

MILK A COMPLETE FOOD-AYURVEDA VIEW

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ABSTRACT

Milk is considered as complete food .This statement suggests its importance in health. Milk is the first food for a new born and it remains on milk diet exclusively until the age of 6 months. Milk is given a lot of importance in *Ayurvedic classics*. Different kind of animal milks have been discussed broadly based on diseases where these milks can be used. Classics even tell what to give in absence of mother's milk. Proper way of breast feeding to a neonate is also discussed. This long description is enough to tell importance of milk for a child. But in present days children start taking fast foods and other market eatables at very young age. Mothers are also not willing for breast feeding to their child because they are not aware of benefits of breast feeding. There is a misconception among women that it also spoils figure and shape. Children are consuming packed milk and powdered milk which is not fresh and stored for several days before reaching markets .Contaminated milk samples are also reported from whole nation. This milk does not contain enough nutrients for child growth. In *Ayurveda* goat milk, cow milk and *Aushadh Siddha* (medicated) milk are advised in absence of mother's milk. All these details and concepts regarding milk are discussed here.

Keywords: Milk, Ayurveda, *Aushadh Siddha*

INTRODUCTION

Milk is primary source of nutrition for infants before they are able to digest other types of food. The early milk is called colostrum. It contains antibodies that provide protection to the newborn baby as well as nutrients and growth factors.¹ World Health Organization recommends exclusive breastfeeding for six

months and breastfeeding in addition to other food for at least two years. Ayurveda classics suggest to take milk everyday and Acharya Charaka even considered taking milk in *Achar Rasayna* (good if followed in daily life or accepted in behaviour)².

Source of milk: The females of all mammal species can by definition produce milk, but cow's milk dominates commercial production. In 2011, FAO estimates 85% of whole milk worldwide was produced from cows. Buffalo, Goat, Sheep, Camel produced about 11%, 2%, 1.4% and 0.2% of milk respectively worldwide in 2011.³

Stanya (milk) amount: 2 Anjali⁴ (96gm)(amount for human female only)

Milk formation⁵: Rasa (digested food) formed by all foods is divided in 3 parts in the body

1. for nutrition of body
2. Garbha (child in uterus) nutrition
3. Stanya(milk) formation

This *Stanya* reaches to site from heart by *Dhamni*⁶ (arteries) or *Sira*⁷ (Veins).

Time of milk secretion after bearing child: 3rd or 4th day after pregnancy.⁸

Proper way of breast feeding- Get an early start, proper positioning, nurse on demand, engorgement, no supplements, delay artificial nipples, use nursing pads, spitting up, nipple cracking, watch for infection, eat right and get rest.

Ayurveda: On auspicious day after child has taken bath, make him or her wear new clothes after this put child's face in north direction and mother's in east direction. Mother should wash right breast first and squeeze some milk out. After chanting hymns only breast feed the child if squeezing is not done child may suffer from coughing, breathlessness and vomiting.⁹

Stanya (milk): Characters of pure milk¹⁰: It should be tested by dropping in water and if it is *Sheetal* (cold), clear, dilute, white in col-

our, becomes homogenous when mixed with water, no bubbles formation, without *Tantu* (thread like structures) and on placing over water doesn't sink in it, is said to be pure milk. *Satmayam* (good for health), *Shwaskasani-brharnam* (helpful to cure breathlessness and cough), *Medhya* (increases intelligence), *Vrushya* (aphrodisiac), vaginal, seminal, urinary tract problems and leucorrhoea can be treated with milk¹¹.

Other uses¹²: In chronic diseases, fallen down persons, insomnia and in persons affected due to use of *Bhallataka*, fever, diarrhoea etc.

In *Pathya* (specially indicated) of *Jalodar* (Ascitis), *Shotha*, *Anupana* (Adjuvant) of many medicines eg. *Vajikarna* (aphrodisiac) medicines.(Charaka)

Stanya Dushti Nidana(vitiated milk with Doshas)¹³: *Paramanna* (saturated foods), Curd, not properly formed curd, Indigestion, *Lavana* (salt), *Amla* (Sour), *Katu* (bitter), *Kshar* (alkalies) kind of foods, day time sleeping etc are the causes *Stanya Dushti*.

