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Heat desiccated milk products world wide

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Abstract

The Indian subcontinent has been producing heat-dried milk products from the earliest times. This industry is positioned for tremendous growth, thanks to advancements in technology, automated manufacturing equipment, packaging, and storage. These classic heat-desiccated dairy products have been subjected to several efforts to improve the product formulation and create batch, semi-continuous, and continuous processes in an effort to overcome the inherent drawbacks of the current production technique. Process optimization and mechanising the production process of dairy products is very difficult in light of the globalisation of the dairy trade. In the World Approximately 843 million tons of milk is produced per year. Out of this whole production up to 50% is used in the conversion of various milk base products. Desiccated milk is referred to the concentrated milk made by the removal of water content by evaporation. Khoa, is the heat desiccated product. This is the primary base for the manufacturing of different milk base products. Sweets organized from khoa are essentially Gulab jamun, kala jamun, kalakand, burfi etc. some of the heat desiccated products are kheer, Khurchan, kulfi, malai. These are known with different names in different areas. Every product is made of milk by the vary in the process of preparation and the amount of heat used in the preparation of the products. The packaging industry also plays a critical role in extending the shelf life of these items and expanding their market reach. There has been a study of the development and improvements made to the process of heat-dried conventional milk products created in the Indian subcontinent, as well as modern packaging alternatives, and the commercial potential of these items.

Keywords: Heat desiccated milk products, milk sweets, dairy products

Introduction

In the World Approximately 843 million tons of milk is produced per year. Out of this whole production up to 50% is used in the conversion of various milk base products. Desiccated milk is referred to the concentrated milk made by the removal of water content by evaporation. Traditional Indian dairy merchandise can be labelled into six classes primarily based totally on the precept of manufacture (Srinivasan and Ananta Krishnan, 1964; De, 1980; Pal & Raju, 2007):

- Heat desiccated merchandise.
- Heat and acid coagulated merchandise.
- Fermented merchandise.
- Products made with addition of cereals.

The manufacturing of conventional milk merchandise gives particular possibility to the organised dairy zone in India as they have got a large mass attraction and the marketplace for those merchandise some distance exceeds that of western fashion dairy merchandise. The intake of conventional dairy merchandise is developing at an annual increase fee of extra than 20%, however for the western dairy merchandise the increase costs are notably plenty lower (5-10%) (Patil, 2009). While the western dairy merchandise (aside from malted milk and milk chocolates) upload approximately 50% cost to milk, the conventional Indian dairy merchandise upload approximately 200% cost to milk (Aneja, 2007). Further, the uncooked cloth fees of sure Indian conventional dairy merchandise viz. Shri khand, rasogolla, Gulab jamun, khoa-primarily based totally chocolates (peda, burfi, kalakand), sandesh and paneer is 29, 33, 34, 35 and 65% of the promoting price, respectively. For the western dairy merchandise, comparative fees are notably better various from 70-80% (Patil, 2009). Significant headway has already been made withinside the business manufacturing of a few conventional chocolates such as Gulab jamun, peda and burfi. This improvement is no much less than a revolution in the manufacturing and advertising of all time famous conventional milk merchandise that have been either to the one of a kind maintain of conventional sweet

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makers on a mile smaller scale. The marketplace length of ethnic milk merchandise (Table 1) in India on my own is predicted at extra than one thousand billion INR with an annual increase predicted at 50 billion INR (Aggarwal, 2007). The gift paper critiques the warmth.

The manufacturing of conventional milk merchandise gives particular possibility to the organised dairy area as they have got a massive mass enchantment and the marketplace for those merchandise a way exceeds that of western dairy merchandise. The intake of conventional dairy merchandise is developing at an annual increase fee of greater than 20%, however for the western dairy merchandise the increase fees are particularly tons lower (5-10%) [4]. While the western dairy merchandise (apart from malted milk and milk chocolates) upload approximately 50% price to milk, the conventional Indian dairy merchandise upload approximately 200% price to milk [2]. Further, the uncooked fabric prices of positive Indian conventional dairy merchandise viz. shri khand, rasogolla, gulab jamun, khoa-primarily based totally chocolates (peda, burfi, kalakand), sandesh and paneer is 29, 33, 34, 35 and 65% of the promoting price, respectively. For the western dairy merchandise, comparative prices are particularly tons better various from 70-80% [14]. Significant headway has already been made withinside the commercial manufacturing of a few conventional chocolates including gulab jamun, peda and burfi. The market place length of ethnic milk merchandise in India by myself is expected at greater than a thousand billion INR with an annual increase expected at 50 billion INR [26]. This improvement isn't any much less than a revolution withinside the manufacturing and advertising of all time popular conventional milk merchandise that had been hitherto. The vitamins that were lost when fat was removed from milk can be replaced by fortifying reduced-fat milk with vitamins. It has been found that fortifying milk with iron and other micronutrients has improved iron status and reduced anemia among

