CHAPTER - 1

Introduction
1.0 INTRODUCTION

In India, the importance of milk and milk products in health and nutrition of human beings is well recognized from Vedic time. About 15 percent of the milk produced in the country is collected by the dairy plants through organized milk procurement systems. Approximately 50 percent (approximately 42 million tones) of India's milk production is utilized for making indigenous milk products valued at Rs.400 billion (Patil & Pal, 2005). It is well established that the conversion of liquid milk into milk products is more profitable than the sale of raw milk. Chhana, among Indian milk products, is the most popular, especially in the eastern part of India. Small quantity of chhana is also produced in Bihar, Uttar Pradesh and other states to cater the local demands. Scattered and small quantity of chhana production makes difficult to have a correct estimate of its production in the country. However, chhana contributes around 4.0 percent of total milk production of India.

Chhana is an acid coagulated indigenous milk product which is very widely used in India as a base material for the preparation of various sweets like sandesh, rasogulla, cham-cham, rasmalai, pantooa, balsahi, etc. The production of chhana is confined to the eastern region of the country. It contains less than 70 percent moisture and approximately 50 percent fat on dry matter basis.

Cham-cham is one of the most popular sweetmeats of Bengal, made from chhana. Slowly, the product is increasing its popularity in other parts of the country. In the traditional custom of West Bengal, a good message to relatives and friends is usually accompanied with good quality of cham-cham also. Quality of cham-cham differ form shop to shop. Some shops are famous for making good quality of cham-cham. In view of increasing demand, high nutritive value and margin of profit in cham-cham, the organized dairy plants in the country are now showing interests in the production and marketing of the product.
At present, cham-cham is prepared by the halwais on cottage scale. Traders sell various qualities of it according to the local demand and the art of preparation, usually at very high prices. Adulteration of cham-cham with starchy materials is a common practice in big cities. The premises used for the preparation and selling are very unhygienic. Consequently, the microbiological and sensory qualities of cham-cham deteriorate very fast. Use of unsanitary methods in its preparation leads to low shelf life and at times passes serious public health hazards. No attempts have been made in past to standardized the technology of cham-cham production suit to various scales of operations. It is obtained after kneading chhana into small cylindrical balls and boiling them in clarified sugar syrup. The method of cham-cham preparation is a secret technique of particular sweet-makers. They neither divulge the recipe composition nor the exact technique of manufacturing to others, under the fear of competition. Thus, in the absence of requisite information, the quality of product varies from shop to shop.

The National commission on Agriculture (1976) had recommended that the production of various indigenous milk products and the sweets derived therefrom should be taken up by the organized dairy plants. The commission also suggested that efforts should be made to standardize the techniques of the products and explore the possibilities of improving their keeping quality and packaging with the minimum expense. It is, therefore, quite pertinent that the technology for cham-cham production is promptly developed. This will help the dairy plants not only to diversify their product mix but encourage the small entrepreneurs to undertake the production of this milk sweet on the scientific and commercial lines also.

A good quality cham-cham is usually prepared from cow milk chhana having soft body and smooth texture with sufficient water holding capacity. To, commercialize the product, there is an urgent need for standardizing being the procedure for preparation of uniform quality of cham-cham that is, too, from buffalo milk, a major proportion of milk production about 60%. Cham-cham manufactured from cow milk chhana has smooth body and spongy texture
due to combined chemical and physical changes taking place in casein micelle during acid coagulation of milk and subsequent heating at relatively higher temperature. The inherent physico-chemical differences of buffalo milk from that of cow milk cause perceptible difference in the quality attributes of chhana and products made therefrom. Buffalo milk chhana is slightly hard in body, coarse and granular in texture and has less water binding capacity.

The cham-cham made from buffalo milk chhana, however, lacks sponginess and smoothness as compared to that made from cow milk chhana, may be due to compositional and structural differences. Presence of higher proportion of long chain structured fatty acid makes the buffalo milk fat distinctly harder. Its casein micelles differ with respect to micelle size, voluminosity, compositional heterogeneity and mineral make-up. All these ultimately lead to differences in the quality of the end product.

On the basis of the above facts, cham-cham to be prepared from buffalo milk needs to be standardized with respect to quality, uniformity, process adoptability and cost effectiveness. Also, buffalo milk and its chhana may require to be modified at certain stages of processing so as to obtain the cham-cham of comparable quality. The limited shelf life of cham-cham, not exceeding a few days at room temperature, is a major constraint in marketing. During storage several changes on physical, chemical, sensory and microbiological characteristics takes place, making it unliking and in extreme cases unfit for human consumption. No literature is available with regard to improving the shelf life of cham-cham under different conditions of packaging and storage.

The paperboard cartons and tree leaves are still continuing as the packaging materials for Indian sweets. The entire world over packaging industry is making rapid growth. New innovations in packaging systems and materials have already been adopted by the other food industries including dairy industry. However, use of modern packaging materials suitable for Indian milk sweets is also in progress. Application of generally safe (Natural
and chemical) preservatives for improving the keeping quality of cham-cham is another area, which needs systematic investigations.

With these points in view, in the present research work, studies on the preparation of cham-cham from buffalo milk has been under-taken with the following objectives:

(i) Existing traditional methods of preparation of cham-cham and its characterization on biological and sensory properties.

(ii) Developing technology to manufacture cham-cham from buffalo milk.

(iii) Maximization of shelf life of cham-cham using suitable packaging materials, preservatives and storage conditions.

(iv) To determine the cost of production of cham-cham.