

PROCESSING OF PANEER



INDIAN INSTITUTE OF FOOD PROCESSING TECHNOLOGY

Ministry of Food Processing Industries, Govt. of India,

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Introduction

Milk plays a significant role as a source of animal protein in the average Indian diet which is predominantly vegetarian.

Because of higher ambient temperatures prevailing in Indian sub-continent, ancient Indians developed more stable products from milk for conservation of its nutritional goodness.

So the ethnic dairy foods, commonly termed as traditional or Indian indigenous milk products, were developed over ages utilizing locally available equipment, utensils and manufacturing procedures.



Traditional Indian Dairy Products



Production of Milk and traditional dairy products

In India only 5-6% of total milk is converted into western type of products in the organized sector.

Nearly half of the milk produced in India (50-55%) is utilized for the manufacture of traditional milk products and approximately 45.7% is used as fluid milk.

Only about 20% of the total milk produced is processed by the organized dairy sector.

Conversion of surplus milk into indigenous milk products in and around production areas is least expensive and more profitable.

A large proportion of the milk is converted into indigenous dairy products such as khoa, chhana, paneer and khoa and chhana based sweets.

Total Production in India: 176 Million Tonnes (2017)

Total percapita availability: 375 g/day



Traditional Indian Dairy Products

Strengths:

- Traditional dairy products enjoy mass appeal.
- Simple manufacturing technologies which are well established for small-scale operations.
- Skilled manpower for cottage scale operations available.
- Lower cost of production and high profit margins.
- Markets are well established
- Easily available markets for sale
- Utilization of surplus milk.

Strengths:

- Traditional dairy products require low infrastructure, equipment and operational overhead costs
- An optimistic demand profile - consumption likely to grow at an annual rate more than 20%
- Permit significant value addition, unparalleled by other dairy products
- Utilization of slightly high acid milk
- Use of low energy
- Approximate for small scale sector

Opportunities:

- ❑ Traditional dairy product sector offers vast scope for innovation, value addition and product diversification.
- ❑ Burgeoning consumer base and greater demand due to higher purchasing power of the newly emerging middle class
- ❑ Greater access to global market under WTO regimen
- ❑ Export potential to the ethnic markets
- ❑ Opportunities exist for financing and establishing modern small scale units to encourage restructuring of unorganized sector.



Classification of Traditional dairy Products

☐ Concentrated / partially desiccated products

i) Khoa ii) Rabri iii) Basundi

☐ Heat and acid coagulated products

i) Paneer ii) Chhana

☐ Fermented products

i) Dahi ii) Misti dahi iii) Chakka iv) Shrikhand v) Shrikhand wadi

☐ Fat rich products

i) Ghee ii) Makkhan (desi butter) iii) Malai

☐ Frozen products

i) Kulfi ii) Malai – ka – baraf iii) Milk – ice

☐ Cereal based puddings

i) Kheer ii) Payasam

☐ Indian milk confections

Khoa based sweets

☐ i) Gulabjamun ii) Burfi iii) Kalakand iv) Milk cake etc

Channa based sweets

i) Rasogolla ii) Rasomalai iii) Sandesh etc.

☐ Refreshing beverages

i) Lassi ii) Chhachh iii) Raabadi



Paneer

Paneer is a heat-acid coagulated milk product obtained by coagulating standardized milk with the permitted acids at specified temperature.

The resultant coagulum is filtered and pressed to get the sliceable curd mass.

Paneer has a firm, close, cohesive and spongy body and smooth texture. It is mainly prepared from buffalo milk and used for large number of culinary dishes.