undernourished children in countries such as India and Mexico.43 (Stekel *et al.*, 1988; Villalpando *et al.*, 2006; Sazawal *et al.*, 2007). Nutritional rickets were eliminated in certain industrialized nations thanks to the widespread fortification of milk with vitamin D. (WHO and FAO, 2006). Long-chain polyunsaturated fatty acid (LC-PUFA)-fortified milk has the potential to boost dietary intake (Givens and Gibbs, 2008; Lopez-Huertas, 2010). It is critical that consumers have access to correct information on dairy products' nutritional compositions, given the broad variety of dairy products available on the market and the wide variability of those compositions.

Nowadays, products like whey protein and probiotic beverages are touted for their supposed health benefits. However, there is little scientific evidence to support these claims for many dairy products to far (Roupas, Williams and Margetts, 2009, and references therein). The dairy sector has a key role to play in distributing health and nutrition information through advertising and labeling. It's possible that industry can help promote health by utilizing this data in conjunction with official government recommendations (Fulponi, 2009). Advertising by the private sector, on the other hand, can reduce the impact of public service announcements. Butter, for example, was found to be more popular in Canada despite rising evidence of the dangers of high blood cholesterol levels, according to a Canadian study (Chang and Kinnucan, 1991). As a result, the regulatory framework is now being changed in several countries to guarantee that consumers receive accurate information and are protected against misleading marketing tactics, as well as to foster innovation in the dairy sector (Roupas, Williams and Margetts, 2009; Falguera, Aliguer and Falguera, 2012). An overview of the wide spectrum of dairy components and products and their effect on human health is provided in this chapter. Accordingly, its findings and conclusions ought to be taken with a grain of salt.

Market size of traditional dairy products

Type of products	End products	Estimated market size
Channa based sweets	Rasogolla, sandesh, pantooa, rasomalai, cham-cham, chhana murki, Rasogolla, sandesh, pantooa, rasomalai, cham-cham, chhana murki, Rasogolla, sandesh, pantooa, rasomalai, cham-cham, chhana murki, rasogolla, chhana murki, cham-cham etc.	260 billion
Khoa based sweets	Kunda, khurchan, basundi, rabdi, peda etc.	260 billion
Paneer	Jilebi, savories etc	20 billion
Fat rich products	Ghee and makkhan	310 billion
Fermented dairy products	Dahi, shrikhand, mattha etc	180 billion

Review of Literature

Heat desiccated dairy products

Heat desiccation is the maximum historic generation used to method the milk and milk merchandise. Scriptures from the early Buddhist and the Jain length have documented chocolates crafted from warmth-desiccated milk such as sihakesara and morandeka. These were used as cakes on the quit of meals. Lord Buddha allowed his fans to take chocolates as a transportable ration for trips on routes in which it became hard to get foodstuffs. In the Maurya Period (268-233 BC), chocolates had been organized from focused milk and honey or jaggery. The publish Gupta length (750-1200 AD) literature additionally describes kinds of milk chocolates (Aneja *et al.*, 2002) Heat desiccated milk merchandise have for that reason been historically produced in Indian sub -continent given that historic times.

Khoa, one of the maximum essential warmth desiccated product, is used as the bottom fabric for a big sort of candy delicacies. Cutting throughout distinctive areas of the Indian sub-continent, a range of warmth desiccated milk confections are popular. These merchandises are primarily based totally on khoa/mawa, which is used as base fabric for chocolates consisting of Gulab jamun, kala jamun, burfi, kalakand, milk cake, peda, rabri, khurchan, basundi, pantua, kunda and lalmohan. Confections like bal mithai, phirni, Kunthalgiri pedha, malaipoori, lal peda, Dharwad peda and thirattupal are region-unique domestically to be had chocolates in distinctive components of India that are desired with the aid of using humans for his or her function flavor and texture.

A most important marketplace for Indian milk-primarily based totally chocolates is growing overseas. The Indian

diaspora gives an thrilling street for globalization of sweetmeats (Rao & Raju, 2003; Patil, 2011). In North America alone, this marketplace is predicted at US \$ 500 million (Aneja, 2007). About 600,000 metric heaps of khoa is produced yearly in Indian sub-continent, using 7% of general milk manufacturing simply in India.

