

Content available at: <https://www.ipinnovative.com/open-access-journals>

International Journal of Recent Innovations in Medicine and Clinical Research

Journal homepage: <https://www.ijrimcr.com/>

## Review Article

## Rationalized approach towards milk consumption integrating ayurveda principles and recent advances for health promotion

Mugdha Shubhang Gore<sup>1\*</sup>, Arpan Bhatt<sup>1</sup>, Shalineer Kumari Mishra<sup>1</sup>, Kalpesh Dattani<sup>1</sup><sup>1</sup>Dept. of Swasthavritta, Institute of Teaching and Research in Ayurveda (ITRA), Jamnagar, Gujarat, India

## ARTICLE INFO

## Article history:

Received 18-06-2024

Accepted 12-07-2024

Available online 30-08-2024

## Keywords:

Ashtadugdha

Dugdha

Synthetic milk

Pathya

Jeevaniya

## ABSTRACT

**Introduction:** Ayurveda has mentioned the role of *Trayopastambha* in health maintenance. *Ahara* and its *Varga* are extensively described. *DugdhaVarga* is one of them. *Dugdha* is considered as *Jeevaniya Dravya*. However, there is a considerable discrepancy between the demand and supply of milk especially in India. To address this gap, various methods are being employed, including genetically modified cattle. These innovations have health implications, making it important to understand a rational approach to milk consumption to achieve the desired outcomes.

**Aim and Objective:** To rationalize the approach of milk consumption integrating Ayurveda principles and recent advances for health promotion.

**Materials and Methods:** A literature review of Ayurveda texts and relevant studies to explore the nutritional and therapeutic values of *Ashta Ksheera*. The electronic databases searched includes Google Scholar, PubMed, the Ayush research portal, and the DHARA database. The search terms used were: '*Ksheera*', '*Dugdha*', 'Milk', and 'Synthetic milk'.

**Observation:** Extensive literature regarding *Dugdha*, *Ashtaksheera*, *Pathya-Apathya* related to *Dugdha* is available in classics.

**Discussion:** Milk is one of the basic food products consumed worldwide. Being mindful of the *Pathya* and *Apathya* related to milk consumption can aid in the prevention of diseases as well as further worsening of conditions. One can think of *Dashavidha Pariksha* and *Ashtavidha Ahara Vidhi Visheshayatana* while rationalizing the approach toward milk administration.

**Conclusion:** A rational approach to milk consumption, based on proper education, can help achieve the desired benefits.

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: [reprint@ipinnovative.com](mailto:reprint@ipinnovative.com)

## 1. Introduction

Ayurveda has mentioned the role of *Trayopastambha* (*Ahara*, *Nidra*, and *Brahmacharya*) in health maintenance.<sup>1</sup> *Ahara* being the foremost has the utmost importance. *Ahara* and its *Varga* are extensively described in Ayurveda. *DugdhaVarga* is one of them. *Dugdha* is considered a *Jeevaniya Dravya* and is consumed from birth till death.<sup>2</sup> *Dugdha* has its therapeutic utility in healthy as

well as diseased. Milk is an essential component of diet owing to its high nutritional status. It is vital in physical growth as well as health maintenance. However, there is a considerable discrepancy between the demand and supply of milk especially in India. To address this gap, various methods are being employed, including genetically modified cattle and synthetic milk. These innovations have health implications, posing a threat to the nutritional profile of milk. Thus, it is important to understand a rational approach to milk consumption to achieve the desired outcomes.

\* Corresponding author.

E-mail address: [mugdha\\_gore97@yahoo.co.in](mailto:mugdha_gore97@yahoo.co.in) (M. S. Gore).

## 2. Aim

To rationalize the approach of milk consumption integrating Ayurveda principles and recent advances.

## 3. Objectives

1. To review milk as *Pathya* and *Apathya* in diseases as per Ayurveda.
2. To explore recent advances in the milk industry and assess milk's nutritional profile.

## 4. Materials and Methods

A literature review of Ayurveda texts and relevant studies was conducted to explore the nutritional and therapeutic values of *Ashta Ksheera*. The electronic databases searched included Google Scholar, PubMed, the Ayush research portal, and the DHARA database. The search terms used were: *Ksheera*, *Dugdha*, Milk, and Synthetic milk.

## 5. Observation

*Dugdha* is extensively elaborated in Ayurveda classics. *Paya*, *Ksheera*, and *Prasavana* are some of the synonyms of *Dugdha*.<sup>3</sup> "*Dugdha*" originates from the Sanskrit root "*Duhyate Smeti*," which means "to milk out." "*Paya*" is derived from "*Pane Karmani*," signifying "for drinking." Going through compiled texts, the following observations can be drawn. the general qualities of milk as per various classics are described in Table 1.<sup>4–9</sup>

The general aspects of *Ashtadugdha* are described in Table 2.<sup>10–33</sup>

*Yogaratanakara* extensively elaborated on other aspects related to milk consumption. While describing the freshness of milk, it is stated that *Akwathita Dugdha* can be consumed till ten *Ghatika* (approx. 10 hours) and *Kwathita Dugdha* till twenty *Ghatika* (approx. 20 hours).<sup>34</sup> *Dugdha* can be consumed even beyond if its taste and palatability are intact. Table 3 describes the most suitable *Dugdha*. Table 4 describes the impact of vessel on milk properties. Table 5 describes the difference in qualities of milk based on *Agni Sanskara*. Table 6 elaborates on the difference in benefits of milk based on time consumption. Table 7 illustrates the compatibility and incompatibility of *Dugdha* with another *Dravya*. Table 8 describes the indications of milk according to conditions.<sup>35–65</sup>

## 6. Nutritional Profile of Milk

Milk is an emulsion or colloid of butterfat globules within a water-based fluid that contains dissolved carbohydrates and protein aggregates with minerals.<sup>66</sup> Because it is produced as a food source for the young, all its contents provide benefits for growth. The principal requirements are energy (lipids, lactose, and protein), biosynthesis of non-essential amino acids supplied by proteins (essential amino acids and

amino groups), essential fatty acids, vitamins and inorganic elements, and water.<sup>67</sup> Table 9 describes the nutritional composition of milk.<sup>68,69</sup>

