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ORIGINAL ARTICLE

Health Benefits of Ashtaksheera (Eight types of Milk) in Ayurveda: Ancient and Modern Perspectives

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ABSTRACT

Milk has always been an important component of Indian diets since ancient times. In Ayurveda, milk is described as an elixir and has been used to treat many diseases. Ancient Indian grew up with various domestic animals in the surroundings depending upon the geographical region; hence, the humans consumed milk of these animals. The properties of Ashtadughda, that is the milk of eight animals domestically reared namely the milk of cow, she-buffalo, she-goat, she-camel, she-sheep, she-elephant and single-hoofed animals like horse, donkey etc., are described in Ayurvedic texts. According to these texts, each type of milk possesses distinct characteristics, and its use is based on specific circumstances.

This article presents a review of the historical applications of eight different types of milk and their uses in treating various ailments as referenced in numerous Ayurvedic texts. Additionally, it outlines the scientific basis for the Ayurvedic indications, incorporating a contemporary viewpoint informed by relevant scientific research on these eight types of milk.

KEYWORDS

• Milk • Ayurveda • Ashtadughda • Modern perspective

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INTRODUCTION

The first dairy animal to be domesticated was sheep around nine thousand years ago. In the next thousand years goats, cattle, buffaloes, donkeys, and horses were domesticated.[1] Humans first consumed the milk of other mammals during the Neolithic period, when there was a transition in the lifestyle of humans from hunting and gathering to agriculture.[2] Ayurveda has mentioned the use of milk, indicating milk was part of the Indian diets for ages. In Ayurveda milk is described as Rasayana and Jeevaniya.[3] In India milk is not only part of the diet but also used in religious practices. It is valued for its medicinal properties. Milk is also used as an *Anupan* in Ayurveda, as an adjuvant for medicines consumed along with or after a medicine, in order to increase the bioavailability and efficacy of the active principles.[4]

Milk contains macronutrients (fats, protein, carbohydrates) and several minerals and vitamins. The initial food of newborns after mothers' milk is generally cow's milk or buffalo milk. Milk provides good quality and quantity of protein and hence is essential in a lacto-vegetarian diet. In the last fifteen years, interest has grown in the uses of milk not only as a nutritious food but also for its therapeutic uses. Ayurveda has described the use of milk from 8 different animals in treatment of various diseases.[5] With increasing interest in the medicinal properties of milk, we deemed it worthwhile to study and understand the ancient texts as well as to actually review these studies from the modern lens based on the evidence available from the published scientific literature.

METHODOLOGY

The properties listed in the following Ayurvedic text Brihatrayees, Raj nighantu, Bhavprkash nighantu, Madanpal nighantu, Raj nighantu and Yog Ratnakar were critically appraised. Published articles were identified using two search engines Google Scholar and Pubmed. Only those papers that focused on the properties described in Ayurveda were included. Keywords used for the literature search were "cow milk as galactagogue, 'cow milk and immunity", 'buffalo milk and digestion', 'goat milk and antibacterial properties', 'camel milk and antiviral', sheep milk and hair growth', 'uses of donkey milk in asthma', 'horse milk and skin health'. Articles were chosen that had been published in that last 20 years and only few articles (n=5) that were beyond this time frame were included because they were highly relevant. The literature review was conducted over a period of 8 months. Major findings were organized into textual analysis, tables, and figures. The aims was to integrate traditional knowledge with scientific research for a comprehensive understanding. The principal limitation of the review is selection bias since studies were chosen on relevance. Furthermore, Ayurvedic descriptions are qualitative and hence were not always comparable to or in concordance with modern biomedical constructs.

RESULT AND DISCUSSION

1. *Goksheera* (Cow's milk):

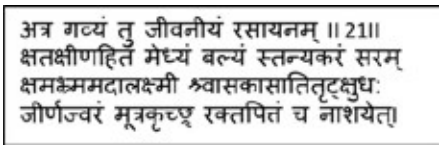
अत्र गव्यं तु जीवनीयं रसायनम् ॥ 21॥
क्षतक्षीणहितं मेध्यं बल्यं स्तन्यकरं सरम्
क्षमाऽग्निमदालक्ष्मी श्वासकासातितृट्क्षुधः
जीर्णज्वरं मूत्रकृच्छ्र रक्तपित्तं च नाशयेत्।

Figure 1: Shloka from Ashtang Hrudayam illustrating the features of cow milk

Cow's milk has been an essential dietary staple for numerous populations around the globe and in India. Along with it being highly nutritious, it has socio-religious significance. On the Indian subcontinent, cows have been an integral part of society for thousands of years, with their milk being used for both nutrition and religious practices.[6] Beyond traditional wisdom, modern research has explored the potential immunological benefits of cow's milk. Ayurveda, the ancient Indian system of medicine, recognizes cow's milk for its therapeutic properties. Table 2 describes the properties of cow milk mentioned in Ayurveda. In the Samhitas and the Nighantus, most frequently cow's milk is described as Rasayana, i.e. a substance that increases the essence of each *Dhatu* which also increases *vyadhi kashmatva* (vyadhi-disease, kashmatva-resistance) which can be interpreted as enhancing immunity of a person.[7] Scientific evidence supporting this claim comes from studies such as those conducted by Splunter et al. who examined the impact of raw, unpasteurized cow milk on innate immunity, also known as trained immunity. They found that raw milk produced IL-6 Bovine miRNAs in extracellular vesicles

