

Goat Milk: A Nutrient-Rich Elixir for Health and Wellness

Rashmi H. D¹, Sahana V. N² and A. Harshini³

^{1,3}Assistant Professor, Livestock Farm Complex, Veterinary College, Hassan

²PhD scholar, Division of Animal Genetics and Breeding, ICAR-NDRI, Karnal

*Corresponding Author: rashmihd1315@gmail.com

Milk, often referred to as "nature's elixir," has been an integral part of human civilization for thousands of years. Cow's milk is typically the first choice for many of us when we think of milk, and goat's milk often doesn't come to mind as readily. However, increased health consciousness of the consumers after covid-19 pandemic goat milk has gained importance. Further due to cow milk protein allergy seen in infants has created the need for searching an alternative to cow milk which brings goat milk into picture which is having nutritional similarities with human milk.

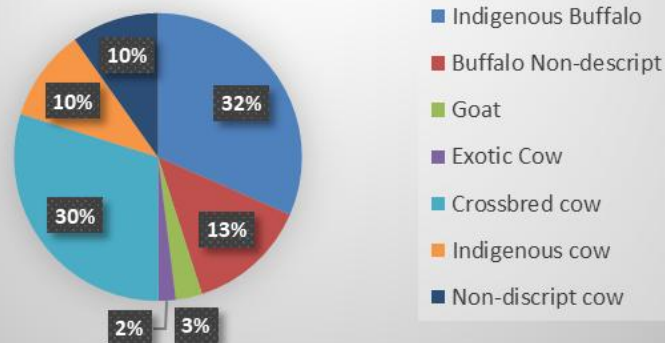
Indian scenario

Usage of goat milk for therapeutic purpose is not a new concept for Indians. Medicinal properties of goat milk are stated in many of our ancient Ayurvedic scriptures like Charaka Samhita which date back to the fourth century. "Mahatma Gandhi" acknowledges goats as "poor man's cow" which play important role in Indian rural economy.

Today, India occupies the first position in global goat milk production (6.09 million tonnes) and in India goat is 3rd (3% of total milk) largest milk contributing species (DAHD 2019). The top five goat milk producing states are Rajasthan, Uttar Pradesh, Madhya Pradesh, Gujarat and Maharashtra accounting for 79.5% of total goat milk production. The amount of milk produced by goats in the country is probably more than what is stated in the official statistics as a significant portion is consumed at home and is not reported.

With 37 different goat breeds spread across, India is home to immense caprine resources. Indian dairy goat breeds include the Beetal, Jamunapari, Jakhrana, Surti, and Zalawadi, which are native to the north and northwestern regions and produce 150 to 500lts of milk/year

Species wise milk production in India



(Source: BAHS, 2022)

Indian goats are raised primarily on communal pasture, unlike their European counterparts who feed their goats a diet high in concentrate, so the milk obtained by Indian goats is relatively rich in health-promoting nutrients like phenolic compound, fat-soluble vitamins, unsaturated fatty acids, medium chain fatty acids, and bioactive peptides.

Currently, there is no established structure for marketing goat milk in the country, and milk in rural areas is sold for very little price (between 25 and 35 cents per litre). However, organised dairy goat farming could expand quickly by providing reasonable price of goat milk to farmers.

Peculiarities of goat milk

1. Has higher content of β -casein and lower α -s₁
2. Biological value of goat milk is 89.29
3. Digestibility Coefficient of goat milk is 92.42
4. Low allergenicity
5. Naturally homogenized with fat globule size 2-2.5 μ m
6. Rich in Vt A, C and B complex.
7. Contain bioactive components.
8. Rich in oligosaccharides and ash content

Composition of goat milk

Due to genetic polymorphism, resulting from variations in amino acid arrangement and altered

protein chains, goat milk's composition is distinct from that of other species and is therefore considered beneficial for human health.

Parameter	Goat	Cow	Human
Protein (%)	3.6	3.2	1.2
Fat (%)	4	3.4	3.8
Lactose (%)	4.5	4.6	7
Minerals (%)	0.8	0.7	0.2
Total solid (%)	13.2	12.3	12.4
Energy (Kcal)/100gm	70	66	63
Casein %	2.9	2.5	0.4
Whey protein	0.61	0.65	0.7

Source: (Alichanidis and Polychroniadou 1996)

Health benefits of goat milk

Anti cow milk Allergy: Due to higher concentration of β -casein and lower concentration of α s1- casein when compared to cow milk, goat milk is easily digested which helps in reducing allergenicity. Hence, used as alternative to cow milk for people having cow milk allergy.

