

Health Series



**Traditional Family  
Medicine**



# Milk and Milk Products

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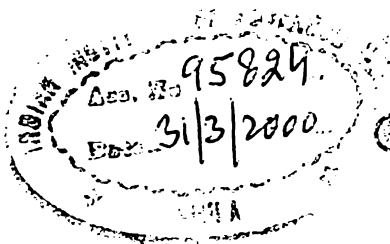
**Milk** Digitized  
**and**  
**Milk Products**

**K.H. KRISHNAMURTHY**

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## **INTRODUCTION**

It is not easy to specify as to when man began using the milk of animals as his food. Domestication of cow for this purpose must have taken place very early in his civilization. Buffaloes, goats and the camels were the few more animals that became added to this list, also quite soon but in some restricted regions of human society. However, cows and then buffaloes constitute the most prevalent animals utilised for this purpose.

Though there is uncertainty like this as regards the age of this original discovery, there is no doubt as to the role that milk and its products have been playing ever since the earliest record of the Vedas in India's history. These have been integral and almost invariable articles of food and rituals in India since then. The number of the cows that an individual man possessed was considered a real

measure of his wealth. Offering a milching cow was the highest of the gifts or *dana* one could think of. It is a well known story that Emperor Janaka had kept thousands of decorated milch cows as the Prize for the competent for answering the questions he intended to ask of the learned sages in his assembly and the sage Yaganyavalkya just ordered his disciples to drive them all away immediately to his own Ashrama. So sure was this great sage of his own prowess here and none could challenge him at all. The "daughter" in English is often traced to be cognate to the Sanskrit term "dogdhru", meaning one who milks, the milking of the cow and taking the milk *dugdha* this way being the important work to be carried out by the daughter or rather the daughter-in-law of the family. The abundance of the availability of milk has always been regarded in India as a sign of prosperity of the country. Even in Independent India, White Revolution—meaning the success of the measures taken to increase the availability of milk in the whole country following the experimental trials in Anand in Gujarat State has been hailed by all as the next significant step after the earlier Green Revolution on the agricultural front. The role that milk and its several products are playing in our daily life as well as the whole national economy is and has always been very important.

The products that have been developed from milk are also many. They include milk, curds, butter, buttermilk, clarified butter or ghee, *khova*, cheese, whey and so on. The specific food

preparations made from these several articles, both savoury and sweet, are too numerous to be mentioned.

We use milk and its products as a major food, as a necessary diet, as an article of luxury-milk sweets being generally the costliest of the food items and also as medicine by itself or as vehicle of other medicines in our ailments. Some basic ideas in this line constitute the subject matter of this book.

## **A. MILK**

### **(a) Constitution**

Milk of the cow is an opaque, white or yellowish white, very slightly alkaline fluid that is chemically termed as an emulsion which is a colloidal suspension of fat and other particles. It is just a little more viscous than water. In taste it is sweet or bland and it also has a faint but a unique odour. If kept for long it ferments and gets sour. Specific gravity of the ordinary milk is between 1.027 to 1.034. This is lower in a milk that has a higher fat content. If a drop of milk is inspected under microscope, numerous minute globules of fat can be seen to be floating as an emulsion. It is these particles that join together when milk is kept for some time to form the cream on the surface. When churned, the cream separates into butter and the buttermilk is also secured simultaneously. The butter on being melted on fire quickly turns into clarified butter or ghee, which can be

preserved for considerably long periods unlike all the other products of milk which get spoiled soon. It is the fat globules that are responsible for the yellowish white colour of the milk.

If milk is kept standing in an undisturbed way, it settles into three layers. The layer at the top consists of these fat particles, the cream being the lightest and also a considerable amount of bacteria that are attached to these particles rather permanently. The middle is constituted by what is called the milk plasma and a small amount of fat. The lowest layer at the bottom consists of the rest of the bacteria in the milk and also various types of dirt. Such a natural settling out of milk makes it possible for us to separate out the butter fat and to control the amount of fat in the milk that the milk we need *shall* contain. If milk is kept raw i.e. unboiled, it becomes spoiled after 10-12 hours. It becomes then indigestible and actually harmful and poisonous and is therefore to be totally avoided from being consumed in any manner whatsoever.

Milk is so much valued as a food because it contains most substances that are nutritionally essential for the growth and development of bones, nerves, muscles and other tissues of the body. Milk also contains vitamins which are indispensable to health and also act as inbuilt mechanisms of the body to combat several debilitating diseases such as rickets (disease of children characterised by softness of the bones caused by deficiency of



vitamin D), scurvy (disease marked by sponginess and bleeding of the gums of the teeth due to a lack of vitamin C) and such other results of defective nutrition. The detailed constituents of the milk is in accordance with the individual animal and the nature of the feed that it consumes. On an average, cow's milk contains principally of 4 per cent of casein (the albuminoids), 4 per cent of butter (fat), 5 per cent of milk sugar (sugar), several types of salts and 86 per cent of water. There is a large percentage of calcium phosphate in it, a very important salt that is required for two inestimable functions of the body viz. development of bones and for bringing about a proper coaguability or clotting of the blood. The following are the other valuable component salts that are found in cow's milk: potassium and magnesium phosphates, sodium chloride and a trace of phosphate of iron. The following are the inorganic constituents: gases like carbon dioxide, nitrogen and oxygen in solution and mineral salts like compounds of calcium, potassium, sodium, phosphorus, iron, sulphur and chlorine. Of these salts, the first four occur in an amount that is slightly higher than necessary to combine with sulphur, phosphorus and chlorine that are available. The excess is principally calcium which gets combined with casein to form calcium caseinate.

The composition of milk, varies specially as regards the percentage of the fat and the proteins which vary much from time to time. Buttermilk or the milk that remains after the cream or its fat

content is fully taken out as butter is an important product of milk that has extensive medicinal application in Ayurveda and also as a household and readily available remedy. Sweetened or salted and seasoned as desired, this forms *lassi*. This is composed of 91% of water, 0.5% fat, 4% sugar, 0.5% lactic acid (an acid that is unique to milk), 3.5% protein, and 0.7% ash. *Whey* is another important product of milk. This is the watery portion of milk obtained when milk is purposefully broken by mixing with it a little bit of sour, like lemon juice. The fat portion that gets separated and collected out by hand or machines is *channa*, *paneer* or *cheese*. All of these products of milk have their own distinctive value in nutrition and medicine.

Cow's milk contains slightly more salt and much less sugar in comparison with breast milk. Cow's milk invariably consists of fat globules and bacteria and also particles of many foreign matters—all floating as a suspension in the fluid portion of the milk or the plasma. Though it is secreted in a sterile i.e. a bacteria-free state in the cavities of the udder, a number of bacteria get introduced in the milk from many sources. In fact, the nature of the bacteria content of the milk is the surest index of the cleanliness of the milk. This however can be assured only with meticulous care taken, such as milking only from healthy cows and in a healthy and hygienic surroundings by milkers who are also healthy and have clean hands. And, a good way of further ensuring the healthiness of the milk

obtained is to chill it as soon as possible. It is because of all these reasons and more so because such scrupulous aspects of hygiene are rarely met with, an important aspect that one should also appreciate in knowing about milk is to evaluate it properly as a disease carrying agent.

The protein or the body building substance in the milk occur in cow's milk in the form of casein in combination with calcium; physically it forms the colloidal particles in suspension. There are too other protein components viz. lactalbumin and lactoglobulin, both being unique and characteristic of milk. Proteins in turn are made up various combinations of about 20 types of aminoacids. In fact the value of protein depends upon the number and the proportion of the amino acids that go into its constitution. Of the several types of amino acids, four are essential in a child's diet; these are: tryptophane, lysine, cystine and hystidine. The lactalbumin found in milk contains 4.08 per cent of this cystine while its casein contains only 0.26 per cent. There is a greater amount of lactalbumin in breast milk in comparison with cow's milk and this is why breast milk is more suited to the infant than the cow's milk. But there is no doubt that cow's milk protein is the next in the list. But to supply an adequate amount of the protein, nearly double the amount of cow's milk will have to be given to the child. But it is interesting to note here that the Indian cow's milk approaches breast milk more nearly in comparison with other milks for eg. of the foreign i.e. European cow's or of the

buffaloes. Ordinarily the amount of protein in European cow's milk is double that of European mother. The fat content is however nearly the same in both while the sugar content is a little less in the cow's milk there. The European physicians therefore advise the mothers there to dilute their cow's milk with an equal amount of water and to also make good the fat and sugar deficiency in such a mixture by adding one teaspoonful of cream to every three ounce of the prepared milk, which they henceforth designate as the humanised milk for their infants. If however this advise is followed blindly by the Indian mothers using Indian cow's milk, the result would be down right harmful. For, the child so fed would be practically suffering from a deficiency not merely of protein, fat and carbohydrates but also of the essential vitamins and mineral salts.

Buffaloe's milk is richer than cow's milk and consequently yields more butter. Ass's milk contains less of salts and fats but more of sugars. Breast milk contains more of fat and less of salts but it contains all the necessary elements for the child in absolutely correct proportion, neither more nor less and is therefore the most ideal food for its all around development. Actually there is no other type of milk or milk substitutes that can replace breast milk in all ways, or, in any way, for that matter. It is *the* food that Nature has intended for the purpose and therefore non replaceable. Goat's milk contains an excess of calcium but in other ways, it varies very little from the mother's milk;

probably this may be thus the next best to breast milk for the human child. Then comes the ass's milk and cow's milk comes only after the ass's milk as it differs much more from the human milk.

In areas where cow's milk of reliable and standard quality is not available as it happens in modern metropolitan complexes, many types of prepared products from milk are used. They are: powdered milk, evaporated milk, condensed milk, lactic acid milk, peptonised milk, butter milk and whey. Of these, the last four are employed only in feeding the invalid, the small, the weak and the premature children. This is specially so in connection with cheese, protein, milk, lactic acid milk and whey. For preparing all of these products only the pasteurised i.e. bacteria free milk should be used.

Milk is *the* diet for energy, bodily heat and growth. Persons who take milk and its products like butter, cheese, curd and buttermilk do not need any medicine generally. Children given ample milk daily grow taller; a milk diet adds to the beauty and is *the satwic* food also. Almost all milk foods are rich in proteins, calcium and phosphates; all of these are vital to build, maintain and energise the body. They are good for bones and teeth and are rich for blood.

#### **(b) Milk Products**

There are many other types of milk products available in modern times.

Some milk products were mentioned above. They and the Sanskrit names of a few of them are as follows: cream (*santanika*), butter (*navanita*), skimmed milk, butter milk (*takra*), curd or curdled milk (*dadhi*), whey (*mastu*), cheese, ghee (*ghrita*) and milk sugar containing the lactose sugar alone.

*Pasteurised milk* is the milk sterilised (by heating not upto boiling point and followed by rapid chilling) and made bacteria free; this is absolutely safe and conserves the vitamins which get destroyed by full boiling. *Condensed milk* is fresh milk which is sweetened by adding 15 to 17 per cent of cane sugar alongwith an alkali; but this milk is condensed or concentrated to half by evaporating it in vacuum till it becomes dry and all the useless water has gone off in the form of steam. Sugar is added here more as a preservative rather than adding to taste and so as to overcome the need for sterilisation. When it becomes reliquified it becomes equal to whole milk plus 15 to 17 per cent of cane sugar that has been added; but the vitamin content is totally destroyed in the way, the protein content is also minimal. As this form of milk contains a high percentage of carbohydrates coupled with a minimal protein content, this is not at all suitable for healthy and normal infants. Premature babies and those babies who are underweight thrive well with this type of milk. *Lactose* is the carbohydrate content alone of the milk. The whole milk can be reduced to a form of a fine powder by drying the watery portion of it fully; this is known as powdered milk or milk powder or

desiccated milk or lactogen milk. This drying is done so instantaneously and carefully that the vital properties and the solid constituents of the milk are both retained absolutely intact though physically the liquid milk becomes just a fine powder. This is in turn easily soluble in water and when dissolved in a proportion of 1 to 7 or 8 parts in water it regains all the nutritional capabilities of fresh whole milk excepting however the two vitamins of A and B that get destroyed during its very manufacturing.

*Evaporated milk* is fresh cow's milk that has been reduced to half of its volume by evaporation in vacuum. It is a fluid in its consistency unlike the powdered milk but has a characteristic cooked taste. It yields but small amount of curds and on dilution with an equal amount of water can form a suitable substitute for fresh milk. But the vitamin content is destroyed here also by the very processes of its manufacture.

*Lactic acid milk* is the fresh milk that is boiled in a double boiler to sterilise it and break it into small curds. It is then allowed to cool. When it is ice cold, 0.4 per cent of lactic acid is added to it drop by drop, slowly and stirring the liquid all the way and throughout. As a result the casein undergoes changes due to the addition of the acid and the curd itself becomes very finely divided. Lactic acid milk may be prepared by bacterial fermentation. The action of these organisms turns the milk sour and when a certain degree of acidity is reached the

further growth of the bacteria is inhibited stopping the fermentation any further. The duration needed for the whole process is 8 to 12 hours depending upon the temperature. In this type of milk product, there is enough lactic acid and the curds obtained are small, friable and easily digestible; this is very suitable as an infant food. But the two points of objection against its popular use are its sour taste and also the acid smell.