Mona Fatih (2021) To maintain microbiological safety and extend shelf life, the majority of milk eaten by humans is heated. In humans, the effects of heat treatment on milk's structure and physiochemical qualities are unknown. A quick search was conducted to uncover studies that examined the effects of heat treatment of milk on protein and fat digestion and metabolism in the postprandial phase in healthy human adult participants (up to 24 h). Methods: Medical databases (Medline, EMBASE, Cochrane, Scopus) were searched for research on healthy adults that examined the effects of heat-treated milk consumption on the postprandial kinetics or presentation in peripheral circulation or urine of ingested protein and/or lipid. Quality was assessed using the risk-of-bias assessment method 2. Research results: 57 persons aged 20-68 years (n = 57) were included in a total of four trials (n = 511 unique database records, including six study treatments). Pasteurization, ultra-high-temperature (UHT) treatment and oven-heated milk were all studied in three separate trials. In two sets of two experiments, protein and lipid appearances in peripheral blood were described. Because different heat treatments and outcome measures were utilized in each study, the findings cannot be extrapolated to a broader population. There was a decrease in protein appearance (ng/mL or area under the curve) when milk was cooked in an oven for 5 hours (n = 7 participants), while there was a decrease in dietary N retention (n = 25 participants) with UHT milk. The plasma triacylglycerol responses were unchanged, but the plasma fatty acid composition altered, by the reported thermal treatments of milk. For the pasteurized group, there was a significant increase in plasma myristic and palmitic acid abundance at 2 and 4 hours after eating, but other differences were inconclusive. There was a moderate-to-high risk of bias in all of the research, thus those conclusions should be interpreted with caution. Discussion: Few research examined the effects of heat treatment on milk on postprandial nutritional responses in adults, according to this review. Milk heat treatment may influence postprandial protein and lipid

dynamics, although generalizing the data is difficult because treatments, outcomes and techniques varied between investigations. It is also difficult to draw inferences about possible long-term health outcomes because of the study variability and the acute post-prandial character of the investigations. Because of this, it is possible that heat treatment of milk could have an effect on outcomes such as long-term muscle mass preservation, as well as protein retention after a meal.

Traditional approach of khoa manufacturing has been scaled up with the aid of using distinctive semi-non-stop and non-stop machines that are utilized in locations in which the amount of milk is sufficiently big for khoa making. Alternative strategies have additionally been used for khoa manufacturing to help the advanced mechanized processes.

Process of manufacturing and formulations for numerous warmness desiccated conventional milk merchandise have been upgraded and optimized with the aid of using mechanization of conventional processes. Pal (2000) reviewed the technological advances in the manufacture of warmness desiccated conventional Indian milk merchandise. These merchandises are wealthy in vitamins and additionally offer critical calories. Gross composition of a few of the desiccated dairy products are presented in the below table. Cutting throughout extraordinary areas of the Indian sub-continent, some of warmness desiccated milk confections are pretty popular. These merchandises are primarily based totally on khoa/mawa, that is used as base cloth for goodies consisting of gulab jamun, kala jamun, burfi, kalakand, milk cake, peda, rabri, khurchan, basundi, pantua, kunda and lalmohan. Confections like bal mithai, phirni, Kunthalgiri pedha, malai poori, lal peda, Dharwad peda and thirattupal are region-precise domestically to be had goodies in extraordinary components of India that are desired with the aid of using humans for their function flavor and texture. The important marketplace for Indian milk-primarily based totally goodies is growing overseas. The Indian diaspora presents an interesting road for globalization of sweetmeats ^[4, 5]. In North America alone, this marketplace is predicted at US \$ 500 million ^[2]. The export of ethnic goodies from India particularly khoa and chhana based sweets. Gross composition of a few of the desiccated dairy products are presented in the below table.

Gross composition of a few of the desiccated dairy products are presented in the below table

Product	Milk Source	Moisture	Fat	Protein	Lactose	Sucrose	Ash	Reference
Milk Cake	Buffalo	16.8	21.3	11.4	7.7	40.5	2.3	Patil (2002)
Peda	Buffalo	14.4	19.3	15.3	15.2	33.3	2.5	Aneja (2002)
Basundi	Buffalo	52.2	11.4	10.1	11.1	12.5	1.8	Patel & Upadyay (2003a)
Rabri	Buffalo	49.8	15.5	9.5	11.3	12.0	2.0	Gayen & Pal (1991 a)
Kurchan	Buffalo	27.9	23.6	15.4	14.9	15.2	3	Gupta & Rao (1972)
Khoa	Buffalo	32.0	24.2	18.3	22.0	-	3.5	Srinivasan & Anantkrishnan (1964)

Milk Cake

An Indian candy dessert recipe organized from solidified, sweetened milk which is ready for the duration of pageant and spiritual events. an on the spontaneous model of the equal recipe is ready with paneer and condensed milk, however historically it is ready with the aid of using solidifying the milk. Traditional sweetmeats of numerous international locations maintain a outstanding and promising scope of their development and so that you can faucet the capacity of the same, numerous corporations and co-operative federations have began out their prepared production. Milk cake, a heat

desiccated and famous sweetmeat of northern India, is one of the nearby specific, unfamiliarized merchandise of India. The standard sweetmeat is characterised via way of means of caramelized and nutty flavour and granular texture. The reason of this detail became to decide the near dating amongst numerous sensory attributes of the product gathered from famed producers positioned in 4 exclusive towns and to represent an universal proper product. Individuals from academia participated in a spherical desk dialogue to generate descriptive phrases associated with coloration and appearance, flavour and texture.

