IV. Milk based fermented foods

1. Curd (Dahi, Thayir)
   Shrikhand, Lassi, Dahi kusum, Rasgullas, Misti dahi

2. Chhurpi (Durkha, Churapi)
   Soft Chhurpi, Hard Chhurpi or Durkha, Chhur singba or Chhur mingba,
   Chhurpupu, Marchang, Paneer,

3. Chhur chirpen

4. Churkham

5. Chhu

6. Philu (Philuk)
   Other milk based fermented foods - Chhu/sheden, Shyow, Gheu, Mohi, Somar,
   Maa, Jhol
1. Curd

Other names, if any: Dahi, Thayir.

Place of origin/usage: India.

Nature of food: Milk based.

Time of consumption: Mostly Summer days.

Importance of the food: As probiotic food.

Usual composition/ingredients: Milk.

Method of preparation: House hold utensils are required for preparation of dahi. Dahi is generally prepared using cow or buffalo milk. It is a weak gel when prepared from cow milk. The gel is relatively firm when buffalo milk is used because of the higher total solids (16-19% compared with 12% for cow milk). Whole milk dahi has a creamy layer on top of a homogenous curd.

Nature of fermentation: Lactic Acid Fermentation.

Microorganism(s) involved: Streptococcus cremoris, S. lactis, S. thermophilus, Lactobacillus bulgaricus, L. acidophilus, L. helveticus, and Lactobacillus cremoris.

Whether native fermentation or inoculum is added: A small amount of already fermented curd is used as a starter inoculum.

Nutritional profile of food: Water 85-88%, fat 5 - 8 %, protein 3.2 - 3.4%, lactose 4.6 - 5.2%, ash 0.70 - 0.75%, lactic acid 0.5 - 1.10%, calcium 0.12 - 0.14% and phosphorus 0.09 - 0.11%.

Biochemical profile of raw material: The 100g of raw milk contains 0.8g mineral matter, 149mg Ca, 96mg P, 118 IU Vitamin A, 55µg Thiamine, 167µg Riboflavin, 96 µg Nicotinic acid, 29µg Biotin, 202 µg Pantothenic acid, 161 µg Folic acid, 0.15 µg Vitamin B₁₂ and 1.4mg Ascorbic acid. The raw cow milk has 0.56% total nitrogen, 0.512% protein nitrogen, 0.048% nonprotein nitrogen, 0.017% dialyzable nitrogen and 0.24mg% ammonia nitrogen.

Changes in physical and chemical profile: It resembles plain yogurt in appearance and consistency and differ in having lesser acidity. The 100g of dahi contains 0.8g mineral matter, 149mg Ca, 93mg P, 102 IU Vitamin A, 49µg Thiamine, 157µg Riboflavin, 86 µg Nicotinic acid, 3.2 µg Biotin, 183 µg Pantothenic acid, 178 µg Folic acid and 1.3mg Ascorbic acid. The cow milk dahi (1 day old) has 0.57% total nitrogen, 0.497% protein...
nitrogen, 0.073% nonprotein nitrogen, 0.027% dialyzable nitrogen and 9.79mg% ammonia nitrogen.

**Improvement of flavour:** Addition of 0.2 % citrate has been recommended to enhance the pleasing aroma of *dahi*. Citrate is converted into diacetyl by *Streptococcus lactis* sub sp. *diacetylactis* and *Leuconostoc cremoris* resulting in a buffer milk aroma.

**Symptom of quality product:** A good quality *dahi* is of firm and uniform consistency with a sweet aroma and clean acid taste. The surface is smooth and glossy and a cut surface is trim and free from cracks and gas bubbles. The composition of *dahi* depends upon the type of milk used and the manufacturing condition.

**Related/Varied forms of the food:**
- **Shrikhand**

  *Shrikhand* is sweetened dewatered *dahi*. It is very popular in western and some parts of southern India (Steinkraus, 1996). It has a distinctive rich flavour and fairly long shelf life. To prepare *shrikhand*, *dahi* is suspended in a muslin cloth until all the free water has drained off. The semisolid mass is then whisked with sugar through a fine cloth, coloured and scented with saffron or rose-water, and flavoured with cardamom if desired. The composition of *shrikhand* is moisture 34.48 - 35.66%, fat 1.93 - 5.56%, protein 5.33 - 6.13%, reducing sugar 1.56 - 2.18% and nonreducing sugar (sucrose) 55.55 - 53.76% (Mital, 1977).