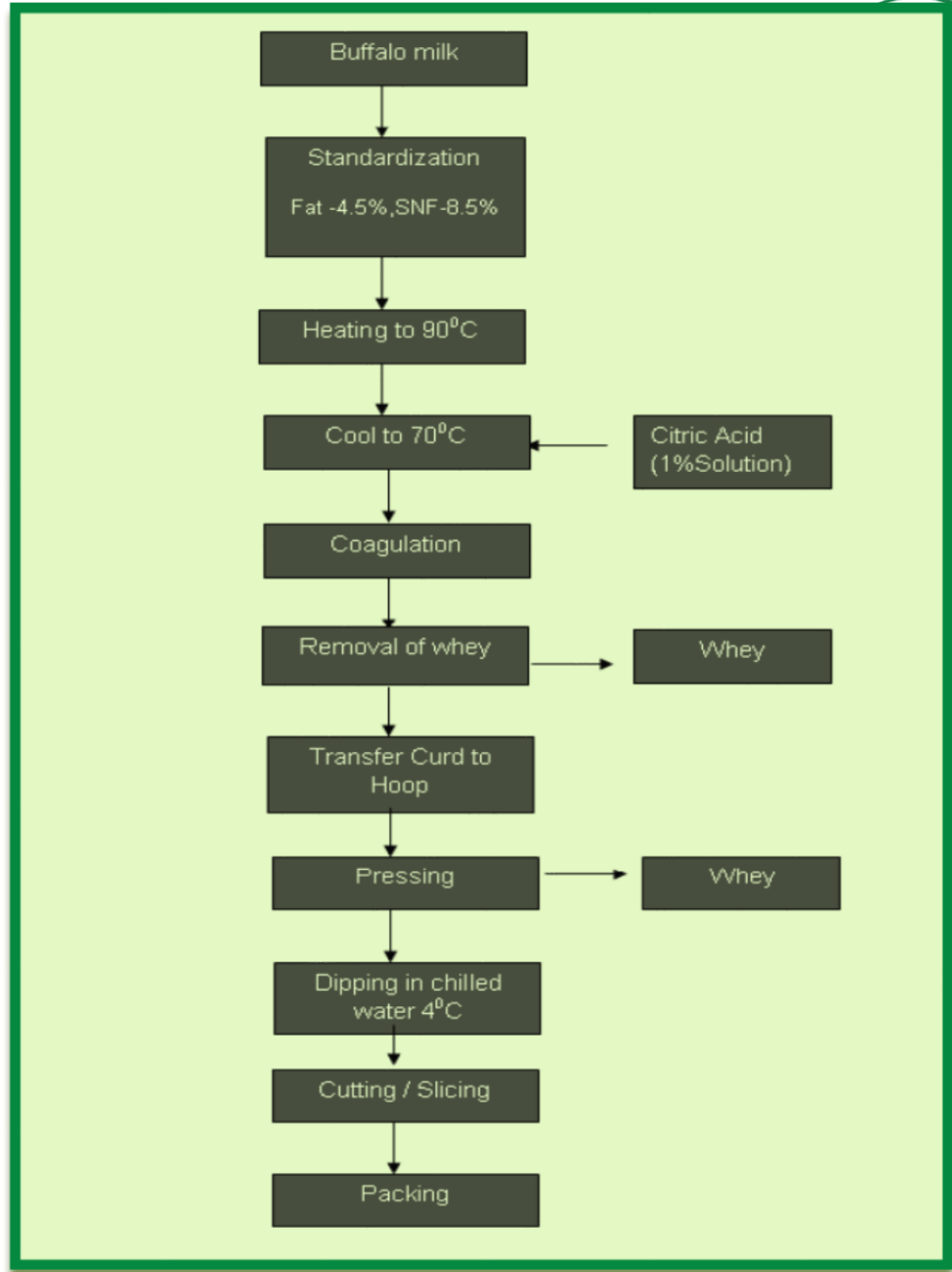
Though originally it was localized in Northern part of India but now it is preferred almost all parts of the country.

Paneer is generally sold as blocks or slices, it is also referred as Indian fresh cheese.

It is reported that about 5% of the milk produced in India is converted into *paneer* and *paneer* production is growing annually at the rate of 13%.



Flowchart depicting industrial method of *Paneer* manufacturing



Nutrition facts



Delays
the signs of
ageing

Makes your
skin glow

Improves
digestion and
aids weight
loss

Strengthens
bones and
teeth

Beneficial
for pregnant
women

May help
improve
vision

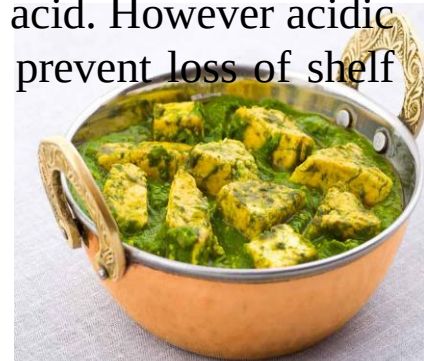


Nutrients present in 100g of Paneer

Amount per 100g	
Energy, kcal	296
Total FAT, g	22
Saturated FAT, g	14
Carbohydrate, g	4.5
Added Sugar, g	0
Protein, g	20
Calcium, mg	480