Kalakand

It is an Indian candy constructed from solidified, sweetened milk known as khoa. It's also referred to as Mishri-mawa, qalaqand. The major components which might be used withinside the practise of kalakand is milk, paneer or chhana, Aspartame. Aspartame changed into used withinside the manufacture of kalakand as opposed to sucrose. Sensory assessment found out that aspartame while used withinside the training of kalakand at a degree of 0.065 % scored the best in phrases of sweetness belief and resembled manipulate. Aspartame sweetened kalakand possessed the equal applicable sweetness, colour, frame and texture/consistency and mouth feel even after 7 days of garage at 6–8 °C. Significant boom in titratable acidity of manipulate in addition to aspartame sweetened kalakand changed into discovered at some point of garage. However, best a mild drop in pH changed into discovered in all samples on garage. The titratable acidity changed into better in aspartame sweetened merchandise than the corresponding samples. Lightness (L^*) changed into much less on top of things samples with sucrose than the aspartame. E. Rao and Goyal^[6] organized kalakand the use of the technique of De^[10] with a moderate change i.e., with the aid of using the use of 0.025% citric acid rather than 0.5%. Buffalo milk standardised to 6 and 9% SNF changed into used. The citric acid answer changed into brought at a later degree while the focused mass began out dropping the aspect of the vessel. Jadhav *et al.*^[8] changed the milk from five to 15% with the aid of using the bottle gourd pulp. The manipulate pattern of kalakand had significantly better sensory ratings for all of the parameters in comparison to the pattern with 10 and 15% bottle gourd pulp. However, manipulate and kalakand with 5% bottle gourd pulp did now no longer range significantly from every different and each had been similar sensorily. So far, no compositional requirements for kalakand were laid down under both withinside the erstwhile Prevention of Food Adulteration (PFA) Act, the modern Food Safety and Standards Rules (FSSR)^[19] or with the aid of using the Bureau of Indian Standards (BIS).

Kheer

Kheer Is a candy dish and a type of wet pudding well-known withinside the Indian subcontinent, typically made thru boiling milk, sugar or jaggery, and rice, despite the fact that rice is on occasion substituted with one of the following: dals, bulgur wheat, millet, tapioca, vermicelli, or candy corn. It is typically flavoured with desiccated coconut, cardamom, raisins, saffron, cashews, pistachios, almonds, or distinct dry give up end result and nuts, and presently pseudo grains are also gaining popularity. It is typically served as a dessert.

Basundhi

Basundhi is an Indian candy frequently in Maharashtra, Gujarat, Andhra Pradesh, Telangana, Tamil Nadu and karnataka. It is a sweetened condensed milk made through boiling milk on low warmth till the milk is decreased through half. The specific beginning of Basundi isn't recognised however it's far said to were organized over numerous centuries withinside the western and southern elements of India. It is served at some point of unique festivities such as weddings and spiritual functions. It is similar to rabri and khurchan that are famous withinside the northern and primary elements of India^[10] Basundi is relatively much less thickened and normally does now no

