

Developments in Infant & Young Child Nutrition

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Feeding New Born

- It is recognized that breast milk is the best source of nutrition for infants.
- Breast-milk provides the best nutrition for infants to achieve optimal growth and development.
- Exclusive breastfeeding in the first six months of life is particularly beneficial for mothers and infants.



World Health Organization

International Code of Marketing of Breast-milk Substitutes

Article 10. Quality

10.1 The quality of products is an essential element for the protection of the health of infants and therefore should be of a high recognized standard.

10.2 Food products within the scope of this Code should, when sold or otherwise distributed, meet applicable standards recommended by the Codex Alimentarius Commission and also the Codex Code of Hygienic Practice for Foods for Infants and Children.

Evolution of Formula Milk

Nutrient	Composition, 100 ml		Energy Distribution, kcal	
	Human milk	Cow milk	Human milk	Cow milk
Energy	70 Kcal	65 Kcal		
Protein	1.1 g	3.3 g	6%	20%
Whey : Casein	60:40	20:80		
Fat	4.2 g	4.0 g	52%	53%
Sat : Unsat	35:65	70:30		
Carbohydrate	7.0 g	4.4 g	42%	27%
Water	87.5	87.5		

Evolution of Formula Milk

Table 2. Typical Compositions of the Major Proteins in Human and Cow's Milk.

Protein	Human (mg/mL)	Cow (mg/mL)
α -lactalbumin	2.2	1.2
α -s1-casein	0	11.6
α -s2-casein	0	3.0
β -casein	2.2	9.6
κ -casein	0.4	3.6
γ -casein	0	1.6
immunoglobulins	0.8	0.6
lactoferrin	1.4	0.3
β -lactoglobulin	0	3.0
lysozyme	0.5	trace
serum albumin	0.4	0.4
other	0.8	0.6

Fatty acids ^b	Human	Cow
Saturated		
Butyric (4:0)	— ^c	3.5
Caproic (6:0)	— ^c	1.9
Caprylic (8:0)	— ^c	1.3
Capric (10:0)	1.4	2.5
Lauric (12:0)	6.2	2.8
Myristic (14:0)	7.8	10.7
Palmitic (16:0)	22.1	27.8
Stearic (18:0)	6.7	12.6
Total	48.2	65.6
Monounsaturated		
Palmitoleic (16:1)	3.1	2.5
Oleic (18:1)	35.5	26.5
Gadoleic (20:1)	0.96	trace
Cetoleic (22:1)	trace	trace
Total	39.8	30.3
Polyunsaturated		
Linoleic (18:2)	8.9	2.5
Linolenic (18:3)	1.2	1.6
Parinaric (18:4)	— ^c	trace
Arachidonic (20:4)	0.72	trace
Eicosapentenoic (20:5)	trace	trace
Docosapentenoic (22:5)	trace	trace
Docosahexenoic (22:6)	trace	trace
Total	12.0	4.1

Draft Regulations 2019

- Infant milk food
- Infant formula
- Milk cereal based foods
- Processed cereal based foods
- Follow up Formula
- **Formula for Special Medical Purposes (FSMP)**
 - Premature infant milk substitute
 - Lactose free – Lactose and sucrose free – and sucrose free – Infant milk substitutes:
 - Hypoallergenic infant milk substitutes
 - **Foods for Infants with Inborn Errors of Metabolism (IEM)**
- **Food for Infants based on traditional food ingredients**

Definitions

- **Infant** - means a person not more than 12 months of age.
- **Infant Milk Substitute** - any food being marketed or otherwise represented as a partial or total replacement for mother's milk, for infant up to the age of two years.
- **Infant Food** - any food (by whatever name called) being marketed or otherwise represented as a complement to mother's milk to meet the growing nutritional needs of the infant after the age of six months and up to the age of two years.

