Compositional Standards under Regulation 252 of the Singapore Food Regulations for Infant Formula

Essential composition

Nutrients/composition	Units	Per 100ml	
Nutrients/composition		Minimum	Maximum
Energy values	Kcal	64	72

Nutrients/composition	Units	Per 100kcal	
Nutrients/composition		Minimum	Maximum
Protein	Grams	1.8	4
Fat ₁	Grams	3.3	6
Linoleic acid	Grams	0.3g	
Vitamin A (retinol)	Micrograms	75	150
Vitamin D	Micrograms	1	2.5
Vitamin C (Ascorbic acid)	Milligrams	8	
Vitamin B1 (Thiamine)	Micrograms	40	
Vitamin B2 (Riboflavin)	Micrograms	60	
Nicotinamide	Micrograms	250	
Vitamin B6	Micrograms	35	
Folic acid	Micrograms	4	
Pantothenic acid	Micrograms	300	
Vitamin B12	Micrograms	0.15	
Vitamin K1	Micrograms	4	
Vitamin H (Biotin)	Micrograms	1.5	
Vitamin E (d-tocopherol compounds)2	IU	0.7	
Sodium	Milligrams	20	60
Potassium	Milligrams	80	200
Chloride	Milligrams	55	150
Calcium	Milligrams	50	
Phosphorus	Milligrams	25	
Calcium:Phosphorus ratio	-	1.2	2
Magnesium	Milligrams	6	
Iron	Milligrams	0.15	
lodine	Micrograms	5	
Copper	Micrograms	60	
Zinc	Milligrams	0.5	
Manganese	Micrograms	5	
Selenium	Micrograms	1	5

¹ Long chain (20 and 22 carbon atoms) polyunsaturated fatty acids (LCP) but their content shall not exceed —

^{1%} of the total fat content for n-3 LCP; and 2% of the total fat content for n-6 LCP (1% of the total fat content for arachidonic acid), and the eicosapentaenoic acid (20:5 n-3) content shall not exceed that of docosahexaenoic (22:6 n-3) acid content

² Vitamin E - also not less than 0.7 I.U. Vitamin E (d-tocopherol compounds) per gram linoleic acid (or per g polyunsaturated fatty acids, expressed as linoleic acid)

Optional ingredients

- Beta-palmitin₃ in an amount not exceeding 80% of the total fat content of infant formula.
- Isolated amino acids may be added to infant formula only to improve its nutritional value.
 Essential amino acids may be added to improve protein quality, only in amounts necessary for that purpose. Only natural L-forms of amino acids shall be used.

Nutriento/composition	Units	Per 1	00ml
Nutrients/composition	Units	Minimum	Maximum
Galactooligosaccharides and long chain inulin and oligofructose from inulin	Grams		0.8
Polydextrose	Grams		0.2
Bovine lactoferrin	Milligrams		100
Nucleotides	Milligrams		16

³ Beta-palmitin, with at least 52% of total palmitic acid esterified at the beta position

Permitted Food Additives in Infant Formula under Schedules Six, Seven and Eight, of the Singapore Food Regulations

Permitted nutrient supplements

Nutrients	Permitted forms
Calcium	Calcium carbonate
	Calcium chloride
	Tricalcium dicitrate (Calcium citrate)
	Calcium gluconate
	Calcium glycerophosphate
	Calcium L-lactate
	Calcium hydroxide
	Calcium oxide
	Calcium dihydrogen phosphate (Calcium phosphate, monobasic)
	Calcium hydrogen phosphate (Calcium phosphate, dibasic)
	Tricalcium diphosphate (Calcium phosphate, tribasic)
	Calcium sulphate
Iron	Ferrous carbonate, stabilised with saccharose
	Ferrous fumarate
	Ferrous gluconate
	Ferrous lactate
	Ferrous sulphate
	Ferric ammonium citrate
	Ferric citrate
	Ferric diphosphate (pyrophosphate)
	Hydrogen reduced iron
	Electrolytic iron
	Carbonyl iron
	Ferric saccharate
	Sodium ferric diphosphate
	Ferrous citrate
	Ferrous succinate
Magnesium	Magnesium chloride
	Magnesium gluconate
	Magnesium glycerophosphate
	Magnesium hydroxide
	Magnesium lactate
	Magnesium oxide
	Magnesium hydrogen phosphate (Magnesium phosphate, dibasic)