Stanya Dosha and their effects on child¹⁴: Total 8 in no.

Vata Dushta-

1. *Vairasya* (tastelessness) –*Krushta* (thin), not pleasant, not proper growth of child.
2. *Fenasanghata* (frothing)-Voice not clear, stool, urine and flatus stop, diseases of upper body (head, neck etc), *Pinas* (rhinitis).
3. *Rukshta* (dry)-*Shosha*(not able to gain weight),*Balahrasa* (decreased strength).

Others-*Kashay Anurasa* (Charaka), floats over water (A.S. and Y.R.)

Pitta Dushta-

1. *Vaivarna* (discoloration)-Excessive perspiration, diarrhoea, always thirsty, body remains hot.
2. *Durgandhita* (unpleasant smell)-*Pandu* (anemia), *Kamla* (jaundice)

Others-*Tikta-Amla-Katuanurasa, Kunapgandhi* (smells like dead) (Charaka), yellow lines over water (Sushruta, A.S.,A.H.),

According to A.S.U.T.2/14-

Tamravbhasama (looks yellowish) causes *Hridyamudveshtana* (twisting pain in heart).

Amlanurasa causes *Amla-Pitta* (hyperacidity like symptoms).

Katukanurasa causes vomiting, diarrhea, coughing, breathlessness.

Ushna causes burning sensation, fever and diarrhoea.

Kapha Dushta-

1. *Sneha* (unctuous)-nausea, vomiting, *Kunthan* (twisting pain while defecation), breathlessness, coughing, excessive salivation and sleep.
2. *Pichchila* (sticky)-excessive salivation, facial and periorbital edema, *Jada* (stable at same place).
3. *Gaurav* (heavy)-heart diseases

Others-*Ghrita* (butter)-*Taila* (oil)-*Vasa* (fat)-*Majja* (marrow) like smell (Charaka, A.S.) Sinks in water (Charaka, Sushruta, A.S., A.H., Y.R.)

According to A.S.U.T.2/14-

Lavanuranura causes *Visarpa* (cellulitis), *Kotha* (skin allergy) *Kandu* (itching).

Tantumada (like thread) causes weakness, breathlessness, coughing.

Guru (heavy) causes *Pratishyaye* (rhinitis), *Singhadaka* (nasal blockage due to dry mucus), *Ksheeralsaka* (disease of children).

***Harita- Stanya Dosha* are five (5).**

1. *Ghana*(concentrated)
2. *Ushna* (hot)
3. *Amla* (sour)
4. *Alpa* (less in amount)
5. *Mridu* (soft)

Some diseases caused by *Dushta Stanya*:

Phakka Roga due to *Kapha Dushta* milk and milk of pregnant mother.(Kashyapa)

Balshosha due to *Kapha Dushta* milk. (Vagbhatta)

Parigarbhika due to milk of pregnant mother. (A.S.,Sharangdhar)

Ahiputna due to *Dushta Stanya*.(Sushruta, Bhoja)

Kukunaka due to *Dushta Stanya*.(Sushruta, Kashyapa)

Visarpa and *Charmadala* due to *Dushta Stanya*. (Kashyapa)

***Stanyashodhana Gana*¹⁵ (Group of 10 medicines which purify milk):**

Patha (*Cissampelos pareira* Linn.), *Mahoshadha* (*Zingiber officinale* Rosc.), *Suradaru* (*Cedrus deodara* Loud.), *Musta* (*Cyperus rotundus* Linn.), *Murva* (*Clematis triloba* Heyne ex Roth.), *Guduchi* (*Tinospora cordifolia* Miers.), *Vatsaka* (*Holarrhena antidysenterica* Wall.) *Kiratikta* (*Swertia chirata* Buch-ham) *Katurohini* (*Picrorhiza kurroa* Royle ex Benth.) *Sariva* (*Hemidismus indicus* R.B.)

Stanya purifiers must contain *Tikta*, *Kashaya*, *Katu* or *Madhura* Rasa(taste)¹⁶.

Haridradigana, vachadigana and *Mustakadi-gana* are *Stanyashodhaka*. (Sushruta)

Causes of diminished milk secretion¹⁷: Anger, grief and lack of *Vatsalya* (love for child).

