

Milk Intolerance and Homoeopathy

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From Southwest Asia domestic dairy animals spread to Europe (beginning around 7000 BC but did not reach Britain and Scandinavia until after 4000 BC), and South Asia (7000–5500 BC). Sheep and goats were introduced to Africa from Southwest Asia, but African cattle may have been independently domesticated around 7000–6000 BC. Camels, domesticated in central Arabia in the fourth millennium BC, have also been used as dairy animals in North Africa and the Arabian Peninsula. Latterly it is seen the huge use of cow milk. In hindu culture milk is use for worship of lord **Shiva**. The actual reason behind it is according to the science of Ayurveda or Indian medical science, every person has 3 components in them: 1) Vata (Air), 2) Kafa (Cough) and 3) Pitta (Acids), all three elements are necessary for smooth functioning of our body. During the month of Shravan (July and august), the Vata component of a person gets higher in proportion. During that period, a person must avoid food that increases the Vata component. For example green leafy vegetable contain higher amounts of Vata in them. Thus a person is asked to avoid them during the rainy season (especially Shravan month) to avoid the ailments caused due to excess of Vata. During the rainy season, the cattle also eat lots of grass, and hence their milk is high in Vata and, in modern times, is susceptible to viral infections. Thus, milk is considered harmful during the Shravan month. Thus Ayurved advices us against consuming milk during Shravan.

Here we can say cow milk is the first food for a baby, which we introduced as a diet food. Due to this it is one of the first and most common causes of food intolerance in early childhood, this is also observed in adult

ABSTRACT

Now a days Milk intolerance is a common food intolerance among children and adult also. It results from an over-reaction of the immune system towards the protein in the milk or milk products. In children or a person who are intolerant to milk, the immune system recognizes the protein in the milk as a harmful foreign substance and starts an immune reaction to fight against it. These symptoms related to this immune reaction varies from person to person. Homoeopathic medicines treat milk intolerance by optimizing the immune system. Once the immune system is moderated, the intensity and severity of the symptoms get reduced.

KEYWORDS: Milk intolerance, Milk allergy, Milk digestion, Homoeopathy

INTRODUCTION

The introduction of cow's milk (CM) into alimentation has a very long tradition. Humans first learned to consume the milk of other mammals regularly following the domestication of animals during the Neolithic Revolution or the development of agriculture. This development occurred independently in several global locations from as early as 9000–7000 BC in Mesopotamia to 3500–3000 BC in the Americas. It is reported that animal milk was included into the human diet approximately 9000 years ago. People first domesticated the most important dairy animals – cattle, sheep and goats – in Southwest Asia, although domestic cattle had been independently derived from wild aurochs populations.

The main components of the cow's milk are: milk protein (casein), milk sugar (lactose), this two are the main cause for the milk intolerance. It is an adverse immune reaction.

What is allergy?

It is a clinical condition in which a misguided reaction to foreign substances by the immune system, the auto immune system of body defence against foreign invaders, particularly pathogens, for that a number of conditions caused by hypersensitivity shows some symptom like sneezing and an itchy, runny or blocked nose (allergic rhinitis) itchy, red, watering eyes (conjunctivitis) wheezing, chest tightness, itchy, red rash (hives) tummy pain, feeling sick, vomiting or diarrhoea dry, red and cracked skin etc.

What is intolerance?

It's a condition caused by the hypersensitivity, for this when the body shows some impulse. At that very moment the chemical reaction for the body or the immune system shows some unwillingness or refusal to tolerate some particular substances.

The topic of definition still causes confusion among physicians. Words such as "allergy," "intolerance," and "hypersensitivity" are used interchangeably. The allergy and intolerance are the hypersensitivity reaction triggered by specific immunologic mechanisms. From here we can say that all "allergies" are "intolerance" but all "intolerances" are not "allergy".

Now let us come to our topic "milk allergy or intolerance and homeopathy". So milk intolerance is an immune reaction to

one of the many proteins in animal milk. It's most often caused by the alpha S1-casein protein in cow's milk. The diagnostic approach includes performing on a medical history, physical examination, diagnostic elimination diets, skin prick tests, specific IgE measurements. There is mainly major two protein in cow milk casein and whey.

Casein: its mainly Casein contains a high number of proline residues. There are also no disulphide bridges. As a result, it has relatively little tertiary structure. It is relatively hydrophobic. It's mainly a long chain of BCAAs (branched-chain amino acid). There are four type of casein present in cowmilk (1) α 1-casein, (2) α 2-casein, (3) β -casein, (4) κ -casein.