longer include flaky/layered texture as withinside the case of rabri. It is much like sweetened condensed milk with the exception that it has a pleasing heated flavour and barely brown colour^[11]. Traditionally, basundi is crafted from buffalo milk through progressive boiling ensuing in increasingly pores and skin formation, pores and skin are eliminated and amassed on topside of the karahi and while preferred attention is reached the sugar is brought withinside the ratio of 10:1. Milk is focused approximately -fold and stirred warmth coagulated movie of milk offers preferred normal tender textured flakes which stay uniformly suspended in thickened milk. Cardamom and/or saffron also are brought. Basundi is served chilled, frequently garnished with slices of almonds and pistachios. Different forms of basundi also are organized like Sitaphal (custard apple) basundi, Angoor basundi (basundi with small rasogolla balls), etc. A procedure for business manufacture of basundi has additionally been evolved. As consistent with this procedure, buffalo milk having good warmth stability (terrible alcohol test), standardized to 0.05 Fat/SNF ratio is taken in an open steam jacketed kettle and is preheated to 90 °C for 10 min. Partial attention upto 2-fold is carried out in a batch-kind steam jacketed chrome steel open, wide-mouth pan. Crystalline cane sugar is brought at this stage @ 5.5% (w/w) of milk and attention is sustained as much as 2. fivefold of authentic total solids along with sugar^[11, 12, 84, 85]. Basundi is then transferred warm in containers, cooled to 10 °C and is saved beneath refrigeration (7 ± 2 °C). Homogenization after attention of milk may want to be wonderful for enhancing the viscosity of the product^[86]. Autoclaving for 10 min i.e., post-manufacturing warmth remedy is given to beautify the shelf lifestyles of basundi and that is said to growth the shelf lifestyles as much as forty days while saved at 7 ± 2 °C^[12]. Different strategies of milk attention viz. open pan, beneath vacuum and an aggregate of Reverse Osmosis (RO) and open pan attention were used for basundi manufacture. Except for the significant lower in lactose content material in RO focused product and appreciably better ash content material determined in vacuum focused product, no different most important compositional modifications have been determined due to the technique of attention^[13]. Mechanization of the basundi manufacturing has additionally been said through Patel *et al.*^[14] who evolved Continuous Basundi Making Machine (CBM) based at the precept of TSSHE. The widespread procedure and CBM is electricity green and the first-class of the product is higher compared to standard product as attention of milk takes location at atmospheric stress and sugar dosing develops normal pleasant caramel flavour. Rajshekhar *et al.*^[15] studied the impact of form of SSHE on warmth switch coefficient in basundi making. They used cylindrical, conical and karahi form SSHE. It is said that in case of karahi kind SSHE, the warmth switch place consistent with unit quantity of milk withinside the SSHE is better compared to the opposite forms of the models, which led to growth in warmth switch charge and the charge of evaporation of water from the milk.

Narsobawadi

Narsobawadi Basundi is a version from narsobawadi, Maharastra. It is a sweetened dense milk made via way of means of boiling milk on low warmth till the milk is reduced the region close to Narsobawadi and Sangli is having adequate quantity of milk. The commercial enterprise in Narsobawadi of Basundi has grown towards that. The milk is accrued from farmers and is boiled withinside the kadhai until

it reduces water content material via way of means of half. The milk turns into thick and adjustments shadeation turns into off white. The sugar is delivered to get the flavour and it's far then packed and dispatched to the diverse dairy and milk product facilities for sale. Basundi is a perishable object so wishes to be preserved carefully. This object wishes to be fed on within 2–three days from the date of manufacturing. Heavy Cream can be delivered throughout the boiling technique to hasten the thickening technique. Once reduced, a bit sugar, cardamom, Charoli and/or saffron are delivered. Basundi is preserved nicely after sugar is delivered. Sugar develops a little acidity over a length of time. If it's far immoderate then it could curdle the basundi. Some instances after including sugar one chefs it for a little extra time, this offers a pleasing purple colour to basundi, as sugar is likewise cooked in milk becoming a mild caramel. Before including sugar, basundi is thick however after including it turns into once more fluid. Stirring nicely prevents from Malai being shaped on pinnacle and all guests (even past due comers) can revel in similarly thick and undeniable basundi. Basundi is served chilled.

Rasogolla

Rasgulla, additionally called Rosogolla, Rasgola or Rosogola is a South Asian syrupy dessert famous withinside the Indian subcontinent and areas with South Asian diaspora. It is crafted from ball-fashioned dumplings of chenna (an Indian cottage cheese) and semolina dough, cooked in mild sugar syrup made from sugar. This is carried out till the syrup permeates the dumplings.

Sandesh

Sandesh is a dessert, originating from the Bengal area withinside the jap a part of the Indian subcontinent, created with milk and sugar. Some recipes of Sandesh name for the usage of chhena or paneer in place of milk itself. Sandesh may be made with the usage of chhena or cottage cheese. The handiest sort of sandesh in Bengal is the makha sandesh (makha = kneaded). It is ready through tossing the chhena gently with sugar over low heat. The sandesh is basically hot, sweetened chhana. When fashioned into balls, it's far known as kanchagolla (kancha = raw; golla = ball). For greater complicated and elaborately organized sandesh, the chhana is dried and pressed, flavored with essence of fruits, and every so often even colored, and cooked to many specific degrees of consistencies. Sometimes it's far packed with syrup, combined with coconut or kheer, and molded into a number of shapes inclusive of conch shells, elephants, and fish. Another variation is nolen gurer sandesh, that is made with gur or jaggery. It is also known for its caramel color.