- ❖ **Type of milk** - *Paneer* prepared from buffalo milk possess desirable frying properties, body and texture as compared to cow milk. The cow milk *paneer* is soft, weak and fragile and during cooking it tends to disintegrate. However, cow milk and buffalo milk mixed in equal quantity yields better product than cow milk. *Paneer* made from skim milk has chewy and rubbery texture and hard body.
- ❖ **Quality of milk** - Milk must be fresh and free from off flavour. Growth of psychrotrophic organisms should be minimized to restrict the off-flavour development. Acidic milk having a titratable acidity of more than 0.20% lactic acid yields a product of inferior quality.
- ❖ **Type, Strength and Temperature of Coagulant** - Citric acid is generally used as a coagulant. Lemon or lime juice or vinegar imparts a typical flavour to the product. 1% solution of citric acid yields good quality of *paneer*. Sufficient acid is added gently but quickly blended with the milk (within one min) to reach optimum pH of coagulation. Normally 1.8 to 2.0 kg citric acid is required for coagulating 1000 L of milk. High acid concentration imparts acidic flavour, hardness and causes greater solids loss. Whey cultured with *Lactobacillus acidophilus* at a level of 2% and incubated overnight at 37°C can be used as a substitute for citric acid. However acidic whey must be heat treated to destroy these lactic organisms before use to prevent loss of shelf life of *paneer*.
- ❖ **Heat treatment of milk** – 90 °C without holding or 82 °C for 5min
- ❖ **pH of coagulation** – 5.2



Paneer in Buffalo Milk Vs Cow Milk

Cow milk yields an inferior product in terms of body and texture. It is criticized to be too soft, weak and fragile and unsuitable for frying and cooking.

Buffalo milk contains considerably higher level of casein and minerals particularly calcium and phosphorous, which tends to produce hard and rubbery body while cow milk produces soft and mellow characteristics.

By replacing one third of buffalo milk with cow milk, a good quality *paneer* can be made.

Buffalo milk *paneer* retains higher fat, protein and ash content and lactose as compared to cow milk *paneer*.

By replacing one third of buffalo milk with cow milk, a good quality *paneer* can be made.

To make *paneer* exclusively from cow milk, modifications to be made like Addition of calcium chloride at the rate of 0.08 to 0.1% to milk helps in getting a compact, sliceable, firm and cohesive body and closely knit texture.

A higher temperature of coagulation (85°-90°C) with coagulation of milk at pH 5.20 to 5.25 helps in producing good quality *paneer* from cow milk.

However, at this pH of coagulation, moisture, yield and solids recovery are less.

Equipments in Paneer Manufacturing

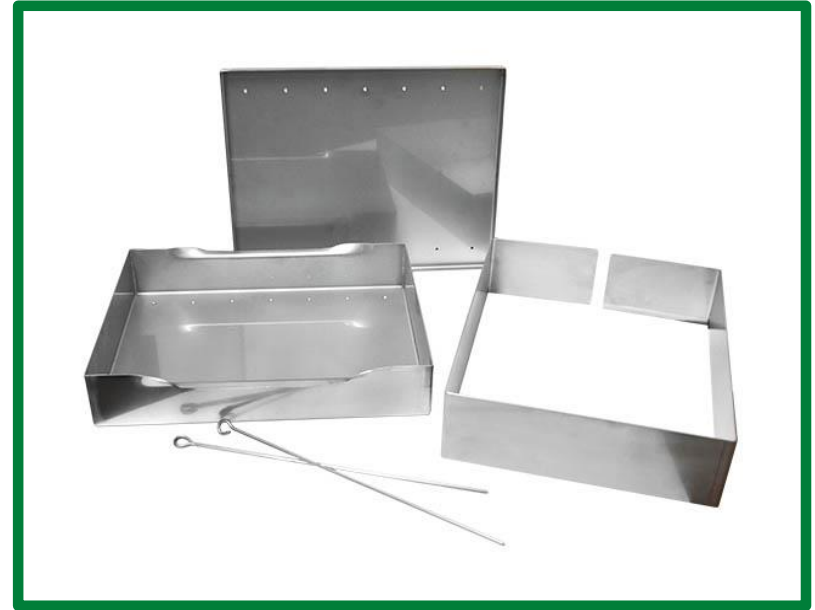
- ☐ Paneer Vat
- ☐ Paneer hoops
- ☐ Paneer Press
- ☐ Chill water tank
- ☐ Whey storage tank
- ☐ Paneer slicer / cutter
- ☐ Vacuum packaging machine