## 7. Recent Advancements in the Milk Industry

White Revolution emphasized, adopting new and modern methods to hold and milk cows, changing the composition of animal feed for better adjustment to the condition and others.<sup>70</sup>

A 1984 review concluded that cross-bred cows are better suited for high milk production compared to Indigenous cattle or buffaloes. They also demonstrated greater efficiency in converting feed into milk.<sup>71</sup> Since then, Dairy production in India has been largely dependent on cross-bred cattle.<sup>72</sup> Various mutations in the bovine beta-casein gene have resulted in the emergence of 12 genetic variants, among which A1 and A2 are the most prevalent. These A1 and A2 variants exhibit disparity at amino acid position 67, where histidine (CAT) characterizes A1, and proline (CCT) characterizes A2 milk, owing to a single nucleotide disparity. This polymorphism induces a significant conformational alteration in the secondary structure of the expressed  $\beta$ -casein protein. Digestion of the A1 variant of  $\beta$ -casein (found in raw or processed milk) in the gastrointestinal tract leads to the formation of a bioactive peptide known as beta-casomorphin 7 (BCM7). Infants may absorb BCM-7 due to the immaturity of their gastrointestinal tract, whereas adults primarily encounter its biological activity at the intestinal brush border.

## 8. A1 and A2 Milk

In hydrolysed milk containing the A1 variant of beta-casein, the level of BCM-7 is four times higher compared to A2 milk. Initial investigations on indigenous cattle breeds (such as Zebu type), buffalo, and exotic cattle breeds (such as taurine type) have shown that the A1 allele is more prevalent in exotic cattle, while Indian native dairy cattle and buffalo exclusively possess the A2 allele, making them a reliable source of safe milk.<sup>73</sup>

## 9. Adulterants in Milk

Synthetic milk closely mimics natural milk. Milk fat is replicated by vegetable oil; the nitrogen component in milk is mimicked by urea; detergents are added to make it frothy.<sup>74</sup> Neutralizers are added to mask synthetic milk's developed acidity or bitter taste. Among these neutralizers, sodium hydroxide is the most common, but it can be very harmful if ingested. Swallowing it may lead to a burning sensation, abdominal pain, shock, or collapse. These contaminants pose a danger and can inflict permanent harm on the organs. In a previous report, the Indian Council of Medical Research noted that detergents in milk can lead to food poisoning and gastrointestinal complications.

**Table 1:** General qualities of milk as per various classics

S. No.	Acharya		Description
1	Charaka	Properties	<i>Madhura</i> (sweet), <i>Snigdha</i> (unctuous), <i>Sheeta</i> (having cold potency), <i>Stanya</i> (galactagogue), <i>Preenanam</i> (refreshing), <i>Brimhanam</i> (nourishing), <i>Vrishya</i> (aphrodisiac), <i>Medhya</i> (promoter of intellect), <i>Balya</i> (promoter of strength), <i>Manaskaram</i> (useful for mental faculties). It is stated to be <i>Jeevaniya</i> (invigorating), <i>Shramahara</i> (fatigue dispelling), <i>Sarva Pranbhritam Satmyam</i> (wholesome for all living beings), <i>Shamana</i> (pacifier of Doshas), <i>Shodhana</i> (eliminates the Malas), <i>Deepaniya</i> (regulates Agni).
		Indications	<i>Shwasa</i> , <i>Kasa</i> , <i>Trushna</i> , <i>Ksheenakshata</i> , <i>Pandu</i> , <i>Amlapitta</i> , <i>Shosha</i> , <i>Gulma</i> , <i>Udara</i> , <i>Shosha</i> , <i>Gulma</i> , <i>Udara</i> , <i>Atisara</i> , <i>Jwara</i> , <i>Daha</i> , <i>Shwayathu</i> . It is advisable in <i>Vata-Pittajanya</i> conditions.
		Utility	<i>Nasya</i> , <i>Lepa</i> , <i>Avagaha</i> , <i>Vamana</i> , <i>Asthapana</i> , and <i>Virechana</i> to <i>Snehana</i> .
2	Sushruta	Properties	<i>Pranada</i> , <i>Guru</i> , <i>Madhura</i> , <i>Pichchila</i> , <i>Sheeta</i> , <i>Shlakshna</i> , <i>Sara</i> , <i>Mridu</i> , <i>Sarvapranbhritam Satmyam</i> . Its qualities include <i>Balya</i> , <i>Vrishya</i> , and <i>Vajikarana</i> , <i>mRasayana</i> , <i>Medhya</i> , <i>Vayasthapana</i> , <i>Jeevana</i> , <i>Brimhana</i> , <i>Sandhana</i> . The qualities are similar to that of <i>Ojas</i> ; hence it increases <i>Ojas</i> in body.
		Indications	<i>Bala</i> , <i>Vridhdha</i> , and <i>Kshataksheena</i> , <i>Vataja</i> , <i>Pittaja</i> , <i>Raktaja</i> , and <i>Manasa</i> disorders. <i>Dugdha</i> has its therapeutic benefits in <i>Jeerna Jwara</i> , <i>Shwasa</i> , <i>Kasa</i> , <i>Shosha</i> , <i>Kshaya</i> , <i>Gulma</i> , <i>Unmada</i> , <i>Udara</i> , <i>Murchcha</i> , <i>Bhrama</i> , <i>Madatyaya</i> , <i>Daha</i> , <i>Trushna</i> , <i>Hridroga</i> , <i>Bastiroga</i> , <i>Pandu</i> , <i>Grahani</i> , <i>Arsha</i> , <i>Shoola</i> , <i>Udavarta</i> , <i>Atisara</i> , <i>Pravahika</i> , <i>Yoniroga</i> , <i>Garbhastrava</i> , <i>Raktapitta</i> , <i>Shrama</i> , <i>Klama</i> .
		Utility	<i>Vamana</i> and <i>Virechana</i> .
3	Vagbhatta	Properties	<i>Swadu</i> , <i>Snigdha</i> , <i>Guru</i> , <i>Sheeta</i> , <i>Ojas</i> -like properties, <i>Vrishya</i> , alleviates <i>Vata</i> and <i>Pitta</i> and elevates <i>Kapha</i> .