	Trimagnesium phosphate (Magnesium phosphate, tribasic)
	Magnesium sulphate
	Magnesium acetate
	Magnesium salts of citric acid
	Magnesium carbonate
Sodium	Sodium carbonate
	Sodium hydrogen carbonate (Sodium bicarbonate)
	Sodium chloride
	Trisodium citrate (Sodium citrate)
	Sodium gluconate
	Sodium L-lactate
	Sodium dihydrogen phosphate (Sodium phosphate, monobasic)
	Disodium hydrogen phosphate (Sodium phosphate, dibasic)
	Trisodium phosphate (Sodium phosphate, tribasic)
	Sodium hydroxide
	Sodium sulphate
Potassium	Potassium carbonate
	Potassium hydrogen carbonate (Potassium bicarbonate)
	Potassium chloride
	Tripotassium citrate (Potassium citrate)
	Potassium gluconate
	Potassium glycero-phosphate
	Potassium L- lactate
	Potassium dihydrogen phosphate (Potassium phosphate, monobasic)
	Dipotassium hydrogen phosphate (Potassium phosphate, dibasic)
	Potassium phosphate, tribasic
	Potassium hydroxide
Copper	Cupric gluconate (Copper gluconate)
	Cupric sulphate (Copper sulphate)
	Cupric carbonate
	Cupric citrate
Iodine	Potassium iodide
	Sodium iodide
	Potassium iodate
	Sodium iodate
Zinc	Zinc acetate
	Zinc chloride
	Zinc gluconate

	Zinc lactate
	Zinc oxide
	Zinc sulphate
	Zinc citrate (zinc citrate dihydrate or zinc citrate
	trihydrate)
Manganese	Manganese(II) chloride
	Manganese(II) citrate
	Manganese(II) glycerophosphate
	Manganese(II) sulphate
	Manganese(II) gluconate
	Manganese(II) carbonate
Selenium	Sodium selenate
	Sodium selenite
Chromium	Chromium (III) chloride
Molybdenum	Sodium molybdate
	Ammonium molybdate
Vitamin A	Retinol
	Retinyl acetate
	Retinyl palmitate
	Beta-Carotene
Vitamin D	Vitamin D2 = Ergocalciferol
	Vitamin D3 = Cholecalciferol
Vitamin E	D-alpha-Tocopherol
	DL-alpha-Tocopherol
	D-alpha-Tocopheryl acetate
	DL-alpha-Tocopheryl acetate
	D-alpha-Tocopheryl acid succinate
	DL-alpha-Tocopheryl acid succinate
Vitamin C	L-Ascorbic acid
	Calcium-L-ascorbate
	6-Palmitoyl-L-ascorbic acid (Ascorbyl palmitate)
	Sodium-L-ascorbate
	Potassium-L-ascorbate
Vitamin B1	Thiaminchloride hydrochloride
	Thiamin mononitrate
Vitamin B2	Riboflavin
	Riboflavin-5'-phosphate sodium
Niacin	Nicotinic acid amide (Nicotinamide)
	Nicotinic acid
Vitamin B6	Pyridoxine hydrochloride
Folic acid	N-Pteroyl-L-glutamic acid (folic acid)
Pantothenic	Calcium-D-pantothenate
acid	Sodium-D-pantothenate
	D-Panthenol
Vitamin B12	Cyanocobalamin

	Hydroxocobalamin
Vitamin K1	Phytomenadione (2-Methyl-3-phytyl-1,4-naphthoquinone/ Phylloquinone/ Phytonadione)
Biotin	D-Biotin
Carnitine	L-Carnitine
Taurine	Taurine
Choline	Choline
	Choline chloride
	Choline bitartrate
Inositols	Myo-Inositol (=meso-Inositol)
Nucleotides	Adenosine 5-monophosphate (AMP)
	Cytidine 5-monophosphate (CMP)
	Guanosine 5-monophosphate (GMP)
	Inosine 5-monophosphate (IMP)
	Disodium Uridine 5-monophosphate salt
	Disodium Guanosine 5-monophosphate salt
	Disodium Inosine 5-monophosphate salt