(exosomes) that may bring out this effect.IL-6 is an important mediator of inflammation, involved in initiating the response to infection and recruiting immune cells to the site of damage.[8] These vesicles are described to induce higher production of IL-6, but not TNF, in LPS-stimulated RAW264.7 cells when stimulated with TLR1/2 ligand PamCSK4.[9] in order to determine whether early exposure to microbial compounds affects immune system maturation and, in turn, lowers risk for development, Riddler et al. conducted a cross-sectional study survey in rural areas of Austria, Germany, and Switzerland in 2001. One of the study's goals was to give the children of farmers raw milk and examine their blood for specific serum IgE antibodies. It was found that children under one year of age who were exposed to farm milk and stables had reduced incidence of atopic sensitisation, asthma, and hay fever.[10] But there were certain limitation to this study such as the early exposure to microbes on the farm, their diet, lifestyle, genetic predisposition that can also play a role in reducing the allergic sensitization. Also raw in thought too influence the immunity positively, it can also be harmful due to presence of bacteria such as *Salmonella, Listeria, E. coli* which can lead to severe infection.

Ayurveda considers cow milk to be a galactagogic and is given to lactating mothers, this feature may be attributed to the levels of prolactin that is hormone secreted by the pituitary gland and stimulates the milk production in the mammary gland. Exogenous recombinant prolactin has been shown to increases the milk volume and the milk composition remains similar to the milk composition during regular lactogenesis. Prolactin in cow milk can act as an exogenous prolactin which may stimulate the human mammary gland to produce milk.[11] There is limitations to scientific evidence supporting its effectiveness in humans. Prolactin being , may be broken down during digestion, thus may not be bioavailable. Hence making its absorption and impact on lactation unclear. Also, human milk production is influenced by multiple factors like nutrition, oxytocin and feeding frequency making it difficult to attribute lactation enhancement solely to cow's milk.

Table 1: Showing the indications of *Goksheera* as per different Ayurveda texts

Texts	Properties
Sushrut Samhita[12]	*Jeevaniya, Rasayana*, treats *Raktta pitta*
Ashtanga Sangraha[13]	*Jeevaniya, Rasayana, Medhya, Balya*, treat dyspnea, dizziness, toxicity, cough, dysuria, treats Raaktta pitta.
Charak Samhita[5]	*Jeevaniya, Rasayana*
Dhanvantari Nighantu[14]	*Rasayana,*increases *Balya*, is beneficial for heart functioning, increases *Medhya*, rejuvenator, cures bleeding disease
Madanapal Nighantu[15]	Increases *Balya, Rasayana*, nourish the tissues and helps produce milk in the breast
Bhavapraksah Nighantu[16]	Acts as galactagogue
Raj Nighantu[17]	Increases Balya and Medhya
Yoga Ratnakar[18]	Increases Balya

2. *Mahisa Ksheera* (Buffalo's milk)

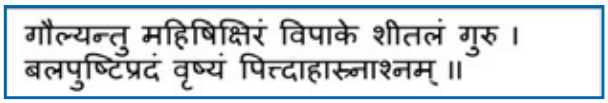
गौल्यन्तु महिषिक्षिरं विपाके शीतलं गुरु ।
बलपुष्टिप्रदं वृष्यं पित्तदाहास्नाश्नम् ॥

Figure 2: Shloka from Raj Nighantu illustrating the features of buffalo milk

Buffalo milk is second to cow's milk worldwide in milk production, it constitutes about 15% of total worldwide milk production, of which 70% is produced in India.[19] Like cow milk, buffalo milk also has a high nutritional value, although it has a higher content of fat and calcium compared to cow's milk. Table 3 describes the features of buffalo milk according to Ayurvedic texts. It has been mentioned in Ayurveda that buffalo milk can help to reduce *Jatthar-Agni* in the person who has increased *Jathar-Agni*, *Jathar-Agni* means digestive fire which is responsible for digestion of food.[7] Increase in digestive fire means increase in the rate of digestion and reduced gastric emptying time according to the modern concept, which leads to poor assimilation of nutrients.[20] The higher fat content in buffalo milk can delay the gastric emptying thus prolonging the feeling of fullness in the stomach.[21-23] Consequently, the food will be properly digested and nutrients absorption will be better.

Ayurveda also states that buffalo milk has sleep-inducing properties. This property of buffalo milk can be attributed to the tryptophan content in buffalo milk.

Tryptophan is a precursor for the hormone melatonin a hormone which regulates the sleep and wake upcycle. There is evidence that 1g of L-tryptophan can reduce sleep latency in clinically diagnosed insomniacs.[24,25] There is a limitation to this clam as the levels of tryptophan present in buffalo milk is almost similar to tryptophan present in cow milk,[26] although Ayurveda dosenot mention whether cow milk has sleep-inducing properties.Also the levels of tryptophan varies across different breed of buffalos. Ayurveda does not mention the specific breed or characteristic of the buffalo.

