

Essential foods–Ayurveda concepts

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Abstract

Milk is an ideal food for infants, children and also a good supplementary food for adults. So the best milk for human baby is breast milk. Vegetable milk is also can be use as a substitute for animal milk. Ayurveda clearly described different types of milk and its indications according to the health status of the person.

Keywords: Panchamahabhoota, Nutritive value, Essential Amino acids, LDL, Anaemia, MCFA, Vegetable milk

1. Introduction

Milk is a supportive & nutrient factor for the development of new born babies^[1] Milk is a rich source of proteins, fats, sugars, vitamins and minerals. Ayurveda says as *ajasrika rasayana*^[2]. By observing the table, human milk is far better than the cow, goat and buffalo milk. The fat content and protein in buffalo milk is more than that of cow's milk^[3]. For human babies for this reason even WHO suggest mother's milk is the best. The nutritive value of mother's milk is always best for the babies rather than animal milk. Each milk is having a different nutritional value as per the table. Vegetable milk like soya, wheat, ragi, coconut are also good for human beings, those who have lactose intolerance. Soybean is in *Shimbi dhanya* varga, Ragi in *truna dhanya* varga, Wheat in *Sooka dhanya* varga and coconut in *phala* varga^[4] According to Ayurveda foods are described as four types *khadyam* (eatables), *chooshyam* (chewables), *lehyam* (jellies) and *peyam* (liquids)^[5] which are for the well being of human kind with the taste of *madhura* (sweet), *amla* (sour), *lavana* (salty), *tikta* (bitter), *katu* (pungent) and *kashaya* (astringent) *rasa*^[6]. The Upanishads has given a greatest value for food as 'para brahma swarupa' or as god. Because all the living creatures are directly depend on food for their life activities^[7]. Food is best among the things which sustain life^[8]. It is one among the three sub pillars which support life^[9]. The food has been created by the *pruthvi*, *ap*, *teja*, *vayu* and *akasa* i.e, *panchamahabhoota* and our body constitutes with the same *pancha mahabhootas*. The disease factors are also comes under the three biological factors i.e, *vata*, *pitt*, *kapha* and *krm*. All these comes under the *panchamahabhoota* theory^[10]. Milk is rejuvenative, aphrodisiac and nourishes the tissues and increases the vital capacity of the body and also improves the immune system^[11]. Milk proteins are casein, lactalbumin, lactoglobulin etc., it contains all essential amino acids and it is a good source of lysine and threonine. Milk contains lactose which less sweet and easily fermented by lactic acid bacilli. Body requirement of all minerals are met with milk, but it does not contain Vitamin C.

Breast Milk

The energy in human milk is 70 kcal. It also contains immunoglobulins and secretory Ig A molecules combat against diseases without causing inflammation, it relieves conjunctivitis^[12]. According to Ayurveda breast milk is useful for eye diseases when used as *tarpana* (retention of medicine in the eyes),

aschodana (eye drops) and *nasya* (nasal drops)^[13]. The breastfed babies are healthy grown compared to animal milk fed babies. Animal milk fed babies will be fatty babies and gradually turned into obese. The breast fed babies are often protected from various illnesses such as respiratory tract and GI tract infections as per the study published in the European Respiratory Journal^[14].

Cow's Milk

After mother's milk the second preference has been given to cow's milk as per Ayurveda. The fat content and protein in cow's milk is less than that of buffalo and goat. The sodium content, riboflavin and pantothenic acid is comparatively more in cow's milk than other animal milk. It is a good source of vitamin A and D and calcium. Its energy level is 67 kcal. According to Ayurveda cow's milk is restorative and regenerative. The properties of cow's milk are similar to that of *ojas*. It is best among the things which sustain life. It is suitable for those affected with weakness after injury. It promotes the power of understanding, improves strength, it is galactagogue and laxative. It relieves fatigue, giddiness, intoxication, inauspiciousness, dyspnoea, cough, thirst, hunger, chronic fever, dysurea and bleeding disorders. Cow's milk is the best drink to pacify *vata* and *pitta*^[15].

