



EFFECT OF MEDICINAL ELEMENTS OF GOAT MILK TO IMPROVE THE QUALITY OF GOAT MILK PRODUCTS

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ABSTRACT :

Growing understanding of the relationship between diet, specific food elements and health is leading to new visions into the effect of food components on physiological function and health. This awareness has moved consumers to become more health-conscious, driving a trend towards healthy and nutritious foods with additional health promoting functions, such as functional foods. Goats are important component of livestock industry having adaptability to harsh climates which make them suitable for landless and marginal farmers. The importance of goats as providers around the world of essential food in meat and dairy products has been conversed and documented. The milk is affordable, available and nutritious hence a wide variation of knowledge on the nutrition and to cause of allergic reaction characteristics of goat milk could promote the direct use of the milk in the nutrition of babies and weak children.

INTRODUCTION

The sociological, economic and nutritional values have significantly impact on the food industries and consumers for the manufacture of functional food products with health-related required properties. A functional food may provide stretched utility beyond its nutritional benefit. Functional foods are those foods which provide health benefits beyond the normal nutritional requirements [1]. These foods contain physiologically-active food components. These benefits can be both physical and mental and are commonly attributed to the active components of the food. Today's animal originated functional foods are typically marketed to large groups of the total population. Goats are known as "Wet nurse of infant" in the United Kingdom and "Poor man's cow" in India. Accurate statistics are required to determine the future outlook of the goat populations and their productivity. Goats are present in all of the continents and the world total numbers of goats are 861.9 million [2]. The livestock population in India includes 135.17 million goats standing at first and second place in milk and meat production overall the world respectively [3]. Research in 20th century has led to a substantial increase in our knowledge of the basic and unique features of the composition of goat milk. Goat is a good source of meat (Chevon), milk, yoghurt, cheese and other by-products such as hide and skin. Goat milk production is a dynamic and growing industry that is fundamental to the wellbeing of hundreds of millions of people worldwide and is an important part of the economy in many countries. Goat milk shows great changeability in biochemical composition, technological properties and bacteriological quality depending on genetic factors, environmental conditions, and goat farming practices [4]. These factors are- pure breeding, crossing, age, birth season, birth type, duration of lactation and dry period, milking type, frequency and duration of milking, mating season, first pregnancy age, survival rate of kids, nutrition and diseases [5].

Average composition of basic nutrients in goat, sheep and cow

Composition	Goat	Sheep	Cow
Fat (%)	3.8	7.9	3.6
Solid-not-fat (%)	8.9	12.0	9.0
Lactose (%)	4.1	4.9	4.7
Protein (%)	3.4	6.2	3.2
Casein (%)	2.4	4.2	2.6
Albumin, Globulin (%)	0.6	1.0	0.6
Non Protein N (%)	0.4	0.8	0.2
Ash (%)	0.8	0.9	0.7
Calories/100 ml	70	105	69

The popularity of dairy products from goats' milk has shown a gradual increase all over the world due to those properties which differentiate it from other milks and beneficial effects on human health.[6] In comparison with cow's milk, goats' milk has a higher concentration of short and medium chain fatty acids and lipoprotein lipase associated with the fat phase [5]. Fat is one of the most important components in the technological and nutritional quality of goat milk [6]. The percentage of total fat in goat and cow milk is quite similar, and the fatty acid composition depends to a large extent on the diet composition in both species. Two characteristics of goat milk fat have important consequences for manufacturing. One is the smaller size of the fat globules in goat milk in comparison to those in cow milk [7-8]. In both species the fat globules range from 1 to 10 μ m, but the number of fat globules less than 5 μ m is ~60% in cow milk whereas it is ~80% in goat milk which results in a softer texture of goat milk products. The second feature, is the fatty acid composition of goat milk with a higher proportion of medium chain fatty acids, i.e., caproic (C6:0), caprylic (C8:0) and 5 capric (C10:0), which are partly responsible for the characteristic "goaty" odour of goat milk [9]

Average fatty acid composition (g/100 g milk) in lipids of goat and cow milk

Fatty Acid	Goat Milk
C4:0 butyric	0.13
C6:0 caproic	0.09
C8:0 caprylic	0.10
C10:0 capric	0.26
C12:0 lauric	0.12
C14:0 myristic	0.32
C16:0 palmitic	0.34
C18:0 stearic	0.44
C6-14 total MCT	0.91
C4-18 total SAFA	2.67
C16:1 palmitoleic	0.08
C18:1 oleic	0.98
C16:1-22:1 total MUFA	1.11
C18:2 linoleic	0.11
C18:3 linolenic	0.04
C18:2-18:3 total PUFA	0.15