  To further extend the shelf life of *shrikhand*, a preparation known as *shrikhand vadi*, which is essentially a desiccated *shrikhand*, is made. The dewatered *dahi* is mixed with an equal amount of sugar by weight and dried in an open pan at low heat. When the mass begins to harden, it is tested for stickiness. The non-sticky product is flavoured and coloured. Powdered sugar is further added as desired. The product is mixed, rolled, cut into shapes, and packed like biscuits. The product yield is about 50% of the original weight of milk. The composition of *shrikhand vadi* is moisture 6.5%, fat 7.4%, protein 7.7%, ash 0.8%, reducing sugar 15.9% and non-reducing sugar 68.9% (Date and Bhatia, 1955).

  The progressive fermentation of milk into *dahi* brought about little or no change in the total solids, fat, proteins and milk salts, but significant decreases in the lactose content and pH value. The conversion of *dahi* into chakka (concentrated milk solids
separated out from whey) and fermentation is advanced. *Shrikhand* prepared either from buffalo or cow's milk retained quantitatively all the constituents in proportion to the addition of sugar. Little or no change in pH was seen during the conversion of *chakka* into *shrikhand*. The mineral make-up remained more or less unchanged, except citrate which disappeared completely at *dahi* stage of both buffalo and cow's milk. Despite greater part of the solubilized minerals drained along with whey, considerable amounts of all the minerals remained aggregated into *chakka* from both milk systems. All the minerals were quantitatively transferred from *chakka* into *shrikhand* for both buffalo and cow's milk. However, the minerals got diluted in proportion to the addition of sugar. The fermentation of milk brought about highly significant changes in mineral contents during transition from colloidal to soluble phase, which was faster and greater for buffalo milk (Boghra and Mathur, 2000).

**Lassi**

*Lassi* is a byproduct obtained in the preparation of country butter (ghee) from *dahi* by indigenous methods. *Dahi* is churned with frequent addition of water until butter granules are formed. The product obtained by manual removal of the butter granules is called *lassi*. It is estimated that approximately 2144 million kg of *lassi* are produced in India annually (Steinkraus, 1996).

The composition of *lassi* varies considerably. The factors affecting its composition are the type of milk used, extent of dilution during churning, and efficiency of fat removal. The composition of *lassi* is water 96.2%, fat 0.8%, protein 1.29%, lactose 1.2%, lactic acid 0.44%, ash 0.4%, calcium 0.6% and phosphorus 0.04% (Rangappa and Achaya, 1974).

Bhanumurthi and Trehan (1970) reported that *lassi* could be preserved for more than 6 days at 37°C by the addition of 0.03 - 0.35% sodium metabisulfite. The characteristic sulfur flavour imparted to the product could be masked by the addition of 0.07 - 0.09% crushed green ginger and 0.5-0.7% salt.

The term *lassi* is also used in some parts of Northern India to designate a cold refreshing beverage obtained by blending *dahi* with water and sugar. Its composition depends upon the composition of *dahi*, amount of sugar added and extent of dilution.
Dahi kusum

Dahi kusum is prepared by heating milk and then sweetening, flavouring and coloring it before inoculating with the starter. It is incubated until it tastes sour. It makes a delicious dish with all the nutrients of milk in it. Whole skim milk may be used for its preparation, but use of homogenized whole milk yields a product with superior flavour.

Rasgullas

Rasgullas are fermented cheese curd kneaded to dough like consistency and rolled into balls. The balls are dipped in sugar syrup and eaten.

Misti dahi

Misti dahi is a traditional Indian fermented sweet savory milk product prepared from partially concentrated sweetened milk. Lactic cultures is viz Streptococcus lactis (C10), S. diacetylactis (DRC1); S. cremoris (C1); S. thermophilus (HST); Lactobacillus bulgaricus (LBW); 1:1 mixture of C10 and DRC1; 1:1 mixture of HST and LBW; LF-40 (a mixed culture of different strains of S. lactis, S. diacetylactis, S. Scremoris and Leuconostoc) were examined for their ability to grow in a concentrated, sweetened milk system (18% milk solids and 14% sucrose). On the basis of lactic acid, diacetyl and acetyl methyl carbinol production and pH and curd tension measurements, the LF-40 culture was found to be the most suitable for commercial production of Misti dahi.

Method of consumption: Directly either sweetened or salted and spiced. It is also consumed with other foods such as rice and chapatti. Dahi is taken once or twice a day at morning or evening meals. It is consumed more in summer than in winter. Dahi is consumed by the rich and poor alike. The consumption depends upon availability of the product, individual food habits and locality.