Table 2: Features of *Mahisa Ksheera* mentioned in Ayurveda

References	Properties
Sushrut Samhita[10]	Reduces *Jatthar agni*, induces sleep
Ashtanga Sangraha[11]	Decreases jatthar agni and helpful in curing insomnia
Charak Samhita[5]	It helps to induce sleep for people suffering from insomnia and decreases jatthar agni.
Dhanvantari Nighantu[12]	Reduces *jatthar agni*, Helpful in insomnia
Madanapal Nighantu[13]	Heavy to digest, enhances bodily strength, induces sleep, reduces the *jatthar agni*
Bhavapraksah Nighantu[14]	Diminishes hunger, act as laxative, reduces the *jatthar agni*.

3. *Aja Ksheera* (Goat milk)

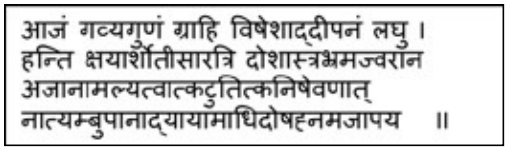
आजं गव्यगुणं ग्राहि विषेशाद्दीपनं लघु ।
हन्ति क्षयार्शोतीसारत्रि दोशास्त्रभ्रमज्वरान
अजानामल्यत्वात्कटुतित्कनिषेवणात्
नात्यम्बुपानाद्यायामाधिदोषहनमजापय ॥

Figure 3: Shloka from Yoga Ratnakar illustrating the features of Goat milk

Goats have been domesticated and have shared a symbiotic relationship with humans for about 10,000 years.[27] Goats can adapt to harsh climate which makes them suitable for rearing by small scale farmers. However, goat milk production is expensive compared to cow milk as a large number of animals are required and the milk yield is also less.

The casein in goat milk is better solubilized than cow milk because it contains smaller casein micelles. This can provide a substitute for people with allergies to cow's milk.[28] Besides its nutritional and functional benefits, goat milk has also been recognized for its medicinal properties. Ayurvedic texts describe its therapeutic efficacy in treating various aliments mentioned in Table 3. Ayurveda describes goat milk as being beneficial against tuberculosis (Rājayakshmā), fever, cough, diarrhoea. Modern research supports some of these claims, as studies have shown that goat milk inhibited the spore germination of Absidia corymibifera which affects the lungs.[29] Lactoperoxidase present in goat milk has shown antibacterial properties against *Klebsiella pneumoniae* which causes pneumonia as *Vibrio cholerae, Salmonella typhi* and *Shigella dysenteriae*, which causes dysentery and diarrhoea.[30] It also shows antimicrobial activity against *S. aureus* which causes fever, further supporting its medicinal potential. However, the claim that goat milk inhibits Absidia corymbifera spore germination does not necessarily translate to clinical effectiveness in preventing or treating lung infections. Also there is no evidence that consuming goat milk alone is sufficient to treat dysentery or diarrhoea.There is no evidence of effect of goat milk on *Mycobacterium tuberculosis*.

Table 3: Features of *Aja Kṣheera* (Goat milk) mentioned in Ayurvedic texts

References	Properties
Sushrut Samhita[10]	Similar in properties with cow's milk, especially suitable for patients of pulmonary TB,
Ashtanga Sangraha[11]	Cures dyspnea, dizziness, bleeding disease, fever, diarrhea
Charak Samhita[5]	Useful in Raktapitta diseases
Dhanvantari Nighantu[12]	Alleviates *Raktta Pitta* , kindles *jatthar agni* , light for digestion, cures cough, bleeding diseases, dyspnea
Madanapal Nighantu[13]	Similar in properties with cow's milk, helps in constipation, increases *jatthar agni* , useful in diseases like diarrhea, leucorrhea, alleviates *Raktta Pitta* disease, fever and very light to digest.
Bhavapraksah Nighantu[14]	Useful in *Raktta Pitta* , diarrhea, cough due to tuberculosis and fever.
Raj Nighantu[15]	Use full in *Raktta Pitta*, fever and cough

4. *Ushtra Ksheera* (Camel milk)

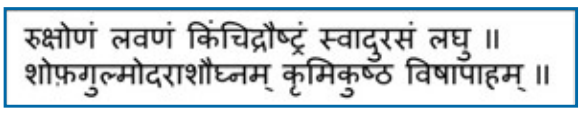
रुक्षोणं लवणं किंचिद्रौष्ट्रं स्वादुरसं लघु ॥
शोफ़गुल्मोदराशौघ्नम् कृमिकुष्ठ विषापाहम् ॥

Figure 4: Shloka from Sushrata Samhita illustrating the features of Camel milk

Camels are called 'Ships of the desert' and are a crucial part of the desert ecosystem. In

addition to being a vital, affordable mode of transportation in the desert, camels provide milk and meat to the residents of the desert. Compared to other domesticated livestock animals, camels can produce milk for a very long time in tough, dry climates. The type of hay offered to camels affects the taste of milk which tastes a little salty.[31] Camel milk contains all the essential nutrients but its composition differ from milk secreted by other animals. It has a lower content of cholesterol, sugar and high content of minerals such as magnesium, zinc, copper, iron, potassium, and sodium,vitamin C, lactoferrin, lysozyme, lactoperoxidase and immunoglobulin.[32,33] Camel milk has shown therapeutic potential for various conditions, including leishmaniosis, jaundice, hypertension, asthma and dropsy.[34,35] Ayurveda mentions the potential of camel milk against intestinal worms. Table 4 describes the features of camel milk mentioned in Ayurvedic text.