Gulab Jamun

Gulab jamun (additionally spelled gulaab jamun) is a milk stable primarily based totally sweet, originating in India and a sort of mithai famous in india, nepal, pakisthan, the maldives (in which is miles referred to as gulab ki janu) and Bangladesh, in addition to Myanmar. It is likewise declared because the country wide dessert of Pakistan formally through Government of Pakistan. It is likewise not unusualplace in countries with enormous populations of human beings with South Asian heritage, inclusive of Mauritius, Fiji, the Malay Peninsula, Great Britain, South Africa, and the Caribbean nations of Jamaica, Trinidad and Tobago, Guyana, and Suriname. It is made especially from milk solids, historically from khoya, that is milk decreased to the consistency of a

smooth dough. Modern recipes name for dried or powdered milk in preference to khoya. It is frequently garnished with dried nuts inclusive of almonds and cashews to decorate. World gulab jamun day is celebrated on October 10th. Traditional technique of gulab jamun manufacture has been standardized with the aid of using Ghosh *et al.* [16]. In this technique, three hundred grams of dhap kind khoa having 40-50% moisture, one hundred g of flour and three grams of baking powder are mixed, kneaded into uniform dough the use of sufficient quantity of water. Dough is split into small balls, after which deep fried in fit to be eaten oil in an open shallow pan to a golden-brown colour. These fried balls are soaked in sugar syrup (62.5%) maintained at approximately 60o C for two hours till it have become tender and spongy. Recently, Renuka *et al.* used Fructo-Oligosaccharides (FOS) and FOS- Citation: Aggarwal D, Raju PN, Alam T, Sabikhi L, Arora B (2018) Advances in Processing of Heat Desiccated Traditional Dairy Foods of Indian Sub-Continent and Their Marketing Potential. Food Nutr J 3: 172. DOI: 10.29011/2575-7091.100072 eight Volume 3; Issue 03 Food Nutr J, an open get admission to journal ISSN: 2575-7091 sucrose combination over sucrose in gulabjamun syrups that indicated the capability of FOS as a low calorie and more healthy opportunity for sucrose withinside the coaching of gulabjamun. Dietetic stuffed milk khoabased gulabjamun become organized from milk with 3% vegetable oil and eight.5% SNF.

Pantua

Pantua recipe, similar to different recipes of Bengali goodies, is a milk candy dish the usage of clean cottage cheese made the usage of cow`s milk. A very famous style of goodies at a Bengali mishti dokan (Sweet shop), Pantua is a sort of Indian doughnut, hailing from the jap elements of the country. Clean cottage cheese is kneaded right into a dough the usage of a hint of flour, earlier than dividing into balls for deep frying after which dipped in sugar syrup. Unlike the Gulab Jamun recipe, it doesn`t use the flavour of Saffron, however Green Cardamoms or Black Cardamoms. Although it seems strikingly much like the very famous Indian candy dish, Gulab Jamun, its education and flavour massively range from the latter. However, Pantua bears a mile nearer resemblance to every other Bengali candy known as Ledikeni. Much like maximum of the recipes of Bengali goodies, Pantua is likewise made the usage of chenna or clean cottage cheese of cow`s milk. For a Bengali candy recipe, cow`s milk is of the essence. Freshly curdled cheese is hung to put off extra moisture earlier than kneading right into an easy dough the usage of a hint of all-cause flour or maida. Several recipes of pantua name for pretty some of elements like semolina or sooji, khoya or mawa (milk solid) or with coconut.

Rabri

Rabri may be a concentrated, sweet milk product, containing many layers of cream. whereas the milk is slowly evaporated, while not being stirred, at stewing temperature associate exceedingly in a very ancient open shallow pan over an open fire, items of skin that kind on the surface of the milk are unendingly choppy and moved to the cooler elements of the pan. Sugar is additional once the quantity of milk has been significantly reduced, layers of thick cream are immersed within the mixture and therefore the finished product is obtained by heating the entire mass for a brief period. It contains all the milk solids in associate degree close to five-

fold concentration, with further sugar. Consumed directly, it's a high food and nourishing value, with approximately 10% protein, 17% lactose, 3% ash, 20% sugar and 30% wet [19]. The concentration of various elements in rabri varied wide thanks to the initial composition of milk, degree of concentration of milk solids and quantity of sugar additional [10]. A way was standardized for rabri manufacture by Gayen and Pal [17]. One metric weight unit buffalo milk (6t) simmered in a steam jacketed kettle at 90 °C, when three-fold concentrations gave a yield of a hundred g thick cream. Pal *et al.* [18] with success used TSSHE for the big scale production of rabri. It concerned standardization of buffalo milk to 6t, addition of sugar @6% to preheated (85-90 °C) milk and concentrating in TSSHE upto 50% solids, addition of sliced paneer and packaging in hot conditions (80 °C) and at once cooling. Chopde *et al.* [20] optimize the method for in-line production of rabri. They integrated the Scraped Surface device (SSHE) with conelike method Vat (CPV) and optimize the method parameters exploitation response surface methodology. The analysis discovered that rabri of higher sensorial, chromatic attributes can be formed.

