

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
- Clycine
- Cystine
- Glutamate
- Histidine
- Isoleucine
- Leucine
- Lycine
- Methionine
- Phenylalanine
- Proline
- Serine
- Taurine
- Theronine
- Tryptophan
- Tyrosine
- Valine
- Camitine (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
- a-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
- Sulpher
- 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)

- Cortisol
- 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

(thought 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)
- slgA (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 tissues)
 - 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)

FATS

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

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

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

ENZYME

- Trypsin

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
- Soy Lecithin

