

Did you ever wonder what's in... ?

Breastmilk

Water

Carbohydrates (energy source)

- Lactose
- Oligosaccharides (see below)

Carboxylic acid

- Alpha hydroxy acid
- Lactic acid

Proteins (building muscles and bones)

- Whey protein
 - Alpha-lactalbumin
 - HAMLET (Human Alpha-lactalbumin Made Lethal to Tumour cells)
 - Lactoferrin
 - Many antimicrobial factors (see below)
- Casein
- Serum albumin

Non-protein nitrogens

- Creatine
- Creatinine
- Urea
- Uric acid
- Peptides (see below)
- Amino Acids (the building blocks of proteins)
 - Alanine
 - Arginine
 - Aspartate
 - Cysteine
 - Cystine
 - Glutamate
 - Histidine
 - Isoleucine
 - Leucine
 - Lycine
 - Methionine
 - Phenylalanine
 - Proline
 - Serine
 - Taurine
 - Threonine
 - Tryptophan
 - Tyrosine
 - Valine
 - Carnitine (amino acid compound necessary to make use of fatty acids as an energy source)
- Nucleotides (chemical compounds that are the structural units of RNA and DNA)
 - 5'-Adenosine monophosphate (5'-AMP)
 - 3':5'-Cyclic adenosine monophosphate (3':5'-cyclic AMP)
 - 5'-Cytidine monophosphate (5'-CMP)
 - Cytidine diphosphate choline (CDP choline)
 - Guanosine diphosphate (UDP)
 - Guanosine diphosphate - mannose
 - 3' - Uridine monophosphate (3'-UMP)
 - 5'-Uridine monophosphate (5'-UMP)
 - Uridine diphosphate (UDP)
 - Uridine diphosphate hexose (UDPH)
 - Uridine diphosphate-N-acetyl-hexosamine (UDPAH)
 - Uridine diphosphoglucuronic acid (UDPGA)
 - Several more novel nucleotides of the UDP type

Fats

- Triglycerides
 - Long-chain polyunsaturated fatty acids
 - Docosahexaenoic acid (DHA) (important for brain development)
 - Arachidonic acid (AHA) (important for brain development)
 - Linoleic acid
 - Alpha-linolenic acid (ALA)
 - Eicosapentaenoic acid (EPA)
 - Conjugated linoleic acid (Rumenic acid)
- Free Fatty Acids
 - Monounsaturated fatty acids
 - Oleic acid
 - Palmitoleic acid
 - Heptadecenoic acid
 - Saturated fatty acids
 - Stearic
 - Palmitic acid
 - Lauric acid
 - Myristic acid
 - Phospholipids
 - Phosphatidylcholine
 - Phosphatidylethanolamine
 - Phosphatidylinositol
 - Lysophosphatidylcholine
 - Lysophosphatidylethanolamine
 - Plasmalogens
 - Sphingolipids
 - Sphingomyelin
 - Gangliosides
 - GM1
 - GM2
 - GM3
 - Glucosylceramide
 - Glycosphingolipids
 - Galactosylceramide
 - Lactosylceramide
 - Globotriaosylceramide (GB3)
 - Globoside (GB4)
 - Sterols
 - Squalene
 - Lanosterol
 - Dimethylsterol
 - Methosterol
 - Lathosterol
 - Desmosterol
 - Triacylglycerol
 - Cholesterol
 - 7-dehydrocholesterol
 - Stigma-and campesterol
 - 7-ketocholesterol
 - Sitosterol
 - β-lathosterol
 - Vitamin D metabolites
 - Steroid hormones

Vitamins

- Vitamin A
- Beta carotene
- Vitamin B6
- Vitamin B8 (Inositol)
- Vitamin B12
- Vitamin C
- Vitamin D
- Vitamin E
 - α-Tocopherol
- Vitamin K
- Thiamine
- Riboflavin
- Niacin
- Folic acid
- Pantothenic acid
- Biotin

Minerals

- Calcium
- Sodium
- Potassium
- Iron
- Zinc
- Chloride
- Phosphorus
- Magnesium
- Copper
- Manganese
- Iodine
- Selenium
- Choline
- Sulphur
- Chromium
- Cobalt
- Fluorine
- Nickel

Metal

Molybdenum (essential element in many enzymes)

Growth Factors (aid in the maturation of the intestinal lining)

