, an infant nutrition specialist with FDA's Center for Food Safety and Applied Nutrition. "But infant formula is increasingly close to breast milk, especially in the area of fatty acids and lipids."

More than half the calories in breast milk come from fat, and the same is true for today's infant formulas. This may be alarming to many American adults watching their intake of fat and cholesterol, especially when high saturated fats, such as coconut oil are used in formulas. (High saturated fats tend to increase blood cholesterol levels more than other fats or oils.) But the low-fat diet recommended for adults doesn't apply to infants.

"Infants have a very high energy requirement, and they have a restricted volume of food that they can digest," says Wallingford. "The only way to get the energy density of a food up is to increase the amount of fat."

HOMEMADE ISN'T BEST

Homemade formulas should not be used, says Nick Duy, assistant to the director in FDA 's division of regulatory guidance. Homemade formulas based on whole cow's milk don't meet all of an infant's vitamin and mineral needs. In addition, the high protein content of cow's milk makes it difficult for an

infant to digest and may put a strain on the baby's immature kidneys. Substituting evaporated milk for whole milk may make formula easier to digest, but it is still nutritionally inadequate when compared to commercially prepared formula. Use of soy drinks as an infant formula can actually be life-threatening (See accompanying article).

Commercially prepared formulas are regulated by the Food and Drug Administration as a food for special dietary use. "Infant formulas are the most heavily regulated food that there is," says Wallingford.

FDA regulations specify exact nutrient level requirements for infant formulas, based on recommendations by the American Academy of Pediatrics Committee on Nutrition. The following must be included in all formulas: Protein, fat, linoleic acid, vitamin A, vitamin D, vitamin E, vitamin K, thiamine (vitamin B1), riboflavin (vitamin B2), vitamin B, vitamin B12, niacin, folic acid, pantothenic acid, vitamin C, calcium, phosphorous, magnesium, iron, zinc, manganese, copper, iodine, sodium, potassium, and chloride.

In addition, formulas not made with cow's milk must include biotin, choline and inositol.

The safety of commercially prepared formula is also enhanced by strict quality control procedures that require manufacturers to analyze each batch of formula for required nutrients, to test representative samples for stability over the shelf life of the product, to code containers to identify the batch, and to make all records available to FDA investigators.

FORMULA CHOICES

The most common sources of protein in infants formulas are either cow's milk or soybeans. "For term infants, soy formulas appear to be as nutritionally sound as milk-based formulas, and their use is unlikely to expose infants to nutritional risk," wrote pediatrician Samuel J. Foman in 1987 in the American Journal of Clinical Nutrition. Baylor's Schanler agrees, but says that there is some question about whether the minerals in soy-based formulas can be used by the infant's body as well as those from cow's milk formula.

For a healthy, full-term infant, "cow's milk formula would be the first choice," Schanler says. "The only indication that I see for soy is for babies with lactose intolerance."

Lactose, also known as milk sugar, is the main carbohydrate in milk. Infants who don't have enough enzyme lactase to digest may suffer from abdominal pain, diarrhea, gas, bloating, or cramps. There is no lactose in soy formula.

Schanler does not think soy formula is a good choice for infants with milk allergies, however. "If there is a real history of milk allergy in the family, the baby might be allergic to soy, too," he says. Instead of soy, Schanler recommends special cow's milk formula known as protein hydrolysates, which won't cause allergic reactions because the proteins are already broken down. "That way the chance of a cross reaction with the soy protein is eliminated," he explains.

Both milk and soy formulas are available in powder, liquid concentrate, or ready-to-feed forms. The choice should depend on "whatever the parents find convenient and can afford," says Schanler.

Whatever form is chosen, proper preparation and refrigeration are essential. Opened cans of ready-to-feed and liquid concentrate must be refrigerated and used within the time specified on the can. Once the powder is mixed with water it should also be refrigerated, if it is not used right away. The exact amounts of water recommended on the label must be used. Under-diluted formula can cause problems in the infant's organs and digestive system. Over-diluted formula will not provide adequate nutrition, and the baby may fail to thrive and grow.

Warming the formula isn't necessary for proper nutrition, says William MacLean, M.D., a pediatrician at infant formula manufacturer Ross Laboratories. "There is nothing magical about having [the formula] warmed up to body temperature," he says. "But if it's cold, some babies may refuse it. It's the baby's preference."

Bottles should not be heated in the microwave oven because the ovens do not heat evenly, MacLean warns. "The drop a mother tests on her wrist could be fine," he says. But, he explains, undetected "hot spots" in the formula could seriously burn the baby.

The best way to warm a bottle of formula is by placing the bottle in a pot of water and heating the pot on the stove, according to Christine Watson, a nurse who specializes in maternal and newborn care at Shady Grove Adventist Hospital in Gaithersburg, MD. "You can also run hot tap water over the bottle, but that isn't very quick.

VITAMIN SUPPLEMENTS--YES OR NO?

The American Academy of Pediatrics says "the normal breast-fed infant of the well-nourished mother has not been shown conclusively to need any specific vitamin and mineral supplement. Similarly, there is no evidence that supplementation is necessary for the full-term, formula-fed infant and for the properly nourished normal child."