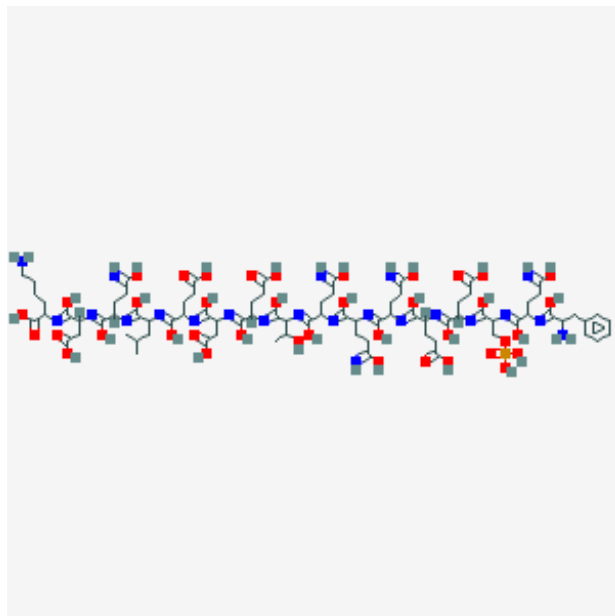


Fig: Casein two-dimensional structure

We know that protein get coagulated when it get temperature but Casein does not coagulate or breakdown in heat. Its only forms micelles in 4.6 pH .

Casein digestion: casein breaks down like brick by brick, Casein proteins in milk form small spheres, called micelles, with the hydrophilic (water-loving) portions of the protein on the outside of the sphere and the hydrophobic (water-fearing) portions on the inside. With hydrophilic structures on the outside, the micelles are soluble in water (or milk, which is mostly water). But when the micelles reach the stomach, the digestive enzyme **chymosin or rennin** snips one of the bonds on the exterior protein (known as the kappa subunit), leaving only the hydrophobic subunits inside. Then it form **paracasein**. After that **paracasein** turned in to **calcium-paracasin** (curd) in the present of calcium (Without their protective layer, the now insoluble proteins form a curd). The calcium paracasein reacts with **pepsin** and forms **peptone**. By this process the casein protein break down in small protein particle. Here the casein protein particle goes through the **glucuronidation** process by which the toxicity of the protein got less and get easily absorbed in small intestine. The small particle are mainly the amino acids of **BCAAs** of casein get metabolised by amino acid metabolism. This is a very time taking process due to the heavy weight of casein micelles which can't easily mix with water, for this its known as slow protein.

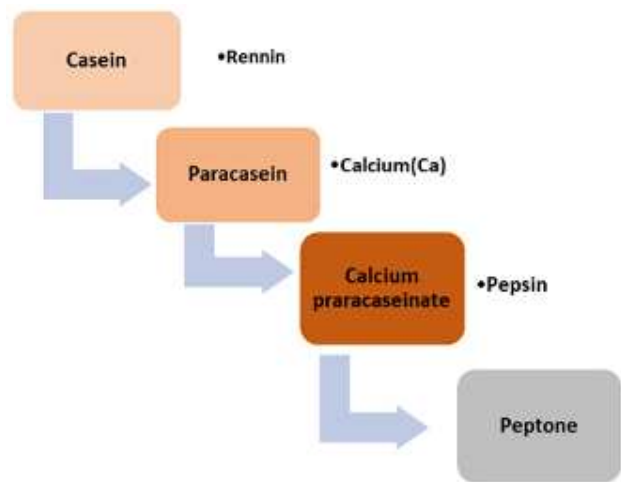


Fig: casein break down flow chart in stomach

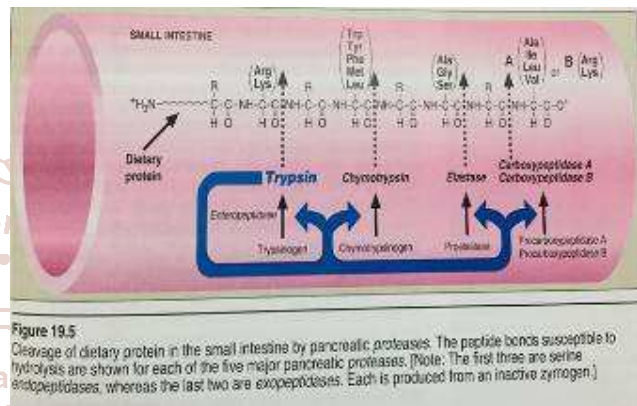


Figure 19.5 Cleavage of dietary protein in the small intestine by pancreatic proteases: The peptide bonds susceptible to hydrolysis are shown for each of the five major pancreatic proteases. (Note: The first three are serine proteases, whereas the last two are exopeptidases. Each is produced from an inactive zymogen.)