Goat's Milk

Goat's milk contains less casein alpha 1 protein as human milk, compared to goat's milk, this protein content is more in cow's milk. The research indicates that intolerance of cow's milk is often due to this protein. The protein composition of goat's milk allows it to form a softer curd during digestion which may assist digestive health and comfort. Goat's milk has more oligosaccharides than cow's milk, with the amount similar to human milk. These act as probiotics in gut and may help to maintain the digestive tract by encouraging the growth of beneficial gut bacteria and preventing the growth of harmful bacteria. The fat content of goat's milk is similar to cow's milk but the fat globules are naturally much smaller in size and this may make it easier to digest^[16]. Compared to other animal milks the potassium content is more in goat's milk. According to Ayurveda goat's milk is light and enhances digestive power. Goat's milk contains more essential fatty acids (linoleic and arachidonic) than cow's milk. These are quick source of energy and not stored as body fat. It helps in the digestion and metabolic

utilization of minerals like iron, calcium, phosphorus, magnesium and enhances the regeneration of haemoglobin and minimizes calcium iron interactions. Hence goat's milk prevents iron deficiency anaemia and bone demineralization. Vitamin A is more in goat's milk than other animal milks. It cures emaciation, respiratory disorders, bleeding disorders and diarrhoea [17]. Its properties are similar to that of human milk than other animal milk so it is good for children. It reduces total cholesterol level and prevents heart diseases. The calcium level is more in goat's milk than that of cow's.

Buffalo's Milk

Buffalo's milk contains more fat, protein and lactose than cow's milk but cholesterol is less. Buffalo metabolizes all carotene into vitamin A which is passed to milk as such, so buffalo milk contains more vitamin A. Compared to cow's milk calcium, iron and phosphorous content is more in buffalo's milk. Its energy is 117 k cal, very high compared to other animal milks. In Ayurvedic view buffalo's milk is extremely heavy and cool. It is suitable for those affected with bulimia and insomnia [18]. This milk will be suitable for working persons with more physical strain, who need more energy.

Table 1: Comparison of different animal milk.

Milk type		cow	goat	buffalo	human
nutrient	units	Values per 100gm of milk			
water	gm	87.99	87.03	83.39	87.5
energy	kcal	67	69	117	70
protein	gm	3.2	3.56	4.3	1.03
Lipids(fat)	gm	4.10	4.14	6.5	4.38
calcium	mg	120	134	210	32
iron	mg	0.05	0.05	0.12	0.03
phosphorous	mg	90	111	130	14
Potassium	mg	185	204	178	51
riboflavin	mg	0.162	0.048	0.052	0.014
Vitamin B6	mg	0.042	0.046	0.023	0.011
Vitamin B12	mcg	0.36	0.07	0.36	0.05
Vitamin A (carotene)	IU	126	185	178	241
vitamin (retinol)	mcg	28	56	53	60

Vegetable Milk

If any animal milk is not suitable for an individual it is better to use vegetable milks like soy milk, ragi milk, wheat milk, coconut

milk etc. Vegetable milks also have good nutritional values and helps to boost immunity.

Soy milk

Soybean [19]
 Botanical name: Glycine max
 Kingdom; plantae
 Family: fabaceae
 Genus: glycine
 Species: G. max

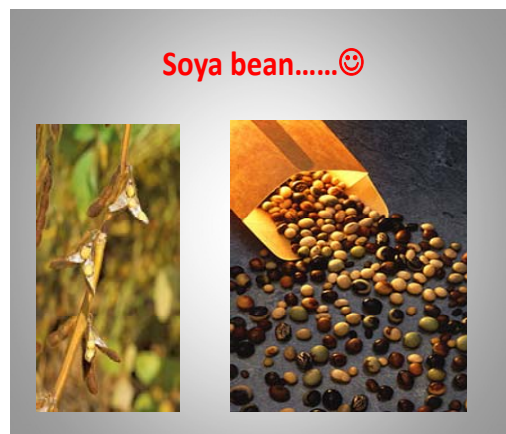


Fig 1



Fig 2

Table 2: Nutrients in soybeans/100gm

Water	8.5 gm	Calcium	277mg
Energy	416kcal	Magnesium	280mg
Protein	36.5 gm	Phosphorus	704mg
Fat(total lipid)	19.9 gm	Potassium	1797mg
Fatty acid saturated	2.9 gm	Vitamin B1	0.874mg
Fatty acid mono nsaturated	4.4 gm	VitaminB2	0.87mg
Fatty acid polyunsaturated	11.3 gm	Vitamin B3	1.62mg
Carbohydrate	30.2 gm	Vitamin B5	0.79 mg
Isoflavones	200mg		

