



## Goat milk: Composition, nutritive value and its health benefits

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### Abstract

In Recent years Goat milk become more popular because of its beneficial characteristics. Goat milk is the good alternative of the Cow or buffalo milk. Goat milk is composed of different usable nutrients, which are important to their young and humans. Among those important nutrients that are found in goat milk are fat, protein, lactose, vitamins, enzymes and mineral salts. Goat's milk is the most complete food known which highly compatible and nourishing natural food is. It is so highly nutritious that it can actually serve as a substitute for a meal. Goat Milk is good source for brain development and prevention of Anemia. It is also helpful in management of gastrointestinal disease and Lactose intolerance.

**Keywords:** fat, protein, vitamin and enzyme

### Introduction

India has witnessed an increasing trend in production of Goat milk from 2010-11 to 2015-16. We have seen a compound annual growth rate of 3.2% in production of Goat milk from 4594 thousand tone during 2010-11 to 5378 thousand tone during 2015-16 <sup>[1]</sup>. Goat milk is slowly getting popular all over the world. It contains many health benefits and is rich in nutrients.

One of the most important contributions of goat milk to human nutrition is the calcium and phosphate that it supplies. Goat milk contains about 1.2 g calcium and 1 g phosphate per liter; these concentrations are similar to those in cow milk <sup>[2]</sup>.

The recent high demand and consumption of health foods in developed countries has resulted in increased interest in dairy goats and goat milk products. Goat milk protein is also hypoallergenic which is important for infants and patients who suffer from cow milk allergy. Goat milk serves three important ways for humanity, which are home consumption, specialty gourmet foods, and medical-therapeutic uses.

### Composition of Goat Milk

The composition of milk varies from goat to goat and differs for the various breeds. The primary importance is for young goat, and especially for man, who drinks the milk, is the composition

### Fat

Lipids are the most important components of milk in terms of cost, nutrition, physical and sensory characteristics that impart to dairy products. The biggest component, about 97%, of the lipid fraction of goat milk is triacylglycerol (TAG), including a larger number of esterified fatty acids <sup>[4]</sup>. The lipid fraction also contains simple lipid such as diacylglycerols, monoacylglycerols and cholesterol esters, complex lipids such as phospholipids and liposoluble compounds such as sterols, cholesterol esters and hydrocarbons <sup>[3]</sup>.

### Protein

There are two distinct phases of milk proteins; an unstable micellar phase composed of casein and a soluble composed of whey proteins. The caseins constitute about 80% of the proteins and are classified as  $\alpha_1$ ,  $\alpha_2$ ,  $\beta$  and  $\kappa$ -caseins, while the major whey proteins are -lactoglobulin and -lactalbumin <sup>[5]</sup>. Goat milk contains lower amounts of the  $\alpha_s$ -casein, higher amounts of the  $\beta$ -casein fractions and approximately equal amounts of the  $\alpha_1$ -casein fractions compared to cow milk. The major protein in cow milk is  $\alpha_1$ -casein, while in goat milk it is  $\beta$ -casein. Goat milk also contains some  $\alpha_1$ -casein, but the amount and genetic variants differ between goat populations <sup>[6]</sup>.

### Mineral salt

A natural minerals nutrition program that includes goat milk can bring excellent health benefits. The milk contains major and trace minerals including Ca, Na, Mg, P, K and Zn, Mn, Se, Co, Cu, Fe respectively. For instance, the milk is a good source of calcium, containing approximately 13% more calcium per serving than cow's milk, and making it one of the predominant natural minerals in milk and containing about 134% more K element.

### Enzymes

The enzymes of the milk of the goat are similar to those of the cow, although some specific differences have been described. Of primary interest, it has been shown that the level of alkaline phosphatase is slightly lower than that found in the dairy cattle, but the enzyme demonstrates the same degree of heat susceptibility and therefore serves equally as well as a pasteurization marker. Peroxidase activity in the milk of both species is the same in all respects, while the xanthine oxidase level is lower in the milk of the goat. Higher levels of activity are observed for both ribonuclease and lysozyme

## Vitamin

Goat milk has a higher vitamin A content than cow milk because goats convert all  $\beta$ -carotene from foods into vitamin A in the milk [7]. For the same reason, goat milk is always whiter than cow milk. Both goat and cow milk have low concentrations of vitamin B6 and vitamin D, which are both important during infancy [8, 9].