The mineral content of goat milk varies from 0.70 to 0.85%, of goat milk contains more calcium, phosphorous and potassium. Goat milk reportedly has higher fat and ash contents in the tropics than cow counterparts although Holstein cow milk fat is similar to that in milk of Swiss goats. Mineral contents of goat milk from French-Alpine and Anglo-Nubian breeds showed higher Ca, P, K, Mg, and Cl, and lower Na and S

levels than bovine milk. Mineral contents of commercial Indian goat milk yogurt have been shown to have significant differences in the levels of Ca, Mg, P, Fe, Zn, and Al between different yogurt varieties. Mineral concentrations of 30 varieties of Indian goat milk cheeses produced in the US revealed that there were wide variations in concentrations of P, K, Ca, Na, Cl, Fe, Al and Zn among and within varieties of the cheeses [10].

Composition of minerals and vitamins in goat milk

Composition	Goat	Composition	Goat
Ca, mg/L	1304	Cu	0.23
P	1080	Vitamin A	548
Mg	136	Vitamin D microg/L	0.6
Na	488	Vitamin K	12
K	1996	Thiamin	0.5
Cl	1566	Riboflavin	1.4
Fe	0.5	Niacin	2.7
Ascorbic acid	12.6	Panthenic acid	3.0
Vitamin B6	0.5	Vitamin B12	.064

Medicinal Properties of Elements in Goat Milk

The differences in genetic types are due to amino acid changes in the protein chains, which in turn are responsible for the transformations in digestibility, cheese making properties and flavors of goat milk products, but the amino acid changes also enable the detection of even small amounts of adulteration with cow milk. The production of cheese from goats' milk has a very long history and is an important source of protein for people in several countries. In the last decade, there has been an increased interest substitute to cow milk for those who suffer from cow milk allergy or goat milk production and its conversion to value added products as well as a renewed interest in goat milk as an alternative milk source for people with cow milk intolerance [11].

Medicinal Dairy Products with Goat Milk

The use of milk with particular nutritional properties (e.g., goats', mares' and donkeys' milk), alone or in combination with bacterial strains having probiotic properties and/or producing physiologically active metabolites, represents one of the technology options for manufacturing new dairy functional beverages. The functional value of goats' milk may be further exploited through fermentation by selected microorganisms possessing specific features. Sheep and goat cheeses are very well recognized by connoisseurs as gastronomic and festive products. Goats' milk products, especially cheeses and yogurt are very popular in the Mediterranean peninsula, the Middle East, southern Russia and the Indian subcontinent. The milk was probably made into soft cheese, and then hard, ripened goat cheeses were later developed in the Mediterranean basin countries. There are goat cheeses made from raw and pasteurized milk. In many countries the manufacture of goat cheese from raw milk is prohibited due to food safety issues. The type of milk used significantly influences the finished cheese. It is mainly produced by Bedouins during the spring season when milk is produced in excess amount [12].

Goat Milk: Development of medicinal Foods

Traditionally, goat and cow milk has been considered as a fundamental food in the diets of many cultures. Milk provides an easily accessible matrix, rich in a large variety of essential nutrients like minerals, vitamins and easy digestible proteins with balanced amino acid profiles, important in supporting most body functions. Together with grains, meats, vegetables and fruits, dairy products are categorized as nutrient-dense foods, i.e., foods that deliver many nutrients with relatively low energy content, and are relevant to health throughout the life cycle [13].

Conclusion

The production of quality goat milk through professional breeding programs can be rewarding, profitable, pleasant and successful. Human had to give more importance to their health and nutritional situation with increasing environmental pollution and stress in their life. So, recently it is watched that there has been increasing demand to foods that has Medicinal foods. Medicinal foods can be defined as foods that have positive effects on the health. The nutritional value of goat meat and milk is becoming recognized because of the medicinal values for treating many human diseases. The research is still required to exploit the use of liquid goat milk as well as its application licensing in manufacture of several milk products especially various types of fermented products through India.

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