Soymilk is excellent source of high quality protein, generally human body requires 1gm protein for 1kg body weight. It is a good source of B vitamins, potassium, phosphorus, sodium and magnesium. The isoflavones in soymilk helps to reduce LDL level and unsaturated fat level is more, so it is ideal milk for persons with dyslipidemia. Its energy is 33 kcal per 100gm.

According to Ayurveda soy is a simbi dhanya. Generally simbi dhanyas are dry and astringent in taste and it is better for emaciation. It contains omega-3 and omega-6 fatty acids as well as the powerful phyto-antioxidants this effectively protect blood vessels from lesions and haemorrhage. The sugar level in soymilk is less compared to animal milks. Soy milk is a rich

source of phytoestrogen, a unique plant hormone, it prevent prostate cancer and post menopausal symptoms. Soy is economic and effectively maintains the human body requirements

Ragi Milk

Ragi

Botanical name: Eleusine coracana
 Kingdom; plantae
 Family: poaceae
 Genus: Eleusine
 Species: E. coracana

Table 3: Nutrients in ragi/100gm

Content	Amount	Aminoacids	mg/gm of protein
Carbohydrate	72.6	Leucine	594
Protein	7.7	Valine	413
Fibre	3.6	Phenylalanine	352
Fat	1.3	Isoleucine	275
Minerals		Threonine	263
Calcium	350mg	Methionine	194
Iron	3.9mg	Tryptophan	191
Vitamins		Lysine	181
Niacin	1.1mg	Cystine	163
Thiamin	0.42mg		
Riboflavin	0.19 mg		



Fig 3

Ragi is a good source of amino acids, calcium, iron, magnesium, potassium and B vitamins. A special amino acid, Tryptophan present in Ragi helps to reduce appetite. The key amino acids Lecithin and Methionine present in ragi helps in lowering cholesterol by extracting and cutting out excess fat from the liver, and the amino acid Threonine prevents formation of fat in the liver. Tryptophan and amino acids in Ragi help in work against the free radicals and reducing oxidative stress. It works as a natural relaxant and helps in relieving stress related ailments like anxiety, hypertension, depression and headaches. It also helps in relieving sleep disorders like Insomnia. The vital amino acids Methionine and Lysine present in this millet helps in creation and maintenance of collagen. It is a substance that supports the skin tissues to make it supple and lively there by making it less prone to wrinkles and sagging of skin. The essential amino acid valine in ragi facilitates metabolism and repair of body tissue. It is loaded with calcium and vitamin D that makes it a vital component for increasing bone strength. It helps development of bones in children, maintains bone health

and prevents bone erosion in adults. It also works as an effective food to avert Osteoporosis. So ragi milk is useful for reducing weight, cholesterol level and stress and it cures anaemia, bone degeneration. It makes the body healthy and sturdy.

Wheat Milk

Wheat

Botanical name: Triticum aestivum
 Kingdom; plantae
 Family: poaceae
 Genus: Triticum
 Species: T. aestivum



Fig 4

Table 4: Nutrients in wheat germ /100gm

Energy	360 kcal
Carbohydrate	51.8 gm
Fat	9.72gm
Protein	23.15gm
Thiamine	1.882mg
Riboflavin	0.499mg
Niacin	6.183mg
Pantothenic acid	0.05mg
Vitamin B6	1.3mg
Calcium	39mg
Iron	6.26mg