Whey protein: In milk is regarded as a “fast” protein because its amino acids appear in the bloodstream relatively quickly after digestion (one of many reasons milk's whey proteins are promoted as recovery foods after exercise).

Principal of intolerance:

The major cow's tolerance belong to the, casein fraction of proteins (1) α 1-casein, (2) α 2-casein, (3) β -casein, (4) κ -casein and whey proteins (1) α -lactalbumin, (2) β -lactoglobulin. There are immune and non-immune-mediated allergic phenomena. Immune-mediated adverse food reactions can be classified into four major categories: IgE-mediated, non-IgE-mediated, mixed, and cell-mediated reactions.

IgE and non-IgE-mediated intolerance:

Two basic mechanisms explain intolerance(allergic) reactions to cow's milk as well as to other food:

IgE mediated intolerance: Food intolerance(allergic) reactions are mostly IgE mediated and also known as immediate type hypersensitivity or type I reaction. These reactions are those that involve antigens that reacts with IgE bound to tissue mast cell results in the release of large amount of pharmacologically active substance. These reactions are rapid (hence immediate) and if injected into the skin a “wheel and flare” reaction can be seen in 5min to 10 min. IgE mediated reactions like primary exposure of allergens, processing of allergens by antigen presenting cells, role of transcription factors like GATA-3, STAT-6, NF-AT, c-maf, c-kit and NF- κ B, Treg cells, toll like receptors, cytokines and chemokines, class switch to IgE, Fc ϵ R1 receptor, priming of IgE on mast cells or basophils, signalling events followed

by secondary exposure of allergens, degranulation and release of mediators like leukotrienes, histamines, prostaglandins, β -hexosaminidase and ultimately anaphylaxis. These molecular mechanisms involved in IgE mediated reactions.

In this case when casein protein is not properly breakdown its shows a toxicity, this toxic casein protein does not goes through glucuronidation process or glucuronidation process get damage by medicinal effect on intestine cell and cell damaging of liver, genetical disorder as Uridine 5'-diphosphoglucuronosyltransferase (UDP-glucuronosyltransferase), is responsible for the process of glucuronidation, a major part of phase II metabolism. Human genes which encode UGT enzymes include:

- B3GAT1, B3GAT2, B3GAT3
- UGT1A1, UGT1A3, UGT1A4, UGT1A5, UGT1A6, UGT1A7, UGT1A8, UGT1A9, UGT1A10
- UGT2A1, UGT2A2, UGT2A3, UGT2B4, UGT2B7, UGT2B10, UGT2B11, UGT2B15, UGT2B17, UGT2B28

If anyone gene get damaged or occurs mutation then encoding of UGT enzyme get damaged and problems show in glucuronidation process; then the toxic protein dictated as antigen by our immune system and attacked by immunoglobulin IgE, this is cause for the hypersensitivity. Which is known as IgE mediated intolerance.

[1] glucuronidation: It is phase II detoxification pathway of toxin conjugated substances which occurs mainly in the liver also found in intestine, kidneys, brain, adrenal gland, spleen, and thymus. The substances resulting from glucuronidation are known as glucuronides and are typically much more water-soluble than the non-glucuronic acid-containing substances from which they were originally synthesised. The human body uses glucuronidation to make a large variety of substances more water-soluble, and, in this way, allow for their subsequent elimination from the body through urine or via bile from the liver.