Additionally, other synthetic compounds have been linked to conditions such as impairments, heart issues, cancer, and even fatalities.<sup>75</sup>

## 10. Discussion

Milk is one of the basic food products consumed in the world owing to its rich source of nutrients. Ayurveda has extensively described milk in *DugdhaVarga*. For assessing the purity of *Dugdha*, it is stated that, if the color of the milk has changed (from white to another color), it is not sweet, has a foul smell, is sour or salty, and has curdled like yogurt, such milk should be discarded.<sup>76</sup> Being mindful of the *Pathya* and *Apathya* related to milk consumption can aid in the prevention of diseases as well as further worsening of conditions. Moreover, while consuming milk one must keep in mind *DashavidhaPariksha*, for judicious use. *AcharyaCharaka* described *AshtavidhaAharaVidhi Visheshayatana*, i.e., eight factors to decide the wholesomeness and unwholesomeness of *Ahara*. One can think on similar lines while rationalizing the approach toward milk administration.

1. *Prakruti*: *Prakruti* of *Godugdha* is *Sheeta*, *Manda* in *Guna*, thus it can be administered in *PaittikaPrakruti Purusha* as well as *Paittika* conditions.
2. *Karana*: Methods like *AgniSannikarsha* and *Toya Sannikarasha* can reduce the *Guruta* of *Dugdha*.

3. *Samyoga*: *Dugdha* with *Sharkara* or *Ghrta* is beneficial. *Dugdha* with *Mudga* causes *Kushtha*.
4. *Rashi*: *Mahisha Dugdha* is *Guru*, *Abhishyandi* thus should be consumed within limits.
5. *Desha*: *AnupaDesha* and *JangalaDesha* have a predominance of *Kapha* and *VataDosha*, respectively. Consumption of *Dugdha* should be promoted in *JangalaDesha*. In, *AnupaDesha*, the use of *Aja Dugdha* should be promoted as it is *Laghu* in nature.
6. *Kala*:

*Nityaga*: *Godugdha* is referred to as *Rasayana* and thus can be consumed regularly in healthy.

*Avasthika*: *Ksheera* is considered as *Pathya* in *Garbhini Awastha*.

7. *UpayogaSanstha*: *Dharoshna Dugdha* is considered best.

8. *Upayokta*: Persons *Satmya* to *Dugdha* can take regularly. However, those who are *Asatmya* to *Dugdha* (Lactose Intolerance) should be advised with *Shunthi*, *Pippali* preparation.

Employing parameters from *Dashavidha Pariksha* while planning diet with *Dugdha*.

1. *Prakruti*: Since milk is *Madhura*, *Snigdha* in nature, it may be beneficial in *Vata-PittaPrakriti*, and should be administered carefully in persons with *Kapha Prakriti* predominance.

**Table 2:** General aspects of *ashtadugdha*

S. No.	Dugdha	Acharya	Description
1	Godugdha	Charaka	<i>Swadu Rasa, Sheeta, Mrudu, Snigdha, Bahala, Shlakshna, Pichchila, Guru, Manda, and Prasanna Gunas</i> . As the qualities of <i>Godugdha</i> are like that of <i>Ojas</i> , it increases <i>Ojas</i> in the body. It is also stated to be the best amongst <i>Jeevaniya Dravyas</i> and is considered as <i>Rasayana</i> .
		Sushruta	<i>Sheeta, Madhura, Snigdha, Guru, Rasayana, Jeevaniya Alpa Abhishyandi</i> , alleviate <i>Raktapitta</i> and it is best advised in <i>Vata Pitta</i> disorders.
		Vagbhatta	<i>Jeevaniya, Rasayana, Medhya, Balya, Sara, Stanyakara</i> . It has its therapeutic efficacy in <i>Kshataksheena, Shrama, Bhrama, Mada, Alakshmi, Shwasa, Kasa, Ati Trishna, Ati Kshudha, Jeernajwara, Mutrakrichchra, Raktapitta</i> .
2	Mahishidugdha	Charaka	<i>Mahisha Dugdha</i> is more <i>Guru</i> and <i>Sheeta</i> than <i>Godugdha</i> due to the greater quantity of <i>Sneha</i> . It is advised in <i>Anidra</i> and <i>Atyagni</i> .
		Sushruta	<i>Madhura, Guru</i> , is more <i>Sheeta</i> , and <i>Snigdha</i> than <i>Godugdha</i> , which is <i>Vahninashaka, Nidrakara</i> .
		Vagbhatta	<i>Guru, Hima</i> , and it is advised in <i>Atyagni, Anidra</i> .
3	Ushtridugdha	Charaka	<i>Ruksha, Ushna</i> , and <i>Laghu</i> in nature have <i>Ishat Lavana Rasa</i> . It is advised in <i>Vata-Kapha</i> disorders, <i>Anaha, Krimi, Shopha, Udara</i> , and <i>Arsha</i> .
		Sushruta	<i>Ruksha, Ushna, Kinchit Lavana, Swadu</i> , and <i>Laghu</i> ; it is advised in <i>Shopha, Gulma, Udara, Arsha, Krimi, Kushtha</i> , and <i>Visha</i> .
		Vagbhatta	<i>Ishat Ruksha, Ushna, Lavana, Deepana, Laghu</i> , useful in <i>Vata Kapha</i> disorders, <i>Anaha, Krimi, Shopha, Udara, Arsha</i> .
4	Ekashephadugdha	Charaka	<i>Ushna, Ruksha</i> , and <i>Laghu Guna</i> with slight <i>Amla</i> and <i>Lavana Rasa</i> . It is <i>Balya, Sthairyakara, Shakhavatahara</i> .
		Sushruta	<i>Madhura, Amla Rasa, Lavana Anurasa, Ushna, Ruksha, Laghu</i> , and alleviates <i>Shakhagata Vata</i> .
		Vagbhatta	<i>Amla, Lavana, Laghu, Ushna</i> , and <i>Jadatakara</i> , alleviates <i>Shakhavata</i> .
5	Chhagadugdha	Charaka	<i>Kashaya, Madhura Rasa Sheeta, Grahi</i> , and <i>Laghu</i> properties. It is beneficial in <i>Raktapitta, Atisara, Kshaya, Kasa, Jwara</i> .
		Sushruta	<i>Deepana, Laghu</i> , and <i>Sangrahi</i> , it is useful in <i>Shosha, Shwasa, Kasa</i> , and <i>Raktapitta</i> and is considered <i>Sarvavyadhihara</i> .
		Vagbhatta	It has its therapeutic potential in <i>Shosha, Jwara, Shwasa, Raktapitta</i> , and <i>Atisara</i> .
6	Avidugdha	Charaka	<i>Ushna</i> in nature and aggravates <i>Pitta</i> and <i>Shleshma</i> . It causes <i>Hikka</i> and <i>Shwasa Roga</i> .
		Sushruta	<i>Madhura, Snigdha</i> , and <i>Guru</i> , alleviate <i>Pitta</i> and <i>Kapha</i> . It is advised in <i>Kevala Vata</i> and <i>Vataja Kasa</i> .
		Vagbhatta	<i>Ushna, Ahridya</i> , useful in <i>Vatavyadhi</i> . It causes <i>Hikka, Shwasa, Pitta</i> , and <i>Kapha</i> disorders.
7	Hastinidugdha	Charaka	<i>Guru</i> in nature has <i>Balya</i> and <i>Sthairyakara</i> properties.
		Sushruta	<i>Madhura Rasa, Kashaya Anurasa, Guru, Snigdha, Sheeta, Vrishya, Sthairyakara</i>
		Vagbhatta	<i>Sthairyakara</i>
8	Manushidugdha	Charaka	<i>Jeevanam, Brimhanam, Satmyam, Snehanam</i> . It is advisable as <i>Navana</i> in <i>Raktapitta</i> and <i>Tarpana</i> in <i>Akshishoola</i> .
		Sushruta	<i>Madhura Rasa, Kashaya Anurasa, Hima, Laghu</i> , and <i>Deepana</i> , are considered as <i>Jeevana</i> and can be utilized for <i>Nasya</i> and <i>Ashchyotana</i> .
		Vagbhatta	Used in <i>Vata Pitta</i> and <i>Rakta</i> disorders, <i>Abhighata, Akshiroga</i> . It is used as <i>Tarpana, Aschyotana</i> and <i>Nasya</i> .