Other permitted food additives

INS	Additive
412	Guar gum
410	Carob bean gum (Locust bean gum)
1412	Distarch phosphate
1414	Acetylated distarch phosphate
1413	Phosphated distarch phosphate
1440	Hydroxypropyl starch
407	Carrageenan
1450	Starch sodium octenyl succinate
322(i)	Lecithins
471	Mono- and diglycerides
472c	Citric and fatty acid esters of glycerol
524	Sodium hydroxide
500ii	Sodium hydrogen carbonate
500i	Sodium carbonate
525	Potassium hydroxide
501ii	Potassium hydrogen carbonate
501i	Potassium carbonate
526	Calcium hydroxide
270	L(+) lactic acid
330	Citric acid
331i	Sodium dihydrogen citrate
331iii	Trisodium citrate
332	Potassium citrate

Requirements for Infant formula based on the Singapore Food Regulations (as of 18 May 2017)

339i, ii and iii	Sodium dihydrogen phosphate, disodium hydrogen phosphate and trisodium phosphate
340i, ii and iii	Potassium dihydrogen phosphate, dipotassium hydrogen phosphate and tripotassium phosphate
307b	Mixed tocopherol concentrate
304i	Ascorbyl palmitate
290	Carbon dioxide
941	Nitrogen

Labelling Requirements under Regulations 5, 9, 10 and 254 of the Singapore Food Regulations for Infant Formula

The following information has to be declared on the product label in English.

Labelling requirements	Explanation
Common name of product	For example, "infant formula" / "follow-on" formula
Net quantity of the food present in the package	In terms of "net" weight, for example, "Net: 1.8kg"
The name of the country of origin	The last processing place of the food
The statement of ingredients	All ingredients and additives used to be listed in descending order of the proportion by weight in which they are present
Name and address of Singapore business entity	The name and address of the Singapore importer, distributor or agent. This can be included after the product is imported, before sale in Singapore.
Date marking	The expiry dates of prepacked food products may be declared in one of the following ways:
	 "USE BY (here insert the day, month and year)"; "SELL BY (here insert the day, month and year)"; "EXPIRY DATE (here insert the day, month and year)"; or "BEST BEFORE (here insert the day, month and year)".
Nutrition information panel	To be declared with the following nutrients present in per 100 ml or other equivalents of formula prepared in accordance with the directions on the label: (i) the amount of energy; (ii) the number of grams of protein, fat and carbohydrate; and (iii) quantity of each vitamin and mineral.
Directions as to the method of preparing the food	Information on how the formula is prepared (in graphic or words)
A statement suggesting the amount of the prepared food to be given each time	Information on the amount of the formula to be given each feed
The number of times such amount is to be given per day; such statement shall be given for each month of the infants' age up to 6 months	The number of servings to be given per day for infants up to 6 months of age
Directions for storage and information regarding its keeping qualities before and after the container has been opened	Information on how the formula should be stored before and after opening the container
Statement that infants over the age of 6 months should start to receive supplemental foods in addition to the formula	Information that complementary food has to be introduced for infants over 6 months of age

Use of claims on infant formula

- The product should not carry any claims or suggestion whether in the form of a statement, word, brand, picture, or mark purporting to indicate the nature, stability, quantity, strength, purity, composition, weight, origin, age, effects, or proportion of food or its ingredients that is false, misleading or deceptive, or is likely to create an erroneous impression regarding the value, merit or safety of the food.
- The product should not carry any claims to suggest or imply that:
 - o the food has therapeutic or prophylactic action;
 - the food will prevent, alleviate or cure any disease or condition affecting the human body; or
 - that health or an improved physical condition may be achieved by consuming the food.
- The label must not include any claim or suggestion that may be interpreted as advice of a medical nature from any person whatsoever.
- Only health claims that are permitted under the Guide to Food Labelling and Advertisement can be used4. The list can be found in **Annex** of this document.

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⁴ Should the product be labelled with health claims not permitted in Singapore, but otherwise permitted by the competent authority in the country of origin, company is to notify the Agri-Food & Veterinary Authority before the import and sale of the product.