Almihi et al, conducted an in vivo study on the anthelmintic effect of camel milk using *Heligmosomoides polygyrus*, a parasite commonly used to test the efficacy of anthelmintics in the mouse. The efficacy was studied by monitoring the faecal egg count and fecal worm count.[36] The findings corroborated with the camel milk's anti-helminthic action of camel milk mentioned in Ayurveda. Also and the findings of this investigation are consistent with those of an in-vitro study conducted by the same group.

Further, Camel milk has shown potential in combating Hepatitis virus C (HCV), major cause of liver cirrhosis. According to Ayurveda, camel milk may aid in treating abdominal distention, one of the effects of liver cirrhosis. Redwan and Tabll (2007) demonstrated that direct interaction between HCV and camel lactoferrin leads to complete virus entry inhibition after seven days of incubation in human leukocytes.[37] Camel IgG also showed the ability to recognize the Hepatitis C virus peptides with a significant titer compared to human IgG which failed to do so.[38]

There are limitations to the Ayurvedic claims as most studies on camel milk's therapeutic effects are preclinical or have been conducted on animals or in *in vitro* models. Human trials are needed to validate these putative benefits. The nutritional and medicinal properties of camel milk may vary depending on the diet. Though the bioactive molecules of camel milk are identified their exact mechanism of action need to be studied in depth.

Table 4: Features of *Ushtra Kṣeera* mentioned in Ayurveda

References	Properties
Sushrut Samhita[10]	Curative in edema, abdominal glands, ascites, piles, intestinal worm and skin disorder.
Ashtanga Sangraha[11]	Cures Vata and Kapha diseases, hemorrhoids, increases hunger and easily digestible
Charak Samhita5	Useful in constipation, parasite infection, edema, ascites, piles, and diseases due to Vata and Kapha.
Dhanvantari Nighantu[12]	Light for digestion, cures dropsy, abdominal tumors, enlargement of abdomen, piles, and intestinal worms.
Madanapal Nighantu[13]	Light for digestion, increases *Jatthar agni* , cures piles, intestinal worms, leprosy, abdominal diseases and diarrhea
Bhavapraksah Nighantu[14]	Useful in diseases like worm, skin disorder, kapha dosa, distentions of the abdomen, dropsy and laxative
Yoga Ratnakar[16]	Helpful in curing worms disease, leprosy, cough, abdominal distention, swelling

5. *Avika Ksheera* (Ewe milk)

छागंक्षायमधुरं शीतं ग्राहि पयो लघु ।
रक्तपित्ततिसारघ्नं क्षयकासज्वरापहम् ॥ 222 ॥

Figure 5: Shloka from Charak Samhita illustrating the features of Sheep milk

Milk was introduced in the diet after humans started domesticating animals beginning with goats and sheep. However, demand and supply for sheep milk remain negligible. India ranks third globally in sheep population, but they are mainly reared for wool and meat rather than milk production.[39] Table 5 describes the feature of Sheep milk mentioned in Ayurveda.

Ayurveda describes various properties of sheep milk, including its potential to stimulate hair gowth. This feature of sheep milk may be attributed to high levels of folic acid and Vitamin B 12 as compared to cow milk and goat milk, although empirical studies validating this claims are scarce. Folate deficiency as well as deficiencies of riboflavin, biotin and B12 have been associated with hair loss. However, there are few studies to date on this aspect.[40] Vitamin B12 is a cofactor of methionine

synthase and thereby it plays role in the synthesis of DNA, RNA and proteins. Hence folate and Vitamin B12 can be important for highly proliferative hair follicles.[41] The results of the study conducted by Cheung et al 2016 concurs with this hypothesis.[42] Most available literature focuses on general association between Vitamin B12, folate and their health rather than well designed trials with Sheep milk.

Table 5: Features of *Avika Kṣheera* mentioned in Ayurveda

References	Properties
Sushrut Samhita[10]	Heavy for digestion, Rasayna, Alleviates Raktta Pitta
Ashtanga Sangraha[11]	Jeevaniya, Rasayna, Medhya, Balya, cures dyspnea, dizziness, toxicity, cough, dysuria, Alleviates Raktta Pitta
Charak Samhita[5]	Heavy to digest
Dhanvantari Nighantu[12]	Beneficial for Vata only and cough produced by Vata, edema and gout
Madanapal Nighantu[13]	Increases the hair volume, cures Vata and Kapha diseases
Bhavapraksah Nighantu[14]	Useful in urinary stones, good for hairs, aphrodisiac, useful on cough
Yoga Ratnakar[16]	Good for hair, Useful in only Vata diseases.

