

# DAIRY PRODUCTS

## A. Introduction

Recent study shows that India is the largest producer of milk in the world which is nearly 10% of the world production. Various milk-based products which can be manufactured commercially in a rural industry are Paneer (Cheese), Dhahi (Curd), Ghee etc. These products can be manufactured by low cost traditional methods and machineries. This kind of industries can be located in area where abundance quantity of milk is available. The cost of these products would be considerably low compared to those of big companies. A good number of employment generations is possible with low investment.

## B. Market Potential

Milk and its products are the essential item of daily life in our country especially majority of Indians are vegetarian and thus milk and milk products are indispensable to Indians. The per capita consumption was 122 gms. Per day in 1979 against an availability of 281 gms. Today per capita consumption as well as production quantity has increased and there is a need to make available milk and milk products to the people at reasonable price which can be attained only by setting small scale model dairy units in different milk producing areas to cater to the local needs. There is a challenge of multi-national companies paying major role in this industry. So it would be better for rural industries to produce milk products with a traditional tinge.

Rural industries can market their dairy products through Co- operative marketing channels. So that their product will no way get compared with that of large industries

## C. Manufacturing Process

**Paneer (Cheese)** – There are different types of Cheese produced commercially, but the process given below is of Cheddar cheese made from buffalo milk. The raw buffalo milk should be preferably fresh and bacteriologic ally sound. The standardized milk is pasteurized at 71° C for 5 minutes and subsequently cooled to 10°C. The pasteurized milk is inoculated with suitable culture of desired quantity and milk is then held at 8-10°C for about 12 hours. The milk is then transferred to sterilized cheese vats for further processing where the temperature is raised to 34-35° C by circulating hot water in the jacket. A 40 per cent solution of Calcium chloride is added @ 15 ml. per hundred liters of milk, which is followed by the addition of starter culture @ 1.5-2 per cent of the milk allowed to ripen until its acidity comes to 0.19-0.2 percent. Hensor's powdered rennet is used @2.5-3 gms.for hundred liters of milk. The renneted milk is allowed to set till the curd attains consistency similar to that required for cheddar cheese making. It is then cut into cubes, which is left undisturbed for five minutes. The curd is then cooked gradually to raise its temperature to 39° C and kept at this temperature for 10 minutes with constant stirring. The temperature of the content of the vat is raised another 10 minutes, which is then lowered to 34-35° C by circulation of cold water.

The cooked curd particles are gathered at the end of the vat and allowed to settle down at the bottom of the vat. The vat is then covered with lid and its content left undisturbed for 8-10 hours, until the acidity of whey increases to 0.4-0.45 per cent, while temperature is maintained 34-36° C. The whey is drained off and curd block is then stripped into long pieces and passed

through milling machine to get small cubes of desired size. The sliced curd is uniformly spread in vat and washed with hot water for 4-5 minutes taking care that the curd cubes should not float in water. The hot water is drained; washed curd is filled in hoops of 35 x 28x 10 cms. Size and then pressed. The block of cheese is then obtained, smeared with salt mash and left in the cold Storage (5-10° C and 90 per cent relative humidity) for 48 hours. The block is turned once and smeared with salt as before at the end of 24 hours. After salt simmering and initial drying for 48 hours the cheese is immersed in 18 per cent brine solution prepared by mixing pasteurized whey and water in the proportion of 2:1 and calculated amount of salt. It is allowed to continue for 12-15 hours in humidity controlled Room at 15-16° C and 10 percent R.H. During this process the upper surface of floating block cheese is sprinkled with dry salt on alternate days. The cheese blocks are then removed and left to dry at the same temperature for 2-3 weeks. Subsequently these are washed with water at 50° C, dried, Para finned and kept in cold storage for another 4-5 weeks for further ripening. Total time for ripening is about 8-9 weeks.

**Dhahi (Curd)** – The raw milk is taken in a well-cleaned vessel and the milk is boiled for about 5 minutes and cooled down to lukewarm temperature of about 45°C and then inoculated with pure Curd culture (1 teaspoonful per litre). Mix the whole content very well and distribute it in small containers of desired size earthen pots. Keep the whole lots or small containers at a warm place at temperature ranging 42-50°C. When it gets completely curded remove it from warm place, which will generally take 3½-4 hours. The temperature should not be kept below 40°C, otherwise no firm curd will be obtained. Once the curd is set, transfer it to a cool place, preferably a refrigerator. It is now ready for consumption.

**Ghee & Butter Milk** – The curd thus prepared is put in churner cum agitator vessel along with pure bacteria free potable water in ratio 1:4. Churn the mixture continuously for 40 minutes and skim out the cream comes up on the top. This cream is boiled to remove the water content and the product is ready for consumption.

Add salt and spice extracts of ginger, chilly, curry leaves to the remaining part to get buttermilk.

#### D. FINANCIAL ASPECT

##### 1) Fixed Capital Investment

##### Land & Building - Own

##### Machinery and Equipment

Sl.No.	Description	Qty.(Nos.)	Rate (Rsin lakhs.)	Total (Rs.in lakhs.)
1	Milk Can	5	1,000/-	5,000/-
2	Vats	2	5,000/-	10,000/-
3	Kettle (SS)	1	7,000/-	7,000/-
4	Churner	1	10,000/-	10,000/-
<b>Total...</b>				<b>32,000/-</b>

**Fixed Capital Investment = 32,000/-**

**(ii) Working Capital (per month)**

(a) Raw material (per month)	Amount (Rs.)
1. Milk 2,500 litres @ Rs.8.00/litre	20,000/-
2. Enzymes, starters & flavors etc. L.S.	1,000/-
3. Packaging materials L.S.	1,000/-
<b>Total....</b>	<b>22,000/-</b>

(b) Wages (per month): Skilled Worker 1 No. Rs. 2,000/- p.m.

(c) Utilities (per month)  
(Power, Water, Fuel) Rs. 500/- p.m.

**Working Capital (per month) (a +b +c) = 24,500/-**

**iii) Total Capital Investment**

Fixed Capital	32,000/-
Working Capital (1 month)	24,500/-
<b>Total...</b>	<b>56,500/-</b>

**iv) Cost of Production (per annum)**

Total recurring Expenses	2,94,000/-
Depreciation of machinery @ 10%	3,200/-
Interest on Capital Investment @ 10%	5,650/-
<b>Total...</b>	<b>3,02,850/-</b>

**v) Sales (per annum)**

Paneer (Cheese) 800 Kgs @ Rs.80 /- p.kg.	64,000/-
Dhahi (Curd) 9,000 kgs. @ Rs.15/- p.kg.	1,35,000/-
Ghee 150 kgs. @ Rs.120/- p.kg.	18,000/-
Butter Milk 20,000 ltrs. @ Rs.6/- p.ltr.	1,20,000/-
<b>Total....</b>	<b>3,37,000/-</b>

**vi) Profit per annum**

Total Sales – Cost of Production = 34,150/-  
(3,37,000 - 3,02,850)

Less: 10% Sales Commission = 3,415/-  
30,735/-