Other applications

- In the Indian system of medicine, dahi has been recommended for dyspepsia, dysentery and other intestinal disorders. It is also believed to improve appetite and vitality.
- Anti-bacterial compounds formed by the fermenting flora, inducing a lower pH in the intestine thus preventing the growth of purgative and other undesirable organisms and increasing digestibility either because of enhanced retention of nutrients or partial
break down of undigestible components are believed to contribute to dahi’s beneficial effect. Inhibition of pathogens in the fermented milk is also due to acid production. The effect of acidity is relatively small compared to specific substances of antibiotic nature formed by the fermenting microorganisms. In addition lactic acid, metabolites such as lactocidin, niscin and acidophiline produced by starter microorganisms during fermentation also exhibit antibacterial properties (Steinkraus, 1996). Singh and Laxminarayan (1973) reported that many lactobacilli exhibited antibacterial action against pathogenic strain of staphylococci and E.coli. They also observed that antibacterial action was a function of pH, the culture filtrate lost antibacterial activity when pH was raised to 5.0 or above.

**Starter**

A good starter for the preparation of dahi should be free from contaminating organisms and have a firm and uniform texture with a glossy surface and sweet aroma. Srinivasan and Banerjee (1946) recommended addition of 2.0-2.5% starter having 1.0-1.2% acidity to obtain good quality dahi. Banerjee (1960) suggested that a mixed culture of Streptococcus lactis, S. thermophilus, and Lactobacillus cremoris be used for preparation of sweet dahi and a mixed culture of S. thermophilus and Lactobacillus bulgarious be used for preparation of dahi of high acidity. Baisya and Bose (1975) found that S. lactis sub sp. diacetylactis imparted desirable flavour to dahi because of higher diacetyl and volatile acid production than S. thermophilus and S. cremoris. However, S.thermophilus inoculated milk showed greater acid production and yielded dahi of superior texture. Dahi obtained by using mixed culture of Streptococcus lactis sub sp. diacetylactis and L. thermophilus was better with respect to acid production, texture and flavour than dahi obtained by using these organisms individually.

**Additives**

Studies to obtain a good quality dahi by addition of the additives viz, gelatin and sodium alginate have revealed that 0.1% sodium alginate can be used successfully to obtain good quality dahi over gelatin (Jogdand et al., 1991).
Probiotic effect of \textit{dahi}

The effects of \textit{Dahi}, the milk fermented using mixed culture of \textit{Leuconostoc citrovorum} and 3 species of \textit{Lactococcus lactis} (\textit{lactis, diacetylactis} and \textit{cremor}) on the specific and non-specific host defense in Swiss mice have been investigated. Animals fed with \textit{Dahi} for 2 days showed 21-fold increase in beta-galactosidase activity of peritoneal macrophages. Similar increases were observed in mice fed \textit{Dahi} for 5 or 8 days. The ingestion of \textit{Dahi} had no effect on beta-glucuronidase activity of macrophages. The mice fed with \textit{Dahi} or milk for 7 days and then challenged with \textit{Shigella dysenteriae} showed viable bacteria in liver and spleen. The colonization of \textit{S. dysenteriae} in liver and spleen was significantly lower in animals fed with \textit{Dahi} than in those fed with skim milk. These results show that \textit{Dahi} activates the non-specific immune system and also protects against enteric infection by \textit{S. dysenteriae} (Singh and Kansal, 2003).

Culture filtrates of 14 natural isolates of lactic acid bacteria from samples of market \textit{dahi} and milk exhibited antimicrobial activity against a few important food borne pathogenic and spoilage bacteria. Among these, 11 cultures were from \textit{dahi} and a higher proportion of these were identified to be the species of \textit{Lactobacillus}. The antimicrobial principles involved are a proteinaceous substance and hydrogen peroxide (Balasubrahmaniyam and Varadaraj, 1994).

The survival rates of \textit{Salmonella typhimurium}, \textit{Yersinia enterocolitica} and \textit{Campylobacter jejuni} in yoghurt and \textit{dahi} stored at 5-7° C or 37° C were determined. Changes in titratable acidity and pH were also measured in these fermented milks. During storage, the lactic acid percent increased from 0.6 to 1.1 in yoghurt and 0.46 to 0.95 in \textit{dahi} after 48 hrs. None of the pathogens survived in \textit{dahi}/yoghurt stored at 37° C for more than 25 hrs. However, a few survivors were still present even after 48 hr storage at 5-7° C (Matt \textit{et al.}, 1991).