Definitions

- (6) “Infant milk food” means a breast-milk substitute specially manufactured to meet the nutritional requirements of infant.
- (7) “Infant formula” means a breast milk substitute specially manufactured product based on milk of cow or buffalo or mixture thereof and other ingredients which have been proven to be suitable for infant feeding, to meet the nutritional requirements of infant.
- (8) “Milk cereal based complementary food” means the food based on milk, cereals and /or legumes (pulses), millets, nuts and protein concentrates/protein isolates and/or defatted edible oilseed extracts and so prepared as to permit dilution with water or milk or other suitable medium.
- (9) “Processed cereal based complementary food” means food based on cereals and legumes (pulses), millets, nuts and protein isolates/protein concentrates or de-fatted edible oil seed extracts and so prepared as to permit dilution with water milk or other suitable medium.
- (10) “Follow-up formula” means a food intended for use as a liquid part of the complementary diet for infants when prepared in accordance with instructions for use.
- (11) “Infant Formula for special medical purpose” means a substitute for human milk or infant formula that is specially manufactured to meet the special nutritional requirements of infants with specific disorders, diseases or medical conditions.
- (12) “Foods for Infant based on traditional food ingredients” are products known to be prepared traditionally at home for feeding infants, but processed and provided in packaged forms.

Infant Milk Food

- Limits are based on two measures i.e. 100g & 100kcal

Sl. No.	Parameters	Limits		Limits per 100 kcal	
		Minimum	Maximum	Minimum	Maximum
1.	Moisture, per cent by weight	-	4.5	-	-
2.	Total milk protein (N x 6.38), per cent by weight	12.0	-	2.50	-
3.	Milk fat, per cent by weight	18.0	-	3.80	-
4.	Total ash, per cent by weight	-	8.50	-	-
5.	Ash insoluble in dilute hydrochloric acid, per cent by weight	-	0.10	-	-
6.	Trans fatty acids, per cent by weight of total fatty acids	-	3.0	-	-
7.	Energy per 100 ml of the reconstituted product prepared in accordance with manufacturer's instructions	60 kcal	70 kcal	-	-
8.	Carbohydrates, g per 100 g	45.0	70.0	9.60	14.90

Infant Formula

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Medical Position Paper

Global Standard for the Composition of Infant Formula: Recommendations of an ESPGHAN Coordinated International Expert Group

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CODEX STAN 72 – 1981

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STANDARD FOR INFANT FORMULA AND FORMULAS FOR SPECIAL MEDICAL PURPOSES INTENDED FOR INFANTS

CODEX STAN 72 – 1981

SECTION A: REVISED STANDARD FOR INFANT FORMULA

PREAMBLE

This standard is divided into two sections. Section A refers to Infant Formula, and Section B deals with Formulas for Special Medical Purposes Intended for Infants.

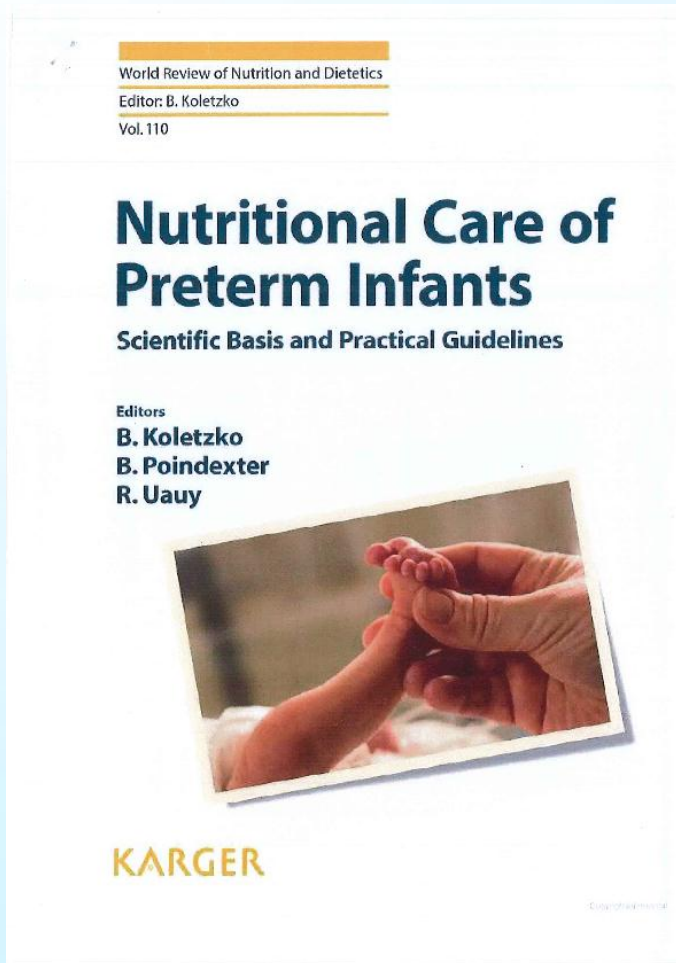
Premature Infant Milk Substitute

- Nutrient requirements for Premature babies needs to be aligned with the Global Expert recommendations