Gundpak

Gandpaks are primarily core-based whole dairy products made using recipes. A real combination of core, sugar, gee, fried gee and real Stir and combine floor-dried dates and nuts (Cashew nuts, almonds, coconuts, pistachios) and spices (cinnamon, Cloves, small cardamoms, solid cardamoms with the help of toppings) With fried watermelon seeds and dried grapes. Herbs Powder can be brought in as a non-essential item for development the characteristic taste and healing price of Gandpak. Gandpak is a high-protein, delicious and nutritious candy milk product. Product demand is growing everywhere Use the extra day outdoors with the help of the day. General manufacturing From the Kathmandu Valley Gandpak in the 2010 Marketing Year about 579.1 MT, really good NR. 192.5 million [21, 22]. Gandpak Even with traditional Nepalese special recipes Machining status for mass production Standardized or verified. The Gandpak you purchased depends on the neighbouring market Mainly appearance, texture, composition and food quality. Acharya [23] optimizes the element plane, Gundpak the use of reactive soil methodologies. He said: The top level of the element, i.e., Core, ghee, sugar, chewing gum Premium products were 74.2 (67.64%), 5.0 (4.56%) and 30.0 (27.35%). 0.5 (0.45%) grams each.

Payasam

Payasam is a traditional sweet delicacy in South India. The basic preparation method is to use legumes, or cereals. Cereal products, sago, poppy seeds or pulp (mango, banana) Or jackfruit) milk or coconut milk. Dried fruits and nuts It is added to several varieties such as cardamom, camphor and saffron. Prajeesha and Rao [24] developed bamboo seed technology Kheer Sam. Payasam bamboo seeds are light brown to dark Brown product, dark colour is due to the dark jaggery used in preparation for that. Various ingredients of bamboo seeds, Payasam, in short. Lots of bamboo seeds, water, jaggery, fresh coconut extract Not only the milk, but also the manufacturing process is optimized. Preparation begins with washing, washing and soaking the bamboo Seed and subsequent pressure cooker. The cooked grains were then mixed Uses jaggery syrup, coconut extract and coloured milk. Over all the mixture was then heated and dried to a fluid

consistency. Until a pleasant caramel taste is born. Kheer Sam has a shelf life 12 to 15 days or more at 30 °C and 5 °C.

Market potential

Milk produced in India is clearly seasonal. It is coming Cow and buffalo in equal proportions, smaller Goat contribution. Reflects the growth of milk production India's unique history, industry and political structure Flood operation conducted by the Indian government and the World Bank And it funded the food aid of the European Community. that is Achieving milk self-sufficiency at the beginning of the next century. annual production Raw milk from all sources in India uses 146.3 million tonnes Increased from 20 million tons in 1970, By the end of 2016, 150 million tons [25]. Operation Flood is a system of local dairy cooperatives that buy, process and sell milk. Technical services and infrastructure. Early loan Operation Flood One Dairy products received as aid under the World Food Program. The product is from the European Community and the revenue is From selling relief supplies to building infrastructure Local co-operative. Operation Flood Two has built a system Framework consisting of three layers of cooperative structure Clubs, unions, associations. Operation flood is now in him It is the third stage and consists of 8 million dairy farmers. there Cooperative, government 200 dairy processing plant Private sector receiving 11 million litres of milk daily Operation Flood's dairy market is three-quarters of that total. Daily milk delivery as part of the operational flood Collected from milk sourcing centres in over 60,000 villages to meet consumer demand for drinking milk. This corresponds to 5.5 million of tons or 10 percent of total milk yield. remaining 90% of milk is used on farms and sent to small businesses. sold out to make nearby cities and ghee and other products.

Health benefits

The fermentation is used as a method of value addition and conversion of raw materials by microorganisms and enzymes into various types of products with distinct nutritional and sensory properties. Fermented dairy foods play a pivotal role in human health and nutrition. Hence, fermented milk and milk products have occupied a place of complacency in satisfying the palate and nutritional requirements of human being since the time antiquity. Indian fermented milk products including Dahi, Misti Dahi, Lassi, Srikhand, Chhas (butter milk) and many more are in use from time immemorial. These foods even find mention in our Ayurveda system of medicine for treatment of various ailments specially, gastrointestinal disorders. Traditionally these are prepared by using undefined cultures (inoculation of previous lot product in fresh milk for fermentation). However, advancement in starter culture technology resulted in well-defined lactic ferments with improved health benefits.

