Spoilage and fermented milk products

ASSIGN BUSTER

The sweet prepared just by boiling the colostrum in pressure cooker is called Junnu in Telugu, kadamb paal in Tamil, ginnu in Kannada, Kharvas in Marathi and posu in Konkani. The literature survey has provided us a great support to initiate, continue and complete the project.

Colostrum is the first form of milk produced by mammals in late pregnancy. Bovine colostrum and its components are harmless for human consumption, unless the individuals are allergic to lactose or other components of it. It shows promise in the prevention or treatment of a diversity of disease states (Playford, RJ. et al. 1999).

Milk is a water-based fluid with colloids of fat globules in it. All fat globules are enclosed by a membrane containing proteins and phospholipids separately. Fat-digesting activity of enzymes fails to digest these globules due to the emulsifiers, as these keep the individual globules from binding together into clear fat granules. The milk fat portion of the milk consists of the fat soluble vit A, D, E and K (McGee, Harold. 1984).

The main structures in the liquid portion of the milk are micelles of casein protein: masses of numerous thousand protein molecules, attached with the support of nanometer-scale substances of calcium phosphate. Each micelle formed by casein proteins is approximately spherical. There are four diverse types of casein proteins which make up around 80% of the protein in milk, by weight. Dairy products are being added with probiotics as they will enhance the friendly microbial flora in the human body, so that the immunity can be enhanced. Milk products can serve as a very good medium for transferring the probiotics.

Colostrum vs Milk

The colostrum is highly proteinaceous when compared to normal milk. It is more opaque compared to the milk. Immune functions of colostrum and milk are known through the previous research. Mature milk was shown to contain lesser concentration of antibodies than colostrum, and the source of these immune proteins from serum was confirmed (Orcutt ML, Howe PE. 1922). Cow colostrum has more Ig G and Ig M and less Ig A than human colostrum (Hanson LA. 1961). The host defense proteins in both cow and human milk have many likely practical applications. Bovine colostrum, a raw material for immune milk preparations, can be used to treat or prevent infections of the gastrointestinal tract. Besides providing immune support, colostrum has remarkable muscular-skeletal repair and growth capabilities (F. O. Uruakpa et al. 2002). It is already been explored that the cow milk extracts can be used as usual functional food ingredients and food preservatives (Thomas T. Wheeler et al. 2007).

Spoilage and fermented milk products

Raw milk will turn sour when it is left standing for a while. It is the effect of fermentation by lactic acid bacteria, where bacteria ferment the lactose inside the milk into lactic acid. Continued fermentation may reduce the milk unhygienic to consume. This process of fermentation is subjugated by the introduction of bacterial cultures (e. g. Lactobacilli sp., Streptococcus sp., Leuconostoc sp., etc) to produce a diversity of fermented products of milk. The reduced pH from lactic acid accumulation denatures proteins and caused the milk to undergo a variety of diverse changes in appearance and texture, ranging from an aggregate to smooth consistency. Some of these

products include yoghurt, viili, kumis, sour cream, cheese, kefir and butter milk.

Pasteurization of cow’s milk increases the shelf-life by killing the potential pathogens (J. JANZEN et al. 1982), but finally outcomes in spoilage that makes it inappropriate for intake. This results in attaining a bad odor and the milk is considered non-consumable due to bad taste and an amplified risk of food poisoning. Under suitable conditions, the lactic acid bacteria ferments the raw milk, and coverts the lactose present to lactic acid. The growth of other organisms is prevented or slowed down due to increase in acidity. However, these lactic acid bacteria are mostly destroyed during pasteurization.

Milk can be stored between 10C – 40C in bulk tanks, in order to prevent spoilage. In general, milk is pasteurized by heating slightly and then transported to local markets after keeping them in refrigerated conditions at factory farms for some time. The spoilage of milk can be anticipated by using ultra-high temperature (UHT) treatment so that the treated milk can be stored unrefrigerated for several months until opened. Milk powder is most durable form. It is produced from milk by removing almost all water. The moisture content is usually less than 5% in both spray-dried and drum milk powder (FDA).

X Plant Extract

The plant belongs to family Asclepiadaceae. The extract of X is a rich source of beneficial components that has pharmacological properties and one of the main applications is in controlling bleeding. The crude extract contains many

proteins, which are highly basic in nature and exhibited strong proteolytic activity. The aqueous extract of X plant contains several hydrolytic enzymes (Abraham and Joshi, 1979; Senugupta et al., 1984). The crude extract hydrolyses casein, human Ã¯¬ ¡brinogen and crude Ã¯¬ ¡brin clot in a dose-dependent manner (R. Rajesh et al. 2005). Among all its hydrolytic enzymes, proteases are found to be relatively rich and are possibly accountable for the different medicinal properties showed by the extract. The latex and some other parts of X have been reported to have purgative, anthelmintic and emetic effects in Indian traditional medicine (Kirtikar and Basu, 1935; Jain et al. 1996).

Probiotics

FAO/WHO defined probiotics as " Live microorganisms which when administered in adequate amounts confer a health benefit on the host". Lactobacilli, Streptococcus and bifidobacteria are the three most common types of microorganisms used as probiotics; but certain yeasts and moulds may also be helpful. Probiotics are usually consumed as part of fermented foods with specifically added active live cultures; such as in soy yogurt, yogurt, or as dietary supplements.

Features of Probiotics to develop a functional product

They must be resistant to acid and bile, metabolically active in the GI tract, reduce the colon pH, poses anti-microbial activity towards pathogenic bacteria. They should have anti-mutagenic and anti-carcinogenic properties.

Role of probiotics in Human health

The beneficial effects of probiotics:

- Modulation of intestinal flora
- Benefit lactose intolerance people
- Anti-carcinogenic activity
- Control of serum cholesterol
- Improvement of constipation
- Reduction, prevention or treatment of various diarrhoeal diseases (antibiotic associated, viral, Clostridium difficile associated)
- Modulation of immune system