Limits for contaminants applicable to Infant Formula under Regulations 29 to 35 of the Singapore Food Regulations

Heavy metals, arsenic, lead and copper

Substance	Unit	Limits
Mercury	ppm	0.05
Tin	ppm	250
Cadmium	ppm	0.2
Antimony	ppm	1
Arsenic	ppm	0.1
Lead	ppm	0.01 (as consumed)
Copper	ppm	20

Microbiological contaminants

Test	Limit
Escherichia coli	20 per gram per millilitre
Pathogenic microorganism	0
Total Count (at 37°C for 48 hours)	100 000 per gram
Coliform Count	50 per gram

Other contaminants

Substance	Unit	Limits
Antibiotic residues		Not detectable
Aflatoxin B1	ppb	0.1
Aflatoxin M1	ppb	0.025 (calculated on the reconstituted ready-to-drink product)
Patulin	ppb	10
Other mycotoxins		Not detectable
Melamine	ppm	1 (powdered formula)
Melamine	ppm	0.15 (liquid formula as consumed)

ANNEX: List of acceptable nutrient function claims

Macronutrients			
Nutrient	Claim	Criteria	
Protein	Protein provides the essential amino acids needed to aid in the building and maintenance of body tissues. Protein balas in tissue building.		
	Protein helps in tissue building and growth		
Lactose	Low lactose content allows easier digestions	≤ 5g lactose in per 100g of solid food; or ≤ 2.5g lactose in per 100ml of liquid food	
	Low lactose content eases digestion for people who are lactose intolerant	The amount of lactose has to be declared under the nutrition information panel	
Dietary Fibre	Dietary fibre aids in digestive system		

Vitamins		
Nutrient	Claim	Criteria
Vitamin A (calculated as retinol	Vitamin A is essential for the functioning of the eye	
activity)	Vitamin A helps to maintain normal skin and mucous membrane.	
	Vitamin A contributes to the normal function of the immune system	
Vitamin B1 (thiamin)	Vitamin B1 helps to release energy from proteins, fats and carbohydrates	
	Vitamin B1 contributes to normal functioning of the nervous system	
	Vitamin B1 contributes to the normal functioning of the heart	
Vitamin B2 (riboflavin)	Vitamin B2 helps to release energy from proteins, fats and carbohydrates	
	Vitamin B2 contributes to the reduction of tiredness and fatigue	
	Vitamin B2 contributes to the maintenance of normal skin	

Vitamins			
Nutrient	Claim	Criteria	
	Vitamin B2 contributes to the maintenance of normal red blood cells		
	5. Vitamin B2 contributes to		
	6. Vitamin B2 contributes to		
	normal functioning of the nervous system		
	7. Vitamin B2 contributes to the protection of cells from oxidative stress		
Vitamin B3 (niacin)	Vitamin B3 helps to release energy from proteins, fats and carbohydrates		
	Vitamin B3contributes to the reduction of tiredness and fatigue		
	Vitamin B3 contributes to the maintenance of normal skin		
	Vitamin B3 contributes to normal functioning of the nervous system		
Vitamin B5 (Pantothenic acid)	Pantothenic acid contributes to normal energy productions		
(Famotherne acid)	Pantothenic acid contributes to the reduction of tiredness and fatigue		
	Pantothenic acid contributes to normal mental performance		
Vitamin B6 (pyridoxine)	Vitamin B6 is important for the production of energy		
(1)	Vitamin B6 contributes to the reduction of tiredness and fatigue		
	Vitamin B6 contributes to normal functioning of the nervous system		
	Vitamin B6 contributes to the normal red blood cell formation		
	Vitamin B6 contributes to the normal function of the immune system		
	Vitamin B6 contributes to normal homocysteine metabolism		
	Vitamin B6 contributes to the regulation of hormonal activity		
Vitamin B12 (cyanocobalamin)	Vitamin B12 is necessary for fat, carbohydrate and protein metabolism		
	Vitamin B12 is needed for/helps in the formation of red blood cells		