Many physicians recommend supplements, nevertheless--especially for breast-fed infants. "There is definitely some controversy here," says Wallingford.

The controversy on supplements usually revolves around the following:

IRON--Although the amount of iron in breast milk is very low (0.3 milligrams of iron per liter), the infant absorbs almost half. In contrast, while iron-fortified formulas contain 10 to 12 mg per liter, babies absorb only 4 percent, amounting to 0.4 mg per liter to 0.5 mg per liter. In either case, those amounts of iron are adequate for the first 4 to 6 months, according to the American Academy of Pediatrics.

In the past, there was the concern that iron-fortified formulas could cause gastrointestinal problems such as colic, constipation, diarrhea, or vomiting. But based on several studies over the past 10 years, the American Academy of Pediatrics does not believe there is any evidence connecting these problems to iron and recommends that iron-fortified formula be used for all formula-fed infants.

VITAMIN D--Insufficient vitamin D can cause rickets, a disease that results in softening and bending of the bones. Although the amounts of vitamin D in breast milk are small, rickets is uncommon in the breast-fed term infant. This may be because, like iron in breast milk, the vitamin D in breast milk is easily absorbed by the baby.

Sunlight is important for the formation of vitamin D, but probably as little as a few minutes exposure a day is all the baby needs, say Schanler, and exposure to the whole body isn't necessary--just the arms and face is enough.

FLUORIDE--No one knows for sure if giving fluoride during the first six months of life will result in fewer cavities. Reflecting the uncertainty surrounding fluoride supplements, the American Academy of Pediatrics recommends starting fluoride supplements shortly after birth in breast-fed infants, but also says that waiting up to six months is acceptable. Because there is no fluoride in infant formula, the twofold recommendation also applies when ready-to-feed formula is used or when the water used for powdered or concentrated formula has less than 0.3 parts per million of fluoride.

SOLID EVIDENCE

Sometime between a baby's 4-month and 6-month birthdays solid food can be introduced. Exactly when depends on several factors.

One factor involves the disappearance of the involuntary action called the extrusion reflex. Before this reflex disappears, feeding solids usually involves putting a spoonful in the mouth and scraping most of it off the baby's face as he or she spits it back out.

Also, babies should be able to sit up and turn their heads away. That way, Schanler explains, they can communicate that they're not ready for the next spoonful or just not hungry anymore.

Usually, the first food recommended is a single-grain, iron-fortified infant cereal. Starting with single-grain cereals makes it easier to pinpoint any allergic reactions. (For more information on introducing solids see ["Good Nutrition for the Highchair Set"](#) in the September 1985 FDA Consumer.)

The biggest concern with feeding solids too early is that the solids will replace breast milk or formula in the baby's diet. "Solids vary nutritionally depending on the food," says Schanler. "None of them is a complete as formula or breast milk. You don't want to rob the baby of milk."

Feeding babies exclusively with breast milk or formula during the first few months is not only the best thing for the babies' health, it can also be a blessing for busy, overtired parents. Now if only the baby would sleep through the night.

SOY BEVERAGES NOT COMPLETE FORMULAS

A severely malnourished 5-month old infant was admitted to Arkansas Children's Hospital, Little Rock, Arkansas, in February 1990 with symptoms including heart failure, rickets, vasculitis (blood vessel

inflammation), and possible neurological damage. According to the hospital, the baby girl had been fed nothing but Soy Moo since she was 3 days old. Soy Moo is a soy beverage sold in health food stores.

This kind of soy beverage, sometimes improperly called "soy milk," should not be confused with soy based infant formulas. Unlike true infant formulas, which are nutritionally complete and appropriate for infants, soy beverages are lacking some of the nutrients infants need. Analysis of Soy Moo by the Arkansas Children's Hospital revealed deficiencies in calcium, niacin, and vitamins D, E, and C.

Labels on Soy Moo cartons and literature about the drink do not suggest that Soy Moo be used as an infant formula. In addition, an FDA investigation found no evidence that infant's parents were explicitly told the Soy Moo could be used as a baby's sole nourishment. Nevertheless, Soy Moo's distributor, Health Valley Foods, Irwindale, California, has voluntarily stopped distribution until the new labels stating "Do Not Use As Infant Formula" can be printed.

FDA learned of a similar incident that occurred in April 1990 when a California couple questioned a physician about their 2-month old daughter's failure to gain weight. The physician discovered that the baby had been exclusively fed Edensoy, another brand of soy beverage. A midwife had recommended Edensoy to the parents, according to the FDA investigator assigned to the case.

In response to this incident, Edensoy's manufacturer, Eden Foods, Clinton, Michigan, wrote all its retailers in the United States and Canada to remind them that Edensoy is not an infant formula. In addition, the letter said, "Please make sure that no store personnel suggest or imply that Edensoy or other soy beverages are suitable for use as an infant formula."

In an effort to prevent this problem with similar soy beverage, FDA asked all 68 known manufacturers, importers, and private label distributors of these products to include a warning against using beverages as infant formula. The agency does not, however, have the regulatory authority to require this warning.

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For more up-to-date information on breast feeding see [Breast Feeding: Best Bet for Babies](#) from the October 1995 issue of FDA Consumer.