**Table 3:** Different form of *dugdha* for intake

S. No.	Different form of <i>dugdha</i> for intake for best result
1	<i>Dharoshna Godugdha</i> (Cow milk taken immediately after milking)
2	<i>Dharasheeta Mahishadugdha</i> (Buffalo milk certain period after milking)
3	<i>Shrutoshna Avidugdha</i> (Sheep milk taken after warming)
4	<i>Shrutasheeta Ajadugdha</i> (Goat milk taken after warming and cooling it down)

**Table 4:** Impact of (*Vasana*) vessel on milk properties

S. No.	Vessel	Description
1	<i>Tamra</i>	Alleviates <i>Vata</i>
2	<i>Suvarna</i>	Alleviates <i>Pitta</i>
3	<i>Raupya</i>	Alleviates <i>Kapha</i>
4	<i>Kansya</i>	<i>Raktaprasadaka</i>

**Table 5:** Effect on qualities of milk by (*Agni Sanskara*) heat treatment

S. No.	Dugdha type	Description
1	<i>Ama Dugdha</i>	<i>Guru</i> , <i>Abhishyandi</i> , and <i>Kaphakara</i> , except for <i>Godugdha</i> and <i>Mahishadugdha</i> .
2	<i>Shrutoshna Dugdha</i>	Alleviates <i>Kapha</i> and <i>Vata</i>
3	<i>Shrutasheeta Dugdha</i>	Alleviates <i>Pitta</i>

**Table 6:** Benefits of milk based on (*Kala*) time consumption

S. No.	Consumption time	Description
1	<i>Purvahna</i> (early morning)	<i>Balya</i> , <i>Brimhaniya</i> , and <i>Agni Vardhaka</i>
2	<i>Madhyahna</i> (afternoon)	<i>Baladayaka</i> , <i>Ruchikara</i> , and is beneficial in <i>Mutrakrichchra</i> and <i>Ashmari</i> .
3	<i>Ratri</i> (at night)	Pacifies multiple <i>Doshas</i>
<b>Based on ( <i>Vaya Avastha</i>) age</b>		
1	<i>Balyavastha</i>	<i>Agnivruddhikara</i>
2	<i>Vridhdhavastha</i>	<i>Shukra Vardhana</i>

**Table 7:** Compatibility and incompatibility of *Dugdha* with another *Dravya*

<b>Compatible</b>	<i>Sahakara</i> ( <i>Amra</i> ), <i>Gostani</i> ( <i>Mridwika</i> ), <i>Makshika</i> , <i>Ghrita</i> , <i>Navneeta</i> , <i>Shringabera</i> , <i>Pippali</i> , <i>Maricha</i> , <i>Sita</i> , <i>Sindhuttha Pruthuka</i> , <i>Patola</i> , <i>Nagara</i> , <i>Abhaya</i> , <i>Amalaki</i> , <i>Ardraka</i> , <i>Yava</i> , <i>Saindhava Lavana</i> , and <i>Madhura Varga Dravya</i>
<b>Incompatible</b>	<i>Matsya</i> , <i>Mamsa</i> , <i>Guda</i> , <i>Mudga</i> , <i>Mulaka</i> , <i>Shaka</i> , <i>Jambu</i> , <i>Sura</i> , <i>Taila</i> , <i>Pinyaka</i> , and <i>Sarshapa</i> among others. <i>Dugdha</i> which is <i>Atapta</i> (not boiled) and even if boiled but mixed with <i>Lavana</i> , <i>Pishta Padartha</i> , <i>Sandhana Dravya</i> , <i>Kanda</i> , and <i>Phalavarga</i> should not be consumed.