*Skimmed lactic acid milk* is made by using skimmed milk in preparing the above type instead of fresh whole milk.

*Protein Milk* is protein fortified milk. This is not useful in feeding healthy and normal infants. But this is useful in feeding infants who are suffering from diarrhoea. Its composition, it is 89% of water, 3.75% protein and 6.65% of salts.

*Citrated milk* is prepared by adding 2-3 grains of sodium citras to every ounce of the milk. This is also used in feeding infants. Because of this addition, casein in the milk is broken into small and easily friable curds that can be digested by the body with ease. The composition here is 87.9% water, 28% fat, 24% proteins, 1.0% digested proteins, 3.9% lactose, 1.2% carbohydrates and 0.8% salts.

*Peptonised or predigested milk* is prepared by heating milk with water in a proportion of two to one to a temperature of 140° fahrenheit and adding to it gelly cooled, peptonising powder or sodium



carbonate 10 grains and pancreatic liquour of 2 drachms in a pint and then boiling the product.

*Plasmon of milk* is the pure soluble milk in which casein has been separated and the albumin has been left as such and unaltered. This becomes a white powder containing 92% of proteids. This is odourless, tasteless and soluble in water as well as soup. When mixed with water it wells up to form a gelatinous mass which however dissolves if more water is added. This contains albumen, phosphates of ammonium sodium and potassium and also a small amount of sodium bicarbonate or the common salt.

*Cheese* is more nutritious than meat and more beneficial. It is a reservoir of Vitamins A, B and D and calcium so needed for bones and teeth. It is prepared by coagulating milk by means of rennet (or calf's stomach extract) or any acid or with yeast, and submitting it to pressure after separation. Like albumen it is not Coagulated by heat but is precipitated by acids. This contains mostly albuminoids (viz casein), fat, salts, other non nitrogenous matter and water. It is extremely rich in the vitamins and most of the minerals in the original milk also enter in the cheese. It is thus rich on a double account viz. in the percentage of its vitamin contents and also the number of the milk salts within. Another advantage is that this cheese, like *khova* which is a boiled and thus condensed and usually sweetened milk, forms the base material for many further preparations.

In India this is equivalent to *paneer*. Channa is generally the home made separation of the coagulated milk leaving the watery form of the milk as whey or *mastu*. *Paneer* can be kept unspoiled quite for sometime and is utilised very abundantly specially in north Indian kitchen in preparing many savoury dishes such as gravy, stuffings and curries. *Channa* forms the base material for many of the famous Bengal sweets such as *rasgulla* and *sandesh*. *Khova* forms similarly a base material for numerous sweet preparations such as *doodh phedes*, *burfies*, *kunda* and so on. *Rabhri* of Rajasthan and Gujarat is also a type of *khova* in which the milk is made to condense in the form of a number of shreds instead of a single whole mass. This is usually chilled, sweetened, seasoned and served - a very favourite local dish specially among the *rhabharis* or cow herds.

*Eucasein* is a casein ammonium compound. This is a milk casein in a soluble form and easily digestible. This is prepared solely from the pure cow's milk. It is a soluble milk powder containing about 95 per cent of pure absorbable albumen. This has no odour or taste. But this is a highly nutritive form of milk product.

*Butter* is a very common and in fact the principal milk product of most countries including India. It is just the fatty matter of milk separated by churning out well boiled and cooled milk which then settles into the cream layer above and the watery portion below in which also considerable

amount of fat globules remain suspended: the process of full churning will remove out this portion of fat as well.

Butter is called *makhan*, *muska* in Hindi, Gujarati; and Persian, *lonee* in Marathi; *benney* in Kannada and *vennai* in Tamil and Malayalam and constitutes a very common form of milk product all over India. The fats contained in butter are many: olein 30%, palmetin and stearin 60 per cent; there also occur 2% of glycerides of many acids such as butyric (which is characteristic of butter), carbonic, caprylic and caprinic.

Cow's butter is probably the most nourishing food. It cleanses, builds and expels harmful germs. It is a rich calcium food and contains vitamins A and D. Its caloric i.e. energy value is 240 in an ounce.

*Skimmed milk* is the milk from which cream is separated. As a result, its casein and the fat content are much less here in comparison with fresh milk. It is therefore more easily digestible. This is devoid of fat and fat soluble vitamins but is a good source of milk proteins (35 per cent) and calcium.

*Buttermilk* is the skimmed lactic acid milk and is actually a residue of casein, serum (i.e. the milk water) and a trace of butter or the fat left remaining after the butter is churned out. It is called buttermilk as it is a direct by product obtained in the preparation of butter from milk.

When the cream in the milk is allowed to sour, the fat molecules become accumulated into one mass after being churned; this constitutes butter and the rest forms the butter milk. This is free from fat and is easily digestible. There are very many uses of butter milk which will be discussed later on separately.

*Cream* is the fat molecules that accumulate as a layer at the top when the boiled milk is allowed to stand undisturbed. This is the part of milk which is most nutritive. But this is hard to get digested. It is called *quimaq* in Persian; *malai* in Hindi, Bengali, Marathi and Gujarati; and *kene* in Kannada; *yed* in Tamil. It sharpens vision. Its energy value is 90 calories for an ounce. It is rich in Vitamins A and B. As it is a fattening food those who desire to slim their body should avoid it; instead they can replace it with curd or still better, with buttermilk.

*Ghee or clarified butter* is obtained by boiling fresh butter and removing the impurities that settle down at the base of the vessel. It is in the form of ghee that Ayurveda uses milk in great many preparations, temporary as well as proprietary, or, *yogas*.

*Curdled milk or curd* is prepared by adding some acid, lime or a little amount of curds as a fermenting agent to milk that is previously boiled and generally when it is still rather warm slightly and not when it is fully cooled down. During an interval of about twelve hours the whole amount of

the milk thus acted upon turns into a more or less thick, somewhat sour and jelly like mass called the curds. This also contains a large amount of nutritive substances. It is known as *dadhi* in Sanskrit, *dahi* in Hindi, Bengali, Gujarati, Marathi and Konkani; *mosaru* in Kannada and *tair* in Tamil. There are many useful applications of *dahi*. This is *jagrat* in Persian and is somewhat similar to *yoghurt*, a Turkish term which however is actually a fermented liquor made from milk and is quite common in Western Countries and cures sleeplessness and is a prescription for longevity.

*Whey* is the watery portion of milk after its fat is separated. This term usually refers to the watery portion in the milk that is purposely broken by adding lime and from which *channa* is taken out. But it is often used as being the same as buttermilk which is strictly speaking not correct. When whey is evaporated, it yields sugar of milk, one or two nitrogenous elements, lactic acid and salts. Whey is prepared by adding a little of lime of juice to 1-1/2 pints of milk heated to 104°F, carefully but thoroughly breaking up the clots which form. Or, in other words, the curd is allowed to settle and this is then filtered or strained through a piece of muslin cloth. The supernatant fluid or the filtrate is called whey. It may often be very sour in taste, when this can be overcome by adding water or sugar or both.

*Lactose of milk* is sugar obtained from this whey. This is a crystalline, greyish white, odourless and faintly sweet hardened mass. This is rather gritty when chewed.

**(c) Some Remarks on the Best Use of Milk**

The most important element in milk is calcium whose non-availability to an adequate degree in the body makes it progressively weak; the deleterious effects are seen in nerves, blood vessels and bones; and, on the intestine and the stomach. To keep the body strong and healthy, milk is essential on many other counts as well. For health, beauty and long life there is nothing like milk. It is advisable that every one should consume milk daily as much as possible.

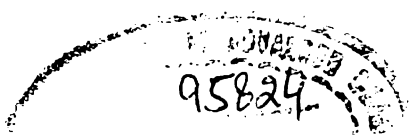
But the milk to be taken should be pure and hygienic; for, milk also happens to be an important disease carrying agent - all types of harmful organisms can thrive best in milk. Moreover, using a spoilt milk should be totally avoided, as it is nothing but poison. Great care is needed to keep milk clean and safe, for, it easily gets influenced by harmful substances kept near it. Some consider that keeping raw milk in a patient's room is the best way to spread that disease, for, the disease germs flourish so well and readily in such a milk.

It has been calculated that in 16 drops of milk purchased from open container in bazaar, there occur 3 lakhs of bacteria in winter season; this becomes 10 lakhs in spring and goes upto 50 lakhs

in summer - so nutritious a food is this milk to bacteria! It is because of this great susceptibility of milk to bacterial infection, modern dairy management takes utmost care at all levels beginning from milking upto delivering at home to ensure safe and hygienic milk to the consumers. And, it is because of this reason milk is always to be taken well boiled. However if full care is taken, consuming raw milk is fully healthy, and incomparably strengthening. Ayurvedists infact advise in some cases the using of fresh milk immediately as it comes from the udders; this is frothy and warm and referred to as *dharoshna* which can be translated as udder hot.

*How to heat milk?* Milk should be kept boiling just for five minutes and then taken out and cooled. Heating them even a little further is harmful; this will destroy the vitamins. Some persons like to drink milk which is being cooked for a long time; *khova* is one product of such a practice. It is necessary to note that boiling milk continously over a long time is likely to destroy many of its valuable substances.

*How to drink milk?* Since milk is not easy to digest, a simple and useful method to drink milk is not to drink it at a single bout but to take it in small quantities, move it about in the mouth a little so that it is well mixed with saliva of the mouth and then gulp in. The digestive efficacy of saliva aids here much. It still happens however that specially in some persons milk remains hard for digestion; they infact need the assistance of



special digestives. Some develop actually a tendency to feel like purging as soon as they consume milk. For them, take 5 *tolas* of borax, cook in half a *ser* of water (if possible mixed with green *chirayata*) till it evaporates; the residual borax is to be finely powdered and stored in bottle. When the occasion arises take 2 *rattis* of this powder, mix it with half a *ser* of milk and use. This digests the milk well and also increases hunger. It is a highly digestive powder. Some get a tendency to vomit immediately after milk or complain of indigestion or stomach upset. They should mix gas filled soda water in one forth proportion to milk and then drink. Another simple procedure is to soak lime in water, take out the superficial liquid secured thereby, add it in little quantity to milk and then drink. Difficulty in digesting milk can be easily overcome in this way also.

#### (d) **Nutritive excellence of milk**

The following comparative table of the contents of milk will serve as a good aid to estimate the value of food as an excellent nutrient food.

(i) A comparative table of the average food content in percentage of the different types of milk:

Milk of	Water	Protein	Fat	Carbohydrates	Minerals
Woman	87.75	1.60	3.95	6.25	0.45
Cow	87.30	3.55	3.70	4.88	0.71
Goat	85.70	4.30	4.50	4.40	0.80
Buffalo	82.20	4.40	7.10	4.70	0.85



(ii) A comparative table of mineral contents of different types of milk. The value is per very 100 dry units. These are alkaline and gas destructive.

<i>Milk of</i>	<i>Potassium</i>	<i>Sodium</i>	<i>Calcium</i>	<i>Magnesium</i>	<i>Iron</i>
Woman	11.73	3.16	5.80	0.75	0.07
Cow	13.70	5.34	12.24	1.69	0.30
Goat	15.60	3.45	13.90	2.30	0.60
Buffalo	6.60	2.88	15.95	1.50	0.08

(iii) A comparative table of acid forming and gas forming principles of different milk.

<i>Milk of</i>	<i>Phosphorus</i>	<i>Sulphur</i>	<i>Chlorine</i>	<i>Silicon</i>
Woman	7.84	0.33	6.38	0.07
Cow	15.76	0.17	8.04	0.02
Goat	21.05	0.30	13.50	0.20
Buffalo	16.15	1.37	3.47	0.00

(iv) Comparative composition of several milk (value as per 100 grams)

<i>Components</i>	<i>Buffalo</i>	<i>Cow</i>	<i>Goat</i>	<i>Human</i>
Fat	7.00	3.80	4.00	3.10
Protein	3.60	3.50	3.50	1.25
Lactose	5.50	4.80	4.30	7.20
Calcium	210	120	170	28
Iron	0.2	0.2	0.3	Nil
Vitamin-C	1	2	1	3
Ash	0.90	0.65	0.70	0.25
Solids	17.00	12.75	12.50	11.80
Water	83.00	87.25	87.50	88.20
Energy	117	67	72	65

As a food milk is unique. It has all the food factors: (1) Proteins. The milk proteins are: casein, lactalbumin and lactoglobulin. Casein, the chief protein occurs combined with calcium as calcium caseinogenate. Milk from cow, buffalo and goat has three times of protein compared to the human milk. The ratio of casein to albumin is nearly 1:1 in the human milk; it is 7:1 in animal milk. Milk protein has all the essential amino acids for body building. (2) Fat. Its content is 3.10 per cent in the human milk ; in the buffalo milk, it is 7 per cent. Milk fat is a good source of retinol and vitamin D. (3) Carbohydrates. Lactose or milk sugar is the carbohydrate in all milks; this is unique to milk and is found nowhere else. It is less sweet than cane sugar and is readily fermented by acid bacilli. Human milk has more sugar than animal milk, Fresh cow's milk yields about 60 kcal or energy per 100 gram. (4) Minerals. Milk has almost all known minerals needed by the body: calcium, phosphorus, sodium, potassium, magnesium, cobalt, copper, iodine and so on. Milk is a specially rich source of calcium and this occurs in an easily assimilable form. It is however a poor source of iron which is just absent in the human milk. The mineral content of the animal milk is two to three times that of the human milk. (5) Vitamin: There is vitamin A in milk, but the amount is dependent on the feed given to the animal, which can therefore be suitably manipulated. Milk is a rich source of riboflavin but contains very little of Vitamin-C.