6. *Hastini Ksheera* (Elephant milk)

हिक्काश्वासकरं तुष्णं पित्तश्लेष्मलमाविकं ।
हस्तिनींनां पयो बल्यं गुरु स्थैर्यकरं परम् ॥ 223॥

Figure 6: Shloka from Charak Samhita illustrating the features of Sheep milk

The elephant is one of the few survivors of prehistoric times. It is very difficult to collect a sample of elephant milk.[43] Strength and stability-promoting properties of elephant milk have been acknowledged in Ayurveda. However, scientific research on its benefits remains limited as,Takatsu et al 2016 analyzed elephant milk by high-performance liquid chromatography to develop an alternative feed for elephant calves and observed that elephant milk contains a high level of glucosamine[44] as compared to human milk of other domesticated animals reviewed herein. Glucosamine an amino saccharide is preferred as substrate for the biosynthesis of glycosaminoglycan chains and, subsequently, for the production of aggrecan, which is responsible for the cartilage's ability to withstand compressive loads. Aggrecan interacts with hyaluronan and link proteins to form a hydrated gel structure that gives cartilage its load-bearing properties.[45]

Ayurveda also mentions the role of elephant milk in curing eye diseases. However, no scientific studies have been conducted to validate these claims. Also, existing research primarily focuses on its nutritional composition rather than its therapeutic effects. Table 6 describes the features of *Hastiniksheera* in Texts of Ayurveda.

Table 6: Features of *HastinKṣhirai* mentioned in Ayurveda

References	Properties
Sushrut Samhita[10]	Good for eyes and Increases Balya
Ashtanga Sangraha[11]	Increases Balya
Charak Samhita[5]	Increases Balya
Dhanvantari Nighantu[12]	Good for eyes and increases Balya,
Madanapal Nighantu[13]	It increases Balya , beneficial for the eye
Bhavapraksah Nighantu[14]	It increases Balya and beneficial for vision
Yoga Ratnakar[16]	Increases Balya

7. Single hoof animals: *AshvaKsheera* & *GardabhaKsheera* (Horse and Donkey milk respectively)

1. *Ashva Ksheera* (Horse milk)

आश्वमुष्णं पयो रूक्षं बल्यं श्वासानींलाएहम् ।
अम्ल पटु लघु स्वादु सर्वमैकशफ़ तथा ॥ 2॥

Figure 7: Shloka from Yoga Ratnakar illustrating the features of Horse milk

Horses and donkeys are the two domesticated equine species. Horse milk has been part of the diet of the people inhabiting the areas of Kazakhstan since 3500 BC.[46] Ayurveda describes the role of horse milk in diseases associated with Vata imbalance. The concept of Tridosha ie. V*ata, pitta, and Kapha* are the core philosophies in Ayurveda and are followed from the 1st chapter of the earliest Ayurveda text Charak Samhita.[47]

Vata is primarily responsible for bodily movement, including muscle and joint movement, respiration, blinking and all the intracellular transport. People who have Vata predominant Prakriti are more susceptible to health problems like pneumonia, tics, flatulence, aching joints, dry skin and hair,

nerve disorder, constipation, and mental confusion.[48]

From a modern scientific perspective, one of the potential benefits of horse milk is its application in dermatological conditions, particularly those associated with dry skin. Mare's milk is recommended in the treatment of skin problems such as atopic dermatitis, eczema, and psoriasis. In atopic dermatitis concentration of fatty acid decreases. The conversion of linoleic acid to α-linoleic acid becomes slow, creating a deficiency of α-linoleic acid.[49] Horse milk contains high levels of α-linoleic acid about 224 times higher than bovine milk.[50] Hence introducing Mare's milk in the human diet can provide essential α-linoleic acid. It can also be given to children to treat allergies and dermatitis.[51,52]

While mare's milk is said to be beneficial for dermatological problems, further in depth studies including a clinical trial is a must for standardizing the dosage. Also, tolerance to the milk proteins and acceptability of mare's milk should be considered.

Table 7: Features of *Ashva ksheera* mentioned in Ayurveda

References	Properties
Sushrut Samhita[10]	Increases Balya, mitigates diseases of Vata origin in extremities,
Ashtanga Sangraha[11]	Alleviates Vata disorders
Charak Samhita[5]	Increases Balya, alleviates Vata diseases of extremities.
Dhanvantari Nighantu[12]	Increases jatthar agni, light for digestion, increases Balya.
Madanapal Nighantu[13]	Enhances Balya, cures Vata and Kaph disorders
Bhavapraksah Nighantu[14]	Increases Balya, Useful in disorder of Vata
Yoga Ratnakar[16]	Increases Balya, Helpful in curing Vata diseases

2.7.2 *Gardabh Ksheera* (Donkey milk)

श्वासवातहरं साम्लं लवणं रुचिदीप्तिकृत् ।
कफ़कासाहरं बालरोगहनं गर्दभिपयः ॥1॥

Figure 8: Shloka from Yoga Ratnakar illustrating the features of Donkey milk

Donkey milk is gaining economic importance for its therapeutic uses and increasing international acceptance, thus donkey milk is expensive.[53] There has been a remarkable increase in the development of donkey milk products in the last 15 years. Donkey milk has been given to infants suffering from multiple food intolerances since the 20th century.[54,55]

In Ayurveda, donkey milk is traditionally regarded as beneficial in managing asthma. Asthma is a multi-factorial inflammatory syndrome characterized by airway hyper-responsiveness, wheezing, coughing, and shortness of breath.[56] The potential therapeutic effect of donkey milk in asthma management is attributed to high levels of selenium (Se) in donkey milk.[57] Epidemiological studies have shown a correlation between low Se levels and asthma. One such small study involving 25 subjects each of asthmatic patients and normal individuals was done by Guo et al 2011. They observed that the persons with asthma had lower levels of Se and higher indicators of oxidative stress. Also lung function was higher with higher Se levels.[58] Concurrent with this result their other studies have also shown a correlation between Se deficiency and the prevalence of asthma.[59-63]

While selenium plays a crucial role in antioxidant defense and immune regulation, the specific impact of donkey milk on asthma requires further investigation through randomized clinical trials.