Vitamins			
Nutrient	Claim	Criteria	
	3. Vitamin B12 contributes to the reduction of tiredness and fatigue 4. Vitamin B12 contributes to normal functioning of the nervous system 5. Vitamin B12 contributes to the normal function of the immune system 6. Vitamin B12 contributes to		
Folate (folic acid)	normal homocysteine metabolism 1. Folate contributes to normal		
	immune system function 2. Folate contributes to the reduction of tiredness and fatigue 3. Folate contributes to normal homocysteine metabolism 4. Folate contributes to normal amino acid synthesis		
Vitamin C	Vitamin C enhances absorption of iron from non- meat products		
	Vitamin C contributes to normal collagen formation for the normal function of blood vessels		
	 Vitamin C contributes to normal collagen formation for the normal function of bones 		
	Vitamin C contributes to normal collagen formation for the normal function of cartilage		
	Vitamin C contributes to normal collagen formation for the normal function of gums		
	Vitamin C contributes to normal collagen formation for the normal function of skin		
	 Vitamin C contributes to normal collagen formation for the normal function of teeth 		
	8. Vitamin C contributes to normal functioning of the immune system		
	Vitamin C contributes to normal functioning of the nervous system		
	Vitamin C contributes to the reduction of tiredness and fatigue		

Vitamins			
Nutrient	Claim	Criteria	
	11. Vitamin C contributes to the protection of cells from oxidative stress		
Vitamin D	Vitamin D helps support calcium absorption and improves bone strength		
	Vitamin D helps the body utilise calcium and phosphorus		
	Vitamin D contributes to normal blood calcium levels Vitamin D contributes to the		
	maintenance of normal muscle function		
	5. Vitamin D contributes to the maintenance of normal teeth6. Vitamin D contributes to the		
Vitamin E	normal function of the immune system 1. Vitamin E is an antioxidant		
Vitamin E	that helps protect cells in the body		
	Antioxidants like vitamin E help to protect cells from free radicals that may have escaped the natural process of our body system		
Vitamin K	Vitamin K is necessary for normal blood coagulation		
Biotin	Biotin contributes to normal energy-yielding metabolism		
	Biotin contributes to normal macronutrient metabolism Biotin contributes to the		
	maintenance of normal hair		
Choline	Choline contributes to normal lipid metabolism		
	Choline contributes to the maintenance of normal liver function		
Choline	Choline helps support overall mental functioning		
Combined vitamin cl	aims		
Vitamin K and D	Vitamins K and D work synergistically on bone metabolism to improve bone strength/build strong bones		

Minerals		
Nutrient	Claim	Criteria
Calcium	Calcium helps build/to support development of strong bones and teeth.	
	Calcium contributes to normal energy metabolism.	
	Calcium is necessary for normal nerve and muscle function.	
	Calcium is necessary for normal blood coagulation.	
lodine	lodine is essential for the synthesis of thyroid hormones by the thyroid gland.	
	lodine is necessary for normal energy metabolism.	
	lodine contributes to normal cognitive function.	
	lodine contributes to the maintenance of normal skin.	
Iron	Iron is an important component of red blood cells which carry oxygen to all parts of the body to help the body's production of energy	
	Iron is needed to produce haemoglobulin, the protein in red blood cells that carries oxygen to tissues	
	Iron is needed to produce myoglobulin, the protein that helps supply oxygen to muscle	
	Iron contributes to normal cognitive function / development	
	Iron contributes to normal energy production	
	6. Iron contributes to the reduction of tiredness and fatigue	
	7. Iron is necessary for normal immune system function	
	Iron is necessary for normal cell division	
	Iron support the child's natural defences	
Phosphorus	Phosphorus contributes to bone development	

Minerals		
Nutrient	Claim	Criteria
	Phosphorus contributes to normal energy metabolism	
	Phosphorus contributes to the maintenance of normal teeth	
Magnesium	Magnesium helps in the absorption and retention of calcium	
	Magnesium contributes to energy metabolism and the maintenance of bone and teeth	
	Magnesium is necessary for normal nerve and muscle function	
	Magnesium is necessary for normal electrolyte balance	
	5. Magnesium contributes to a reduction of tiredness and fatigue	
Zinc	Zinc is essential for growth	
	Zinc contributes to normal metabolism of fatty acids	
	Zinc contributes to the maintenance of normal bones	
	Zinc contributes to the maintenance of normal hair	
	Zinc contributes to the maintenance of normal nails	
	Zinc contributes to the maintenance of normal vision	
	7. Zinc contributes to normal cognitive function	
	Zinc contributes to the normal macronutrient metabolism	
	Zinc contributes to the normal carbohydrate metabolism	
	Zinc contributes to the normal protein synthesis	
	Zinc contributes to the normal metabolism of Vitamin A	
	12. Zinc is necessary for cell division	
	13. Zinc is necessary for normal immune system function	