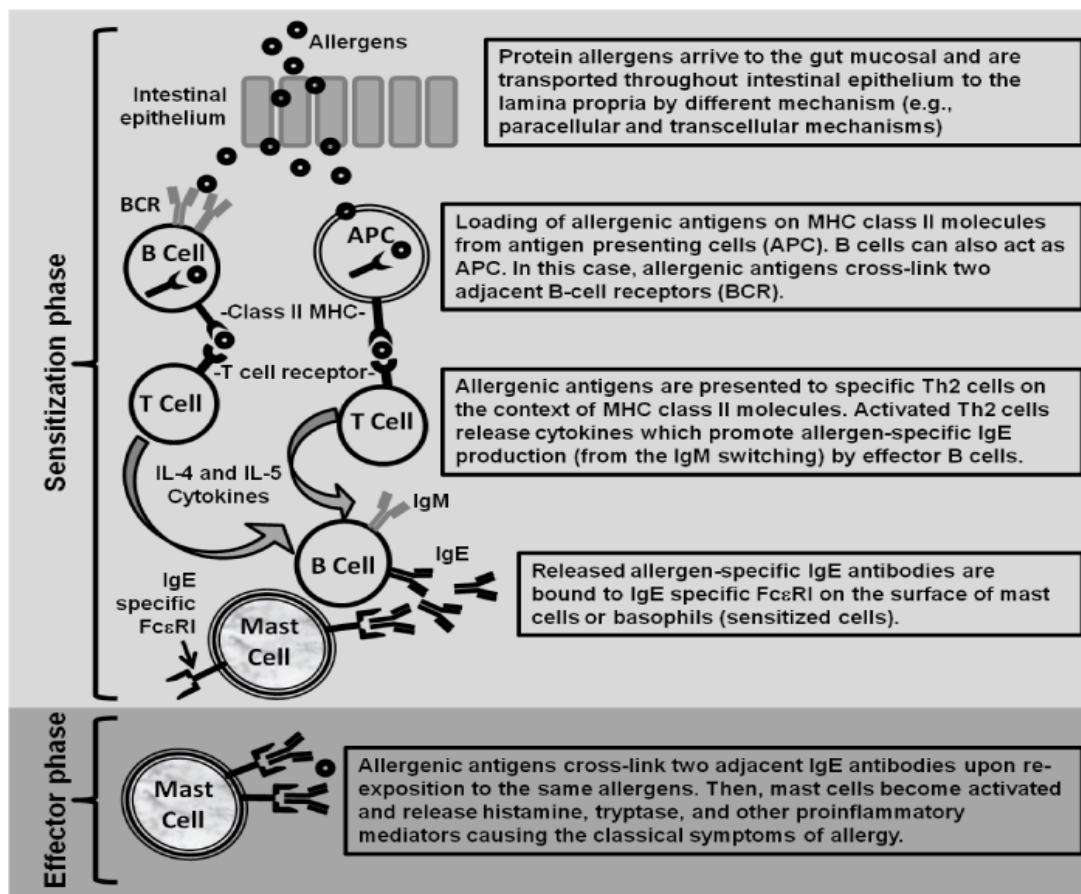


Fig: IgE-Mediated intolerance

Non-IgE-mediated: These reactions are initiated by antibody reacting with antigen on the membranes. IgM and IgG can be involved in these reactions. The gut mucosal barrier is thought to have developed to execute an immensely difficult task; digestion and absorption of nutrients without provoking immune responses and cohabiting with Proteins in the milk release biologically active peptides upon enzymatic digestion. characterized immunomodulatory peptide derived from bovine milk caseins is casein phosphopeptide (CPP) from β -casein. CPP displays mitogenic activity on mouse spleen and rabbit Peyer's patch cells and stimulates their IgA production. The monocyte/macrophage chemotactic peptides derived from

enzymatically digested bovine β -casein, a casein family member that is a major constituent of the milk. β -casein fragments generated by actinase E showed potent chemotactic activity for human and mouse monocytes/macrophages, but not neutrophils, T lymphocytes or dendritic cells. The fragment-induced migration of human monocytes was inhibited by pertussis toxin and was not desensitized by a variety of known chemoattractants. Immune tolerance to macronutrients (DPs) is maintained in part by active suppressive mechanisms involving antigen (Ag)-specific regulatory T (Treg) cells. This active immune system shows the intolerance with milk protein.

What is Lactose intolerance?

Lactose intolerance is a condition in which people have symptoms due to the decreased ability to digest lactose, a sugar milk sugar. Those affected vary in the amount of lactose they can tolerate before symptoms develop. Symptoms may include abdominal pain, bloating, diarrhea, gas, and nausea. These symptoms typically start thirty minutes to two hours after eating or drinking milk-based food.