**Table 8:** Indications of milk according to conditions

<b>Pathya</b>	<i>Shwasa</i> (Respiratory Disorders), <i>Arochaka</i> (Anorexia), <i>Murchcha</i> (Fainting), <i>Daha</i> (Burning sensation), <i>Unmada</i> (Insanity) [ <i>Dharoshna</i> ], <i>Apasmara</i> (Epilepsy), <i>Vatavyadhi</i> (Nervine disorders), <i>Vatarakta</i> (Gout)[ <i>Godugdha</i> ], <i>Mutraghata</i> (Urinary obstruction), <i>Udararoga</i> (Ascites), <i>Netraroga</i> (Eye diseases), <i>Garbhini</i> (pregnancy).
<b>Apathya</b>	<i>Krimiroma</i> (Worm infestation), <i>Kasa</i> (Cough), <i>Shwasa</i> (Respiratory Disorders) ( <i>Meshidugdha</i> ), <i>Amavata</i> (Rheumatism), <i>Shotha</i> (Oedema), <i>Galaganda</i> (Goitre), <i>Gandamala</i> (Scrofula), <i>Apachi</i> (Abscess), <i>Granthi</i> (Cyst), <i>Arbuda</i> (Tumour), <i>Stanavidradhi</i> (Mastitis), <i>Sadyavrana</i> (acute wounds), <i>Kushtha</i> (Skin diseases), <i>Amlapitta</i> (Acid dyspepsia) ( <i>Avidugdha</i> ), <i>Mukharoga</i> (diseases of mouth), <i>Shiroroga</i> (diseases of head).
<i>Ajadugdha</i> is considered as <i>Pathya</i> in <i>Grahani</i> (IBD), <i>Arsha</i> (hemorrhoids), <i>Rajayakshma</i> (TB) and <i>Kasa</i> (cough).	

**Table 9:** Nutritional profile of milk

Constituents	Cow	Buffalo	Goat	Sheep	Camel	Horse	Human
Protein%	3.42	4.38	3.26	5.73	3.26	1.90	1
Fat%	4.09	7.73	4.07	6.99	3.80	1.30	3.8
Lactose%	4.82	4.79	4.51	4.75	4.30	6.90	7
Saturated Fatty Acids (% of total fatty acids)	71.25	65.86	70.42	65.17	69.90	-	44.30
Monounsaturated fatty acids (% of total fatty acids)	25.56	26.43	25.67	24.29	28.07	-	36.56
Polyunsaturated fatty acids (% of total fatty acids)	3.20	2.67	4.08	2.45	2.12	-	19.10
Cholesterol concentration (mg/100gm)	25.6-31.4	6.5-10.2	16.9-18.1	14.23	31.3-37.1	-	-
Calcium (mg/100gm)	122	112	134	195-200	114-116	132.7	33
Phosphorous (mg/100gm)	119	99	121	124-158	87.4	88.4	43
Potassium (mg/100gm)	152	92	181	136	144-156	66.5	55
Magnesium (mg/100gm)	12	8	16	18	10.5-12.3	10.2	4
Sodium (mg/100gm)	58	35	41	44-58	59	19.8	15
Zinc (µg/100g)	530	410	56	520-747	530-590	270	380
Iron (µg/100g)	80	161	7	72-122	230-290	37	200
Copper (µg/100g)	60	35	5	40-68	140	64	60
Manganese (µg/100g)	20	27	3.2	5.3-9	80	-	70
Iodine (µg/100g)	2.1	-	2.2	10.4	-	-	7
Selenium (µg/100g)	0.96	-	1.33	3.1	-	-	1.52
Vitamin A (IU), (*µg)	126	-	185	146	26.7	-	190
Vitamin D (IU), (*µg)	2	-	2.3	1.18	0.3	-	1.4
Thiamine (mg)	0.045	-	0.068	0.08	0.048	-	0.017
Riboflavin (mg)	0.16	-	0.21	0.376	0.168	-	0.02
Niacin (mg)	0.08	-	0.27	0.416	0.77	-	0.17
Pantothenic acid (mg)	0.32	-	0.31	0.408	0.368	-	0.20
Vitamin B6 (mg)	0.042	-	0.046	0.08	0.55	-	0.011
Folic acid (µg)	5	-	1	5	87	-	5.5
Biotin (µg)	2	-	1.5	0.93	-	-	0.4
Vitamin B12 (µg)	0.357	-	0.065	0.712	85	-	0.03
Vitamin C (mg)	0.94	-	1.29	4.16	33	-	5

2. *Vikruti*: Ayurveda classics have mentioned milk as *Pathya* in *Unmada*, *Apasmara*; and *Apathya* in *Kushtha*, *Shiroroga*.

3. *Sara*: If all the *Dhatus* exhibit *DhatuSarataLakshana*, then it is said to be *PravaraSara*. In the case of *Avara Sarata* one can consume *Dugdha* as it is *Brimhaniya*.

4. *Samhanana*: *Avara Samhanana* can be due to deformity in the strong adhesion of *Dhatus*. It may be caused due to *Dhatu Shaithilya* or due to *Vikrut Dhatu Bandhana*. In the case of *Dhatu Shaithilya*, *Dugdha* should be avoided. In the case of *Vikruta Dhatu Bandhana*, *Dugdha* can be advised, which is *Sandhanakruta*, along with *Abhyanga* and *Vyayama*.

5. *Pramana*: Persons with *Hina* and *AdhikaPramana* may fall under *Karshya* and *Sthoulya* respectively (with exceptions). *HinaPramana* should consume *Dugdha* and *Adhika Pramana* persons should avoid *Dugdha*.