*Toned milk* is an Indian term. This is made by reconstituted milk (using skimmed milk powder and water) with milk having a high fat content such as buffalo milk. When the supply of buffalo milk is restricted, toned milk is prepared from imported butter, fat or butter oil and dried skimmed milk powder. It is much cheaper though quite a wholesome product.

#### **(e) The Action and the Medicinal Use of Milk**

Milk is usually considered as cooling, nutritive, strengthening and infact a very vitalising food. It is also demulcent (soothing) and emollient (softening).

To appreciate the action of milk in the body, it is relevant to enquire as to how bacteria act upon the milk. Bacterial action destroys milk by fermentation and putrefaction. Fermentation or what is usually called as souring is the usual change and this consists in breaking down of the lactose sugar of the milk to lactic acid which on its turn precipitates and thus separates casein. If this souring is carried out by non pathogenic viz. non-disease causing bacteria, it is very salutary and the product then becomes a healthy food. Putrefaction or downright rotting by bacteria specially meant for the milk for this purpose is however less common. This consists of the precipitation of the casein followed by peptonising the curd. This occurs usually in boiled milk in which spore forming rod like bacteria or the bacilli as they are called or the hay bacteria that dwell in the surrounding hay of

the cowshed become introduced. Putrefaction means destruction or decomposition of molecules accompanied with the release of a foul smell. As such this turns out to be poisonous and unfit for human consumption.

*Kumiss* and *kefir* are the alcoholic beverages made from milk by introducing alcohol producing yeast cells in it. These are somewhat intoxicating drinks common in some European countries. *Kumiss* is specially a Russian drink produced by fermenting mare's milk; the term *kumiss* is a Tartar word. We shall now consider the qualities of milk from different animal sources.

Cow's milk is a demulcent (soothing), nutrient liquid food. This promotes strengthening of the body and an improvement in the power of memory. It is a tonic to the heart, very pleasing and wholesome and conducive to longevity of life and to an increase in the secretion of semen and is thus a desirable aphrodisiac also. The chief drawback of milk is its difficult digestibility and also a rather constipative effect. Boiling milk kills the harmful germs in it but increases its constipative efficacy. This can be however counteracted by eating bread along with such milk. Ten ounce of bread taken with a pint of skimmed milk constitutes a nutritious lunch that can act as a third of the nutrient needed by an adult for the whole day.

Ayurveda has extensive references for the uses of milk and its various products. These will be considered later. It is pertinent here to include an

interesting information it provides. This is the categorisation of milk in accordance with the colour of the skin of the cow from which the individual milk is extracted. Milk of black cow is very wholesome and good in diseases due to *vata*. Milk of yellow cow is good for the diseases of *vata* and *pitta*. Milk of white cow is heavy for digestion and aggravates the vitiation of *kapha*. Milk of red cows and those that have a speckled (i.e. spotted) skin is good in the diseases of *vata*. Milk of small hilly cows is more oily and heavy for digestion. It is relevant to note here that cows in hilly regions are mostly of small build; the heavily built cows are essentially the cows of the plains. Milk of cows that eat rather scantily is heavy for digestion, increases the vitiation of *kapha* but is really a very good tonic. In general, milk of cows with calves living is good while the milk of cows whose calves are no longer living is bad. And, milk of cows who have calved long ago is a good tonic and checks or regulates the vitations of all the three *doshas* of *vata*, *pitta* and *kapha*. There is a persistent but an erroneous belief in South India that the fat content of cow's milk is inimical to child's health and gives rise to enlargement of liver and spleen.

*Buffaloe's milk* is sweeter than the cow's milk. It is heavier for digestion, more oily, refrigerant (i.e. cooling), demulcent (soothing), stimulant to heart, and aphrodisiac. But it is also phlegmatic (i.e. increasing the aggravation of *kapha*) and also somewhat hypnotic (i.e. inducing sleep). When taken in large quantities, it definitely induces a

sleepiness and in addition spoils appetite and brings in cold as well. This does not agree with some persons; it causes a purging in them. It contains more fat than the cow's milk and is consequently heavier. There is another erroneous belief here that feeding infants with buffaloe's milk is better avoided as it is likely to cause catarrh or a running discharge in the respiratory tract. Actually however, it is really of greater value, easily obtainable and often cheaper, contains plenty of cream and when prepared properly it is an ideal substitute for human milk and much better than the cow's milk. For this purpose buffaloe's milk should be diluted by adding water to the tune of 1/3rd of its volume and its natural deficiency of sugar should also be rectified by adding one teaspoonful of sugar to every ounce of the milk so prepared. Given in this way, it forms the ideal substitute for the breast milk to the infants. For older babies however - say, of six months and after, buffaloe's milk can be given as such without any dilution whatsoever and in quantities of four ounces twice or thrice a day.

*Goat's milk* is sweet, cooling, astringent (i.e. causing a contracting effect in the living tissues and hence aiding in healing) but constipative. It is however very invigorative or energising and actively promotes appetite and digestion. It may be recalled that Mahatma Gandhi was full of praise for goat's milk and he had always nuturing goats in his Ashram. Maintenance of goat's is almost cost free as its feed is just anything that is available easily.

*Ewe's milk* is saltish, heating and oily and is also not easily digested. Its fat content is 6.18 per cent. Its use causes eye troubles but it is good for hair growth. It is also likely to cause ulcers on tongue, lips and gums.

*Mare's milk* is saltish and somewhat soury. But it is strengthening, stimulative, and demulcent or cooling. It also alleviates the aggravation of the vitiations of both *kapha* and *vata*. It has been recorded that *moghuls* were using this milk more just as the Arabs were more habituated to use the camels milk.

*Ass's milk* is saltish and easily digestible. It is also a heart stimulant and good for stomach. It counteracts the aggravation of *kapha*. Historically ass's milk had been a cosmetic article in the sense that its cream was used for a facial uplift and more importantly beautiful queens like Cleopatra of Egypt were using ass's milk for bathing purposes in the belief that it was very wholesome to the health, the complexion and the beauty of skin.

*Camel's milk* is light, sweet, slightly salty and laxative. It is easily digestible and also acts as a stimulative. It is good for stomach.

*Sheep's milk* is alleviative of the aggravation of phlegm and bile or *kapha* and *pitta*.

*Elephant's milk* is sweetish, astringent, muscle building and heavy. It fattens, increases vigour and augments strength.

Some qualitative differences are also noticeable in the milks depending upon the time of milking the animal. The milk taken out in early morning has the cooling effect of night on the animals as also their lack of exercise during the nights. This milk is heavy, constipative and refrigerant or cooling. The milk taken out during the evening has the effect of the animals that are warmed due to physical exercises during the day. This milk relieves rheumatism and fatigue. It is good for the eyes.

Raw milk (excluding the human milk) is heavy, but the boiled milk becomes lighter and more easily digestible. But the former becomes contaminated very soon and should therefore be kept carefully.

In some persons milk causes constipation while in others it will result in outright diarrhoea. Pure milk diet in Indian patients of diarrhoea is contra-indicated.

Similar variations in the qualities of the milk products is also traceable depending upon the animals concerned. Butter from cow's milk is tonic, good for the heart, stimulative, energising and good for the stomach as well. For many medicinal preparations, especially for those that are meant for the eye, butter from the cow's milk is preferred. Butter from buffaloe's milk is sweetish, astringent, refrigerant and soothing. It augments semen production and alleviates both *pitta* and *vata* troubles.



The qualities of the different types of the milk products are as follows:

*Butter Milk* is astringent, light for digestion, cooling, appetising, *nutritive* and is a general fortifying tonic.

*Curd or curdled milk* is agreeable, wholesome, digestive and cooling. It is acidic and astringent. It alleviates *vata* disorders, promotes the production of bone marrow and semen; it increases strength and blood; helps in digestion and is an excellent appetiser. But it aggravates both *pitta* and *kapha* and if taken in excess it causes billousness and catarrh for eg. running nose. It is very good for meat eaters in whom proteolytic coli predominates. It aggravates amyolytic fermentation and hence Ayurvedic physicians advise limited use of the curds for vegetarian persons.

*Ghee* is prepared mainly from the milk of cow or buffalo. Cow's ghee is generally much praised. It is good for stomach, quite nutritive, a tonic, a counteracting agent for *pitta* and improves memory. In general, ghee is regarded as cooling, softening (hence advised for all injuries as an external application) and good for stomach. It increases the fatty tissues and mental powers. It also improves the quality of the voice as well as the general beauty of the persons and the complexion.

*Whey* has properties that are similar to those of curdled milk. It especially promotes the circulation of fluids and is therefore recommended

highly in rectifying constipation. Whey from buffaloe's milk is curative of *kapha* and also generates oedema or fluid filled swellings.

*Curd of milk (kilataka in Sanskrit)* is hard for digestion. But it is nourishing and a good tonic. It is much suited to persons who have strong digestive efficacies.

*Cream* is also hard for digestion, but is nourishing and a tonic. It is also agreeable and soothing. An interesting use of cream is that it is a much preferred cosmetic article for a facial uplift. It is also sometimes recommended as a healing application.

*Powdered milk* which is more popularly designated also as lactogen is regarded to be sterile (i.e. bacteria free), soluble in water with which it forms a homogeneous solution which does not produce any cream but forms small soft curds that are easily digestible.

*Lactose* is nutrient and is also an uterine tonic. in addition, it is a stimulant and a general tonic. It is harder, less soluble and less sweet in comparison with ordinary viz. cane sugar. It is a very effective diuretic that causes profuse urination.

As an article of food milk is uniquely and incomparably suited to all types of individuals - the infants, the children, the youth and aged; the emasiated, the starved, the convalescent; the exhausted, the weak and those who become weak

due to sexual excesses; for sucking women; and, for persons suffering from varied diseases, such as chronic fever, mental diseases, gastric or stomach discharge, ulcers and cancers of the stomach, gastric disorders like dyspepsia or indigestion, intestinal disorders like diarrhoea as well as dysentery, urinary disorders such as albuminuria (i.e. discharge of albumen along with urine, as in diabetes) and also ascites (or collection of morbid fluids or dropsy and abdominal swellings) and anasarca (dropsy—in the skin and the layers beneath the skin). Sushruta, a very respected classical author on Ayurveda however cautions that milk should not be given for drinking in cases of low fever as it might even cause death.

In case of certain diseases like later stages of anasarca, ascites and chronic bowel complaints, a wholly milk diet excluding every other article including even salt and water is prescribed. Milk is useful in relieving irritation of respiratory and digestive tracts and is therefore prescribed in injuries and lesions there. A mixture of skimmed milk and cream in equal quantities is an excellent and a natural cure for acidity in stomach and heart burn. For persons troubled with sleeplessness, a cup of hot milk before going to bed is recommended. Even for normal persons, this is a good and health giving as well as nourishing habit. Malted milk i.e. milk in which powder of sprouted grains such as those of barley or *ragi* is also added is good for this condition. Ragimalt whose use is becoming somewhat fashionable of late is a very

good and easily digestible practice, specially suited also to young and vigorously developing children. This is best taken early in the morning and instead of coffee or tea.

If some persons feel a sense of distension in the stomach after they drink milk, they can avoid this feeling by adding and dissolving a pinch of salt in the cup of milk before they take it. Milk is a very effective remedy in cases of poisoning by toxic substances such as corrosive sublimes, copper sulphate and even corrosive acids. Physicians of modern medicine advise a free use of milk for patients of enteric fever and mucous diarrhoea. Milk is then diluted with barley water, or with lime water or with any other diluent. However, Ayurvedic physicians do not give milk in mucous diarrhoea. The former also consider that well diluted and peptonised milk is useful in treating patients of low fevers.

