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Human Milk and Infant Formula

Nutritional Content and Health Benefits

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1. WHAT IS THE BEST MILK FOR AN INFANT?

1.1. Recommendations from Authoritative Bodies

Current recommendations by the Canadian and the American Pediatric Societies are to breastfeed for the first year of life, with human milk being the primary source of milk (1,2). Formula feeding is recommended for those who choose not to breastfeed. The consumption of whole or reduced-fat cow’s milk is not recommended during the first year of life (3). As of 2000, approx 68% of mothers in the United States initiate breastfeeding and 20% continue to 6 mo (Ross Mother’s Survey). In Canada, 77% of children under the age of 3 yr were breastfed for some period of time (1996–1997 National Longitudinal Survey of Children and Youth [NLSCY]).

The first year of life is a time of more rapid growth, development, and maturation than any subsequent year. Body growth and development of the nervous system depend on an appropriate intake of calories and essential nutrients. The recent joint publication by the American and Canadian nutrition working groups, sponsored by the American Institute of Medicine, defines infancy as the period from birth to 12 mo of age, divided into two 6-mo periods (4). The determination of the Adequate Intake (AI) during the first 6 mo of life for every nutrient is based on the average intake by full-term infants who are born to healthy well-nourished mothers and exclusively fed human milk. The mean intake of a nutrient was calculated based on the average concentration of the nutrient from 2 to 6 mo of lactation and assuming an average volume of milk intake of 780 mL/d. In the second 6 mo of infancy, AIs are based on nutrients available from 600 mL/d of human milk and that provided by the usual intake of complementary foods. Exclusive human milk feeding is the preferred method of feeding normal full-term infants for the first 4–6 mo of life, as recommended by most health professionals (2,3).

Although there are national regulations for upper and lower limits of nutrient content of infant formulas, specific Dietary Reference Intakes (DRIs) to meet the needs of formula-fed infants were not proposed. This was an error, because as a percentage of the total kinds of milk consumed during the first year of life (5), formula is the milk food...
Breastfeeding is rarely contraindicated (2). Infants who have galactosemia or whose mothers use illegal drugs, have untreated active tuberculosis, or have been infected with HIV should not breastfeed (1). However, smoking, environmental contaminants, moderate alcohol consumption, or prescription and over-the-counter drugs use should not preclude breastfeeding.

With all the best intentions and technologic expertise, “humanized” infant formulas do not compare to mother’s own milk. Therefore, it is logical and appropriate for health professionals to encourage human milk consumption whenever possible. However, once the information is presented, there is no justification for attempting to coerce women into making a feeding choice (6).

Sometimes a formula-fed child and, rarely, a breastfed infant develop a sensitivity to cow’s milk, either cow milk allergy (CMA) or lactose intolerance. The CMA incidence has been estimated to occur at 0.3–7.5% (7). Secondary lactose deficiency occurs in infancy usually after a gastrointestinal (GI) disorder.

Although human milk is “uniquely superior” for infant feeding and is species specific, the most acceptable alternative is commercial formulas. Manufacturers do their utmost to mimic human milk. Presently, all substitute feedings differ markedly from human milk (1). A “formula” is just that: an equation that is proprietary, consisting of a composite mix of nutrients, emulsifiers, and stabilizers that differs between manufacturers. Formulas in North America that are marketed for term infants are either (1) cow-milk based (casein or whey predominant), (2) soy-protein based, or (3) protein-hydrolysate based. The use of soy-based formulas, speciality formulas, or formulas for the feeding of the premature infant is beyond the scope of this review.

The success of formula manufacturers is due to: (1) aggressive marketing; (2) lack of support for breastfeeding from family, friends, and the medical profession; (3) cultural...