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| **Indian Dairy Products**  The term Indian Dairy Products refers to those milk products, which originated in undivided India.  FLOW CHART OF CONVERSION OF MILK INTO TRADITIONAL INDIAN DAIRY PRODUCTS  **Milk**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **1.jpg (7460 bytes)** | | | | | | | Cultured | Condensed Acid | | | | Precipitation | | 2.jpg (2015 bytes) | 2.jpg (2015 bytes) | | | | 2.jpg (2015 bytes) | | 1.Shrikhand | 1.Mishti dol | | | | 1.Paneer | | 2.Ghee | 2.Rabri | | | | 2.Sandesh | | 3.Lassi | 3.Kheer | | | | 3.Chhana | | 4.Kadbi | 4.Khoa | | | | 4.Rasgoola | |  | 4.jpg (6782 bytes) | | | | 5.Pantoda | |  | Burfi | Pedha | Kalakand | Gulabjamun | 6.Rasmalai |   **Cultured**  **Srikhand: -** Srikhand is a semi-soft sweetish sour, whole milk product prepared form lactic fermented curd. The basic ingredient of Srikhand is Chakka.  Method of preparation: - the standardized method of preparation consist of fresh, sweet buffalo milk, which has been standardized to 6% fat, is pasteurized at 710C for 10 minutes and then cooled to 28-300C. It is then inoculated @ 1% with lactic culture which is mixed well, and incubated at 28-300C for 15-16 hours. When the curd has set firmly (acidity 0.7-0.8% lactic), it is broken and placed in a muslin cloth bag and removed after 8 to 10 hours. Now the curd gets change into a solid mass called Chakka. This Chakka is then mixed with grinded sugar. Colour and flavour can also be added to obtain the product known as Srikhand.  **Ghee**:- Ghee is a clarified butter fat prepaired from cow or buffalo milk. The largest ghee producing states are U.P, A.P, Punjab, Rajasthan, M.P, Bihar, Hariyana etc. The production of ghee is higher in winter and lower in summer.  Method of preparation: - cream accumulated after few days is usually taken in a suitable vessel and heated and stirred on a low flame to remove the moisture contain. After removing moisture contain further heating is stopped then cooling is done. On cooling, when the residue has settled down the clear fat is decanted into suitable containers.   |  |  |  | | --- | --- | --- | | **Characteristics** | **Cow** | **Buffalo** | | Milk fat | 99 to 99.5% | | | Moisture | Not more than 0.5% | | | Unsaponiable matter |  | | | Carotene (m g./g.) | 3.2-7.4 | - | | Vit. A (I.U./g.) | 19-34 | 17-38 | | Charred casein, salts of copper and iron, etc. | Max.2.8 (Agmark) Traces | |   **Lassi**:**-** Lassi, also called chhas or matha, refers to desi buttermilk, which is the by-product obtained when churning curdled whole milk with crude indigenous devices for the production of desi butter (makkhan). It appears that 50-60kg. (ave.55kg) of lassi are producted for every kg of ghee. Lassi contains appreciable amounts of milk proteins and phospholipids.  **Composition**   |  |  | | --- | --- | | **Characteristics** | **Milk(%)** | | Water | 96.2 | | Total solids | 3.8 | | Fat | 0.8 | | Solids-not-fat | 3.0 | | Protein | 1.3 | | Lactose | 1.2 | | Ash | 0.4 | | Lactic acid | 0.44 |   **Cheese**: - Cheese has a high protein content in a very digestible form, is rich in calcium and phosphorous, and is an excellent source of fat-soluble and water-soluble vitamins. It is concentrated form of energy, contributing 4cal/g and is also a highly suitable food for those suffering from lactose intolerance. Cheese is a bio-enriched food the enrichment being brought about by vitamins and micronutrients being produced as metabolites of the starter bacteria. Although the precise mechanisms are not known, there is sample evidence to suggest that the consumption of cheese at the end of a meal prevents dental caries by reducing the thickness of the film formed on teeth, the degree of abrasion of the chewing surfaces, dental surface defects and caries.  **Condensed**  **Rabri: -** it is prepared concentrated and sweetened product comprising of several layers of clotted cream. The layer of cream formed, as a skin is continuously removed. When the milk is reduced to 1/3 of the original volume, sugar is added and the layer of cream skin is mixed.  **Composition**   |  |  | | --- | --- | | **Characteristics** | **Percentage** | | Moisture | 30 | | Fat | 20 | | Protein | 10 | | Lactose | 17 | | Ash | 3 | | Sugar | 20 |   Method of preparation: - Rabri is normally prepared by heating 3-4kg of milk in a karahi over an fire to simmering temperature (85-900C), and then maintaining the temperature by controlled heating. The milk is neither stirred nor allowed to boil. The surface of the milk may be gently fanned to help the process of skin formation. A piece of this skin, about 3-4cm. square, is continuously broken with a thick wooden stick and moved to the cooler parts of the karahi. This operation requires considerable skill and constant attention. Simultaneously, as slow evaporation reduces the milk to about one-fifth of its original volume, good quality round sugar at 5-6 per cent by weight of the original milk is added to the milk concentrate and dissolved in it. The layers of skin collected on the karahi surface are then immersed in the mixture and the finished product obtained by gently heating the whole mass for another brief period.  **Khoa: -**khoa is a partially dehydrated whole milk product.  Method of preparation: -Milk is cautiously stirred in a circular motion to prevent scorching. When milk becomes viscous the rate of stirring is increased to maintain a uniform consistency. The pan is removed from the fire and the product is worked up with the flattened end of the scraper by alternatively spreading into thin layers and collecting repeatedly until it retains its shape. After cooling it becomes solid. Nearly 36% of the country’s total khoa production takes place in U.P.  **Composition**   |  |  |  | | --- | --- | --- | | **Characteristics** | **Cow** | **Buffalo** | | Moisture | 25.6 | 19.2 | | Fat | 25.7 | 37.1 | | Protein | 19.2 | 17.8 | | Lactose | 25.5 | 22.1 | | Ash | 3.8 | 3.6 | | Iron (ppm) | 103 | 101 |   **Products of Khoa**  **Peda**  Ingredients Khoa (Mawa) 225g. Sugar 75g. Pista (optional) A few pieces Silver paper (optional) 1 leaf Cardamom (optional) A few sticks  Method  Break freshly made khoa (mawa) into bits. Mix (preferably ground) sugar into it. Put into a karahi and cook over a very slow non-smoky fire, stirring all the while with a khunti. Add crushed cardamom if desired. When mixture is ready (mixture forms balls when tested), pour into a tray and leave to cool and set. Peda is now ready. Decorate with sliced pista. Cut into required size and shape to serve.  **Kalakand**  Ingredients Milk 1 kg Sugar 60g. Citric acid 1/2g. Pista (optional) a few pieces Silver paper (optional) 1 leaf Cardamom A few sticks  Method  Boil the specific quantity of milk in a karahi placed over a brisk and non-smoky fire. Stir continuously with a khunti with a circular motion. After 10-15 minutes, add to it the required amount of citric acid as a dilute solution in water. These will partially coagulate the milk. At this time vigorous stirring is required to obtain a product of good quality. When a semi-solid stage is reached, add sugar and stir well. Add crushed cardamom if desired. Remove after five minutes. This finished product is set in a greasy tray or plate and allowed to cool at room temperature. Kalakand is now ready. Decorate, if desired, with silver paper and sliced pista. Cut into required size and shape to serve.  **Gulabjamun**  Ingredients Khoa 300g. Maida 35 g. Baking powder ½ tsp. (teaspoonful) Sugar 1kg. Water 1kg. Ghee 500g.  Method  Break the entire (freshly made) khoa into bits. Mix baking powder into the maida separately. Add this mixture to the broken khoa and mix again. Now start kneading by adding small quantities of water until uniform dough is obtained. While kneading, there should be no oozing of fat. To avoid this, especially in summer, keep the vessel in which the kneading is done upon a tray in which ice or chilled water is kept. The consistency of the dough should be such that when made into small balls it has a smooth uncreaked surface. Meanwhile dissolve all the sugar in water, and boil the solution till a 2-string-consistency-syrup is obtained. During this process, and 4 tablespoonfuls of milk and ladle out the scum to obtain a clear syrup. Keep this in a container so that a minimum depth of about 10-cm of syrup is obtained. Now make the balls and test-fry in sufficient ghee or dalda (vegetable ghee) in a shallow karahi, so as to immerse the balls completely during frying. The balls should be neither over-nor under fired. They should be deep brown in colour. Cut one fried ball into two and examine the inside for porosity. If found satisfactory, then fry the whole lot. If insufficiently porous, add a minute quantity of baking soda solution, sprinkling and mixing it well into the dough, and repeat the process of test frying, etc. if it is too porous and the ball bursts when fried, add small lots of maida instead and repeat the testing process. Remove the balls and put them into syrup immediately, pressing them down in the sugar syrup for some time so that it soaks in. Keep gulabjamun at room temperature for at least 10-12 hours before serving.  **Burfi**  Ingredients Khoa (fresh and hot) 250g. Sugar (crystal) 75g. Chocolate 10g.  