- Cytokines
 - Interleukin-1β (IL-1β)
 - IL-2
 - IL-4
 - IL-6
 - IL-8
 - IL-10
 - Granulocyte-colony stimulating factor (G-CSF)
 - Macrophage-colony stimulating factor (M-CSF)
 - Platelet derived growth factors (PDGF)
 - Vascular endothelial growth factor (VEGF)
 - Hepatocyte growth factor-α (HGF-α)
 - HGF-β
 - Tumor necrosis factor-α
 - Interferon-γ
 - Epithelial growth factor (EGF)
 - Transforming growth factor-α (TGF-α)
 - TGF β1
 - TGF-β2
 - Insulin-like growth factor-I (IGF-I) (also known as somatomedin C)
 - Insulin-like growth factor- II
 - Nerve growth factor (NGF)
 - Erythropoietin
- Peptides (combinations of amino acids)
 - HMGF I (Human growth factor)
 - HMGF II
 - HMGF III
 - Cholecystokinin (CCK)
 - β-endorphins
 - Parathyroid hormone (PTH)
 - Parathyroid hormone-related peptide (PTHrP)
 - β-defensin-1
 - Calcitonin
 - Gastrin
 - Motilin
 - Bombesin (gastric releasing peptide, also known as neuromedin B)
 - Neurotensin
 - Somatostatin
- Hormones (chemical messengers that carry signals from one cell, or group of cells, to another via the blood)
 - Cartisol
 - Triiodothyronine (T3)
 - Thyroxine (T4)
 - Thyroid stimulating hormone (TSH) (also known as thyrotropin)
 - Thyroid releasing hormone (TRH)
 - Prolactin
 - Oxytocin
 - Insulin
 - Corticosterone
 - Thrombopoietin
 - Gonadotropin-releasing hormone (GnRH)
 - GRH
 - Leptin (aids in regulation of food intake)
 - Ghrelin (aids in regulation of food intake)
 - Adiponectin
 - Feedback inhibitor of lactation (FIL)
 - Eicosanoids
 - Prostaglandins (enzymatically derived from fatty acids)
 - PG-E1
 - PG-E2
 - PG-F2
 - Leukotrienes
 - Thromboxanes
 - Prostacyclins

Enzymes (catalysts that support chemical reactions in the body)

- Amylase
- Arylsulfatase
- Catalase
- Histaminase
- Lipase
- Lysozyme
- PAF-acetylhydrolase
- Phosphatase
- Xanthine oxidase

Antiproteases (are used to bind themselves to macromolecules such as enzymes and as a result prevent allergic and anaphylactic reactions)

- a-1-antitrypsin
- a-1-antichymotrypsin

Antimicrobial factors (are used by the immune system to identify and neutralize foreign objects, such as bacteria and viruses.)

- Leukocytes (white blood cells)
 - Phagocytes
 - Basophils
 - Neutrophils
 - Eosinophils
 - Macrophages
 - Lymphocytes
 - B lymphocytes (also known as B cells)
 - T lymphocytes (also known as C cells)
 - sIgA (Secretory immunoglobulin A) (the most important anti-infective factor)
 - IgA2
 - IgG
 - IgD
 - IgM
 - IgE
 - Complement C1
 - Complement C2
 - Complement C3
 - Complement C4
 - Complement C5
 - Complement C6
 - Complement C7
 - Complement C8
 - Complement C9
 - Glycoproteins
 - Mucins (attaches to bacteria and viruses to prevent them from clinging to mucosal surfaces)
 - Lactadherin
 - Alpha-lactoglobulin
 - Alpha-2 macroglobulin
 - Lewis antigens
 - Ribonuclease
 - Haemagglutinin inhibitors
 - Bifidus Factor (increases growth of Lactobacillus bifidus - which is a good bacteria)
 - Lactoferrin (binds to iron which prevents harmful bacteria from using the iron to grow)
 - Lactoperoxidase
 - B12 binding protein (deprives microorganisms of vitamin B12)
 - Fibronectin (makes phagocytes more aggressive, minimizes inflammation, and repairs damage caused by inflammation)
 - Oligosaccharides (more than 200 different kinds!)

Formula

Water

- Carbohydrates
 - Lactose
 - Corn maltodextrin

Protein

- Partially hydrolyzed reduced minerals whey protein concentrate (from cow's milk)

Amino acid

- Taurine
- L-Carnitine (a combination of two different amino acids)

Nucleotides

- Cytidine 5-monophosphate
- Disodium uridine 5-monophosphate
- Adenosine 5-monophosphate
- Disodium guanosine 5-monophosphate

Fats

- Palm olein
- Soybean oil
- Coconut oil
- High oleic safflower oil (or sunflower oil)
- M. alpina oil (Fungal DHA)
- C.cohnii oil (Algal ARA)
- Soy Lecithin

Vitamins

- Sodium ascorbate
- Inositol
- Choline bitartrate
- Alpha-Tocopheryl acetate
- Niacinamide
- Calcium pantothenate
- Riboflavin
- Vitamin A acetate
- Pyridoxine hydrochloride
- Thiamine mononitrate
- Folic acid
- Phylloquinone
- Biotin
- Vitamin D3
- Vitamin B12

Minerals

- Potassium citrate
- Potassium phosphate
- Calcium chloride
- Tricalcium phosphate
- Sodium citrate
- Magnesium chloride
- Ferrous sulphate
- Zinc sulphate
- Sodium chloride
- Copper sulphate
- Potassium iodide
- Manganese sulphate
- Sodium selenate

Enzyme

- Trypsin