6. *Satmya*: Persons *Satmya* to *Dugdha* can take regularly. However, those who are *Asatmya* to *Dugdha* (Lactose Intolerance) should be advised with *Shunthi*, *Pippali* preparation.

7. *Sattva*: *Dugdha* is said to be *Manaskaram*. Hence is an excellent *Dravya* for promoting *Sattva*.

8. *Aharashakti*: One after assessing the cause of *AvaraAharashakti*, one can plan the diet based on *Apatarpanjanya* or *Santarpanjanya Samprapti*.

*ApatarpanjanyaVyadhi*: *Dugdha* should be advised.

*SantarpanjanyaVyadhi*: *Dugdha* should be avoided.

In the case of *PravaraAharashakti*: *Mahisha Dugdha* can be advised as indicated in *Atyagni*.

9. *Vyayamashakti*: After assessing the cause of the *Avara Vyayamashakti*, the diet can be planned based on *Samprapti*. *Dugdha* can help in promoting *Vyayamashakti*.

10. *Vaya*: In *Balyavastha*, *Dugdha* is indicated as it is *Agnivridhdikara*.

Owing to the recent advancements in milk production, one should emphasize milk obtained from indigenous cows. To meet the increasing demand of the population, natural methods can be implemented like exposure to Indian classical music among others which has demonstrated efficacy.<sup>77</sup> To identify the adulterations in the milk, the public should be properly educated regarding the same. Synthetic milk is significantly more alkaline (pH-10.5) than natural milk, which has a pH range of 6.4 to 6.8. Additionally, synthetic milk has a bitter taste, unlike the taste of natural milk. These are some key distinguishing factors among others. Resorcinol test and Rosaline test can also be implemented for the same.<sup>78</sup>

## 11. Conclusion

*Dugdha* has been used for ages and extensive literature on the subject is available. This literature covers both the benefits and drawbacks of milk consumption, along with the associated rules and regulations. As the population grows, the demand for milk has significantly increased. However,

there is a notable gap between milk production and consumption. To meet the needs of the growing population, genetically modified cattle are being used to produce milk, which has its health implications. Additionally, synthetic milk is being introduced to the market, which has adverse effects on health. Due to these advancements, the nutritional value of milk is at risk. A rational approach to milk consumption, based on proper education, can help achieve the desired benefits.

## 12. Source of Funding

None.

## 13. Conflict of Interest

None.

## References

1. Agnivesha, Charaka, Dridhabala. Charaka Samhita, with Ayurvedic-Dipika commentary of Chakrapanidatta, Chikitsasthana Chapter 11 Verse 35. Trikamji A, editor. Varanasi: Chaukhamba Orientalia; 2009.
2. Agnivesha, Charaka, Dridhabala. Charaka Samhita, with Ayurvedic-Dipika commentary of Chakrapanidatta, Chikitsasthana Chapter 1 Verse 111. Trikamji A, editor. Varanasi: Chaukhamba Orientalia; 2009.
3. Nighantu K, Varga D. Verse 114 ;Available from: <https://niimh.nic.in/ebooks/eNighantu/kaiyadevanighantu>.
4. Agnivesha, Charaka, Dridhabala. Charaka Samhita, with Ayurvedic-Dipika commentary of Chakrapanidatta, Chikitsasthana Chapter 1 Verse 107. Trikamji A, editor. Varanasi: Chaukhamba Orientalia; 2009.
5. Agnivesha, Charaka, Dridhabala. Charaka Samhita, with Ayurvedic-Dipika commentary of Chakrapanidatta, Chikitsasthana Chapter 1 Verse 108. vol. 108. Varanasi: Chaukhamba Orientalia; 2009.
6. Agnivesha, Dridhabala, Dridhabala. Charaka Samhita, with Ayurvedic-Dipika commentary of Chakrapanidatta, Chikitsasthana Chapter 1 Verse 111. Varanasi: Chaukhamba Orientalia; 2009.
7. Agnivesha, Dridhabala C, Samhita. Charaka Samhita, with Ayurvedic-Dipika commentary of Chakrapanidatta, Chikitsasthana Chapter 1 Verse 113. Varanasi: Chaukhamba Orientalia; 2009.
8. Acharya YT, Ram AN, editors. Sushruta Samhita of Sushruta, Sutrashtana Chapter 45 Verse 49. Varanasi: Chaukhamba Sanskrit Sansthan; 2013.
9. Bhisagacharya PH, editor. Ashtanga Hridaya Samhita of Vagbhata, Sutrashtan Chapter 5 Verse 20. Varanasi: Choukhambha Orientalia; 2014.
10. Agnivesha, Charaka, Dridhabala. Charaka Samhita, with Ayurvedic-Dipika commentary of Chakrapanidatta, Chikitsasthana Chapter 27 Verse 218. Trikamji A, editor. Varanasi: Chaukhamba Orientalia; 2009.
11. Acharya YT, Ram AN, editors. Sushruta Samhita of Sushruta, Sutrashtana Chapter 45 Verse 50. Varanasi: Chaukhamba Sanskrit Sansthan; 2013.
12. Bhisagacharya P, editor. Ashtanga Hridaya Samhita of Vagbhata, Sutrashtan Chapter 5 Verse 21. Varanasi: Choukhambha Orientalia; 2014.
13. Agnivesha, Charaka, Dridhabala. Charaka Samhita, with Ayurvedic-Dipika commentary of Chakrapanidatta, Chikitsasthana Chapter 27 Verse 219. Trikamji AY, editor. Varanasi: Chaukhamba Orientalia; 2009.
14. Acharya YT, Ram AN, editors. Sushruta Samhita of Sushruta, Sutrashtana Chapter 45 Verse 55. Varanasi: Chaukhamba Sanskrit Sansthan; 2013.