Milk is a good source of many essential nutrients, including calcium, protein, and vitamin D. Many people see it as a vital part of a balanced diet. Others, however, cite various reasons for choosing not to consume it.

Sources of milk and milk products include cows, sheep, camels, goats, and many others. Milk alternatives include soy milk, almond milk, flax milk, coconut milk, and hemp milk.

This article will focus on the benefits and risks of drinking cow's milk.

Milk's healthfulness depends on the individual and the type of milk they consume.

Pasteurized milk that is high in protein, low in fat and free

from unnecessary additives can be healthful for many people. On the other hand, some flavored milks contain as much sugar as a can of soda. These are not a healthful choice. Present day cow's milk is not a single product. It can be fresh or long life, fat free, lactose free, fortified with added omega-3s, hormone free, organic, or raw, among other options.

Bone health

Milk can be good for the bones because it provides vitamin D and calcium. In fact, it may help prevent osteoporosis. Learn more about osteoporosis here.

Brain health

Some researchers Trusted Source have found that older adults who consume more dairy products have a higher amount of glutathione, a powerful antioxidant, in the brain.

Those who consumed three daily servings of milk and milk products had antioxidant levels that were approximately 30% higher than those of adults who had less than half a serving per day.

Blood pressure and heart health

A higher potassium intake and a lower sodium intake are important for reducing the risk Trusted Source of cardiovascular disease, according to the AHA.

In 2014, scientists published their findings Trusted Source after looking at the data of more than 90,000 postmenopausal women. Around 25% of the women who consumed the most potassium had a 21% lower risk of any type of stroke and a 27% lower risk of ischemic stroke.

However, the saturated fat in full fat dairy products can increase the risk of atherosclerosis and heart disease. For this reason, people at risk of stroke or cardiovascular disease should opt for skim or low fat milk.

Depression

Adequate vitamin D levels support the production of serotonin, a hormone associated with mood, appetite, and sleep.

The findings Trusted Source of a 2019 meta-analysis indicate that vitamin D supplementation may help people with major depression to manage their symptoms. However, the researchers called for more studies to confirm these findings.

Muscle building and weight loss

Providing about 8 g per cup, milk is a good source of protein, which is necessary for repairing body tissues and preserving or increasing lean muscle mass.

A diet that includes an adequate amount of protein can enhance trusted source wound healing, and it may lead to an increase in muscle mass. It may also promote weight loss, but further studies are needed to confirm this.

People who wish to lose weight should opt for skim or low-fat milk, and they should be mindful of their total daily calorie intake if consuming full fat milk.

Summary

In India, even after drinking organized milk for nearly 30 years Procurement and market intervention as part of an operational flood Program, from an estimated 30% of total production Sold by village producers (after meeting locals) Consumption needs of both producers and non-producers), Only 35% is collected from organized processing and dealers of all the remaining colours. Households and unorganized the

sector (sweet makers and milk vendors) processes about 82% of the total Milk production and rest by organized departments. From all About 50% of milk production is converted to indigenous people Dairy products. India's dairy market is highly valued It is more than Rs. 65,000 chlores. Several organized sectors have begun Production of traditional dairy products (TDP) with commercial dairy products to the extent, this effect is still limited. According to another quote 28% of total production is converted to ghee and another 20% is converted to ghee. Percentage of dairy products such as curd (quark) and khoa (dehydrated) Milk) and various milk candies to extend shelf life ^[26]. the Villagers try to keep the milk fresh before it becomes sour This allows for better recovery of milk solids in the product. It is made. Much of India's milk production is seasonal Almost half of the production comes from seasonal buffalo Calf. Seasonal surplus will be converted to the above products India has a premium. The pattern is similar Pakistan, Bangladesh, Nepal, Sri Lanka.

Conclusion

Heat-desiccated traditional dairy products Ancient and an integral part of diet and culture Heritage of the Indian subcontinent. They are great social, religious, Cultural and economic importance. In addition to saving Milk solids for a long time at room temperature, upgrade hot-dried dairy products, milk and take care of it too A tremendous job opportunity. The core of this category is It is very economically important because it is used in the manufacture of. Various local sweets. Mechanize technology for Core, a lot of research has been done and can be closed TSHE and ISSHE devices have great potential for industrial use. Most heat-dried dairy products are healthy the manufacturing process has been standardized In a mechanized or partially mechanized system. Given India Outstanding position in milk production More and more milk processing in the organized sector, more focused Research and development in the field of machine manufacturing the amount of domestic dairy products is a need for time. Growing Population of diaspora from the Indian subcontinent of the United States and Europe and Canada, the market for these products is expected to grow tremendously in the next few years. Topics such as quality, safety, packaging, shelves, etc. Life, nutrition and health associated with these products Considered in the focus of new R & D.

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