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Feeding Babies: Birth to Six months

The information explosion in the science of nutrition very often creates the impression that available information is contradictory. Consequently, it is no longer easy to distinguish between fact, misinformation and fiction. The Nutrition Information Centre of the University of Stellenbosch (NICUS) was established to act as a reliable and independent source of nutrition information.

Exclusive breastfeeding is recommended worldwide as the optimal feeding mode for young infants.

This article highlights the infant's basic nutritional needs as well as differences and indications of available infant formulae for those mothers who might not be able to or may choose not to breastfeed their babies.

There is no finer investment for any community than putting milk into babies.
Winston Churchill, 1943

Breastfeeding

Breast milk as the infant's sole nutrition is recommended for the first 4-6 months of life because of its compatibility and excellent nutritive value. Biochemical, immunochemical and cellular components of breastmilk are uniquely beneficial to the infant. It contains factors that provide protection against certain bacteriological infections, diarrhoea and otitis media.

New research leaves little doubt that in order for infants and their mothers to achieve optimal health, the necessary environment has to be created, which will allow women to practice their right to exclusive breastfeed their infants for about four to six months (and up to two years with the correct complementary foods). Practitioners and other health professionals should encourage and help the new mother to reach this goal. When faced with problems such as sore nipples, mastitis and other general malpractices or misbeliefs about breastfeeding such as "too little milk", the mother should be advised to consult a breastfeeding consultant before any formula feed is recommended. Tired and emotional mothers need little discouragement to stop breastfeeding their babies, while simple solutions and advice such as correct latching could have supported their original decision to breastfeed their babies.

Contraindications to breastfeeding include mother's refusal to breastfeed, galactosemia, phenylketonuria, urea cycle defects and other inborn errors of metabolism or any medical disorder in the mother or the infant on the recommendation of a medical practitioner. HIV has been repeatedly documented to be transmitted through breast milk and is usually considered as a contraindication in most developed countries. Mother to child transmission from breastfeeding can occur at any time during the feeding. The mother should be educated and informed on the choice available in order to enable her to make an informed decision, before birth if possible.

Infant formulae

Practitioners and other health professionals will always be faced with the task of recommending baby milk formulae to the mother. As such, they should be appropriately trained in the choices available and the correct management of the mother who chooses to use them. A wide range of formulae is now available in South Africa, which could cause confusion regarding their suitability and appropriate use.

The consensus of current opinion is that unmodified cow's milk is inappropriate for infants before the age of 12 months and certainly before the age of 6 months. The tough hard curd is difficult for young infants to digest and less of cow's milk fat is absorbed as compared with that of human milk. Also, the much higher protein and ash content results in a higher renal solute load. Infant formula companies have progressively modified and supplemented milk formulae to resemble human milk as much as possible in order to eliminate the above-mentioned problems.

Modified cow's milk formulas (healthy full-term babies)

Presently available cow's milk formulas are constructed to provide 67 to 70 kcal/100 ml when prepared according to the directions and provide a protein content of 1,5g/100 ml, approaching that of human milk. In some formulas the protein is primarily whey and in other the protein is primarily casein. The whey- based formulas are highly modified and result in a softer curd, resembling breastmilk. These formulas are usually recommended in the first 4-6 months of life, but can be continued longer if the baby is satisfied and growing well according to the road to wellness growth chart. Casein-based formulas resemble cow's milk, but are modified and fortified with vitamins and minerals. The higher casein content is more filling and satisfying for the "hungry" baby and is usually recommended from birth to twelve months.

Allergy to cow's milk allergy:

- A reasonable estimate for milk allergy in general population is probably 1-3%.

Allergy to soya protein:

- The prevalence of soya protein allergy in children who are allergic to cow's milk protein is probably around 10% in infants with IgE -mediated cow's milk allergy.
- The prevalence of soya protein allergy is approximately 50-60 % in infants with Non -IgE mediated cow's milk allergy and soya milk is not recommended in this situation.

The major difference between these milks produced by different companies is the variance in taste, since the compositional differences are minor. Follow-on formulas are usually recommended between 6 and 12 months. These formulas have a higher protein and sodium content and are casein based resembling cow's milk (preparing the child for unmodified or partially modified full cream cow's milk, which can be included in the diet from 12 months onwards).