Milk is frequently utilised as a vehicle to poultices for external application. Milk is given as an injection with prompt benefit and relief of pain in cases of acute iritis. In infants who are constitutionally disposed to develop eczema, injections of milk upto 4 CC are given. This is also repeated every fourth day till 5 or 6 or even 10 injections are given. There is one more rather dramatic way of using milk as an injectable material. This is to give milk protein injections regarding whose medicinal efficacy. Some authorities declare that though one cannot expect

to raise the dead by this means, these injections do a lot to the patients by building up their natural resistance to diseases remarkably in certain cases of crisis. Ophthalmic physicians and surgeons use them to treat corneal ulcers with 100 per cent success. The advised course of injections is the following. Injection of 5 CC of milk is given the first day, 8 CC the third day and 10 CC for the following injections with an interval of one or two days between the successive injections. These intervals are to be lengthened if several adverse reactions occur in the mean while. Such reactions however occur after the first two or three injections only, and, the severity of the reaction is not related to the results accomplished. The full course is usually 10 injections though remarkable and definitive improvements become visible ever after the first three or four doses. The white cell count in the blood gets directly augmented, although quite gradually and is then restored to the normal value finally. These white blood corpuscles in the blood are the defensive mechanisms of the body as they engulf and digest all pathogenic or disease causing foreign matter. As such, their increase in blood is a sure sign of the increase in the body's resistance power.

As an embrocation viz. to moisten and rub the skin as with a lotion and to clear it and also to improve the complexion, milk is applied to the body and this is followed by a warm bath within half an hour. This is an excellent cosmetic procedure.

Goat's milk plain or medicated with suitable drugs is useful in pthisis or consumption and the *pitta* aggravation of the piles. This cures dyspnoea or difficulty in breathing, bronchitis and chronic cases of enlarged liver and spleen as well as discharge of fluids in the stomach. Goat's milk added or prepared with barley gruel is recommended as a nourishing, sustaining and also curative diet for patients who are weak due to dysenteric diarrhoea.

Goat's milk alone or still better, the ghee prepared from the milk is a very good diet for convalescents of an attack of diarrhoea.

Ewe's or sheep's milk is beneficial to persons who are obese as it helps in slimming down and losing excess fat. This is also salutary in flatulence or bloating of the belly due to gas collection and in gonorrhoea. It forms a good diet for patients of rheumatism and violent attacks of cough.

Ass's milk is very beneficial in conditions of general debility or weakness and also in such urinary afflictions as are characterised by high coloured or scanty urine. It is extensively used as a curative in cough and liver complaints specially in children and old people and also in chronic bronchitis or inflammation of the bronchil or the wind pipe and specially in cases of whooping cough.

Camel's milk is useful in many disorders such as oedema (fluidy swellings), dropsy (morbid fluid

collections), asthma, consumption, ~~leprosy~~, general scrofulous conditions, inflammations, cancers, piles, intestinal worms, skin lesions, abdominal tumours and even in cases of poisonings. It is much used among the Arabs and also in Rajasthan.

*Mare's milk* is beneficial in cases of rheumatism of the legs and the hands.

*Human milk* is much recommended as a collyrium to be applied for the eye and also as an application to head in cases of eye complaints. It is also beneficial to nose bleeding when it is used to irrigate nose. Even eyelids are irrigated with it. It is said that in China, sucking breast milk is resorted to for persons suffering from chest pain.

*Elephant's milk* is definitely beneficial for the eyes. Its curd is beneficial in relieving the shooting pains or *shoola* and in diseases due to the aggravation of *kapha*. The butter and ghee prepared from this milk is regarded as being good for the stomach, and counteracts phlegm, biliousness and worms.

*Butter* from cow's milk is used with sugar in the complaints of piles, consumption, chronic dysentery, anorexia or tastelessness in food and also facial paralysis. It agrees best with the aged and the young. Charaka, the ancient famous Ayurvedic author considers it as beneficial in chronic dysentery, piles and anorexia. For a diabetic patient, it is given in irritation of the

alimentary canal. Use of plenty of butter and other fatty foods is a preventive as well as a curative procedure in the disease of berry-berry. A very common and much recommended use of butter is to smear the broad leaves of plants like *Calotropis* and *Argyrea* and apply them over the abdomen in securing relief from the colic or the twisting pains.

A few other use of butter are the following: 2 *tolas*\* of butter are washed one hundred times in water and then mixed with half a *tola* of sandal oil. This is an effective application to cure all sorts of sores and ulcers on the skin. Plantain leaves that are themselves cooling in nature are smeared with cow's butter and used as a soothing and healing application for broad scalded and burnt regions after an incidence of burning. This is an immediate and a useful measure.

Butter from goat's milk is good for stomach. It is a heart tonic, relieves *doshas* of all the three types and is beneficial in the complaints of eye, cough, consumptions and phlegm.

Butter from any milk is a soothing base for an ointment.

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+ The modern equivalents of the traditional units of measure indicated in the Text henceforth are as follows:

1 ratti = 1gunza the weight of one seed of *Abrus precatorius* or *gunza* plant; 8 gunzas = 1 masha; 10 mashas = 1 tola; 24 tolas = 1 ser; 1 pav = 1/4 ser; 1 tola = 10 grams.



*Butter milk* is efficacious in dyspepsia or indigestion in which case it is best given along with ginger. It is the best diet for feeding infants suffering from diarrhoea. It is an excellent and well known remedy for most cases of digestive disturbances, specially those that are accompanied with fever. It is the most valuable drink for those who are prone to attacks of appendicitis and constitutes a nice and refreshing beverage in a tropical country like ours and most popularly used so, specially by the poorer and the middle class of our society. It is quite beneficial also on account of the vitamin C that it contains. Mixed with 6 *mashas* of alum powder or *bhringaraj* leaves, pestled well in a mortar and given would result in a clean vomiting. This procedure is recommended for counteracting poisons including those of snake bites.

*Whey* is highly recommended for patients of consumption, dysentery, piles, tumours, colic, running nose and other types of catarrh. Fresh whey from cow's milk specially is recommended and given with suitable carminatives in chronic diarrhoea, particularly for those conditions when giving other carbohydrates is not advisable and also when *vayu* is deranged and there is an excess of fermentation that needs to be checked. This is the ideal food for convalescents of diarrhoea and in chronic cases of enlarged liver and spleen. In general, whey is very good and it is particularly so in those cases of piles where both *vata* and *kapha* are aggravated, it is then excellent when given with

back salt. Whey is recommended in cases of many complaints such as urinary stones, constipation, inflammations in mouth and spleen, increased fat or obesity, flatulence and in jaundice when it is given with carbonates of potassium and sodium. In fever accompanied with coryza and tastelessness, whey is mixed with *trikatu* (the three pungents, pepper, peepul and dry ginger) and given with great benefits. A diet of whey, fruits and vegetables is recommended and actually much practiced by persons who have exhausted themselves by too fast a life. In the disorders of stomach and intestines of children 2-4 ounces of whey is given per feed ever 3 or 4 hours. Infact, whey can very well form the diet whenever a fat-free food is to be taken. As such, this is the best food for feeding babies that are premature and for the invalid and the debilitated children who cannot digest fat.

Curd is beneficially given in cases of tastelessness in food and also for these who have a feeling of nausea or have a tendency of vomiting. It is good for rheumatic patients. For dysentery in children it is given with the bark of pomegranate. Whey from buffaloe's milk is beneficial in splenic enlargements, piles, diarrhoea and cholera.

*Curdled milk* is useful in fever during jaundice, urinary disorders of several types also and acts as an antidote counteracting poisoning by copper. Curd mixed with black pepper powder is given to persons bitten by snake and is reputed to be an effective antidote. Ayurvedists do not advise giving curd to patients of mucous diarrhoea as noted

above; instead, they advise a solution of milk, salt and sugar which is then curdled by adding lime juice to this mixture. The resultant curd is then strained through cloth and the separated watery whey is given for the patient.

*Ghee* is very extensively used in several practices of Ayurveda. *Ghee* by itself or mixed with honey is a highly esteemed application to heal wounds, inflammatory swellings and particularly the blistered surfaces as well as the scalded and the burnt regions of the skin. It is given with either plantain leaf or betel leaf over which the *ghee* is smeared; this promotes quick healing. *Ghee* is an invariable base of many medicated oils and also forms the base for varied types for irritating skin and is used in the form of injection in cases of wasting diseases. It is given internally along with honey, sugar and mineral ashes or *bhasmas* of various types. This is administered for tympanitis (or inflammation of the ear drum or the tympanum), painful indigestion and retained secretions. *Ghee*, sugar candy and honey is a delectable and efficient medicine for all ordinary complaints of children; this constitutes infact, a routine household remedy. For those children who continuously cry and do not suck mother's milk and feel always restless, another simple household remedy is advised. This is to give a little salt mixed with *ghee* and sugar candy. *Ghee* is given as a nasal drop for cold in the head or coryza. A thin layer of it is smeared over the face and then well

massaged; this improves the complexion and adds to the beauty.

An interesting aspect of Ayurvedic medication employing ghee is to use very old ghee and also use ghee after washing it in cold water several times, nearly hundred times. Ghee of both these types are considered to improve in their quality to a great extent.

For instance, in strong fevers, an emulsion of sandal wood and of old ghee which has been washed one hundred times in cold water, or, an emulsion of black pepper and old ghee is applied to the body of the patient. This is followed by a bath in lukewarm water after half an hour. He is then made to lie on a spread of lotus leaves that are in themselves quite cooling and soothing. This is an old regimen of some classical ayurvedic Texts.

*Purana ghrta* or old ghee that is more than ten years old has a strong and pungent odour; its colour is reddish brown. This is a very valuable external application in cases of pleurisy (an inflammation of pleura, which is a delicate membranous cover that encloses the lungs and lines the cavity of the chest) and also the painful affections of the joints. Ghee that is of a hundred years old is sometimes available. This is quite dry, hard and nearly smell-less. It looks more like some sort of earth. This is first repeatedly washed with cold water and is then rubbed in with cold water till it is reduced to a soapy and frothy fluid. This is

used as a liniment or a thin layer of ointment. This is regarded for cooling, and also for softening simultaneously. This is much used in such grave afflictions like insanity, epilepsy, neuralgia or acute nervous pain, severe head-ache, asthma, rheumatic affections, stiff joints, persistent burning sensations of the body, hands and the feet and also the affections of the eye. This is the specification of the great Charakacharya. Such a medication also has a great reputation for reducing temperature in fever. This is evidently due to the profuse perspiration that the treatment induces. Old ghee is used in combination with dry ginger powder in cases of pains in the breast; this is a very successful remedy. A ghee that is of 111 years old is called *mahaghrta* or a Great Ghee. This is soothing and good at alleviating the aggravations of both *vata* and *kapha*.

Ghee from buffaloe's milk is good for heart, improves digestive efficacy, augments semen generation and is beneficial in piles and diarrhoea.

Ghee from camel's milk is cooling and good for stomach. It is salutary in *vata* type of piles. This is beneficially used in cases of convulsions, worm infection and leprosy.

*Cream* is a vehicle for using certain calxes or substances of minerals or metals that remain after the latter are heated very strongly. Such calxes are medicinal drugs for consumption of the lungs, cough and asthma.

human beings. But it has lesser amount of sugar, salts and watery portion and greater amount of fat and oiliness; it yields greater amount of *paneer*. It is therefore unsuitable directly to new born babies. When felt needed, sugar and water are added; it is also boiled and then given. It is said that taking cow's milk for a very long time daily may lead to stone complaints in urine in some persons; there is a likelihood of developing leucoderma (*shwitra kushī*) or an infection of lice in some. For persons of *kapha* constitution, raw milk does not agree.

Buffaloe's milk is thicker and heavier. It has greater fat content, the yield of *paneer* is also greater. Experienced *vaidyas* and *hakims* are of the opinion that excessive consumption of buffaloe's milk leads to a dulness of intelligence.

Goat's milk is considered to be uniquely excellent to purify blood. In fact nothing is considered to equal goat's milk in this respect. This is believed to be due to the fact that goat's feed consists of all types of leaves and herbs and these do leave their blood purifying ability in the milk. This destroys itching, ring worms and freckles on the skin. Goat's milk should not be consumed raw; that would lead to lice infection and a smell like goat. This can be avoided by boiling it two to four times and then drinking.

Sheep's milk is like that of buffalo; thick and aphrodisiac, increasing the urge of sex. This is very much sticky. Excessive and habitual use of this milk leads to a foul smell of the body and an

infection of lice. It may also lead to itching in the body.

Camel's milk is thinner than most other milks. Its taste is somewhat salty. Just as goats do, camels also feed on a very varied plant source of leaves and twigs. As such, its milk is also useful in many diseases. This is an excellent laxative and a diuretic, promoting profuse urination. In many cases of affliction, camel's milk is purposefully broken with lime and the watery portion alone is used with great advantage. For persons who are having fever and those that are of *pitta* constitution, camel's milk is harmful.

Ass's milk is considered excellently beneficial to patients of tuberculosis. This is the least sticky among the milks and the yield of *paneer* is also the lowest. But, the sugar content is great. This is why it is rather equivalent to breast milk and is best suited to weak children.

Mare's milk is hot.

Human milk has great sugar content. It is also useful in many diseases.

#### (a) **Medication with Milk**

It has been claimed that there is probably no disease excepting those of the organic heart troubles that cannot be cured by an intelligent use of milk. This is presumed to be so however incurable and resistant has been any specific disease. Milk is a substance that can ward off

disease as such. For this purpose however, some definite procedures of taking milk has been devised. One such procedure as laid down is as follows. Here, milk is employed as if it is a *rasayana* or an elixirising article, where the patient sustains himself solely on milk for a few days.