1. Paneer vat



2. Paneer Hoops



3. Paneer Press



Machine Operated



Hand Operated



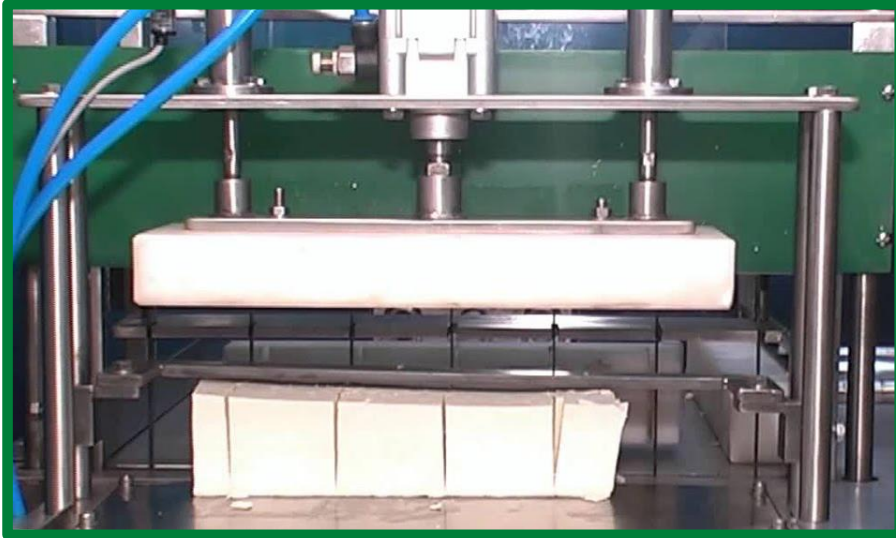
4. Chilling tank for Paneer blocks



5. Whey storage tank



6. Paneer Slicer / Cutter



Paneer Blocks



Paneer Cubes



7. Paneer Packaging Machine



Ink jet Printer – Batch code and Manufacturing date



Vacuum Packaging Machine



FSSAI

2.1.5: CHHANA OR PANEER

1. Chhana or paneer means the product obtained from the cow or buffalo milk or a combination thereof by precipitation with sour milk, lactic acid or citric acid. It shall not contain more than 70.0 per cent moisture and the milk fat content shall not be less than 50.0 per cent of the dry matter.

Milk solids may also be used in preparation of this product.

Provided that paneer or chhana when sold as low fat paneer or chhana, it shall conform to the following requirements:—

(i) Moisture

Not more than 70.0 percent

(ii) Milk fat

Not more than 15.0 percent of dry matter:

Provided further that such low fat paneer/chhana shall be sold in sealed package only and shall bear proper label declaration as provided in regulation 2.4.5 (39) of Food Safety and Standards (Packaging and Labeling) Regulations, 2011.



PM FME Scheme



M F P I

AATMANIRBHAR BHARAT

PM Formalisation of Micro Food Processing Enterprises Scheme (PM FME Scheme)



“A combined resolve of 130 crore citizens is to make India self-reliant. The way ahead lies in LOCAL- Local Manufacturing, Local Markets, Local Supply Chain. Local is not merely a need but a responsibility”

Narendra Modi, Prime Minister

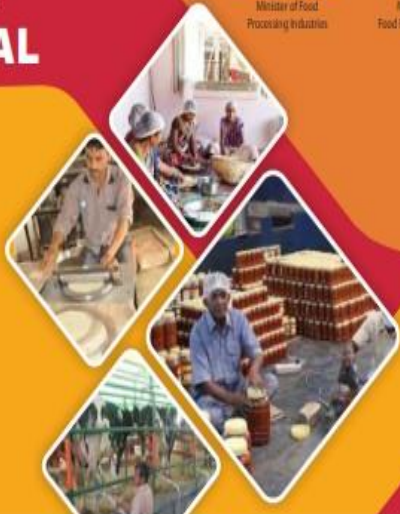
**Opening gates for growth
of Micro Enterprises in Food Industry**




Harsimrat Kaur Bhatli
Minister of Food Processing Industries

Ramswar Teli
Minister of State,
Food Processing Industries

**VOCAL
FOR
LOCAL**



For the details regarding the PM FME scheme, scheme guidelines, various food processing demonstration videos and DPRs, please visit our weblinks:

<https://mofpi.nic.in/pmfme/> and <http://www.iifpt.edu.in/ab-pmfme.php>



Thank You All!