Characters of Stanya Kshaya (decreased secretion)¹⁸: Constriction of breast tissue, less or absent secretion.

Milk producing factors: *Somnasyata* (making happy), *Yava, Godhuma, Shali, Shashtika*, meat soup, *Sura, Sauviraka* (both alcohol preparations), *Pinyaka* (paste of *Tila* added with jaggery), *Lashuna* (garlic), fish, *Kasheruka, Shringataka, Bisa, Vidarikanda, Madhuka, Shatavari, Nalika, Alabu, Kalshaka* etc¹⁹.

Kapha increasing food²⁰.

All *Madha* (alcoholic preparations) except *Sidhu*, all green vegetables except *Siddhartaka*, all non-veg diets except hog and buffalo are beneficial²¹.

Stanyajanana Mahakashaya²² (group of 10 medicines which help in increasing milk formation): *Virana* (*Vetiveria zizanioides Nash*), *Shali* (*Oryza sativa Linn.*), *Shashtika* (a variety of *Oryza sativa Linn.*), *Ikshubalika* (*Asteracantha longifolia Nees*), *Darbha* (*Desmostachya bipinnata Staff.*), *Kusha* (a variety of *Desmostachya bipinnata Staff.*), *Kasha* (*Saccharum spontaneum Linn.*), *Gundra* (*Saccharum sara*), *Itkata, Kattrana* (*Cymbopogon schoenanthus Spreng.*)

Kakolyadigana Stanyajanana (Sushruta)

Milk to be taken in absence of human female milk:

Goat's milk or cow's milk.²³

Table 1: Benefits of different milks consumption²⁶:

Taste	Effect
Swadu(sweet)	Excessive faeces and urine
Kashaye(astringent)	Retention of feces and urine
Taila(oil) coloured	Good strength
Ghrita coloured	Very rich
Dhumra(smoke) coloured	Famous
Shuddha(pure)	Attains all qualities

Milk boiled with *Hrisva* (small) *Panchmula* (group of five medicines-*Shalparni, Prishnaparni, Gokshura, Brihati* and *Kantkari*).²⁴

Yogratnakara suggests taking milk after medicating it with *Rudraksha*.

Physical effects of breastfeeding on mothers:

Weight loss: Breastfeeding may help mothers lose weight after their baby is born.

Changes in Uterus: Breastfeeding promotes production of the hormone oxytocin in a woman's body. This hormone helps your uterus contract so it returns to its pre-pregnancy size more quickly.

Mother-Infant Bonding:

Hormones released during breastfeeding: prolactin and oxytocin –help new mothers connect with their babies. Prolactin helps bring on a peaceful and nurturing sensation, while oxytocin produces a strong sense of love and attachment between a mother and her child.

Other Health Benefits:

Lowers the risk of Type 2 diabetes, breast cancer, ovarian cancer and postpartum depression.

Breastfeeding provides a natural form of contraception as long as the infant is less than 6 months old, the mother's menstrual cycle has not returned and baby is breastfeeding throughout the day and night.²⁵

Contraindications: *Amaj* conditions (indigestion), infants with classic galactosemia (galactose 1-phosphate uridyl transferase deficiency)²⁶ mothers who have active untreated tuberculosis disease or are human T-cell lymphotropic virus type I-or II-positive²⁷.

Purification: Mainly two methods are used-

Pasteurization: Heating milk for short time then immediately cooling it.

Microfiltration: longer shelf life without change in taste of milk. Cream is separated from the whey and pasteurized in usual way

Results of Pasteurization: modifies structure of proteins, decreases vitamin B2, B12, C and folate, kills Lactic acid bacteria responsible for food digestion, inactivates enzymes like protease and lipase, Epidemiological evidence suggests protective role of unprocessed cow's milk consumption on the development of asthma, hay fever and atopic sensitization.