**(b) Milk as an elixir**

It is advisable to start the regimen by fasting for two to three days. During these days of fast about 5 sers of water are to be drunk, per day. This will clear out all the vitiations of the body. Starting milk therapy after such a fasting is advisable, but if this is not possible one need not be very insistent about it. When the regimen has started, it is advisable that one should take complete rest, for, that would be most beneficial. If the disease is not very severe, carrying out just ordinary routine work is not contraindicated. The patient should keep his mind calm and unagitated. During the days of taking milk, no other food is to be taken. This is quite possible, for, milk contains all substances that are necessary for nutrition. There need not be any other type of food to come in the way of the full action of milk and its contents.

It is difficult to specify exactly how much total intake of milk that an individual can indulge in this regimen; this is to be best judged by the individual himself. Starting with 3 sers of milk a day is probably satisfactory. The milk to be taken should be clean without any water, pure and raw,



as boiling would destroy many of its valuable contents. First, half a *ser* should be taken and this is to be consumed in small quantities after moving it well in the mouth every time and then gulping in. It will need about three to four minutes for completing half a *ser* of milk. After half an hour of interval another half *ser* of milk is to be taken in the same manner. About 2 *sers* of milk can be consumed in this manner by about 9.30 A.M. Give an interval of about two hours and start the regimen again. Use fresh milk every time but if this is not possible, use chilled milk. Take rest till evening and when fresh milk comes, start again and complete the remaining quantity of milk giving the same amount of interval and in the same manner.

The procedure may be continued for two days. From then on, the net quantity of milk may be increased to five or even seven *sers* but only gradually and never all on a sudden. It is better to increase one *ser* per day.

Atleast two months of such a regimen is prescribed for a person to derive the maximum of the possible benefits. All troubles of the stomach should go, weakness should disappear totally and all the limbs should appear well nourished and healthy. The exuberance of health should be visible in the very face and its lustre. Till such a time the regimen is advised to be continued. The disease a patient has been suffering from is expected to be taken care of by the very vibrant health that would set in.

*A point of note :* For some, an intake of milk leads to "voices in the stomach" due to gas trouble or so. Such persons are best advised to take one or half a lemon, squeeze it fully, mix a little water and then drink it, an hour or half an hour before they drink milk in the early morning. Some find a distaste in taking milk. They may also adopt the same procedure. Those who have an acidity in stomach do not find taste in taking milk. Lemon juice is an advisable drink in all such circumstances.

*Two highly nutritious milk dishes :* Milk is one of the most nutritious and infact an all sufficient food substance. There are many preparations of milk that are healthy and specially rich in nutrition. Two such common and popular though rather costly preparations are as follows:

(a) *Badam Kheer :* Take a *pav* of *badam* or almond seeds and soak them in hot water and after some time remove their skin. Cut them afterwards into small rice like pieces. Take two sers of good milk and cook on low fire till to half a ser of water gets evaporated. Add now the cut pieces of almond and go on stirring. As the milk gets thickened and the almond pieces become homogeneously mixed, add cardamom and *ruh kevada* or the essence of the *pandanus* flower as desired, and mix well. Remove from the fire. Mix country sugar or sugar candy, spread it on wide saucers or plates and cool. When it becomes somewhat cool, decorate with silver foil.

This is a very tasty dish believed to be very good and strengthening for the brain as well.

(b) *Rice Kheer*: Take a *pav* of very good quality rice, and keep it soaked in a *ser* of rose water for about three hours. Then tie this whole quantity in a clean napkin and hang it up so that the water drips down and till the rice becomes fully dry. Then place it in a pan and fry in a *pav* of good ghee, till the rice grains become crisp. Afterwards keep this rice in three *ser*s of buffalo milk and cook. When fully cooked add a little quantity of *ruh kevada* or pandanus essence and cardamom, and five *chataks* (1 *chattak* =  $1/2$  a *pav*) of sugar candy. Cool this in wide saucers and decorate with silver foil.

This is a very luxurious but highly nutritious milk preparation that is delectably tasty as well.

### (c) **Milk as a Medicine**

A few diseases where milk forms a curative article are as below:

#### ***Diseases of the Head***

(i) *Headache due to heat*: This affects those who consume too much of heating substances or those who wander too much in sun. For this, take half a *ser* of cow's milk and take also three *tolas* of tamarind that is washed well with hot water. Add sugarcandy, cool it down and then drink. 3-4 days of its use would definitely stop the ache in the head. Massaging the head along with this

procedure will ensure non-recurrence of the pain also.

(ii) *Headache due to cold* : A fumigation with hot milk in a closed room where there is not much scope for strong breeze or open breeze or open puffs of wind will often give relief.

(iii) *Severe headache* : Fomentation with a piece of cloth dipped in hot milk followed by a wrapping up of the region in a flannel cloth would prove beneficial. Fomentation can be done two to six times depending upon the condition of the patient. Wrapping can also be kept accordingly for an hour or two.

Such a fomentation would give relief in other regions of the body also, for example at the kidney.

(iv) *Baldness* : This is said to improve to some extent by fomentation of the head with raw milk even after just a week's continuous treatment. A duration of one and half a month is expected to yield appreciable results.

### ***Diseases of the Eye***

*An useful eye lotion* : Take raw, pure and clean milk. Churn and take away the fat i.e. butter as much as possible. Use this defatted milk as a lotion to clean the eyes. This may be injected for the purpose or applied directly. Redness of the eye and painful eyes become rectified with this procedure. Using milk that is not defatted in this way is not useful.

**Painful eyes :** When pain in the eyes is not subsiding by any treatment, use the breast milk of a feeding mother as an eye drop. There will be an immediate relief from pain, burning as well as throbbing pain.

**A cooling drug :** Take some swabs of clean cotton, soak them in goat's milk and place them at the rim of a fresh mud to drip dry. Tie this over the paining eye for two hours. Remove and keep the eyes untied for four hours. Tie again specially at night. See that these goat milk treated cotton swabs are kept tied the whole night. There will be a quick relief.

### ***Diseases of Nose and Ear***

**Bleeding nose :** Drinking goat's milk is presumed to be beneficial. Smelling breast milk is also expected to be useful in stopping such a bleeding.

**Swellings at the nose ring (nathan):** This is a type of injury common in young ladies. Milk is useful here. Gargling with milk and smelling milk as a nasal drug will prove beneficial.

**Ear ache :** Steam of hot milk let in the ear will give some relief. Or, take goat's milk, mix it with an equal quantity of vinegar, make the mixture comfortably hot and use it as an ear drop. Even throbbing pain will stop and the patient will feel relief in about two minutes.

Or, mix a little opium with breast milk, give a few drops in the ear and the pain will stop immediately.

*Pimples in the ear* : Clean the ear with milk and a swab of cotton. Do so three to four times a day using fresh milk every time. This will give beneficial effect quickly.

*Pus in the ear* : Clean the ear with hydrogen peroxide or with a decoction of neem. Keep fresh milk morning and evening in the ear each time and plug with cotton. This will give an effective relief and quite quickly. Or, using breast milk for healing in the ear is also well advised.

### ***Diseases of the Mouth***

*Peeling of skin* : This is a frequent complaint in some persons - a peeling of the inner mucous lining of the mouth cavity. A simple but an effective cure is to use clean, raw milk to gargle three or four times a day.

*Weak and decaying gum* : This is a very painful affliction and the teeth also become shalky. Gargling with deer's fresh and raw milk is presumed to be a quick and a sure relief. Securing deer's milk is not an impossibility but if this is rather hard to come by, employing goat's milk would also do. But this would need a longer duration of treatment.

### ***Diseases of the Throat***

*Painful swellings* : Sometimes the swelling is so much that gulping even water within becomes difficult and highly painful. It has been seen that gargling with milk and giving fomentation with

milk will prove much beneficial in such cases. Gargling with ass's milk will be particularly effective.

*Goitre* : The following medication with milk will be useful only if the glandular knots of goitre have become split open; otherwise this procedure would be valueless. In the former case, give a fomentation with milk thrice a day and do so for atleast a couple of hours every time. This regimen is to be continued for fifteen days. This is a simple process of treatment but considerably beneficial.

*Lesion and injuries in the throat* : If these are not healing well for any type of treatment take recourse to gargling with goat's milk. This proves a quick remedy.

For injuries, sores and ruptures on the tongue gargling with goat's milk will be very beneficial.

### ***Chest and Lung Disease***

*Blood during coughing* : When blood comes out during coughing but not from the lungs, drinking sheep's milk daily and to the extent of his desire will prove beneficial to the patient.

*Cough due to heat* : Fresh milk from the goat as it comes from the udder (*dharoshna*, hot from the udder) is to be drunk, mixing sugarcandy with it.

Camel's fresh milk is also beneficial in cough.

*Hiccup*: Snuffing breast's milk would stop this effectively.

**Asthmatic attacks :** When an asthmatic bout attacks a patient his condition becomes highly distressing and pitiable. An effective remedy to secure immediate relief and stop the bout is as follows: Take 10 *munakka* or the large black grapes, remove their seeds, bruise them well and place them in 10 *tolas* of cow's milk to which an equal quantity of water has been added. Boil this mixture till only milk remains and the water is fully evaporated. Strain, add 6 *mashas* of almond and 1 *tola* of sugarcandy plus 5 grains of black pepper. Give this as a drink, the bout will stop immediately. The milk should be drunk hot.

**Pleurisy and pneumonia :** Fomentation with raw milk decreases the violence of fever to a large extent and the attendant distresses also would be largely lessened. This also has a curative effect to some extent. Such a fomentation is to be carried out three to four times a day and continued for days together, even upto a fortnight. Some cases have been seen that have responded well to this treatment when they had failed earlier to other useful methods of treatment.

### ***Diseases of the Digestive System***

**Vomiting :** Fomentation with milk with stop vomiting excellently. Cold milk drunk sip by sip would also be effective here.

**Loss of hunger :** All types of milk bring about a loss of hunger. But camel's milk alone is *promotive* of hunger.



*Painful swellings in the stomach* : This is often followed with vomitings. To give fomentation with milk in these cases proves extremely beneficial. For about 24 hours the patient should not be given any food apart from milk. This is to be then followed with rice and milk and then *khilchadi* and then only *chapatis* or *rotis* and such an increase in heavy food is to be adopted only gradually. This affliction gets cured only with difficulty. Fomentation with milk definitely gives a relief.

*Dysentery* : Take 1/2 a ser of boiled and cooled cow's milk. Take a big piece of iron, make it red hot and immediately place it in the milk and extinguish. When this becomes cold, heat it again as before and dip in the same milk. Do so for 7-8 times. Add sugarcandy and give this milk for drinking. This will stop purging. Or, instead of an iron piece, a fragment of an earthen pot can also be employed similarly. Yet another method is to place a few pieces of broken earthen pot in a vessel. Pour half a ser of milk on it, boil, cool, add sugar candy and administer.

*Intestinal mal-absorption (samgrahani)* : This is a terrible affliction when there is a defective absorption of food at the intestines. It is difficult to be cured. Milk is an efficient curative to this disease but the difficulty is that it is hard to digest and the patient of *samgrahani* is particularly already inefficient here. The patient should be made to sustain himself on a diet of milk alone, though giving special digestives for milk become a

simultaneous necessity. When mal-absorption becomes chronic it becomes indispensable that the patient should strictly adhere himself to taking milk alone. For this purpose curds also constitute a beneficial diet like the milk.

*Diseases of heat* : The following recipe is a simple but effective remedy for many types of afflictions including those of heat. They are: throbbing heart, *prameha* or urinary distress, restlessness of acute type and terrific palpitations of the heart. The recipe is so simple that one is likely to distrust its value which is just undoubtable. This is to take half a *ser* of goat's milk or cow's milk, place it in a fresh earthen pot, tie at its throat by means of a rope and hang it overnight exposed to moonlight. The patient should drink 3 *tolas* of this milk with sugar candy, moving it about 3-4 times in the mouth. Within a few days the patient becomes free from the affliction almost miraculously.

### ***Liver Complaints***

*Pains at the liver* : This generally comes in a violent way. There will be a nausea or a bout of vomiting or even hiccup. The distress becomes almost unbearable. To treat this, give a fomentation with milk at the region of the liver. Quite often the complaints will disappear after just a few fomentations.

*Enlargement of liver* : This is also difficult to be cured. The very colour of the face changes and a

pain is felt at the region of the liver. Breathing becomes difficult and the patient gets violent attacks of fever. The patient cannot turn on the left side while sleeping. Eyes will become yellow. In such a condition give a fomentation with raw milk four times a day, not less than one and half an hour of duration every time. Within a few days the patient is sure to get relief.