Method  Break khoa into bits and spread it in a karahi. Add (preferably crystal) sugar to it and mix well by working vigorously with a wooden ladle. Collect the mixture into a compact mass when all the sugar has dissolved. This is Plain burfi. Now separate one third of the mixture and mix chocolate into it. Take a well-greased plate and spread plain burfi (two-thirds of the mixture) as a thick layer. Apply the chocolate-mixed portion all over it as a thin layer. Allow cooling and setting at room temperature. This is chocolate Burfi. Cut into desired size and shape to serve.  **Kheer: -**Kheer is also known as Basundi. It is used for direct consumption as desert. It is prepared by concentrating milk to half of its original volume by open pan concentration and adding sugar and other condiments.  Method of preparation: - fresh, sweet, cleaned milk standardized to 4.0% fat and vigorously boiled in a jacketed stainless steel pan for 3 to 5 minutes accompanied by constant stirring cum scraping with a khunti. High-grade rice 2.5%of milk, pre-cleaned and washed with cold water before use, is now added. The mixture is gently boiled, with periodical stirring-cum-scraping. When the concentration is about 1:8:1, clean, good quality sugar is added @ 5% of milk. Gentle heating is continued for another 3 to 5 minutes till a final concentration of about 2:1 is obtained. The yield of finished kheer should be about 50% of the milk used.  **Acid precipation**  **Panir: -** Panir refers to the indigenous variety of rennet-coagulated, small-sized, soft cheese.  Composition   |  |  |  | | --- | --- | --- | | **Characteristics** | **Cow (%)** | **Buffalo (%)** | | Moisture | 71.2 | 71.1 | | Fat | 13.5 | 13.1 | | Total solids | 28.8 | 28.9 |   Method of preparation: - Surati Cheese or panir is the best known of the few indigenous varieties of cheese. The name Surati appears to have been derived from the town of Surat.  Technique of production: - Fresh buffalo milk, standardized to 6 per cent fat, is pasteurized by heating it to 780C (1720F) for 20 seconds and promptly cooling it to 350C (950F). about 0.5 to 2 kg of this milk is placed in the coagulating pan and the temperature maintained at 350C (950F) by circulating warm water in the jacket. Good quality lactic starter @0.5 per cent of milk is now added to the milk and thoroughly mixed into it. This is followed by the addition of rennet @6-7ml/100 lit. milk, the rennet being previously diluted with about 20 times its volume of water (The quantity of rennet added should be such as to give a clean cut in the curd at the end of about 60 minutes.) after mixing it adequately, the renneted milk is allowed to set till a firm coagulum fit for basketing is obtained. The temperature during this time is maintained at 350C/950F. The curd is then ladled out with a vertical slant in thin slices, and filled into especially made bamboo/wicker baskets. These baskets are previously prepared by cleaning them with heated water, keeping them soaked in a 10% lukewarm salt solution for about 10 minutes, and then thinly dressed with salt. Each successive layer of curd put into the baskets is uniformly sprinkled with salt. Salting is done @4-5% of the green cheese (which works out to approximately 2% of the milk taken). After they have been filled, the baskets are placed on the draining rack to allow for drainage of whey, which is collected in a tray placed underneath. Generally, at the end of 50 to 60 minutes, the individual pieces of cheese are firm enough to be handled without breaking. At this stage, they are carefully turned upside down in their respective baskets. This is known as the ‘First Turning’. After draining them for a further 30-40 minutes, the cheeses, on attaining the desired firmness and consistency, are subjected to their ‘Second Turning’. The collected whey is then strained through a muslin cloth and kept in the cheese-soaking basin. The pieces of cheese are removed from the baskets and carefully submerged in the whey. They are then left steeped in whey for 12-36 hours till disposed of or used. The yield of surati panir is approximately 28.5% for cow and 34.0% for buffalo milk.  **Chhana: -**  Chhana, also called panir in certain parts of the country, constitutes one of the two chief bases (the other being khoa) for the preparation of indigenous sweetmeats. Chhana refers to the milk-solids obtained by the acid coagulation of boiled hot whole milk and subsequent drainage of whey. The acids commonly used are lactic or citric, in both natural and chemical forms. It should not contain more than 70% moisture, and the milk fat content should not be less than 50.0 per cent of the dry matter.  Composition   |  |  |  | | --- | --- | --- | | **Characteristics** | **Cow (%)** | **Buffalo (%)** | | Moisture | 53.4 | 51.6 | | Fat | 24.8 | 29.6 | | Protein | 17.4 | 14.4 | | Lactose | 2.1 | 2.3 | | Ash | 2.1 | 2.0 |   Method of production: - There are two methods for making chhana, which are adopted by commercial manufacturers.  