Table 2: Composition of human breast milk²⁸

Fat (g/100 ml)	
Total	4.2
fatty acids - length 8C	Trace
polyunsaturated fatty acids	0.6
Cholesterol	0.016
Protein (g/100 ml)	
Total	1.1
Casein	0.4
a-lactalbumin	0.3
lactoferrin (apo-lactoferrin)	0.2
IgA	0.1
IgG	0.001
Lysozyme	0.05
serum albumin	0.05
β-lactoglobulin	-
Carbohydrate (g/100 ml)	
Lactose	7
Oligosaccharides	0.5
Minerals (g/100 ml)	
Calcium	0.03
Phosphorus	0.014
Sodium	0.015
Potassium	0.055
Chlorine	0.043

Table 3: Comparing milks (per cup)²⁹

Nutrient	Human Milk	Cow's Milk	Goat's Milk
Calories	172	146	168
Protein (g)	2.5	7.9	8.7
Fat (g)	10.8	7.9	10.1

Saturated fat (g)	4.9	4.6	6.5
Monounsaturated fat (g)	4.1	2.0	2.7
Polyunsaturated fat (g)	1.2	0.5	0.4
Carbohydrate (g)	17.0	11.0	10.9
Folate (mcg)	12	12	2
Vitamin C (mg)	12.3	0	3.2
Sodium (mg)	42	98	122
Iron (mg)	0.07	0.07	0.12
Calcium (mg)	79	276	327

Table 4: Milk composition analysis, per 100 grams.³⁰

Constituents	Unit	Cow	Goat	Sheep	Buffalo
Water	G	87.8	88.9	83.0	81.1
Protein	G	3.2	3.1	5.4	4.5
Fat	G	3.9	3.5	6.0	8.0
Saturated fatty acids	G	2.4	2.3	3.8	4.2
Monounsaturated fatty acids	G	1.1	0.8	1.5	1.7
Polyunsaturated fatty acids	G	0.1	0.1	0.3	0.2
Carbohydrate (i.e. the sugar form of lactose)	G	4.8	4.4	5.1	4.9
Cholesterol	Mg	14	10	11	8
Energy	Kcal	66	60	95	110

Table 5: Milk composition analysis³¹

Properties	Cow	Goat	Buffalo	Camel
Cholesterol	Higher than buffalo or camel milk	Higher than buffalo or camel milk	Lower cholesterol than cow or goat milk	Lower cholesterol than cow or goat milk
Vitamins and minerals	Higher fat and protein than human milk	Low in B6 and B12, higher in calcium than cow milk	Similar to cow's milk, although higher in calcium	3 times higher in vitamin C than cow's milk, 10 times higher in iron but less vitamin A and B2
Protein	3.29%	3.56%	4 %	2.2-5%
Cross reactivity of milk protein	Casein antibody cross-reactivity with goat and cow. 2-3% infants allergic to milk proteins	Similar casein structure to human milk and different from cow. Those allergic to cow milk might also be allergic to goat milk in about 25% of	Some protein antibody cross-reactivity with goat and cow.	Little or no cross-reactivity between cow and camel milk proteins. This indicates that those allergic to cow milk can drink camel milk.

		the cases		
Lactose	4.7%	4.1%	4.8%	4.8%
Fat	1-3%	3-6%	7-8 %	3-5%
Fat characteristic	Needs to be homogenized otherwise fat rises to the top, large fat molecules have a tendency to clump	Larger number of small fat molecules than cow milk, Does not contain agglutinin, so the fat molecules do not clump together. Believed to be the reason why it is easier to digest	Smaller molecules which don't clump together like in cow's milk.	Size of the fat molecules are similar to cows
Butter, cheese making	Contains agglutinin, fat separates easily, butter made by churning, cheese is made using rennet	Lacks agglutinin, difficult to make butter	Traditionally used to make mozzarella in Italy, better color and texture, yogurt is thick and creamy	Does not contain sufficient agglutinin for efficient cream separation.
Health	Good source of calcium and vitamin D	More easily digested because of smaller fat size and distribution characteristics.	Low in cholesterol, good source of nutrients such as calcium and other vitamins and minerals	Used to treat type 1 diabetes (contains insulin like molecules), strengthens cellular immune response, high in lactoferrin, which has antimicrobial activity,
Problems	Linked to milk allergies and intolerance	Not appropriate for those who have severe lactose intolerance	Contains lactose so may be a problem with those suffering with lactose intolerance	Contains lactose so may be a problem with those suffering with lactose intolerance