*Udavarta* or retention of urine, faeces and flatus. Here a weakness in the liver arises first and then a swelling in the legs, the belly and the face. A measure of therapy for this patient is to give only camel's milk whenever he feels hungry. If such an amount cannot be tolerated, it should be given at least four times a day. Within two to three weeks the patient is bound to get relief. Feeding the camel from which the milk is given with the leaves of *peepal*, *babul* and such other suitable leaves during this period will render the milk more effective. Fresh milk alone from the camel is to be given. This is not very difficult for a camel can be milked any time like the goat.

### **Splenic Enlargement**

The patient here becomes very weak. He cannot tolerate even the least amount of work and even walking about leads to a difficulty in breathing. He loses interest in eating or drinking and there is constant pain in the region of the spleen.

For treating this, take one *ser* of cow's milk and boil. After two or three simmers of this boiling, add

4 *tolas* of *kalmishor* and remove the milk from fire immediately. Milk will break down. The water of it should be strained out and given for drinking. The patient should then lie down on the left side. The diet should consist of *mung dal khitchadi* or a gravy of *harhar dal* mixed with ghee. But he should take this only at afternoon after taking the medicine in the early morning without anything in the interval. Relief is expected within 3 days. If not, the treatment may be continued for a week. This will be quite adequate for full relief. Ghee should be given in plenty.

Constant fomentation with milk for a few days would also give relief.

### **Piles**

A simple and an effective remedy advised is as follows : Take buffalo's milk and keep it on fire. Take a few sticks of *tanghi* plant (*Abutilon indicum* and *A. hirtum* or Country Mallow) and go on stirring the milk with it. The whole milk soon turns into a soft *maida* like flour. Take this flour, mix with it an equal quantity of country sugar and store in a bottle. One palmful (*hatheli*) of this powder is to be given daily along with water. This will be a beneficial treatment.

### **Skin Diseases**

*Itchings and eczema* : Wash the region of itching three to four times a day with cow's milk. There will be a quick relief specially for the dry eczema - a very simple but effective remedy.

If itching has spread almost all over the body, add water in milk, dip a piece of cloth in it and massage all over, an hour daily. Within three to four days the good effect will become visible.

*Ring worm (dadru)*: Give a fomentation with milk twice a day. Itching will stop the next day itself. But to get the full relief this is to be continued for a few days.

*Weeping eczema* : Give a fomentation with raw milk twice or thrice a day. Itching will mostly stop the next day. But continue for quite a few days to secure full relief.

*Boils and ulcers* : Wash them well with linseed oil first. Then give a fomentation with milk two times a day. Continue doing so for two or three weeks. Full relief will ensue. Painful boils can be split open and given a fomentation with milk. This will offer a quick relief.

For chronic ulcers, keeping wicks of fine cloth dampened in milk will give some relief.

*Internal lesions* : Drinking milk is a good measure to treat internal lesions. The violence of the latter will lessen and quite often they will heal up also.

*Freckles and Warts on the face* : Soak mustard seeds in goat's milk overnight, crush them the next morning, rub the paste on the face and after some time wash with warm water and soap. Doing so for a few times will take care of the affection.

Prepare a *khova* out of human milk and the ass's milk. Apply this at bedtime on the face. Wash them in the morning with warm water. A treatment of this nature for a few days will destroy all freckles of the face, warts and black spots. The face will also secure a new lustre.

Bathing in milk specially of the ass and sometimes of goat has been recorded to be a normal practice specially among the aristocratic Roman ladies. This bears out the fact emphatically that milk will remove black spots, freckles and blemishes of the skin and render it soft, clean and lustrous.

*Fever* : Milk is no use for fever. But when there is a great violence of fever, fomentation with milk on the head, as well as to the chest and the knees will definitely reduce its severity quite soon.

### ***Tuberculosis and Milk***

This is a very grave disease. It is said that for tuberculosis and also cancer, ass's milk will have a beneficial effect through gradually.

Texts speak much of beneficial results of bathing in a milk tub by a patient of tuberculosis, rubbing himself well at the chest and the navel for about fifteen minutes.

The great Charaka writes extensively in his Samhita on the inestimable value of bathing in milk for many types of complaints. A few of these benefits are: gradual lessening down of the

increased heat of the body, expulsion of unwanted foreign materials from the body accompanied by an increased vigour and lightness all over, gradual reduction in the violence of the bouts of cough and fever, removal of fatigue and a feeling of tiredness and lassitude all over, easy occurrence of good and sound sleep, gracefulness of mind, increased digestive power and relief from all complaints.

### ***Diseases of the Children***

*Swellings below the ear.* This is often accompanied with fever and is in itself very painful. The child cannot usually tolerate an application of strong drugs for this purpose. It is under such circumstances, fomentation with raw milk comes in very handy. The distress will disappear with not much of a trouble. Relief is definite. Quite often the swelling will subside and the fever will also decline. One can also give some drugs for bringing down the fever.

*Black cough :* This is called black cough (*kali khasi*) because when the child coughs, the face will assume a black colour. For this, take 10 *tolas* of cow's milk, 6 *mashas* of ghee and 10 *tolas* of water. Mix them and cook together to such an extent that the water content evaporates out fully and only ghee remains. And now 2 *tolas* of sugar candy and administer this as a drink in small sips. This is an extremely effective medication.

*Gripings at the stomach :* Gripings and contortions in the bowels that follow indigestion

make the child highly restless. In such cases it is not advisable to give medicine only to stop the gripings (*peichish* or *murod* in Hindi) : the dry faeces that are mostly responsible here should first be removed out—otherwise it will be deleterious. Some purgative should first be given. 3-6 *mashas* of castor oil may be mixed with warm milk, sweetened with an addition of little country sugar. This will result in 2-3 purges and the gripings would also stop on its own now. Or, take fresh goat's milk and give a hot drink of about 5 *tolas* of this milk to the suffering child. Without the use of any purgatives, this itself will purge out the dry faeces and offer relief. The child becomes healthy and normal.

*To fatten the child* : Giving goat's milk to the developing child for quite some time will make it well grown and fattened without any complaints of constipation and the like.

Regularly consuming goat's raw milk as such or after adding water with it is a good procedure to increase fatness of the body even for the adults.

### C. CURDS

Milk no doubt contains all the constituents needed for the body. But the difficulty is that it does not suit some constitutions. That is why it is sometimes said that instead of taking milk directly, it may be better to convert the net quantity of the milk needed for the body into curds and then consume it in that form. All the contents of the



milk will naturally enter into the curds. But it does not mean thereby that the qualities and properties of the latter remain the same. The very act of such a conversion results in many changes in the properties. Milk and curds do differ a lot here.

Milk is a longevity promoting *rasayana* or an elixir ; this property simply does not exist in curds. Consumption of milk is advised daily and constantly, while this is not so with the curds. Ancient Acharayas like Sushruta advise in fact not to eat curds in the night meals. Even now the use of curds and butter milk as a routine ingredient is a characteristic of the South Indian meals alone; infact, a South Indian would not feel his meal complete unless he takes curds rice at the end. But this is not so with the North Indian meals; curds is mostly optional there.

Milk is converted into curds by adding a sour substance in it. The quantity used of the later and the duration of the curds making determine the sourness of the finished product. If the temperature of the surroundings is more as in summer, the process takes place quicker. During these days the quantity of the sour substance needed is smaller and the process is also quicker. Both are in reverse order during cold weather.

In terms of taste one can distinguish three types of curds. That which is made by using as little of the sour substance needed and prepared in the shortest time is dense and sweet. Greater addition of the substance and longer duration renders it

sour. A 24 hours of duration would make the curds most sour.

All types of curds are sour to lesser or greater degree. They are also astringent but to a slight degree only. The sour taste is what increases in general the relish of food substances. That is why curd constitutes an important ingredient in preparing tasty dishes like *koshimbir*, *rayta* or *tair patchadi*, *cuddy* and so on. Taken in small quantities this promotes hunger greatly.

Curd happens to be hot in quality, unctuous or oily in nature, strengthening and also nourishing. But its use in excess is harmful; this will lead to an augmentation of phlegmatic tendencies. Taking curds again and again is a sure measure to increase fat and obesity. An obese person is best advised not to use curds at all. Excess of using curds also leads to asthmatic bouts, cough, *amavata* (or torpor due to defective digestion) and such other complaints. For persons using sour curds in excess, a vitiation of blood will ensue and this is followed by an incidence of various types of skin affliction. His very skin will become blackish. A patient of skin diseases should totally avoid curds. In the disease of leprosy and eczema particularly, curd is definitely deleterious.

Sour curd promotes biliousness or *pitta dosha*. Thus patients of bilious eruptions on the skin, tendency of bleeding in many places and the like should also avoid curd altogether. This is to be avoided in the following afflictions also. Loss of

hunger, oedemas and swellings, giddiness and high blood pressure. Buffalo's milk which is not so sour as that of either goat's milk or cow's milk is always more salutary.

As sour curd happens to be deleterious, there is a practice in some places to use curd that is not fully ready; but, this is more harmful and therefore better avoided.

In fine it is not incorrect to say that while milk is generally wholesome and salutary, curd is generally unwholesome and non-salutary. Still however, in cases of old chronic cold, advanced dysentery, difficulties in passing urine, tastelessness and the like curd happens to be beneficial. Adding black pepper with curds will reduce the deleterious effect of the latter.

#### **D. BUTTER MILK**

It seems that the twin gods Ashwinikumaras, the physicians of the Gods in heaven once entreated the Lord of Creation. Brahma in the following words : "Sir, you expressed the opinion that one should drink buttermilk which happens to be the only substance that can ward off all types of diseases. Therefore kindly let us know now extensively as to what are all the properties that exist in buttermilk, what exactly are its *rasas* (or tastes), what is its virility, what is the benefit of consuming it, how long one should take it, how much and in what way and what are the things that should be avoided while taking it and are

there any deleterious effects of it and what exactly are they?" Thus requested, the Lord Brahma began expounding on the virtues of buttermilk in great detail.

This is how the subject of buttermilk is introduced in one of the ancient *prakarana granthas* or Incidental Texts called Takra Kalpa - the preparation of buttermilk.

The above fable is an index of the great esteem in which butter milk has been held by the physicians of Ayurveda. Its use is even now prevalent in great many ways. An attempt is done here to give a brief account of this nature as found in many Texts besides Takra kalpa and also as to what exists in current practices. Buttermilk is such an easily available and household article that it will be very useful to have a knowledge of its many uses in health and diseases. Modern medicine is also coming to appreciate many of these claims. The sheer diversity of the matters discussed is itself impressive.

(a) When to take buttermilk and its excellence :

Buttermilk should be drunk after the meals and with salt. After drinking it, one should also drink some water and nothing else afterwards. Drinking water thus, hot or cold, will ensure that no acidity would remain at the throat or the teeth. This is a good measure for the healthy and strengthening if taken with meals this way. But the same taken alone and excessively will be weakening and

inimical to virility. There is an ancient Sanskrit saying that buttermilk is to be taken after the meals, milk at the end of the day, ghee after cohabitation and water at the end of the night.

Buttermilk will act like nectar in the following diseases: splenic (or glandular) enlargement, piles, intestinal mal absorption (*samhgraphani*), anaemia, tastelessness and specially dysentery. Specially for dysentery or sprue which is difficult to be cured, it has been stated that this affliction will not get mitigated by thousands of medicines without taking buttermilk.

(b) How to prepare curds and buttermilk:

The usual ways to prepare curds is to place a bit of sour substance like the previous curds, or buttermilk in milk that is heated and cooled. Within 8-10 hours curds will form. Raw milk taken from market is an excellent agent for many disease germs of tuberculosis, cholera, typhoid, typhus and so on. To prepare buttermilk from it directly will make it really a poison. That is why milk should be boiled well and then only used for making curds and then, the buttermilk. This is the normal way of preparing curds. Here are a few other ways mainly meant for some specific diseases.

Sprinkle one *tola* of a mixture of the powders of dry ginger and the root of *chitrak* (*Plumbago zeylanica*) mixed with honey at the base of the pail of milk in which curd is to be formed. Use cow's milk. Or use the milk of a healthy goat that has

had a feed of the leaves of green gram and blackgram. Prepare buttermilk.

Or, take the pulp of wood apple or the juice of a well ripened mango, smear the vessel and prepare curds in it. The buttermilk obtained from this method is to be mixed with dry ginger powder and administered for patients of *samgrahani* or intestinal mal-absorption.

Take the bark of the root of *chitrak*, grind into a paste, smear the vessel and prepare the curds in it. The curds as such or the buttermilk destroys piles.

(c) Difference in the properties depending upon the vessel of the preparation:

For curing intestinal mal-absorption, buttermilk from the curds prepared in a golden, a silver, a stone or an earthen vessel is beneficial. Steel vessel is meant for jaundice. For treating piles any metallic vessel will do. But it is important to note that copper vessel should never be used. Brass vessel should be well tinned and aluminum should be avoided.

(d) Kinds of buttermilk and their properties:

There are four kinds: *ghol* (mixed), *mathita* (churned), *shweta* (white), *udashvit* and *chacchika*.