## Nutritional Value of Goat Milk

Due to impressive health benefits, goat milk has become quite popular in recent years. It is full of nutrients, and contains carbohydrates, proteins, sugars and sodium etc. It also has minerals, such as calcium, magnesium, potassium, copper and zinc. Furthermore, it contains vitamins, such as vitamin A, B and C.

Goat's milk is the most complete food known which highly compatible and nourishing natural food is. It is so highly nutritious that it can actually serve as a substitute for a meal. It is also preferred due to its low fat content and its capability to neutralize the acids and toxins present in the body. Cow milk is mucus forming for many people; however, goat milk is not only non-mucus forming, but actually helps to neutralize mucus. It is known for its superior in calcium content, in comparison with other animals' milk and the healing enzymes present in it.

## Health benefits if Goat Milk

Goat milk is one of the demanding milk items, which are trending in the world in recent years. Goat milk rich in nutrients, especially in mineral such as calcium and phosphorus. It is also suitable to those who have lactose intolerance problem, overall it can be said that goat milk is very beneficial for the prevention of gastrointestinal diseases and also in other diseases.

## A good Source of key Vitamins

One 200ml serving of goats' milk provides 14% of the NRV for vitamin B5 (pantothenic acid), which helps the body produce energy and reduces tiredness and fatigue), 12% of the NRV of biotin (a B vitamin which is important for a healthy nervous system, skin and hair). And, 11% of the NRV for vitamin A (needed for healthy skin and vision) [10].

## Good for Heart

Goat milk is rich in medium-chain triglycerides (MCT) including fatty acid esters of caproic, caprylic and capric fatty acids. These MCT have been shown to have a lowering effect on plasma cholesterol in rat models and also to inhibit and/or limit cholesterol deposition in the tissues. Altogether MCT found in goat milk act anti-atherogenic. An in-vitro study have shown that cells isolated from humans who had been drinking goat milk

From different breeds weretriggeredbycomponentsinthe milk to release nitric oxide (NO). In turn, the NO reaches the blood stream via lymphatic route, thus provoking vasodilatation and exerts a cardio-protective and anti-atherogenic affect.

## Prevention of Gastrointestinal diseases

IBD is an important health problem because of its effect on the patient's quality of life and because of its high prevalence, which has increased in the past few years. Despite intense investigative efforts, the cause of IBD is essentially unknown [11].

Colitis could be compared with the intestinal inflammation that occurs in IBD. The oligosaccharides from goat milk are shown to have an anti-inflammatory effect. The expected decrease in body weight, increased colon size and extension of necrotic lesions are prevented by the oligosaccharides. They also decreased clinical symptoms (Diarrhea and bloody stools) and caused a weaker immune response with less neutrophil infiltration [12].

## Lower in lactose

Goats' milk is not recommended for anyone who has been diagnosed with lactose intolerance. However, goats' milk typically contains slightly less lactose (the natural sugar found in milk and other dairy foods) than cows' milk [13], and the amount of lactose people can tolerate varies [14, 15]. This may help to explain why some people who experience sensitivity to lactose are able to enjoy goats' milk without any repercussions. However, do consult your GP or a health professional before making any changes to diet.

## Prevents Anemia

Goat milk has a higher bioavailability of iron and enhances iron absorption. Which means, in a way, it helps prevent anemia [16]

## Improve brain Health

The goat milk contains conjugated linoleic acid (CLA), which can influence physical growth and brain development. This study investigated the impact of a diet containing goat milk fat (GMF) on physical parameters of gestating (G) and/or lactating (L) rat dams, and their progeny's physical growth, and anxiety behavior. Data show developmental and behavioral modifications in the progeny of dams fed the GMF-rich diet consumed during gestation and lactation, suggesting the involvement of CLA in such effects [17, 18, 19].

## Conclusion

Recently, goat milk consumption and production increases globally as people recognize the advantage of goat milk especially in the developed nations. It is well known that goat milk has high nutritional value. Goat has the ability to produce milk of good composition and quality for human consumption. These compositions of milk are fat, protein, ash, vitamins, lactose and enzymes. Although it is known that goat can produce milk, which have high nutritional value and composition. Moreover, it also has medicinal value for human being and is healthy alternative to cow's milk that may be more easily digested than regular cow's milk, especially to children and those who have sensitive stomachs to other animals' milk. Goat milk lacks folic acid and it does not recommend for infants under one year because it can cause anemia.

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