15. Bhishagacharya P, editor. Ashtanga Hridaya Samhita of Vagbhata, Sutrasthan Chapter 5 Verse 23. Varanasi: Choukhambha Orientalia; 2014.
16. Agnivesha, Charaka, Dridhabala. Charaka Samhita, with Ayurvedic-Dipika commentary of Chakrapanidatta, Chikitsasthana Chapter 27 Verse 220. Trikamji A, editor. Varanasi: Chaukhamba Orientalia; 2009.
17. Acharya YT, Ram AN, editors. Sushruta Samhita of Sushruta, Sutrasthan Chapter 45 Verse 53. Varanasi: Chaukhamba Sanskrit Sansthan; 2013.
18. Bhishagacharya P, editor. Ashtanga Hridaya Samhita of Vagbhata, Sutrasthan Chapter 5 Verse 25. Varanasi: Choukhambha Orientalia; 2014.
19. Agnivesha, Charaka, Dridhabala. Charaka Samhita, with Ayurvedic-Dipika commentary of Chakrapanidatta, Chikitsasthana Chapter 27 Verse 221. Trikamji A, editor. Varanasi: Chaukhamba Orientalia; 2009.
20. Acharya YT, Ram AN. Sushruta Samhita of Sushruta, Sutrasthan Chapter 45 Verse 56. Varanasi: Chaukhamba Sanskrit Sansthan; 2013.
21. Bhishagacharya P, editor. Ashtanga Hridaya Samhita of Vagbhata, Sutrasthan Chapter 5 Verse 27. Varanasi: Choukhambha Orientalia; 2014.
22. Agnivesha, Charaka, Dridhabala. Charaka Samhita, with Ayurvedic-Dipika commentary of Chakrapanidatta, Chikitsasthana Chapter 27 Verse 222. Trikamji A, editor. Varanasi: Chaukhamba Orientalia; 2009.
23. Acharya YT, Ram AN. Sushruta Samhita of Sushruta, Sutrasthan Chapter 45 Verse 51. Varanasi: Chaukhamba Sanskrit Sansthan; 2013.
24. Bhishagacharya P, editor. Ashtanga Hridaya Samhita of Vagbhata, Sutrasthan Chapter 5 Verse 24. Varanasi: Choukhambha Orientalia; 2014.
25. Agnivesha, Charaka, Dridhabala. Charaka Samhita, with Ayurvedic-Dipika commentary of Chakrapanidatta, Chikitsasthana Chapter 27 Verse 223. Trikamji A, editor. Varanasi: Chaukhamba Orientalia; 2009.
26. Acharya YT, Ram AN, editors. Sushruta Samhita of Sushruta, Sutrasthan Chapter 45 Verse 54. Varanasi: Chaukhamba Sanskrit Sansthan; 2013.
27. Bhishagacharya PH, editor. Ashtanga Hridaya Samhita of Vagbhata, Sutrasthan Chapter 5 Verse 26. Varanasi: Choukhambha Orientalia; 2014.
28. Agnivesha, Charaka, Dridhabala. Charaka Samhita, with Ayurvedic-Dipika commentary of Chakrapanidatta, Chikitsasthana Chapter 27 Verse 223. Trikamji A, editor. Varanasi: Chaukhamba Orientalia; 2009.
29. Acharya YT, Ram AN, editors. Sushruta Samhita of Sushruta, Sutrasthan Chapter 45 Verse 58. Varanasi: Chaukhamba Sanskrit Sansthan; 2013.
30. Bhishagacharya P, editor. Ashtanga Hridaya Samhita of Vagbhata, Sutrasthan Chapter 5 Verse 27. Varanasi: Choukhambha Orientalia; 2014.
31. Agnivesha, Charaka, Dridhabala. Charaka Samhita, with Ayurvedic-Dipika commentary of Chakrapanidatta, Chikitsasthana Chapter 27 Verse 224. Trikamji A, editor. Varanasi: Chaukhamba Orientalia; 2009.
32. Acharya YT, Ram AN, editors. Sushruta Samhita of Sushruta, Sutrasthan Chapter 45 Verse 57. Varanasi: Chaukhamba Sanskrit Sansthan; 2013.
33. Bhishagacharya P, editor. Ashtanga Hridaya Samhita of Vagbhata, Sutrasthan Chapter 5 Verse 26. vol. 26. Varanasi: Choukhambha Orientalia; 2014.
34. Sastri L, editor. YogaRatnakara, Purvardha, Dugdhaaguna. Varanasi: Chaukhambha Prakashana; 2022. p. 98.
35. Dugdhaavarga KN, editor. Verse 164;. Available from: <https://niimh.nic.in/ebooks/eNighantu/kaiyadevanighantu>.
36. Sastri L, editor. YogaRatnakara, Purvardha, Dugdhaaguna. Varanasi: Chaukhambha Prakashana; 2022. p. 99.
37. Sastri L, editor. YogaRatnakara, Purvardha, Dugdhaaguna. Varanasi: Chaukhambha Prakashana; p. 100.
38. Sastri L. YogaRatnakara, Purvardha, Shwasanidana. Varanasi: Chaukhambha Prakashana; 2022. p. 436.
39. Sastri L, editor. YogaRatnakara, Purvardha, Shwasanidana. Varanasi: Chaukhambha Prakashana; 2022. p. 436.
40. Sastri L, editor. YogaRatnakara, Purvardha, Arochakanidan. Varanasi: Chaukhambha Prakashana; p. 447.
41. Sastri L, editor. YogaRatnakara, Purvardha, Murchchanidan. Varanasi: Chaukhambha Prakashana; 2022. p. 471.
42. Sastri L, editor. YogaRatnakara, Purvardha, Dahanidana. Varanasi: Chaukhambha Prakashana; 2022. p. 485.
43. Sastri L, editor. YogaRatnakara, Purvardha, Unmadanidana. Varanasi: Chaukhambha Prakashana; 2022. p. 492.
44. Sastri L, editor. YogaRatnakara, Purvardha, Apasmaranidana. Varanasi: Chaukhambha Prakashana; 2022. p. 502.
45. Sastri L, editor. YogaRatnakara, Purvardha, Vatavyadhinidana. Varanasi: Chaukhambha Prakashana; 2022. p. 548.
46. Sastri L, editor. YogaRatnakara, Purvardha, Vataraktanidana. Varanasi: Chaukhambha Prakashana; 2022. p. 559.
47. Sastri L, editor. YogaRatnakara, Uttarardha, Vaghatanidana. Varanasi: Chaukhambha Prakashana; 2022. p. 67.
48. Sastri L, editor. YogaRatnakara, Uttarardha, Udararoganidana. Varanasi: Chaukhambha Prakashana; 2022. p. 434–434.
49. Sastri L, editor. YogaRatnakara, Uttarardha, Netraroganidana. Varanasi: Chaukhambha Prakashana; 2022. p. 395.
50. Sastri L, editor. YogaRatnakara, Purvardha, Stanarogadhikara. Varanasi: Chaukhambha Prakashana; 2022. p. 434.
51. Sastri L, editor. YogaRatnakara, Purvardha, Krimiroganidana. Varanasi: Chaukhambha Prakashana; 2022. p. 336.
52. Sastri L, editor. YogaRatnakara, Purvardha, Kasanidana. Varanasi: Chaukhambha Prakashana; 2022. p. 422.
53. Sastri L, editor. YogaRatnakara, Purvardha, Shwasanidana. Varanasi: Chaukhambha Prakashana; 2022. p. 436.
54. Sastri L, editor. YogaRatnakara, Purvardha, Amavatanidan. Varanasi: Chaukhambha Prakashana; 2022. p. 473.
55. Sastri L, editor. YogaRatnakara, Uttarardha, Shothanidana. Varanasi: Chaukhambha Prakashana; 2022. p. 134.
56. Sastri L, editor. YogaRatnakara, Uttarardha, Galagandagandamalaapachigranthiarbudanidana. Varanasi: Chaukhambha Prakashana; 2022. p. 156.
57. Sastri L, editor. YogaRatnakara, Uttarardha, Stanavidradhinidana. Varanasi: Chaukhambha Prakashana; 2022. p. 168.
58. Sastri L, editor. YogaRatnakara, Uttarardha, Sadyovrananidana. Varanasi: Chaukhambha Prakashana; 2022. p. 185.
59. Sastri L, editor. YogaRatnakara, Uttarardha, Kushthanidana. Varanasi: Chaukhambha Prakashana; 2022. p. 234.
60. Sastri L, editor. YogaRatnakara, Uttarardha, Amlapittanidana. Varanasi: Chaukhambha Prakashana; 2022. p. 251.
61. Sastri L, editor. YogaRatnakara, Uttarardha, Mukharoganidana. Varanasi: Chaukhambha Prakashana; p. 309.
62. Sastri L, editor. YogaRatnakara, Uttarardha, Shioroganidana. Varanasi: Chaukhambha Prakashana; 2022. p. 340.
63. Sastri L, editor. YogaRatnakara, Purvardha, Grahaniidana. Varanasi: Chaukhambha Prakashana; 2022. p. 293.
64. Sastri L, editor. YogaRatnakara, Purvardha, Arshanidana. Varanasi: Chaukhambha Prakashana; 2022. p. 309.
65. Sastri L, editor. YogaRatnakara, Purvardha, Kasanidana. Varanasi: Chaukhambha Prakashana; 2022. p. 421.
66. Jost R. Milk and dairy products. *Ullmann's Encyclopedia of Industrial Chemistry*. 2002;.
67. Fox PF. Lactose, Water, Salts and Vitamins. In: *Advanced Dairy Chemistry*. vol. 3. New York: Chapman and Hall; 1995. p. 7402982–7402982.
68. Barlowska J, Szwajkowska M, Litwinczuk Z, Krol J. Nutritional value and technological suitability of milk from various animal species used for dairy production. *Compr Rev Food Sci Food Saf*. 2011;10(6):291–302.
69. Kim SY, Yi DY. Components of human breast milk: From macronutrient to microbiome and microRNA. *Clin Exp Pediatr*. 2020;63(8):301–9.