Neutralized extracellular culture filtrate obtained from isolates of \textit{Lactobacillus acidophilus}, \textit{Lactobacillus delbruecki} ssp. \textit{bulgaricus}, \textit{Lactobacillus salivarius} and \textit{Lactococcus lactis} ssp. \textit{lactis} from 'dahi' showed weak to moderate inhibition of \textit{Staphylococcus aureus}, \textit{Bacillus cereus}, \textit{Escherichia coli}, \textit{Bacillus brevis}, \textit{B.circulans}, \textit{B.coagulans}, \textit{B.laterosporus}, \textit{B.subtilis} and \textit{Pseudomonas aeruginosa}. 

when tested by the diffusion agar well assay method. The effective minimum quantity of lactic culture filtrates required to obtain complete inhibition of an inoculum of 10^3 cfu/ml of the bacteria tested was between 20 and 26% (vol/vol), as determined by the agar incorporation method. Neutralized extra cellular culture filtrate of these lactic cultures added at a level of 10% in sterile, 10% reconstituted non-fat dry milk was able to either suppress or retard growth of selected bacterial cultures when incubated at 37°C for 24 hrs. This study indicated the antimicrobial activity of dahi and the potential of using neutralized extra cellular culture filtrate of lactic acid bacteria in the bio-preservation of foods (Varadaraj et al., 1993).

**Storage**

During storage, the effect of total solids and culture was found to be significant. Yeasts and molds count also increased tremendously at 48 hrs storage period at room temperature and at 18 days storage period at refrigerated temperature. Storage for 48 hrs at room temperature or 18 days at refrigerated temperature showed the absence of coliform (Dave et al., 1993).

Attempts were made to produce curd by using pure lactic acid cultures and packing it in sterile polyethylene bags. Such curd could be stored at room temperature safely without any spoilage and without development of foul smell for 7 days and with constant acidity of about 1.85% (Bire and Pande, 1983).


2. **Chhurpi**

**Other names, if any:** Durkha, churapi.

**Place of origin/usage:** Arunachal Pradesh.

**Nature of food:** Milk based.
Usual composition/ingredients: Yak milk is preferred for making this cheese although any other fresh milk may be used.

Method of preparation: Milk is churned in a large three-chambered wooden drum called Shoptu made from the trunk of Thuja plant (Thuja occidentalis L.). After pouring of milk in the Shoptu, it is corked tight with a wooden lid known as Dup. Milk in the Shoptu is vigorously stirred with a wooden stirrer known as Kelu until the milk is warmed and curdles. On stirring the milk for 2–3 hours, butter is formed which is kept a side. After extracting the butter, the milk is again stirred continuously until the white cheese is formed. On formation of cheese, which floats on the upper surface of the Shoptu is separated using a piece of cotton cloth or through a large bamboo sieve called Chergang. This process of slow dripping takes up to an hour or more. The Cheese is pressed hard to drain out the remaining water particles and is cut into small pieces and sun dried. The hard sun dried light yellowish product is known as Chhurpi.

Nature of fermentation: Lactic acid fermentation

Microorganism(s) involved: Lactobacillus plantarum, L. curvatus, L. fermentum, L. paracasei subsp. pseudoplantarum, L. alimentarius, L. kefir, L. hilgardii, Enterococcus faecium and Leuconostoc mesenteroides

Nutritional profile of food: Moisture 73.8%, pH 4.2, acidity 0.61%, ash 6.6% DM, fat 11.8% DM, protein 65.3% DM and carbohydrate 16.3% DM; minerals (mg/100g): Ca 44.1, Fe 1.2, Mg 16.7, Mn 0.6 and Zn 25.1

Related/Varied forms of the food:

Soft chhurpi

The soft type is prepared in both hilly and terai areas of Arunachal Pradesh. Soft Chhurpi also called Kachcha Churpi. During its preparation, the cow’s milk is boiled and kept in a wooden vat at room temperature for 24 hrs. The milk is churned in bamboo or wooden vessel (30-45 min) with addition of warm or cold water. The cream layer (butter) is hand separated, and the milk is curdled by boiling. The casein curd is wrapped tightly in a piece of muslin cloth and allowed to drain for 3 to 5 hrs. It is then removed from the cloth, cut into desired pieces, and consumed at soft stage as a condiment (Tamang and Sarkar, 1988). Soft chhurpi is consumed as an excellent source of protein and as a substitute for vegetables. Soft chhurpi is prepared into a curry by cooking it in oil along
with onions, tomato and chilies. The curry is also prepared with edible ferns, locally called ‘sauney ningro’ (*Diplazium polypodiodes*) and ‘kali ningro’ (*Diplazium* sp.). This curry is eaten with rice. It is also used to prepare ‘achar’ or pickle by mixing it with chopped cucumber, radish, chilies, etc (Tamang et al., 2000). Soup prepared from soft *chhurpi* can be consumed as a substitute for dhal along with rice. *Chhurpi* is sold in all local periodical markets by rural women. It is packed in the leaves of fig plant and then tied loosely by straw.

- **Hard Chhurpi**

  Hard *Chhurpi* or *Durkha* is prepared from yak’s milk. The cream is separated from milk by centrifugation, and the skimmed milk is boiled and curdled by adding Fitkiri (Alum) or *Mahi* (buttermilk). After filtration, the casein curd is wrapped tightly with a cloth and cured at room temperature (15–20°C) for 2–3 days under pressure of heavy stones. The cheese is sliced and allowed to dry in shade or over a wood fire oven. This type of *Chhurpi* becomes very hard and having low moisture content, can be stored for a number of years. *Chhurpi* is sweet to taste and chewy. The colour of the *Dhurkha* is white to smoked grey (Karki, 1986). Processing of *Dhaukho* is similar to *Durkha* or *Chhurpi*, but curd is used instead of milk. *Dhaukho* is sourer than *Dhurkha* or *Chhurpi* (Dahal et al., 2005).

  The presence of *chhurpi* in diet is an indicator of social status. According to its age *churpi* is of three types, i.e. *Chhursingba*, *Chhur chirpen* and *Chhurpupu* (Singh et al., 2007a).

- **Chhur singba or Chhur mingba**

  The fresh *chhurpi* is known as *chhur singba* or *chhur mingba*. It is the *paneer* like product made from yak milk after fermentation of milk by adding the extract of crab apple fruits (*thung*) (Singh et al., 2007a).

- **Chhurpupu**

  The *churpi*, which becomes very old (4-5 yrs) is called *chhurpupu*. The *churpi* is kept in yak skin (mongnang) and after sealing can be kept for 3-20 yrs. *Chhurpupu* is more priced and is culturally valuable to Monpa people. Sometimes it is used for curing stomach pain. A small quantity (about 5-10 gm) of *chhurpupu* is taken and mixed with the beverage made of indigenous barley or finger millet and then given to the person
suffering from stomach ache. Some dishes are made of chhurpupu, of which Marchang is quite popular (Singh et al., 2007a).

- **Marchang**

  Chhurpupu is fried in yak ghee to remove the unpleasant odour and then kongpu flour is added to it and mixed properly. This dish is known as marchang. Ghee and chhurpupu is mixed in old seasoned rakshi and is given to cure body ache (Singh et al., 2007a).

- **Paneer**

  Paneer is also a fermented milk product which is soft milk-flavoured cheese and consumed as a fried curry (Tamang, 1998).

**Method of consumption:** Used as a traditional chocolate, mouth freshener and also in preparation of vegetable and non-vegetable dishes.

**Related/Varied forms of food:** The raw butter (Mar) formed during Chhurapi is used in the preparation of traditional Monpa salty butter tea. The clarified butter called, Jimar is used to flavour rice and is also added to vegetable and meat dishes in small amounts.


3. **Chhur chirpen**

**Place of origin/usage:** Arunachal Pradesh.

**Nature of food:** Milk based.

**Usual composition/ingredients:** Yak milk and cut fruits of crab apple (‘Thung’).

**Method of preparation:** The yak milk is boiled and the cut fruits of crab apple (‘Thung’) are added to the lukewarm milk to facilitate the fermentation. After some time, the water is removed and remaining material is placed in cotton cloth and kept for 3-4 days till its turns into creamy yellow in colour. Then, it is pressed with stone to give proper shape and kept on a bamboo mat placed over the fire place in the kitchen. Gradually, the creamy yellow colour of the churpi turns into light yellowish brown in colour.

**Nature of fermentation:** Lactic acid fermentation.

**Whether native fermentation or inoculum is added:** The cut fruits of crab apple are added to the lukewarm milk to facilitate the fermentation.
Method of consumption: Mixture of Chhur chirpen, ghee and dried boiled green chilli (‘solukrepu’) is consumed with any flour and rice.