Wheat is rich in mineral like calcium, magnesium, potassium, sulphur, chlorine, arsenic, silicon, manganese, zinc, iodide, copper, vitamin B, and vitamin E. The antioxidant activity of wheat milk is due to its vitamin E content. Wheat is also recommended to treat sterility. The Cell regeneration stimulating activity is due to the carbohydrates content of wheat milk. In Ayurveda wheat is sweet in taste, cool, unctuous and laxative. It is enlivening, pacifies vata and pita, improves the repairing mechanism of tissues in post traumatic conditions and increases body strength and stability. It is good for diabetic patients. Wheat milk is widely use in cosmetic

Coconut Milk

Coconut

Botanical name: cocos nucifera
 Kingdom; plantae
 Family: Aracaceae
 Genus: cocos
 Species: C. nucifera



Fig 5

Table 5: Nutrients in coconut

Calorie	552 cal
Total Fat	57.2 g
Cholesterol	0 mg
Sodium	36 mg
Carbohydrates	13.3 g
Protiens	5.5 g
Vitamin A	0%
Vitamin C	11%
Calcium	4%
Iron	22%

Coconuts are highly nutritious and rich in fibre, vitamins C, E, B1, B3, B5 and B6 and minerals including iron, sodium, potassium, calcium, magnesium, zinc and phosphorous. The energy level is 76 kcal. Coconuts contain significant amounts of fat, mostly in the form of medium chain saturated fatty acids (MCFAs) in particular, one called lauric acid. Lauric acid is converted into monolaurin which has antiviral and antibacterial properties that destroys a wide variety of disease causing organisms. Minerals in the coconut help circulation and controlling blood flow. Coconut milk keeps blood vessels flexible, elastic and free from plaque build-up hence lowers the blood pressure. Magnesium in coconut milk helps in circulation and keeps muscles relaxed. So the stress and muscle tension reduces it, is important for preventing heart attacks. Studies find that medium-chain triglycerides (MCT) fatty acids found in coconut milk increase energy expenditure and help to enhance physical performance. These MCTs are easily used by brain for energy, without even needing to be processed through the digestive tract. According to a study done by the School of Dietetics and Human Nutrition at McGill University consumption of a diet rich in MCTs results in greater loss of fat (adipose tissue) compared with long-chain fatty acids, perhaps due to increased energy expenditure and fat oxidation observed with MCT intake. MCTs may be considered as agents that aid in the prevention of obesity or potentially stimulate weight loss. Coconut milk is a quick and efficient source of healthy calories for the brain. Coconut milk also provides important minerals needed to maintain blood volume, regulate heart health, and prevent dehydration or diarrhoea. Coconut milk nourishes the digestive lining due to its electrolytes and healthy fats, improving gut health and preventing conditions like IBS. One cup of coconut milk (about 240 gm) contains 13 gm carbohydrates, 5 gm fibre, 5 gm protein and 57 gm fats, mainly saturated fats. One cup of coconut milk can provide about 552 calories, which means that coconut milk is high in calories and

hence, should be consumed in small amounts. Coconut milk can give about 22% of the recommended daily allowance of iron. Hence coconut milk helps to cure iron deficiency anaemia. Apart from these it reduces joint inflammation. According to Ayurveda coconut is cold in potency, not easily digestible, increases semen and kapha. It relieves burning sensation, bleeding disorders and consumption coconut meat added with jaggary is most useful in emaciated persons to improve the muscle mass and supports the body with overall nourishment of the tissues.

Conclusion

One should select the milk according to the age, physical exercise, health condition, disease and digestive power. Breast milk is the primary source of nutrition for newborns. The immunoglobulins present in breast milk gives antibacterial properties and it protects the infant from infections. Ill-nourished persons, children or patients who are weak due any diseases can be consume goat's milk. Persons who want to enhance the power of understanding, pregnant ladies, lactating mothers can use cow's milk. Buffalo's milk can be given to healthy individual with good appetite and physical work, since the energy is higher. Persons who have lactose intolerance can use vegetable milk. Soya milk contains good quality proteins and B vitamins. It helps to reduce LDL cholesterol. Ragi milk is a good source of calcium and iron. So it is especially good for adolescent girls, old aged people, and obese persons or persons with osteoarthritis, osteoporosis etc. Wheat milk has antioxidant property and it can be given to diabetic patients. Coconut milk is highly nutritious and helps to prevent dehydration. It is especially beneficial for skin and hair.

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