70. White revolution (India). India;. Available from: [https://en.wikipedia.org/wiki/White\\_revolution\\_](https://en.wikipedia.org/wiki/White_revolution_).
71. Singh AK, Rao SV, Venkatasubramanian V. Dairy Development in India: An Appraisal of Challenges and Achievements. Concept Publishing Co; 2003.
72. Annual Report 2021-22 . 2022; Available from: <https://dahd.nic.in/sites/default/files/AnnualEnglish.pdf>.
73. Sodhi M, Mukesh M, Kataria RS, Mishra BP, Joshii BK. Milk proteins and human health: A1/A2 milk hypothesis. *Indian J Endocrinol Metab*. 2012;16(5):856.
74. Paradkar MM, Singhal RS, Kulkarni PR. An approach to detecting synthetic milk in dairy milk: 1. Detection of urea. *Int J Dairy Tech*. 2000;53(3):87–91.
75. Paradkar MM, Singhal RS, Kulkarni PR. An approach to the detection of synthetic milk in dairy milk: Effect of the addition of synthetic milk on the flow behavior of pure cow milk. *Int J Dairy Tech*. 2008;54:36–7.
76. Nighantu K, Dugdhavarga. Verse 157;. Available from: <https://niimh.nic.in/ebooks/e-Nighantu/kaiyadevanighantu>.
77. Ganesh JS. Impact of Carnatic Raga-s on the Milk Yield of Cows. *Shanlax Int J Arts*. 2020;8(2):83–7.
78. Mudgil D, and SB. Synthetic milk: A threat to Indian dairy industry. *Carpathian J Food Sci Technol*. 2013;5:64–8.

### Author biography

**Mugdha Shubhang Gore**, PG Scholar

**Arpan Bhatt**, Professor and Head

**Shaline Kumari Mishra**, Assistant Professor

**Kalpesh Dattani**, Lecturer

**Cite this article:** Gore MS, Bhatt A, Mishra SK, Dattani K. Rationalized approach towards milk consumption integrating ayurveda principles and recent advances for health promotion. *Int J Recent Innov Med Clin Res* 2024;6(3):61-69.