Minerals		
Nutrient	Claim	Criteria
	14. Zinc helps in physical development	
	15. Zinc support the child's natural defences	
Selenium	Selenium contributes to the maintenance of normal hair	
	Selenium contributes to the maintenance of normal nails	
	Selenium contributes to the maintenance of the normal function of the immune system	
	Selenium contributes to the protection of cells from oxidative stress	
Potassium	Potassium contributes to normal muscle function	
	Potassium contributes to normal functioning of the nervous system	
Copper	Copper contributes to normal energy production	
	Copper contributes to normal functioning of the nervous system	
	Copper contributes to the normal functioning of the immune system	
	Copper contributes to the normal hair pigment	
	Copper contributes to normal skin pigmentation	

Other nutrients / food constituents		
Nutrients / Food constituents	Claims	Criteria
Chromium	Chromium contributes to normal macronutrient metabolism	
Collagen	Collagen is a protein in connective tissues found in skin, bones and muscles	
Docosahexaenoic acid (DHA) and Arachidonic acid (ARA)	DHA and ARA are important building blocks for development of the brain and eyes in infant.	

Other nutrients / food constituents			
Nutrients / Food constituents	Claims	Criteria	
Nucleotides – claim only for infant formula less than 1 year of age	Nucleotides support body's natural defences	 The total nucleotides content must be within the range of 72mg/L to 115mg/L. The amounts of nucleotides have to be declared under the nutrition information panel 	
Nucleotides	Nucleotides are essential to normal cell function and replication, which are important for the overall growth and development of infant	 Food has to be labelled clearly for this age group The amounts of nucleotides have to be declared under the nutrition information panel 	
Taurine	Taurine helps to support overall mental and physical development	 Food has to be labelled clearly for this age group The amount of taurine has to be declared under the nutrition information panel 	
Inulin	Inulin helps in calcium absorption	 The amount of inulin present in each serving or other equivalents of the product must be declared on the product label Food manufacturer/importer to ensure that the amount and combinations of shorter and longer chain inulin present in the product is able to bring about the claimed effect. 	
	Inulin helps support growth or beneficial bacteria/good intestinal flora in gut	Food manufacturer/importer to ensure that the amount of inulin present in the product is able to	
	Inulin helps increase intestinal bifidobacteria and helps maintain a good intestinal environment	bring about the claimed effect.	
Oligofructose (Fructo- oligosaccharides)	Oligofructose stimulates the bifidobacteria, resulting in a significant increase of the beneficial bifidobacteria in the intestinal tract. At the same time, the presence of less desirable bacteria is significantly reduced	Food manufacturer/importer to ensure that the amount of inulin present in the product is able to bring about the claimed effect.	
Prebiotics	Prebiotic promotes the growth of good <i>Bifidus</i> bacteria to help maintain a healthy digestive system	 The exact identity of the prebiotic and must be declared on the product label Food manufacturer/importer to ensure that the amount of inulin present in the product is able to bring about the claimed effect. 	

Other nutrients / food constituents		
Nutrients / Food constituents	Claims	Criteria
Prebiotic blend of Galacto- oligosaccharides and long chain Fructo- oligosaccharide	Prebiotic blend (galacto- oligosaccharides and long chain fructo-oligosaccharides) support the child's natural defences	The combination of Galacto- oligosaccharides and long chain Fructo-oligosaccharide present in the product must be in ratio of 9:1
Probiotics	Probiotics to help maintain a healthy digestive system	The exact specie of the probiotic present in the product must be declared on the product label
	2. Probiotics helps in digestion	Food manufacturer/importer to
	Probiotics helps to maintain a desirable balance of beneficial bacterial in the digestive system	ensure that the viable count of the probiotic present in the product is able to bring about the claimed effect.
	4. Probiotics helps to suppress/fight against harmful bacteria in the digestive system, thereby helping to maintain a healthy digestive system	