High Digestibility: Smaller fat globules in goat milk make it naturally homogenized and highly digestible. Unlike cow milk, goat milk forms soft curd upon acidification in stomach which is readily digested. Because of its efficient digestive capabilities goat milk is used as alternative to mother's milk for young ones of many species including humans hence, called as universal foster mother. Medium chain fatty acids such as capric, caprylic and caproic acids present in goat milk have potential pharmacological effects against malabsorption syndromes.

Pre-biotic effect and gut health: In comparison to cow and sheep milk, goat milk has higher oligosaccharides content which is known to have prebiotic property by stimulating intestinal bifidobacterium and lactobacilli. Addition to this, it is also known to exhibit anti-inflammatory effects on gut

there by improving mineral absorption and prevent chances of colic cancer.

Maintain blood pressure: Goat milk is a rich source of potassium and nitrogen, which are essential to maintain blood pressure and prevent cardiovascular diseases. Taurine is high in goat milk, being 20–40 folds higher than cow milk which is involved in osmoregulation. Recent studies have confirmed that goat milk and milk products have a significant effect on ACE inhibition which is the principal hormone in blood pressure regulation.

Bone strength: Higher content of phosphorus and calcium in goat milk enhances bone mineralization and goat milk is also known to provide bio-organic sodium that is known to prevent arthritis.

Antibacterial – Antiviral property: Goat milk contains a higher proportion of medium-chain fatty acids, i.e., caproic, caprylic and capric which are known for anti-bacterial and antiviral properties.

Anti-carcinogenic: Goat milk is a rich source of conjugated linoleic acid (CLA), which helps in reducing oxidative stress, atherosclerosis, improves blood lipids profile and protects the growth of tumors of mammary gland and skin.

Infant growth: The goat milk-based infant formula contains a level of nucleotides similar to human milk, which facilitates the immune system of the milk-fed offspring.

Immunomodulatory: High content of β casein in goat milk is known to provide immune peptides thereby increasing immunity.

Goat milk products

Special beverage - The goat milk standardized to 2% fat and 10.5% SNF was fortified with Vitamin A and D to label it as protein fortified low fat goat milk.

Chhana - Goat milk has been used to make high-quality chhana, which has been utilised to make Sandesh and Rasagolla.

Paneer- Good quality paneer free from goaty odour can be prepared using goat milk.

Infant Foods: Goat milk is offered for sale as evaporated or spray dried form for pediatric usage in the USA and South Africa.

Khoa mawa- Mawa made from goat milk is sticky, no release of fat occurs during preparation.

Ice-cream- A good quality ice cream can be prepared using goat milk.

Yoghurt- fermented product of goat milk.

Cheese- Soft and semi hard varieties of cheeses are made from goat milk. In European countries, these cheeses are marketed as Premium Cheese.

Ghee – Ghee prepared from goat milk is greasy and difficult for preparation due to small fat globules.

Commercially available goat milk and milk products in India:

Product	Brand	Price
Liquid milk	Countryyard farms (New Delhi)	Rs. 140/300 ml
	Quidditaswhole (Kalaburagi)	Rs. 145/200 ml
Ghee	Shree Radhey (Rajasthan)	Rs. 1500/500 g
	Countryyard farms (New Delhi)	Rs. 688/200 g
Milk powder	Aadvik Goat milk powder	Rs. 999
	Nutra Vita Freeze Dried Goat	Rs. 974
	As fresh freeze-dried goat milk powder	Rs. 950
	Urban Platter Freeze-Dried goat milk powder	Rs. 1150

Goat milk based Cosmetic products:

Product	Brand	Price
Soap	Al essentials	Rs. 169/100 g
Double nourishing shower cream	Fruiser	Rs. 445/1000 ml
S.L.S and paraben free goat milk with protein shampoo	Vagad's Khadi	Rs. 280/210 ml



Conclusion

Goat milk may not be as ubiquitous as cow's milk, but its significance cannot be understated. Its nutritional benefits, environmental advantages, and culinary versatility make it a valuable addition to our diets and agricultural practices. Whether you're lactose intolerant, health-conscious, or environmentally aware, goat milk stands as a compelling choice, offering a sustainable and nourishing alternative to traditional dairy products. So, consider adding goat milk to your shopping list and enjoy its wholesome goodness while contributing to a more sustainable future.

References

- | | | |
|--|------|---|
| BAHS,
(https://dahd.nic.in/schemes/programmes/animal-husbandry-statistics)
Bhattarai, R.R., 2014. Importance of goat milk. <i>Journal of Food Science and Technology Nepal</i> , 7. | 2022 | Zenebe, T., Ahmed, N., Kabeta, T. and Kebede, G., 2014. Review on medicinal and nutritional values of goat milk. <i>Academic Journal of Nutrition</i> , 3(3), pp.30-39. |
|--|------|---|

* * * * *