Table 8: Features of *Gardabh Ksheera* mentioned in Ayurveda

References	Properties
Raj Nighantu[15]	Proven useful in treating Bronchial asthma, Vata, Kapha and children's diseases.
Yoga Ratnakar[16]	Useful in the treatment of asthma, Cough and children's diseases.

CONCLUSION

Milk has been an integral part of human nutrition, medicines, and culture for centuries, particularly in Ayurveda, where it is regarded as a tonic and has many therapeutic properties some of which have also been studied by modern science. With the paradigm shift of choice of natural alternatives over drugs, there has been an increase in the research of milk from different animals.

Though there is considerable concordance between ancient knowledge and related evidence obtained from modern scientific methods, traditional knowledge is largely qualitative in its description and paucity of well defined clinical end projects. This make it

difficult to correlate acient system with modern scientific research. Majority of scientific studies that are been compared in this review are observational or preclinical, more clinical trials that are well designed with adequate number of subjects need to be carried out.

REFERENCES

1. Sadowski R.F. Neolithic Revolution. In: *Springer eBooks*; 2017: 1-8. doi:10.1007/978-94-007-6167-4_540-1
2. Gerbault P., Roffet-Salque M., Evershed R., Thomas M., How long have Adult Humans been consuming milk? *International Union of Biochemistry and molecular Biologylife*. December 2013, 65(12)
3. Kamath S.D., Commentary (1st ed.). Bhavprakaksh Nighantu of Bhavmishra. Sootrastan; Dugdhvarga, verses 14-23, Chokamba Sanskrit Pratishthan, Delhi, p. 1058.
4. Kadegaon, Mohasin. (2017). Anupana - A key of success in Ayurveda. Journal of Ayurveda and Integrated Medical Sciences (JAIMS). Doi:1. 10.21760/jaims.v1i4.6931.
5. Kaviratna C.A., Commentetor, (2nd ed). Charak Samhita of Acharya Charak.Part 1. Adhyay 27, Verses 220-227, Sri Satguru Publication, Delhi, p. 239.
6. Bajaj K.K., Chavan V., Raut N., Gurav S. Panchgavya: A presious gift to human kind. *Journal of Ayurveda and Integrative medicine*. 2022; 13: 100525
7. https://www.wisdomlib.org/definition/rasayana#ayurveda
8. Tanaka T., Narazaki M., Kishimoto T. IL-6 in inflammation, immunity, and disease. *Cold Spring Harb Perspect Biol*. 2014; 6(10): a016295
9. Van Splunter M., Van Osch T.L.J., Brugman S., et al. Induction of Trained Innate Immunity in Human Monocytes by Bovine Milk and Milk-Derived Immunoglobulin G. *Nutrients*. 2018; 10(10): 1378. doi:10.3390/nu10101378
10. Riedler J., Braun-Fahrländer C., Eder W., *et al*. Exposure to farming in early life and development of asthma and allergy: a cross-sectional survey. *The Lancet*. 2001; 358(9288): 1129-1133. doi:10.1016/s0140-6736(01)06252-3
11. Powe C.E., Puopolo K.M., Newburg D.S., *et al*. Effects of Recombinant Human Prolactin on Breast Milk Composition. *Pediatrics*. 2011; 127(2): 359-366. doi:10.1542/peds.2010-1627
12. Dalhacharya, Commentator, (1st ed.). Sushrut Samhita by Acharya Sushrut, Adhyay 45, Verses 50-58, Choukhamba Orientalia, Varanasi, p. 201.
13. Gupta A., Commentator, (1st ed.). Ashtangasangrha by Shreemad Vagbhata, Sootrasthana; Dravadravya Vidnyan, Verses 42-59, Choukhamba Sanskrit Pratishthan, Delhi, pp. 46-47.
14. Sharma P., Editor,(3rd ed.). Dhanvantari Nighantu. Sootrasthan; Drava Dravyani. Verses 148-172, Chokamba Orientalia, Varanasi. pp. 205-210.
15. Prasad R., Commentator, (1st ed.). Madanapal Nighant, Sootra sthana, Paniyadi Varga, Verse 61-81, pp. 167-171.
16. Bhavprakash Nighantu (2025). https://niimh.nic.in/ebooks/e-Nighantu/bhavaprakashanighantu/?mod=read
17. Rajanighantu. (2020). Retrieved 10 April 2020, fromhttp://niimh.nic.in/ebooks/eNighantu/rajanighantu/?mod=read
18. Shastri L., Commentator. Yogratnakar. Sootrasthan; Dugdhaguna, Verse: Atha Gardabham. Chokamba Sanskrit Sansthan. p. 67.
19. http://www.fao.org/dairy-production-products/production/dairy-animals/en/ Last visited 7/4/2020
20. Agrawal A., Yadav C., Meena. Physiological aspects of Agni. *AYU (an International Quarterly Journal of Research in Ayurveda)*. 2010; 31(3): 395. doi:10.4103/0974-8520.77159
21. Vesa T., Marteau P., Briet F., Ruault M., Rambaud J. *The journal of Nutrition*. 1997; 127(12), 2316-2320.
22. Özdemir-Kumral Z.N., Koyuncuoğlu T., Arabacı-Tamer S., Çilingir-Kaya ÖT, Köroğlu A.K., Yüksel M., Yeğen BÇ. High-fat Diet Enhances Gastric Contractility, but Abolishes Nesfatin-1-induced Inhibition of Gastric Emptying. *J Neurogastroenterol Motil*. 2021 Apr 30; 27(2): 265-278. doi: 10.5056/jnm20206.
23. Ahmed I., Rasheed S., Quazi M., Durrani Y., Azmat Z. Comparative Study of Cottage Cheese Prepared from Various Sources of Milk. *Proceedings of the Pakistan Academy of Sciences*. 2016; 53. 269-282.
24. Silber B.Y., Schmitt JAJ. Effects of tryptophan loading on human cognition, mood, and sleep. *Neuroscience & Biobehavioral Reviews*. 2009; 34(3): 387-407. doi:10.1016/j.neubiorev.2009.08.005
25. Minet-Ringuet J., Ruyet PML, Tomé D., Even PC. A tryptophan-rich protein diet efficiently restores sleep after food deprivation in rat.