*Ghol*: This is prepared from curds without adding water and without taking out the fat. It is just emulsified from the whole milk. *Mathita*: Here no water is added but the fat is taken out by churning and the butter milk is then prepared

after such a churning. *Shweta*: Water is mixed in equal quantity and then curd is prepared. *Udashvit*: Half the quantity of water alone is mixed here and churned. *Chacchika*: Here water is added in a great quantity, and the fat is churned out. The term *takra* which means buttermilk is generally restricted to the buttermilk prepared by adding one fourth of water to the curds. This is the correct measure of preparing buttermilk. *Chacchika* where too much water is there is not at all nutritious, though this is how it is done among the poor. But this is still supposed to cool the eyes and keep them bright.

*Ghol* is destructive of the aggravation of *vata* and *pitta*, *mathita* is good for *kapha*. *Takra* is astringent and acidic and also sweet in taste and light for digestion; in post—assimilation it is sweet and its virility is hot. This is stimulative, astringent (contractive of tissues and hence healing), pleasant, promotive of virility and destructive of *vata* and bodily fatigue. *Udashvit* is curative of *kapha* but strengthening and best for removing fatigue. *Chacchika* is cooling, light and removes bile, fatigue and thirst. Buttermilk added with *saindhav* salt destroys *vata* troubles but causes *kapha*; it stimulates digestive power.

*Takra* or buttermilk is the best for feeble digestion, tastelessness and many other diseases. Therefore this is of the best kind. This *takra* however is of three kinds: one, where the butter is taken out fully, one where it is only taken out in

half and the other where no butter is taken out. These three types should be employed depending upon the vitiations of the *dosha* concerned in the disease, strength of the patient as well as his digestive capacity.

Stimulation of the digestive fire, actual digestivity and an astringency of action (whereby the living tissues are made to contract and thus help in healing) are the three important properties of a medicinal or a drug material). All of them are found in buttermilk (of the *takra* variety, which is what is mostly meant by "buttermilk") and they do so in a special way. That is why it is very salutary. This buttermilk destroys the diseases of man, elephant and horse.

Buttermilk is particularly beneficial to persons suffering from a heaviness of stomach, tastelessness and feeble digestivity and those that have a lesion or who are trouble by phlegmatic complaints. For patients of piles due to *vata* and *kapha* there is no medicine in this world like buttermilk; they should be given dry or unctuous buttermilk depending upon their vitiation. And, the piles destroyed once by buttermilk will not recur.

For aggravation of *vayu* buttermilk mixed with *saindhav* salt is the best. For *pitta*, it is to be mixed with sugar (*lassi*). For *kapha*, add dry ginger, pepper and the smaller pipal. Buttermilk mixed with *hing*, cumin seeds and *saindhav* salt is extremely beneficial for all gas troubles and *vata* aggravations. This destroys piles and dysentery.



promotes taste in food, and offers strength and nourishment and takes away the shooting pains of the bladder. In cases of difficult urination (*mutra kricchra*) buttermilk is to be taken mixed with jaggery. For jaundice, add the powder of the roots of *chitrak* (*plumbago*).

(e) A regimen for medicative use of buttermilk:

When buttermilk is to be used as a definitive medical treatment for any selected disease the following regimen has been prescribed.

Before commencing the taking of buttermilk, the patient should be given a meal of *kalami* or *shali* rice (good quality of rice of those days), green gram (a very easily digestible article much recommended elsewhere also for its great ease of digestion), or horse gram or a meat soup that can be digested quickly. When the stomach is cleaned, buttermilk is to be given so as to counteract the gases.

First should be taken for seven days, a buttermilk mixed with half the quantity of water. Then should be drink the buttermilk mixed with one fourth quantity of water. Afterwards buttermilk with no addition of water whatsoever should be employed. For persons of very delicate constitution and those who have very feeble digestive fire, buttermilk alone should be given and nothing else. However, if they do not receive sufficient nutrition to sustain themselves in this way, grind parched rice and prepare a gruel from out of it (called *takra avalehika*) and give. But persons with good digestive capacity should consume buttermilk

alone in the morning. After this is digested a drink of buttermilk added with *saindhav* salt and buttermilk with fat are advised. The meals should consist of cooked rice and buttermilk or meat soup prepared with buttermilk and rice.

It is advisable that the patient should sustain himself as much as possible on buttermilk alone. He should drink buttermilk alone when he feels thirsty. In case however the patient cannot sustain himself solely on buttermilk, he can be given preparations of buttermilk, or buttermilk and cooked rice or buttermilk and meat soup. But it is necessary that the first drink in the morning should be buttermilk alone and nothing else. He may be given other things after some time and only as the need arises.

The physician should carry out this regimen for a week, or ten days or even a month after taking into consideration, the necessary factors of time, strength and the vitiation of the patient.

The dosage of the intake of the buttermilk is as follows: The patient should first take 4 *tolas* of it and then double this amount. Afterwards he can take as much as he desires and this is to be taken again and again but in small quantities each time. How much of buttermilk he can take in the whole day however depends essentially upon his own digestive capacity. But it is always important to keep in mind that buttermilk should never be given in a great quantity at a time. It is always to be taken in small amount and that too sipped slowly.

The amount of buttermilk taken should be less in rainy season as compared to any other season. By consuming a great quantity at a single time, stomach will get agitated and quite likely there may ensue a purging. The net desirable amount of buttermilk intake is also prescribed. This ranges from 5 *tolas* to a child of 2 to 5 year, to 30-40 *tolas* to an adult from 25 to 60 years of age and 20-26 *tolas* to those of 60-80 years and 10-20 *tolas* for those aged 80 to 100 years. However this amount basically depends on the digestive capacity of the individuals which varies considerably.

(f) With what articles buttermilk should be taken:

We have told above how to take buttermilk alone. But buttermilk can be taken with much benefit along with many articles of food and there are many special culinary preparations of buttermilk as well that are tasty, salutary and quite popular. Among the latter belong, *tair patchadi* or *raita*, and *mor kolambu* prepared with many vegetables. Both are common in South. Or, buttermilk can be drunk along with many beneficial and salutary articles of food such as chutney, curries and the like.

Some of the vegetables given best with buttermilk or prepared best with buttermilk (as a *raita* for instance) are the following: *chilli*, *vathua*, brinjal, small radishes, *pitta papada*, wood apple, small, raw cucumber, *amrataka*, *jivanti* and *marisha* or salted ginger or raw turmeric and *shatavari* or Asparagus.

(g) As an after drink in disease:

After drink or *anupana* as it is technically called is a liquid that is given after a specific medicine is first administered. This liquid may be just water or any other substances such as honey, milk, buttermilk and so on. The function of *anupana* is to facilitate the best action of the medicine employed. Buttermilk happens to be one such after drink prescribed in many diseases. For instance this is the after drink or *anupana* for copper ash (*tamra bhasma*) given in stomach diseases and mercuric ash (*parada bhasma*) given in the diseases of *vata*.

(h) Is buttermilk compatible or not to specific individuals?

How do we test this important consideration that ought to be borne when buttermilk is used specially for medicinal purposes.

The following are the signs to indicate that buttermilk agrees well with certain individuals. For these persons, following a drink of buttermilk there will be no ill effect on the face; instead, there will ensue an increase in hunger, a lightness and a lustre of freshness in the body. Disease will clear out and a nourishment will ensure.

Persons to whom buttermilk does not agree exhibit the following characteristics. There will be an increase in urination, greater amount and thinness of the stools, an agitated state of mind,

a dimness in digestive fire, a belching out and many other minor disturbances.

(i) A few miscellaneous informations:

A person who takes to buttermilk especially as a medicine should keep the following precautions. He should give up cohabitation, sleeping by day, hard physical exercises, sitting in awkward and wrongful postures, eating non-salutary diets, bathing and controlling non-controllable urges of the body such as urination, defecation and the like.

Consuming buttermilk in the days of autumn, in cases of feebleness of digestive ability, and also obstructions of the passage of *vayu* and *kapha*, should be done rather judiciously.

Taking buttermilk in the following circumstances is not praiseworthy: patient of lesions in the chest, in very hot days, for the very weak and to persons troubled by thirst, loss of consciousness and agitated or confused mind and also to women following child birth. In the season of summer, and winter, in a state of weakness, under conditions of a confused mind, and for a patient of plethora, intoxication and painful swellings, giving butter milk is never proper.

For the following persons, giving buttermilk with cooked rice is advised: the hungry, the thirsty, the weak, the child, the aged, and the timid as well as a patient of *vata* disease, and *prameha* or the urinary affection.

One who regularly takes buttermilk would destroy the following diseases. Buttermilk would act as a preventive agent here; piles, intestinal mal-absorption, splenic enlargements, tuberculosis, swellings, stomach diseases and the like. He will be sturdy in his body, well nourished, strong and satisfied. He will be a more beautiful person than the Lord Kama deva himself and will live for hundred years.

It is important to note thus that Ayurveda advises drinking buttermilk regularly as a food accompaniment. This is the best way to derive the maximum benefits from the many inestimable values of buttermilk.

### **Comparative Nutritional Values**

There is a considerable variation in the nutritive values of milk and several products of milk. This is shown in the following table.

Comparative nutritional values of milk and milk products (in percentage).

	<i>Proteins</i>	<i>Fats</i>	<i>Carbohy- drates</i>	<i>Mineral Salts</i>	<i>Calorises (energy values)</i>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
Breast Milk	1.0	3.9	7.0	0.1	67
Ass milk	1.7	1.0	6.5	0.4	47
Cow's milk	3.3	3.6	4.8	0.7	65
Goat's milk	3.7	5.6	4.7	0.8	84

(Contd.)

1	2	3	4	5	6
Buffaloe's milk	4.3	8.8	5.1	0.8	117
Curd	2.9	2.9	3.3	0.6	51
Buttermilk	0.8	1.1	0.5	0.1	15
Casein	21.5	17.5	0.75	1.75	252
Cheese	24.1	25.1	6.3	4.2	348
Powdered milk (Creamless)	38.0	1.0	51.0	6.8	357
Creamless milk	2.5	0.1	4.6	0.7	29
Butter	1.5	85.0	Nil	1.5	790
Ghee	Nil	99.2	Nil	Nil	992

### **Some Tips in the Household Use of Milk**

Here are some household tips for an effective use of milk. They will come in handy for many purposes.

Milk is an all sufficient nourishing food. It is probably the only food that can offer all that our body needs for sustenance and health. It is essential for children, the pregnant and the feeding mothers. It quickly restores to health those who are emaciated, and those who are convalescing. For the healthy, it is a strengthening tonic. But those who consume great quantities of milk should also carry out adequate amount of physical exercises. Healthy persons taking milk would find it beneficial to take one or two date fruits along with milk.

Milk is no doubt easily digestible. But infants and children would find it heavy to digest pure milk. It is therefore necessary to mix a little water and give milk to them, after boiling it well. Pure buffalo milk is not good for drinking, it may lead to indigestion. Therefore one should add adequate water to this milk and then only use it.

Boil milk for half an hour and then cool it down quickly by placing the vessel in cold water. By this method taste of the milk does not get spoilt. One should drink milk only when it is hot. But drinking milk after a very heavy meal is better avoided; that may lead to constipation. Taking milk after meals following an interval of three hours is healthy. It is more healthy to drink milk without adding sugar. Eating sour fruits following a drink of milk helps in the latter's easy digestion.

Mix well half a teaspoonful of fine ground turmeric powder to a cupful of boiled milk and also honey as per taste. Taking this three to four times will quench thirst if it is a sign of a disease.

Ground two almond seeds into a fine paste along with milk. Mix this well in two spoonfuls of milk. Take some pieces of bread, soak them in this milk and rub your face with them from top to downwards. Adopt this measure daily twice once in the morning and then another time in the evening for fifteen minutes. This will give you an excellent and unfailing benefit. Pimples on the face will disappear, black spots and freckles will vanish and your facial lustre increases considerably.



Take a cupful of fresh milk at night, boil it well and then add the juice from a freshly cut lemon. After fifteen minutes, apply this milk to palms and soles of the feet. When the wetness of the application disappears lie down and sleep. Wash your face and the paste concerned in hot water next day morning. Adopting this measure for a few days continuously would increase the beauty of your face, soften the skin and add lustre to it. Apply milk over the soles and massaging them well leads to sound sleep. Adding some water to milk and washing your face would prevent crackling of the facial skin that is particularly frequent in winter.

For quietening the common cold and the running nose, a simple measure is to drink hot milk adding pepper powder and sugar candy. Take a piece of dried ginger, grind its tip on a stone along with cow's milk and breast milk. To smear this paste over the temples would pacify headache.

Add a pinch of salt to four teaspoonfuls of milk and apply this mixture to your face. This will prevent wrinkling of your facial skin. When eyes are burning or they have turned red or they are having a sensation of being pricked with needles as it were, a few drops of pure milk or breast milk on the eyes will prove much beneficial.

Taking a cup of fresh frothy milk from the cow daily in the morning for two or three days will cure sores on the inside of the mouth.

Adding half a teaspoonful of pure turmeric powder in a cupful of boiled and cooled milk and then taking it will cure obstructed urination. One should continue this for four to five days twice a day.