Table 6: Milk & properties as described in Ayurveda³²

Milk	Properties	Specific Property	Disease Indication
Cow	<i>Swadu</i> (sweet), <i>guru</i> (difficult to digest), <i>manda</i> (slow acting)	<i>Rasayana</i> (Rejuvenating)	<i>Jeevniya</i> (Necessary for life)
Buffalo	<i>Guru, sheeta</i> (cold) compared to Cow milk	More butter than cow milk	<i>Anidra</i> (insomnia), <i>At-yagni</i> (too much hunger)
Camel	<i>Ruksha</i> (dry), <i>ushna</i> (hot), <i>laghu, Ishata Lavna</i>	Antibacterial,antiviral ³³	<i>Vata-kapha Anaha krimi</i> (worm infestation) <i>Shofa</i> (inflammation) <i>udara roga</i> (GIT problems), <i>arsha</i> (piles)
Horse(Mare)	<i>Ruksha, ushna, Laghu</i> <i>Amla- Lavna</i>	<i>Sthairyakara</i> (Strong built)	<i>Shakhagata Vataharam</i>

Goat	<i>Laghu, Sheeta, Kashaya-Madhura</i>	<i>Grahi</i> (good in diarrhoea)	<i>Rakta-pitta, Atisara (Diarrhea), Kshaya (rundown condition) ,Kasa (cough) Jwara (Fever)</i>
Sheep	<i>Pitta-Shleshmalam</i> (increases pitta kapha)	Causes <i>Hikka</i> (Hiccups) <i>Shwasa</i> (Respiratory problems)	<i>Vatika Kasa, Vatakopa</i> (Increasesd Vata) ³⁴
Elephant	<i>Guru</i>	<i>Balya, Sthairyakara</i> (Strong built)	<i>Chakshushya</i> (beneficial for eyes) ³⁵
Woman	<i>Brimhana</i> (providing nourishment)	<i>Satmya</i> (Well accepted to body)	<i>Naveen Rakta-pitta, Akshi (eyes) shoola(pain)</i>

DISCUSSION

Milk contains all essential nutrients required for human beings. It provides immunity against many infections. It is suggested to remove some milk by squeezing before administering to child it is because early milk may come in direct contact of infectants from external environment, also it is *Guru* both these conditions can cause certain infections and diseases in child. Different methods are used to keep milk safe for longer duration in dairy industry but it happens on the cost of micro-nutrients in milk. Pasteurized milk is said to be free from bacteria responsible for tuberculosis. But if individual is healthy and gastric secretions are proper this bacteria can not survive in human body. Quality of milk depends on mother's health and food habits. If it is vitiated by *Doshas* it can be assessed by certain characters as described by Acharya Shushruta. Goat milk is preferred by *Acharyas* in absence of mother's milk because it contains same protein structure as in humans; also it contains high percentage of calcium (Table 3) which is required in larger amounts for growing bones of new born. Fat globules in goat's milk are smaller in size (Table 5) and in this way easy to digest. Milk of buffalo is rich in fat (Table

5) that's why it requires more time to get digested and good in *Atyagni roga* (Increased appetite). Woman milk is *Satmaya* (Accepted to all individuals) which means it is well tolerable by body where as cow milk is *Rasayana* (rejuvenating and to be used every day) that's why it is generally accepted in absence of human milk (Table 6). Goat's milk could be another option but it is not easily available secondly large amount is needed to fulfill the daily requirements of body though it is enough to meet the requirements of new born.

CONCLUSION

Milk is essential food for every child either human or animal. It contains almost all required nutrients for a healthy life. Sushruta and Vaghbhata preferred Goat milk over cow milk because it's easy to digest, higher in calcium and casein structure same as human. Human milk and cow milk are rich in all minerals and other required nutrients for growth and development but poor in iron content (0.07 mg/100ml), it is generally said milk is complete food after adding jaggery in it which is rich in iron containing 8.5-10 mg/100 gm iron content. But first choice is always mother's milk as it is beneficial to mother and

child both and generally well tolerated to child. It is enough to complete all requirements of human body but for adult's large amounts needed to be consumed otherwise other sources should be used for completing requirement for high protein and other nutrients. On the other hand market milk is poor in Vitamin B complex and other nutrients. So, better to use fresh milk after boiling it with some water mixed in it.

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