Reference(s): Singh et al., 2007(a).

4. Churkham
Place of origin/usage: Arunachal Pradesh.
Nature of food: Milk based.
Usual composition/ingredients: Chhurpi and fresh milk.
Method of preparation: Chhurpi is mixed with pieces of old stored Chhurpi and a little fresh milk into a smooth paste, shaped with hands and cut into pieces of desired size. Usually large cakes of this soft cheese are packed in Yak skin and sun dried. Churkham cakes of 5-10 kg size are packed and stored for 2-12 months or more, as taste improves with storage.
Nature of fermentation: Lactic acid fermentation.
Method of consumption: Used as a traditional chocolate, mouth freshener and also in the preparation of vegetable and non-vegetable dishes in the form of paneer.
Reference(s): Tiwari and Mahanta, 2007.

5. Chhu
Place of origin/usage: Sikkim.
Nature of food: Milk based.
Usual composition/ingredients: Yak or cow milk.
Method of preparation: Curd (Shyow) is prepared from boiled or unboiled milk of yak or cow. Shyow is churned in a bamboo or wooden vessel, with addition of warm or cold water to produce ‘maa’ and ‘kachhu’. ‘Kachhu’ is cooked for 15 minutes till a soft, whitish mass is formed. This mass is sieved out and put inside a muslin cloth, which is hung by a string to drain out the remaining whey. The product is called chhu. Chhu is placed in a closed vessel and kept for several days to months to ferment the product.
Microorganism(s) involved: Lactobacillus farciminis, Lactobacillus brevis, Lactobacillus alimentarius and Lactococcus lactis subsp. cremoris.
Method of cooking: It is prepared into a curry by cooking it in maa along with onions, tomato and chilies and is consumed with boiled rice. Soup prepared from strong flavoured
*chhu* is also consumed by the East Sikkim people ‘*Bhutia*’. It has a sour taste with strong aroma and is used as appetizer.

**Nutritional profile of food**: Moisture 75.5%, pH 6.3, acidity 0.15%, ash 1.9% DM, fat 5.8% DM, protein 58.4% DM and carbohydrate 33.9% DM; mineral (mg/100 g): Ca 111, Fe 4.5, Mg 64.3, Mn 3.1 and Zn 87.6

**Reference(s)**: www.sikenvis.nic.in/CCSOTB/vol VIII_Food%20Resources.pdf.

### 6. Philu

**Others names if any**: Philuk

**Place of origin/usage**: Sikkim.

**Nature of food**: Milk based.

**Usual composition/ingredients**: Cow or yak milk.

**Method of preparation**: Fresh milk collected in cylindrical bamboo vessels (locally called ‘*dzydung*’ by the Bhutia) or in wooden vessels (called ‘*yadung*’) is slowly swirled around the walls of these vessels by rotating these vessels for a few minute. Sometimes a thick mesh of dried creeper is kept inside the vessel to increase the surface area for the *philu* to stick. A creamy mass sticks to the walls of the vessels and around the creeper. The milk is then poured off and utilized elsewhere. The vessel is then kept in an upside down position to drain out the remaining liquid. This process is repeated daily for about 6-7 days until a thick, white cream-layer is formed on the vessel walls and the creeper surface. This soft mass as *philu* is scraped off and stored in dry place for later consumption.

**Nature of fermentation**: Lactic Acid Fermentation.

**Microorganism(s) involved**: *Lactobacillus casei* subsp. *casei*, *Lactobacillus bifermentans* and *Enterococcus faecium*.

**Method of consumption**: *Philu* is consumed as a side dish with rice. *Philu* is cooked with butter and little salt is added. Rich gravy is prepared and consumed along with boiled rice.

**Nutritional profile of food**: Moisture 38.2%, pH 4.3, acidity 0.61%, ash 3.6% DM, fat 32% DM, protein 52% DM and carbohydrate 12.5% DM; minerals (mg/100 g) Ca 34.9, Fe 0.8, Mg 16.9, Mn 0.9 and Zn 27.1.

**Reference(s)**: www.sikenvis.nic.in/CCSOTB/volVIII_Food%20Resources.pdf.
The following milk-based fermented are consumed by the people of the Himalayan region (www.sikenvis.nic.in/CCSOTB/volVIII_Food%20Resources.pdf, Savitri and Bhalla, 2007).

Other milk-based fermented foods consumed by the people of the Himalayan region

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<td>Cow/yak milk</td>
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