Digestion of lactose: lactose forms by galactose and glucose subunits and has the molecular formula $C_{12}H_{22}O_{11}$. In small intestine with the help of lactase and UDP-glucuronosyltransferase, break down the lactose in glucose and galactose. These two subunits metabolised by the normal carbohydrate metabolism process.

Lactase is mainly secreted from our small intestinal cell. **the LCT gene** provides instructions for making the lactase enzyme. There is many good bacteria are present which help in our digestion **Lactobasilus** is one of this bacteria, which produce lactase enzyme.

1. If the small intestinal cell got damaged or unable to produce lactase enzyme.
2. If the pH of the small intestine got any how basic the number of lactobasilus bacteria get decrease as it's a highly acidophilic bacteria.
3. Due to Medicinal effects the cells get damage and the number of bacteria also decrease and vitamin deficiency also occurs.
4. If the mother is atopic then the baby also has the intolerance problem due to the genetical problem specially in LCT gene.
5. If the father was alcoholic then baby got genetical problem in liver cell which also cause for intolerance as the UDP-glucuronosyltransferase produced in liver and its break the glycoside bonds of lactose
6. Fetal alcohol syndrome: Alcohol acts as a teratogen in the fetus, resulting in prenatal or postnatal growth failure, characteristic facial dysmorphic features, and central nervous system dysfunction, for this the over all body working process does not work properly.
7. If the liver and small intestine of the baby are damage from the birth.

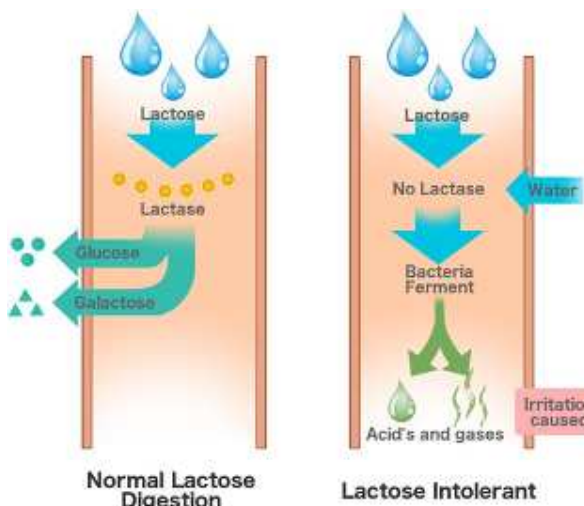


Fig: lactose intolerance in small intestine

Now how it is occurs, lactose intolerance also a part of milk intolerance, but its causes by unable to digest the lactose properly. There is Various causes for that;

Above all intolerance for the bovine milk. Now the topic is breast milk intolerance. Human breast milk typically does not cause intolerance reactions in breastfeeding infants. Its mainly show that babies cry, fuss, or even nurse when the mother was going to feed them, this is a totally phycological based matter where digestive system is not involved. But in the case of mother is atopic then the infant shows the intolerance, if the mother is atopic to some food and that food is her diet then its goes through the breast milk to the infant in causes intolerance mainly shows the IgE mediated allergy as mother milk also content casein and lactose.

In case the mother cant tolerate the milk protein and milk sugar and she is taking bovine milk in her diet the baby must be cant tolerate the bovine milk protein and sugar. As the composition of bovine milk and human milk is quite similar but the component present in of both milks are in different percentage. Where casein is presents in human milk 0.4% and in bovine milk its almost 82% and in other hand in human milk antibody IgA and IgG both r present but in bovine milk mainly IgG is present.

Nutrient	Cow milk	Goats milk	Human milk
Fat	3.67	3.8	4.0
Solid not fat	9.02	8.68	8.90
Lactose	4.78	4.08	6.92
Total Nitrogen	3.42	3.33	1.22
Total protein	3.23	2.90	1.10
Casein	2.63	2.47	0.4
Vitamin A (i.u. per gram fat)	21	39	31.9
Vitamin B (ug/100ml)	45	68	17
Vitamin C (mg ascorbic acid/100ml)	2.0	2.0	3.6
Vitamin D (i.u. per gram fat)	0.7	0.7	0.27
Sodium	60mg	50mg	15mg
Calcium	120mg	307mg	30mg
Iron	0.1mg	0	0.5mg
Phosphorus	90mg	204	15mg

In 50ml of cow milk there are 22 calories in 1%fat milk.