Modified cow's milk formulas versus soy-based formulas and goat's milk

It is well-documented that cow's milk along with a few other foods, can be allergenic for some individuals, especially those with a family history of atopy. Foods implicated most frequently in IgE-mediated hypersensitivity include egg, peanut, cow's milk, soy, wheat, fish, tree nuts and shellfish. It is often the case, however, that the so- called allergy to these foods is not diagnosed upon further investigation. Nevertheless, any indication of an allergic reaction to any foods should be properly investigated and confirmed in view of its potentially serious implications.

For years soy formulas were widely used for feeding babies with cow's milk allergy, being the only available cow's milk substitute. The lack of a suitable diagnostic test for food allergy or sensitivity allowed for an exaggeration of the incidence of cow's milk allergy or lactose intolerance. In Australia the soy formula accounts for approximately 12% of formula sales, while the true incidence of milk intolerance is approximately 2%. Over the years the tendency to exclude milk products in order to protect the infant against the possibility to develop an allergy also led to an increasing number of prescriptions for soy milk formulae, especially in infants with a positive family history for allergies.

Soy protein is also listed among the allergenic foods. Indeed, growing evidence suggest that soy proteins can induce enteropathy in young infants in the presence or absence of cow's milk intolerance. Soy protein induced colitis has also been described especially if the protein is fed immediately after intestinal injury. There is no evidence that soy formulae are nutritionally superior to cow's milk formulae for normal infants. Furthermore, the substitution of soy formulae for the prevention of allergic reactions to cow's milk does not seem to have any documented and consistently confirmed advantages.

If an infant with a family history of atopy is not breast-fed at all, there is overwhelming evidence in favour of choosing a hydrolyzed hypoallergenic formula rather than a soy formula. Evidence that goat's milk is beneficial to allergic or eczematous children is also rather unsubstantiated. Goat's milk is not always pasteurized and it provides insufficient amount of folic acid to meet requirements.

Infant soymilk formulas (soy beverages sold in health shops are not suitable for babies) are indicated in confirmed lactose intolerance, but the child should be challenged with cow's milk based products from time to time.

Contact NICUS for advice on which product to choose for your infant or toddler.

Treatment for Cow's milk protein allergy:

- Extensively hydrolysed formulas have been found to be substantially less antigenic and allergenic than partially hydrolysed formulas, BUT infants highly sensitized to cow's milk protein may react against residual hydrolysed formulas.
- This illustrates that none of the "hypoallergenic" formulas based on hydrolysates are non-allergenic.
- In highly sensitive infants a skin prick test with a fresh sample of the ready to feed hypoallergenic formula should be done in order to evaluate its allergenicity.
- An open challenge with the chosen formula should be performed under medical supervision if the skin prick test is positive before recommending use of the product.
- In infants with severe cow' milk protein allergies and multiple food allergies a synthetic amino acid based formula has been shown to be safe.
- Controlled rechallenges should be carried out every 6-12 months in order to avoid over treatment and unnecessary restricted diets.

Examples of hypoallergenic formulas:

Partially Hydrolysed Formulas: Nan HA
Extensively Hydrolysed Formulas:
Nutramigen (casein)
Pregestimil (casein)
Alfa-Ré (whey)
Amino acid mixtures:
Neocate

Introduction of solid food (Weaning food)

The weaning process is recommended to start between 4 and 6 months. At this age the infant's energy requirements are increasing and the gastrointestinal and renal functions have matured to cope with an increased variety of foods. Non-wheat cereals (rice), maize, fruit, vegetables or potato purees are ideal starting foods. Small amounts (1-2 teaspoons) are tried at first and are gradually increased to 3 meals at six months. (In the follow-up article: Part two: Feeding Babies Six to Twelfth Months, we expand on weaning foods considerably.)

Nutritional Requirements of a healthy full-term baby: 0-6 months

Fluid requirements: 150-180 ml/kg

Energy:
0-6 months: 100-110 kCal/kg/day (454 kJ/ kg/day)

Protein:
0-6 months; 2.2 g/kg/day

For further, personalized and more detailed information, please contact NICUS or a dietitian registered with the Health Professions Council of South Africa.

References from the scientific literature used to compile this document are available on request.

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