Premature infant milk substitute: (a) The premature infant milk substitute is required for babies born before 37 weeks only and till they attain 40 weeks of age. In addition to the requirements specified under regulation 5(2)(vii) and 5(2)(viii) for Infant formula, the premature Infant Milk Substitutes shall also meet the following requirements:

- (i) Protein content ($N \times 6.25$) shall not be less than 10.6 and not more than 19.2 per cent by weight or not less than 2.25 and not more than 4.1 g per 100 kcal only till 40 weeks.
- (ii) The energy content shall not be less than 70 kcal and not more than 80 kcal.
- (iii) Mineral content: Not less than 2.35 per cent by weight or 0.5 g per 100 kcal.
- (iv) Calcium: Phosphorus ratio shall be 2:1

Premature Infant Milk Substitute



Enteral Nutrient Supply for Preterm Infants: Commentary From the European Society for Paediatric Gastroenterology, Hepatology, and Nutrition Committee on Nutrition

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Feeding Preterm Infants After Hospital Discharge

A Commentary by the ESPGHAN Committee on Nutrition

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Follow-up Formula

- Limits are based on two measures i.e. 100g & 100kcal

S. No.	Parameters	Limits		Limits Per 100 kcal	
		Minimum	Maximum	Minimum	Maximum
1.	Moisture, percent by weight	-	4.50	-	-
2.	Total ash, per cent by weight	-	8.50	-	-
3.	Ash insoluble in dilute hydrochloric acid, per cent by weight	-	0.10	-	-
4.	Vitamin A (as retinol equivalent, RE), µg per 100-g	350.0	400.0	75.0	85.0 225
5.	Vitamin D (expressed as Cholecalciferol or ergo calciferol), µg per 100-g	5.0	10.0	1.0	2.10 3.0
6.	Vitamin E (as alpha-tocopherols), mg per 100-g	2.50	6.0	0.50	1.30 5.0 (GUL)
7.	Vitamin K, µg per 100-g	7.50	15.0	1.60 4.0	3.20 27(GUL)

Follow-up Formula

Compositional Requirements of Follow-Up Formula for Use in Infancy: Recommendations of an International Expert Group Coordinated by the Early Nutrition Academy

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Composition of Follow-Up Formula for Young Children Aged 12–36 Months: Recommendations of an International Expert Group Coordinated by the Nutrition Association of Thailand and the Early Nutrition Academy

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PROPOSED DRAFT REVISED STANDARD FOR FOLLOW-UP FORMULA (CXS 156-1987)

- ESSENTIAL COMPOSITION -

(for adoption at Step 5)

SECTION A: FOLLOW-UP FORMULA FOR OLDER INFANTS

3 ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Essential composition

- 3.1.1 Follow-up formula for older infants is a product based on milk of cows or other animals or a mixture thereof and/or other ingredients which have been proven to be safe and suitable for the feeding of older infants. The nutritional safety and adequacy of follow-up formula for older infants shall be scientifically demonstrated to support growth and development of older infants.
- 3.1.2 When prepared ready for consumption in accordance with the instructions of the manufacturer, the products shall contain per 100 ml not less than 60 kcal (250 kJ) and not more than 70 kcal (295 kJ) of energy
- 3.1.3 Follow-up Formula prepared ready for consumption shall contain per 100 kcal (100 kJ) the following nutrients with the following minimum and maximum or guidance upper levels (GUL)¹ as appropriate.

Beneficial Nutrients

- Medium Chain triglycerides(MCT)
- Human Milk Oligosaccharides
- Inulin
- Lutein

Thank you

