CHAPTER - I

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After manufacturing Chhana/Paneer and to some extent Cheddar also we find a big product which be called whey.

In a developing country like India per capita availability of 178 gm milk/day should be construed as very low when compared to the recommended nutritional norms (ICMR) of 280 gm/day. These norms established earlier, it may be reiterated were lowered to 250 gm and subsequently to even 220 grams in view of the population spurt but have now been upvalued again to 250 gm/day.

(Dairy India, 1992)

According to data 1994-95 against the target of 80 mt. in the country the production of the milk is about 65.6 Mt. The our population is increasing 2 per cent per annum and we have increase availability of milk from 178 gm/day (1991) to 197.26 gm/day (1994-95).

Global production of whey was estimated to be 85 million tonnes in the year 1984 (Zall, 1984). In India about 70 million litres of whey was produced, out of this about 4.75 million litres of whey was available from organized dairy Sectors (Bambha et. al., 1978).

The Indian Dairy Industry acquired substantial growth during the 8th Plan, achieving an annual output of over 69 million tonnes of milk. India's milk output during the year 2000-2001 was estimated to be 81 million tonnes and is expected to reach the level of 85 million tonnes during 2001-02. This has not only placed the industry first in the world, but also represents sustained growth in the availability of milk and milk products for the burgeoning population of the country. Most important, dairying has become an important secondary source of income for millions of rural families and for millions more, has assumed the most important role in providing employment and income. The per capita availability of the milk has also increased to a level of about 221g/person per day, but this is still very low as compared to developed nations of the world average of 285g/person per day. Government of India is making efforts to increase the productivity of milch animals and thus increase the per capita availability of milk. *

Milk and milk by product due to their nutrient availability are valued at a relatively competitive cost it may be added that these mammary secretion passes almost at the essential nutrients in a balanced ratio and are no doubt helpful to supporting disease free human health.

Whey contains lactose, common minerals and whey proteins (only cheese whey). Half of the milk solids and the entire lactose

Source: w.w.w.nicdotcom.

[2]
of milk, being present in whey. It is a source of commercial lactose. If we do not utilize whey as a human food it would cause a great economy loss and also create problems for its disposals. As the byproduct contains high percentage of organic matter in from of protein, carbohydrate and fat etc. its biological demand is very high. Our being a density populated country that locks essential dairy nutrients, we cannot afford to let dairy byproducts go as waste. In this way we have to lay emphasis on economic utilization of these byproduct in the manufacture of composite food let alone the reduction in test (B.O.D.) load in sewage.

In addition to its soft compositional make-up, these beverages contain a good amount of nutritional and therapeutic attributes which the medical world requires to a very great extent. Even more, the conversion of dairy byproduct in to refreshing beverage minimise the problem of these economic disposal also. Their BOD loads under a tropical environment like ours, the process involves a very high techno economic feasibility.

In our country the common dairy based beverages were mostly utilized in the urban areas which is of non fermenting byproducts. Acidified and fermented based beverage are also taking their place steadily in the country. Mann (1999) has compiled a comprehensive review concerning various beverages like instant milk beverages, alcoholic beverage, chocolate milk beverage, whey beverage and cultured milk beverage. The easiest and economic option of whey utilization is the production of whey
beverages. If whey milk beverages are prepared, the consumers would like it more than the beverages prepared from whole milk due to its low cost, less viscosity and negligible fat content. So I think that its usage as an economically viable product is sure to get popularity in future.

Gandhi (1989), discussed about the utilization of whey in the manufacture of beverages. These beverages include alcoholic and non-alcoholic beverages, high protein beverages with added fruit juice, cultured beverages and sweetened carbonated beverages.

Yalcin (1994) has given the method of Chhana whey utilization, its preparation and its utilisation in several drinks which have potential as well as valuable nutritional source. According to him utilization of Chhena whey in the preparation of fruit juice beverages is as under beverages were made by combining Channa whey (either centrifuged or uncentrifuged) with orange (15.3), pineapple (20%), mango juice (20), sugar (0.37) water and stablizer. Sensory, Chemical and incrobiological analysis of the drink were done. The mango, Chhena whey, whey drink was the most acceptable in tonnes sensory properties and the least acceptable blends was pineapple, 4% of sugar gave optimum sweetness of the juice drink. The concentrated orange juice in corporated into the drink was mostly acceptable. Colour and flavour were optimal of a juice : whey ratio of 0.6%. If fat was separated in beverage prepared from uncentrifuged whey, centrifugation of the whey washed out this problem. and its
assceptability was improved. It was proved by microbiological analysis that drink could be restored at 25°C for \( \leq 1 \) month without refrigeration.

Shaikh, S. et. al., (2001) developed process for the preparation of fermented carbonated whey beverage was found to be highly acceptable with respect to sensory and physico-chemical qualities. The heat and chemical pre-treatment given to whey for clarification also improved physical qualities. The developed fermentation process imparted acceptable lactic acid flavour by hindering unacceptable odour of natural whey. The carbonation of beverage further helped in improving the acceptability. The most acceptable preparation was a sugar level of 12.0%, pineapple flavour of 0.1% and carbonation of 72.48 Kg cm\(^{-1}\), and was approved well by judges.

Though paneer whey was utilised by developing and acidified whey drink with the mixture of equal parts of butter milk by adding sacchromices sp., sugar and colour but these drinks could not be of fruit-ful utilization in the market.

It is very important to mention that packing industry plays a vital role in the preservation and presentation in food market. During summer season thirsty consumers require cold drinks for their refreshment and so the well packed cold drinks are highly acceptable. New type of packaging bearing attractive, innovative attributes has invoked a new thirst to beverage industry for easy dispensation. Media has also given an
awakening liking to the consumers who cherish well-packed and milk based beverage. Investigation were under taken to improve the feasibility of utilizing whey milk for the manufacture of a beverage with lasting characteristics and which may be able to quench the thirst of consumers during summer.

A survey in planned way from time to time was organised to know the acceptability of the consumer about these beverage. Since this drink could be produced from whey it was styled as "whey soft drink".

OBJECTIVES:

With these perspective in mind and with a view to serve better the interest of beverage industry the current investigations were under taken with the basic objectives envisaged as:

1. To standardize the manufacturing process of acidified whey soft drink.
2. To find out the best levels of combination of pH, total solid and sugar level for preparation of acidified whey soft drink.
3. To assess the organoleptic, physio-chemical and microbiological aspects of the acidified whey soft drink.
4. To study the factor that help in enhancing the self life under various storage conditions viz. the room and the refrigeration temp.
5. To produce a product - keeping in view of consumer's overall acceptability in the market.
6. To work out the cost of production of the finished product under different conditions.