CHAPTER - I

INTRODUCTION
A child's entire life is determined, to a great extent, by the quality of food provided in his first five years. Serious dietary deficiencies in this period will damage his health, inhibit his growth, drain his physical strength and possibly rob him of the chance to attain full mental development (Cravioto, 1966).

The need for milk based dietary foods in worldwide child and infant feeding programmes is becoming more and more critical due to inadequate production of milk in developing countries and the declining supplies of non-fat dry milk solids for worldwide distribution. In a country like India, where per capita availability of milk is only
105 grams per day and mostly the only source of animal proteins, it is easy to infer that 80 percent of the population lives below subsistence levels of the protein requirements. In this context conservation of proteins from all sources, and specially from by-products of milk for human nutrition assume a special significance.

The serious and widespread problem of malnutrition during the weaning period and inability of lower income groups to purchase sufficient animal protein foods or high cost special children's foods call for manufacture and marketing of nutritious low cost mixtures based mainly on vegetable proteins with admixture of other proteins wherever appropriate.

Soybeans are capable of producing the greatest amount of protein per unit of land of any major plant or animal source used as food by man. The protein is of good quality, being slightly lower to casein in value, when properly processed. The two attributes make the soybean potentially an excellent food crop for the protein deficient countries of the world.

Soybean has attracted considerable attention from nutritionists, who have tried to substitute vegetable protein for milk protein for infant and children feeding. History reveals that the soybean
always has been an important human food in the diet of ancient China (Smith and Circle, 1972). Considerable amount of work has been reported in the literature on efforts to prepare milk substitutes based on soybean. In recent years efforts have been made on the use of soybean with whey to simulate milk/beverages.

Pollution caused by effluents discharged from dairies and factories associated with the manufacture of milk products, such as cheese, butter, dried milk and milk foods has been a problem for the last 30 years or more (Hemming, 1976). The size of the problem becomes more clear when it is realised that BOD (biological oxygen demand) of whole milk is of the order of 110,000 mg/litre and that of whey in the range of 20,000 to 40,000 mg/litre, depending on the source (compared with 300 mg/litre for domestic sewage).

The milk processing industry has the advantage over other sectors of industry, in that the raw material handled is expensive. It is necessary, therefore, to give attention to the reduction of losses. One of the most significant advances in this direction has been in the economic utilization of whey. Whey is an excellent source of both protein and lactose, but suffers from a high mineral to total solids ratio.

Work on improving the image of whey as human
food has been reported with the objections that a large population group suffers from lactase deficiency (Rosensweig, 1969) and the hypertensive effects of salts in infant diets (Guthrie, 1968) tend to cloud future prospects of extended use of whey in this area. But the literature of past few years on whey utilization, as human food, continues to grow at tremendous speed, reflecting no doubt, to a large extent the technological break-through in whey processing.

1.1. Availability of soybean

Soybean can be made available according to the market needs as the agro-climatic conditions are very much favourable for growing soybean in this country. Research conducted at the G.B. Pant University of Agriculture and Technology, Pantnagar, J.N. Krishi Vishwa Vidyalaya, Jabalpur and in other parts of the country have conclusively shown that soybean can be successfully grown in India (Singh, 1969). Economics of this crop, has also shown beyond any doubt, that soybean is far superior than its competitors like hybrid maize and groundnut, as it ranks first in protein content among pulses and is one of the most important amongst oil seeds. In addition to these merits soybean helps in increasing the fertility of
the soil, being a leguminous crop.

1.2 **Availability of whey**

In India, an estimated amount of 133,000 tons of whey is produced as a by-products of casein, chhana and cheese manufacture. Out of this, approximately 12 percent or 16,000 tons is contributed by the cheese industry.

Methods have been developed to manufacture soy-whey milk using soybean and sweet cheese-whey. Sweet-cheese-whey used by different workers was obtained from cow milk. Since organized dairy sector in India primarily handles buffalo milk, the utilization of buffalo milk Cheddar cheese whey was considered to be of much economic significance. Very little, if any, work has been carried out in this country on the utilization of buffalo-milk cheese whey.

Present study was, therefore, undertaken with a view to explore the possibility of utilizing soybean (a rich source of vegetable protein and fat) in combination with whey (a cheese industry waste by-product), for manufacturing a weaning food, which could be used from the weaning stage onwards as a good milk-substitute for children. This blend of soybean and whey was considered to be worth studying,
as whey contains almost half of the total-solids of the milk, supplying whey proteins, lactose, minerals and water soluble vitamins.

Moreover, the nutritional value coupled with the strict legislation on water pollution are valid reasons for the utilization of whey for manufacturing quality products. Preparing weaning-food from soybean-whey blend (of high protein value) is desirable both from economic and nutritional points of view.