Behavioural Brain Research. 2004; 152(2): 335-340. doi:10.1016/j.bbr.2003.10.018

26. Fantuz F, Salimei E, Papademas P. Macro- and Micronutrients in Non-cow milk and product and their impact on human health. *Non-Bovine Milk and Milk Products*. 2016: 209-261

27. Bertolini F., Servin B., Talenti A., Rochat E., Kim E., Oget C. *et. al*. Signatures of selection and environmental adaptation across the goat genome post-domestication. *Genetics selection Evolution*. 2018; 50(1) DOI: https://doi.org/10.1186/s12711-018-0421-y

28. Zenebe T., Ahmed N., Kabeta T., Kebede G. Review on Medicinal and Nutritional values of goat milk. *Academic journal of nutrition*. 2014; 3(3): 30-39. doi: 10.5829/idosi.ajn.2014.3.3.93210

29. Yadav A.K., Singh J., Yadav S. Composition, nutritional and therapeutic Values of Goat milk: A review. *Asian J. Dairy & Food Res*. 2016; 32(2): 96-102 doi: 10.18805/ajdfr.v35i2.10719

30. Pal U.K., Mandal P.K., Rao V.K., Das CD. Quality and Utility of Goat Milk with Special Reference to India: An Overview. *Asian Journal of Animal Sciences*. 2010; 5(1): 56-63. doi:10.3923/ajas.2011.56.63

31. Faye B., Konuspayeva The sustainability challenge to the dairy sector- The growing importance of non-cattle milk production worldwide. *International dairy journal*. 2012; 20: 50-56.

32. Zibaei S., Barazandeh R., Eshaghi Z., Jafariy S. Purification and immobilization of lactoperoxidase extracted camel milk using sodium alginate. *Journal of Veterinary Research*. 2016; 71(3): 321-327.

33. Kumar Y.K., Rakesh K., Lakshmi P., Jitendra S. Composition and medicinal properties of camel milk: A Review. *Asian Journal of Dairy and Food Research* 2015; 34: pp. 83-91.

34. Kula J. Medicinal Values of Camel Milk. *International Journal of Veterinary Science and Research*. 2016; 2(1): 018-025. doi:10.17352/ijvsr.000009

35. Asresie A., Yusuf M. Traditional Consumption, Therapeutic Value and its Derived Dairy Products of Dromedary Camel (Camelus Dromedaries) Milk in Somali Regional State, Eastern Ethiopia: A Review. *Global Journal of Animal Scientific Research*. 2014; 3: 240-246.

36. Alimi D., Hajaji S., Rekik M., Abidi A., Gharbi M., Akkari H. First report of the in vitro nematicidal effects of camel milk. *Veterinary Parasitology*. 2016; 228: 153-159. doi:10.1016/j.vetpar.2016.09.003

37. Redwan E.M., Tabll A. Camel Lactoferrin Markedly Inhibits Hepatitis C. Virus Genotype 4 Infection of Human Peripheral Blood Leukocytes. *Journal of Immunoassay and Immunochemistry*. 2007; 28(3): 267-277. doi:10.1080/15321810701454839

38. El-Fakharany E.M., Abedelbaky N, Haroun B.M., Sánchez L., Redwan N.A., Redwan E.M. Anti-infectivity of camel polyclonal antibodies against hepatitis C virus in Huh7.5 hepatoma. *Virology Journal*. 2012; 9(1). doi:10.1186/1743-422x-9-201

39. https://www.vetextension.com/livestock-animal-production-statistics-of-india-2020/ last visited 9/8/2024

40. https://woodlandsdairy.co.uk/why-sheep-milk-is-better-for-you-than-cow-or-goat-milk-nutritional-benefits-of-sheep-milk/ Last visited 9/8/2024

41. Mahmood L. The metabolic processes of folic acid and Vitamin B12 deficiency. *Journal of Health Research and Reviews*. 2014;1(1):5. doi:10.4103/2394-2010.143318

42. Cheung E.J., Sink J.R., English Iii J.C. Vitamin and Mineral Deficiencies in Patients with Telogen Effluvium: A Retrospective Cross-Sectional Study. *Journal of drugs in dermatology*.2016; Oct 1; 15(10): 1235-1237

43. Mainka S., Cooper R., Black S., Dierenfeld E. Asian elephant (Elephas maximus) milk composition during the first 280 days of lactation. *Zoo biology*. 1994; 13, 389-393.