Persons having a tendency of bleeding at the nose would find it beneficial to place a few drops of breast milk at frequent intervals at the nostrils. Bleeding will stop.

Take a cup of frothy milk just fresh from the cow. Squeeze a lemon fruit into it and immediately drink this milk. Those who have bleeding piles would find this an efficient cure that would show its effect within a week.

Taking a bath in milk as a cosmetic measure was a historical practice in many countries besides India. This would confer an attractive skin colour, render the skin flower like soft, freckles free and lustrous as the literature says. It is a historical record that the princes of Rome were adopting this practice and it is also presumed that some Hollywood beauties do have this practice still. The famous beautiful Egyptian queen Cleopatra had specialised in using donkey's milk specially for this purpose. They all had a practice of having a tubful of milk and dropping their whole body within it, lie down like that and massage their limbs with milk quite frequently in addition. Coming out of such a tub bath after half an hour and then having a cold water bath would ensure the skin to be free from any diseases, freckles or black spots. It will also make it effulgently lustrous.

Though bathing in milk is an impossibility now a days even for the very wealthy, utilising milk for skin health is quite possible. One can drink as much milk as possible and simultaneously massage the body with milk at intervals. This is a sure and quite a feasible method of skin care and skin beauty.

Apply the cream of milk to face, palm and soles of the feet. Follow this up with a good massaging. This will render the skin, free from infections, smooth, devoid of black spots and freckles and retain it taut and free from wrinkling. This measure continued for nearly a month would prevent black tanning of the skin by the sun. A paste of turmeric mashed well with cream and applied to the sole of the feet, the palms and the lips that have crackled because of the winter cold proves beneficial.

Taking butter lessens the aggravations of *pitta*. It will remove fatigue, quench thirst, mitigate cough and breathlessness and will also augment virility. Persons with a complaint of piles would find this salutary. Butter is a good hair dresser. Keep using it so and you will thereby prevent premature greying and also increase the lustre of the hair. Mixing butter in the ointments meant for dressing of the wounds would render them more quickly effective. Applying colyrium prepared from butter to the eyes that are paining would quieten down the pain. If the palms have become rough because of such hard labours like splitting fuel wood or

farm work, applying butter and following this up with a good massaging would rectify.

Wounds get healed quickly by an application of a paste prepared by a fine grinding of turmeric, sweet neem leaves, black sesame and pure ghee. Mix a teaspoonful of pure ghee, with equal quantities of the juice of white onion and honey. Add egg's yolk. Taking this daily in the morning is an effective aphrodisiac, promotes excellent memory and removes all nervous debility. This is advisable for a continuous intake till the cure is effected by patients of hysteria, insanity and sleeplessness or insomnia.

Massaging palms and soles with cow's ghee will calm down their burning.

But persons having the complaints of high blood pressure, diabetes and jaundice should better completely give up taking ghee.

Curds constitute a good tonic. It cools the body, quenches thirst and tones up well. It is an excellent energiser to the emaciated and the weak. It is curative of dysentery, bleeding dysentery, constipation, burning at the nose, ordinary fever and urinary disorders. Curd proves very effective in curing intestinal disorders. It is a nourishing as well as a medicative material even for infants who are just fifty days old. This is a beneficial food for persons suffering from excessive urination due to travel, dysentery and common cold. Adding a little water and salt while taking curd is a healthy practice.

For patients of jaundice, eating par boiled rice mixed with curd is a curative diet. Persons suffering from piles would find it mitigative to drink a cupful of sour butter milk from which the butter has been removed. Taking curds and jaggery along with rice is an advised curative diet for them.

If one consumes curds rice mixed with cow's curds daily in the morning before sun rise, one can get rid of one sided head-ache.

Diabetic patients would find it advantageous to take curds rice mixed with jaggery and pepper powder. This particularly mitigates the severe burnings at the regions of urination and the anus. Anal itching, pains and burnings can be cured by taking curds rice after squeezing lemon juice in it. Results can be seen within two to three days.

Persons suffering from gastric ulcers would find it safe to drink butter milk in great quantity. If the disease is in its initial stage, this itself will act as a curative measure.

For patients of dysentery, tastelessness in food, indigestion, too much of obesity, piles, excessive thirst, vomiting, lose motion, obstructed urine, jaundice, burning urination and the like, butter milk is an excellently useful drink. Butter should have been completely skimmed out here.

When you eat a pomegranate fruit, you are likely to discard its central pith as well as the outer rind. Do not throw them. Instead add a teaspoonful of cumin seeds as well as eight to ten grains of

pepper to them, fry in ghee and store. Add a little quantity of coconut flesh, salt to taste and grind the entire mixture to the consistency of a smooth paste. This is to be mixed with butter milk and taken. This is almost a first aid measure for diarrhoea.

If you use cucumber seeds instead of pomegranate skin here, the butter milk is an excellent drug for urinary disorders. If you use dried powders of *amalaka* fruit, the butter milk would serve for removing the aggravations of *pitta*. Made out of garlic mixing, the buttermilk is an antidote to indigestion. Adding soaked *methi* seeds would make it capable of removing back pain. By mixing dry ginger powder, the buttermilk would calm down common cold and cough.

Add the powder of the three pungents (black pepper, *peepal* and dry ginger) and also the powder of *saindhav* salt, and mustard in curd. Eating this in autumn and winter (*hemant* and *shishir*) removes *vata* and *kapha*, stimulates digestive ability, strengthens the body, and gives lustre to the eyes. This is an excellently wholesome diet.

The cream of curd is sweet, heavy, promotive of virility but increases phlegm.

Bleeding at the piles will stop if curd or buttermilk is regularly taken.

If nutmeg is taken in a little heavy dose it leads to intoxicatedness. This can be overcome by eating curd mixed with sugar.

Externally applying water of the curd calms down the burning sensations.

Diarrhoea stops by licking up creamy curd mixed with honey.

Curd rice is beneficial in dysentery.

Drinking buttermilk mixed with *saindhav* salt and cumin powder proves beneficial in bleeding piles.

Dip a piece of cloth of cow's buttermilk and rub all over the body. This will cool down burning sensations.

Some persons become constipated by eating ground-nuts. This is best cured by a drink of buttermilk. This holds good for constipation due to ghee and oil.

Even chronic constipation can be cured in a few days by drinking buttermilk added with *ajwain* and black salt.

One-sided headache gets cured within 2-3 days by eating curd mixed cooked rice to which sugar candy is added. This is to be eaten before sunrise.

Loose motion gets rectified by drinking fresh buttermilk in which white cumin seeds are fried, ground, strained with cloth and then mixed.

Dysentery stops by drinking one *pav* of buttermilk in which one *tola* of honey is added.

## Medicinal Uses of Butter Milk

General features and some preliminaries regarding buttermilk have been mentioned so far. It is time to note a few of the specific medicinal uses of buttermilk in connection with particular afflictions. These have been selected from a few ancient classics. Stress is laid on selecting the simple medications alone that employ buttermilk as a chief if not the only means. Medicaments employing a very large number of ingredients are generally avoided. The texts from where the selection has been made are mentioned at the head of the lists given:

### A. Buttermilk given internally

#### From Charka Samhita

A drink in dysentery and sprue: The pulp of wood apple, the pulp of bael fruit (*Aegle marmelos*) and pomegranate are to be cooked in the buttermilk and given. This will hasten the cure and stop the purgings.

To overcome intoxicatedness : Prepare a gruel (*yavagu*) with cooked *poi* vegetable and curds. This destroys intoxicatedness. To ward off excess obesity: Use *takrarishta* (a proprietary preparation or yoga in which buttermilk is the principal ingredient) and honey.

For intestinal mal-absorption, swellings and inflammations and piles: As a preventive as well as a curative measure, make it a habit of taking buttermilk daily and regularly.



Using buttermilk is advantageous also in difficulties in urination, diseases of the stomach, tastelessness, jaundice and anaemia and also in cases of poisoning by artificial poisons (*gara*).

To increase the efficacy of buttermilk: If buttermilk is drunk mixed with a powder of *ajwain* and *vit* salt, the digestive fire will get more stimulated and there will be a comfortable passing of urine, faeces and flatus, as well.

In Piles: Buttermilk is excellent here.

Prepare a drink with dried ginger and peepal, sour it with buttermilk. Add a powder of black pepper and administer this to a patient of piles.

In case of bleeding piles, drinking of buttermilk in which a powder of *harad* or chebulic myrobalan or of *triphala* or all the three myrobalans are added will be useful.

Stomach diseases: These can be cured by using butter milk in which a powder of *chitrak* (*plumbago*) root is mixed.

### **From Sushruta Samhita**

For patient of wounds: They should give up taking curds, buttermilk and the like. For, these would provoke the existing vitiations and also augment pus formation.

Culvultions (*apatanak*): Early in the morning and on an empty stomach, eat sour curd mixed with a powder of black pepper and *vacha* (*Acorus calamus*). This will destroy the disease.

In Dysentery accompanied with blood; Lick up some butter and drink buttermilk over it. This is beneficial and often curative.

### **From Arya Bhishak**

In fever due to biliousness or *pitta*: Take the seeds of *apamarga* (*Achyranthes aspera* or *chirchira*), soak them overnight in water, grind in the morning and administer as a drink.

In jaundice: Rub the root of *apamarga* in buttermilk and administer as drink.

In splenic enlargement due to *kapha*: Add the powders of *ajwain* and *vit* salt in buttermilk and administer.

In chronic fever: Dry ginger is to be rubbed in the water of the buttermilk. This should be drunk for 21 days.

For piles: Give dry ginger powder mixed with buttermilk.

In prameha: Mix one *pau* of the juice of the tamarind fruit with an equal quantity of buttermilk. This is to be drunk.

For bleeding dysentery: Grind the seed of mango in buttermilk and administer as the specific curative drink here.

In cholera: Give pieces of cucumber ground in curd.

In the poison of a dog bite: First give jaggery for eating and over it give a drink of buttermilk in which a powder of the bark of *hingota* is added.

For Urinary stones: Bark of *indrajava* (*Holarrheea anytydysenterica*) is to be ground in curd and then given.

For taking out the intoxication of opium: Take 3-4 *mashas* of *hing* or *asafoetida* and administer it as a drink in buttermilk.

Giving curd for drinking will take away the poison of *dhatthura* (*Datura stramonium*).

For poisoning in cattle: Grind soapnuts (*shuka kayi*) along with the husk in buttermilk and feed the cattle with this mixture. Poison will sink down.

In jaundice: Take 1 *tola* of turmeric powder, mix this with 4 *tolas* of curds and let the patient eat it early in the morning.

### **From Sharngadhara Samhita**

To remove the violent smell of garlic: Remove the husk from the garlic bulb and separate it into individual bits, soak them overnight in buttermilk.

This will greatly lessen the strong smell of garlic.

### **From Yoga Ratnakara**

In recent fever: Buttermilk is unwholesome.

In disease accompanied with burning sensations: Buttermilk should be given up.

Patients of heart diseases: Buttermilk should not be touched.

For tastelessness: Both curds and buttermilk are salutary.

Swellings in the joint: Taking powder of *triphala* and dry ginger along with the water of curds would be beneficial.

### **B. Buttermilk given as an external application**

Buttermilk is best used as a routine food adjunct. It is very useful in various types of affections as attempted to be shown above. Besides these, butter milk forms a medicinal external application also occasionally. This is usually in combination with many other ingredients. A few examples are as below:

Itchings, boils and eruptions and oedema: A number of drug materials like turmeric, *daruhaldi* (*Berberis astatica*), tulasi, neem leaves, deodar, drumstick leaves, coriander seeds and so on are all taken in equal amounts and ground in buttermilk and applied on the oil besmeared regions.

Stomach ache: Barley flour is mixed with buttermilk, a little bit of *javakhar* is added, the whole is warmed and applied as a poultice. A bandage is tied around over this poultice.

In elephantiasis of the foot and the scrotal swellings: The bark of the root of *Calotropis* (*madar*) is ground with cow's buttermilk. This gives a good relief.

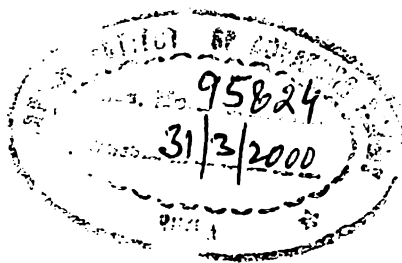
Itchings and eczema: The leaves of *amaltas* are ground in the buttermilk and the paste is rubbed all over the body and a bath is taken after some time. This is quite an effective medication.

Tumour on vital parts: Grind *poi* vegetable in oil gruel of flour and buttermilk. Add salt and apply by night and day.

Ringworm: Take the seeds of radish, *san* (hemp) and drumstick and also of mustard, barley and *alsi*. Grind them all in buttermilk and apply.

Leprosy: In a kind of leprosy called *siddhma kushta* take cotton leaves, the root of *kakjangha* and the seeds of radish. Grind them all in buttermilk and apply.

Or, take only radish seeds and grind them in cow's urine, buttermilk or old rice water and apply.



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