



	Breast Milk	Formula 1	Formula 2	Cow Milk
Introduction	The most nutritious one of them all, the perfect food for the infant. it has everything at the right time. It changes as the child grows.	Comes from cow milk. Can <u>satisfy by itself</u> the needs of the infant during first 6 months.	Comes from cow milk. From >6M to 1 year. Need of <u>additional foods</u> in the diet.	Worst option for the infant due to too many caseins, ↑dry extract, inflammatory and too fatty
Energy	65-70 kcal/dL	60-70 kcal/dL	60-80 kcal/dL	65-70 kcal/dL
Proteins	0,9-1,2 g/dL Whey 65% Caseins 35% Biological Value: 100 No inflammatory β-lactoglobulin, 3x Ig, essential aa's	1,1 - 2,1 g/dL Whey 60% Casein 40% Biological Value: 85 +Choline, Taurine, Inositol, Carnitine Optional supplementation	1,1 - 2,5 g/dL Whey 20% Casein 80% Biological Value: 70 +Choline, Taurine, Inositol, Carnitine Optional supplementation	3,5 g/dL Whey 15% Casein 85% Biological value: 70 50% β-lactoglobulin 25% α-lactoalbumin
Carbohydrates	6-7 g/dL Mainly lactose Amino-sugars 1,2-1,4% prebiotics for ↑microbiota growth	5,6 - 8,7 g/dL Malted dextrino flours <30% No sugar, honey or fructose	5,4 - 10 g/dL Lactose >50% Sugar, fructose and honey <20%	5 g/dL Lactose ↓↓ amino-sugars
Fats	3,5-4 g/dL Saturated 40% ↑omega 3 ↑essential FA 75% β-fatty acids 2x cholesterol	2,8 - 3,8 g/dL Saturated 40% Trans <3% Mono (oleic) 40% Poly (ω6 5-6%, linolenic, EPA, DHA, arachidonic)	3,1 - 4,2 g/dL ω6 >2,7% similar percentages as F1	3,5-4 g/dL Saturated 60% ↓omega 3 ↓essential FA ↑butyric acid 33% β-fatty acids
Vitamins	<u>Fat-soluble:</u> A (2x) and E <u>Water-soluble:</u> C (3x) and B ₃ (2x)	<u>Fat-soluble:</u> A and E <u>Water-soluble:</u> C and B ₃	<u>Fat-soluble:</u> A and E <u>Water-soluble:</u> C and B ₃	<u>Fat-soluble:</u> D and K <u>Water-soluble:</u> B complex
Minerals	0,2% of the total kidney development Bioavailability Ca 75% Ca/P ratio 1,5-2,3 Fe 0,07mg/dL Bioavailability Fe 50% (lactoferrin)	Na <12 mE/L, Na+K+Cl <50 mE/L Ca >30 mg/dL P >15 mg/dL Fe 0,07-0,14 mg/dL	Na <25 mE/L, K <34 mE/L Cl <29 mE/L Ca >42 mg/dL P >20 mg/dL Fe 0,7-1,4 mg/dL	0,7% of the total Ca, Mg (3x) P (6x) Bioavailability Ca 20% Ca/P ratio 1,3 Bioavailability Fe 1,3% Zn (2x)

Other Formulas	Adverse Effects of Using Formulas
Premature babies: similar to F1 but "on steroids", $\uparrow$ kcal $\uparrow$ Protein (2g/dL) $\uparrow$ Biological Value (70% Whey) + Micronutrient supplementation = rapid growth	1- Defects in its composition/hygiene
Lactose Free: in case of congenital intolerance or Intestinal mucosal alteration. Exchange lactose or adding lactase. Lactose fermentation $\downarrow$ pH	2- Improper use of the type of formula
Protein hydrolysates: proteins pre-digested = $\downarrow$ allergenicity. They can be $\downarrow$ hydrolysis (hypoantigenic) 8k Daltons or $\uparrow$ hydrolysis (hypoallergenic) 3k Daltons	3- Problems with reconstitution water
Monomeric formulas: everything predigested. Proteins: L aa's CH: Dextrinomaltose Free FA: short and medium chain (40%); essential FA. $\uparrow$ osmolarity	4- Nutritional modification (Sterilisation)
Supplemented with polyunsaturated FA: breast milk has a lot of Polyuns. Fatty Acids which are essential in the first week of life (development)	5- Long term impact???
Soy formulas: for cow milk protein intolerance, lactose free or vegetarian. Problem of antinutrients because of soy, decent quality protein but lacks nutrients.	
Anti-reflux formulas: with thickeners to prevent regurgitation (20% of babies). Postural (no lie down after eating), diet ($\uparrow$ frequency $\downarrow$ quantity, special milk)	
Anti-constipation formulas: F1 with β -palmitate 70% $\approx$ Breast milk $\rightarrow$ better digestion (pancreatic lipase), better absorption of Ca, Mg. + supplementation	
Anti-colic formulas: Partially hydrolyzed proteins, Lactose $\rightarrow$ maltodextrins; Fat with a higher proportion of short chain FA and β -palmitate, FOS (prebiotics)	
Day-Night formula: From 6am to 6pm (proteins, vitamins A,C,E, $\downarrow$ tryptophan, $\downarrow$ carbs). From 6pm to 6am ($\uparrow$ tryptophan) $\rightarrow$ mimics human milk	
Metabolism errors formulas: Phenylketonuria (hydroxylase def), Homocystinuria, Tyrosinemia, <u>Non-essentials:</u> Fructose or Galactose (elimination)	