44. Takatsu Z., Tsuda M., Yamada A., Matsumoto H., Takai A., Takeda Y, & Takase M. Elephant's breast milk contains large amounts of glucosamine. *Journal of Veterinary Medical Science*. 2017; 79(3), 524-533. DOI: 10.1292/jvms.16-0450

45. Reginster J., Neuprez A., Lecart M., Sarlet N., Bruyee O. Role of glucosamine in treatment for Osteoarthritis. *Rheumatol Int*. 2012; 32: 2959-2967.

46. Outram A.K., Stear N.A., Bendrey R., *et al*. The earliest horse harnessing and milking. *Science*. 2009; 323(5919): 1332-1335. doi:10.1126/science.1168594

47. Sharma P.V., editor. (4th ed.). Charak Samhita of Acharya Charak. Adhyay 1, Chaukhamba Orientalia, Varanasi, Verse 57.

48. https://www.ayurveda.com/resources/articles/ayurveda-a-brief-introduction-and-

guide Last visited 10/04/2020

49. Orlandi M., Goracci J., Curadi M. Fat composition of mare's milk with reference to human nutrition. *Annalidella Facolta di Medicina veterinaria.* 2003; 56: 97-105.

50. Salamon R.V., Salamon Sz, Csapo-Kiss Zs, Csapo J. Composition of mare's colostrum and milk I. Fat content, fatty acid composition and vitamin contents. *Alimentaria*. 2009; 119-131.

51. Horrobin D.F. Essential fatty acid metabolism and its modification in atopic eczema. *American Journal of clinical Nutrition*. 2000; 71(1): 367-372.

52. Solaroli G., Pagliarini E., Peri C. Composition and nutritional quality of mare's milk. *Italian Journal of Food Science*.1993; 5: 3-10.

53. Martini M., Altomonte I., Trico D., Lapenta R., Salari F. Current knowledge on functionality and potential therapeutic uses of donkey milk. *Animals*.2021; 11(5): 1382

54. Tozzi B., Liponi G., Meucci V., Casini L., Dall'Asta C., Intorre L., & Gatta D. Aflatoxins M1 and M2 in the milk of donkeys fed with naturally contaminated diet. *Dairy Science & Technology.* 2016; 96(4), 513-523. DOI: 10.1007/ s13594-016-0285-2

55. Iacono G., Carroccio A., Cavataio F., Montalto G., Soresi M., Balsamo V. Use of ass' milk in multiple food allergy. *Journal of Pediatric Gastroenterology and Nutrition*, vol. 14, no. 2, pp. 177–181,

56. Monti G., Bertino E., Muratore M., Coscia A., Cresi F., & Silvestro L. *et al.* Efficacy of donkey's milk in treating highly problematic cow's milk allergic children: An in vivo and in vitro study. *Pediatric Allergy and Immunology.* 2007; 18(3), 258-264.DOI: 10.1111/j.1399-3038.2007. 00521.x

57. Locksley R. Asthma and Allergic Inflammation. *Cell*. 2010; 140(6), 777-783. DOI: 10.1016/j. cell.2010.03.004

58. Zhang C.Y., You J., Zheng J., Luo Y.K. Nutritional composition and function of donkey milk. *Academic Periodical of Farm Products Processing*. 2009; 2(2). 71–72.

59. Guo C.H., Liu P.J., Hsia S., Chuang C.J., Chen P.C. Role of certain trace minerals in oxidative stress, inflammation, CD4/CD8 lymphocyte ratios and lung function in asthmatic patients. *Annals of Clinical Biochemistry*. 2011; 48(4): 344–351.

60. Qujeq D., Hidari B., Bijani K., Shirdel H. Glutathione peroxidase activity and serum selenium concentration in intrinsic asthmatic patients. *Clinical Chemistry and Laboratory Medicine.* 2003; 41(2): 200–202.

61. Flatt A., Pearce N., Thomson CD, Sears MR, Robinson M.F., Beasley R. Reduced selenium in asthmatic subjects in New Zealand. *Thorax*. 1990; 45(2): 95–99.

62. Shaw R., Woodman K., Crane J., Moyes C., Kennedy J., Pearce N. Risk factors for asthma symptoms in Kawerau children. *N Z Med J.* 1994; 107(987): 387–391

63. Stone J., Hinks L.J., Beasley R., Holgate S.T., Clayton B.A. Reduced selenium status of patients with asthma. *Clin Sci (Lond).* 1989; 77(5): 495–5