Now the casein is the main factor for the intolerance from this component percentage we can say that with out any atopic reason when the normal infant consume the breast milk there is no intolerance occurs but when its takes the bovine milk its show the intolerance because the percentage of the casein protein in much higher then breast milk in bovine milk as we know the casein form the toxic casein which causes the intolerance and the toxicity level get higher in the condition of bovine milk. From this we can say that the bovine milk is not for human.

Milk intolerance symptom: children or a person with a milk allergy will have a slow reaction. This means symptoms will develop over time, from several hours to days later. Symptoms associated with a slow reaction include:

- abdominal cramps
- loose stool (which may contain blood or mucus)
- diarrhea
- skin rash
- intermittent coughing
- runny nose or sinus infection
- failure to thrive (slow to gain weight or height)

Symptoms that occur quickly (within seconds to hours) may include:

- wheezing
- vomiting
- hives

Although rare, it's possible for a child with a milk allergy to have a serious reaction known as anaphylactic shock. Anaphylactic shock may cause swelling of the throat and mouth, a drop in blood pressure, and trouble breathing. It can also lead to cardiac arrest. Anaphylaxis requires immediate medical attention and is treated with epinephrine (EpiPen) in the form of a shot.

Now the relation with "**Homeopathy with the milk intolerance**", mainly there is no particular medicine for milk intolerance. Depending on the symptom there some medicine use in this case, these are:

- **Sulphur:** It is the important component in glucose digestion. It is mainly help in absorption of glucose molecule in small intestine. Its is very use full medicine for milk intolerance.
- **Magnesia Muriatica** – is a well-indicated homeopathic medicine for milk allergy with stomach pain. The person needing this remedy complains of a stomach ache from milk intake. The abdomen is tensed and sensitive to touch. Other symptoms that may appear include flatulence and vomiting. Magnesia Muriatica is also useful for children who pass milk indigested during their teething period.
- **Pulsatilla** – it's a homeopathic cure for milk allergy when consumption of milk products triggers a reaction. Any milk-based products like creams, pastries, ice cream, butter etc, tend to bring on the reaction. The symptoms appearing from these products include abdominal colic, flatulence, and a distended abdomen. Diarrhea with cutting pain in the abdomen may be present. Other attending symptoms include the sensation of a weight in the stomach, along with nausea and vomiting.
- **Lac Vaccinum Defloratum:** It is made by potentization of skimmed milk; hence it is suitable for treating the

symptoms of lactose intolerance. In these patients ingestion of milk and other dairy products, you develop symptoms of nausea with a headache and vomiting. They may also suffer from obstinate constipation leading to the passage of large stools that involves excessive straining.

- **China Officinalis:** These patients are unable to digest milk or other dairy products, which when taken will produce symptoms of bloating, belching and flatulence. They also suffer from abdominal colic due to gas that becomes relieved only by bending double or by vomiting of food.
- **Natrum Carb** – it is an effective homeopathic medicine for milk allergies when the person gets diarrhea after consuming milk. Natrum Carb is used in cases where yellow, watery and gushing stool occur after consuming milk. The stool smells sour, and blood may appear. There is a marked urgency to pass stools along with fetid flatus. There may also be severe abdominal colic present in some cases.
- **Lac caninum:** its an effect homeopathic medicine for decided effect in drying up milk in woman who cannot nurse the baby. Its mainly work on the cause for milk intolerance for a infant which work in mother's body.
- **Calcarea Carb** – it is an important homeopathic medicine for milk allergy when there is vomiting after consuming milk. There is nausea, cold sweat, and trembling along with a distended abdomen and cutting pain. In some cases, there may be a cold sensation in the abdomen.
- **Silica**– it is an effective homeopathic medicine mainly in infants breast milk intolerance. A patient needing silicea might lack vital heat and has cold hands and feet. The indications include diarrhea in response to milk along with abdominal pain and bloating in the morning.

Conclusion:

As Hipocrate's dictum stated "Let the food be thy medicine and medicine be thy food". Therefore, From this study we can say that casein is a toxic protein for health if we take it in a limited amount then it can be tolerated. Because of this in infant diet bovine milk should be avoided. For the who have milk intolerance should avoid bovine milk and kind of milk product and have a healthy diet. As casein is a heavy protein it's BCAAs increased the LDL,VLDL,HDL levels and increased the insulin resistance which is not good for health. By the growing age our body enzyme secretion get decreased, so the digestion process get slower. For all these causes we should avoid bovine milk.

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