Batch method: Usually all the milk for chhana-making is brought to boil by heating it directly in a large iron karahi over an open fire, all the while stirring it with a khunti, and later keeping it simmering hot in the karahi. This hot milk is ladled out in batches of 0.5 to 1kg into a separate coagulation vessel, either already containing, or to which is promptly added the required quantity of the coagulant. The latter is normally cleansed sour chhana-whey, which is maintained in a large earthen vessel from day to day. The mixture of milk and whey is stirred with the ladle, and when it has completely coagulated, the contents are poured over a piece of clean muslin cloth stretched over another vessel (for receiving the whey). The process is repeated till all the milk is used up. The cloth containing the coagulated solids is then removed, tied up into a bundle without applying pressure and hung up not only to drain out the whey completely but also to cool the chhana-pat.  Bulk method: All the milk (5-15kg) is brought to boil as above in the karahi, which is then removed from the fire. The coagulant is then added slowly and gradually in the required quantity to the entire lot of milk and stirred with the ladle so that it mixes properly and clear coagulation takes place. The chhana is collected by straining it through a cloth.  **Sandesh**  Ingredients Chhana 250g. Sugar 75g. Flavour (optional) A few drops Cardamom (optional) A few sticks  Method  Break freshly made chhana into bits. Mix (preferably ground) sugar into it. Put the mixture in a karahi and heat on a slow fire stirring all the time with a khunti. (Add crushed cardamom, if desired, towards the end). When the mixture is ready (mixture forms balls when tested) pour it into a tray and leave it to cool and set. Sandesh is now ready. It is cut or moulded into the desired size and shape. (A popular flavour-cum-colour is saffron, which is mixed with the finished product before it is cut or moulded).  **Rossogolla**  Ingredients Chhana (soft) 200g. Maida (optional) 8g. Sugar 250g. Water 1 kg. Elaichidana A few pieces Flavour (Rose) A few drops  Method  Break the above quantity above quantity of chhana into bits and start kneading. There should be no oozing of fat during this operation. To avoid this, especially during summer, keep the vessel in which the kneading is done, upon a tray in which ice or chilled water is kept. If required, a small quantity (as above) of maida may be added to avoid cracks in the finished rossogollas. The consistency of the kneaded mass should be such that when made into small balls, it has a smooth surface without signs of cracks. Meanwhile, dissolve all the sugar in water and boil the solution. During this process, add 2 tablespoonfuls of milk and ladle out the scum to obtain clear syrup. Keep this in a suitable-sized degchi in which the chhana balls are be cooked, such that a minimum depth of 10-15cm. of syrup is obtained.  Now make the balls of chhana. While doing this, one sugarcoated Elaichidana may be put in the centre of each ball. After all the balls (10-15) have been made, put them gently in the boiling sugar syrup for the cooking process. See that the balls do not overcrowd the degchi and that there is enough space for them to move freely, especially after they swell. Close the lid of the vessel. The heating should be so controlled that the balls are constantly covered with foam. Keep a watch form time to time. After 5-10 minutes, the balls will swell. If the chhana has been well made and properly kneaded, the balls will not crack or break. After 5-10 minutes, the colour of the balls will darken slightly. The finished rossogollas should normally be ready after 20-25 minutes. During the last stage, the lid should be removed so that the sugar syrup finally attains 1-string consistency. After cooling, sprinkle flavour (rose) to serve.  **Kulfi: -** Ice cream frozen in small containers. While the milk is boiling, it is sweetened by an addition of sugar and the product is concentrated to approximately 2:1. To this concentrate, when it has cooled, are added malai (indigenous cream), crushed nuts and a flavour (commonly rose or vanilla). The mix is placed in triangular, conical or cylindrical moulds of various capacities made of galvanized iron sheets. The moulds are closed on top by placing a small disc over them. A mixture of ice and salt in the ratio of 1:1.  Source: <http://www.indiaagronet.com/indiaagronet/DAIRY/CONTENTS/Indian%20Dairy1.htm> |  |
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