

KHOA PROCESSING



AATMANIRBHAR BHARAT

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

INTRODUCTION

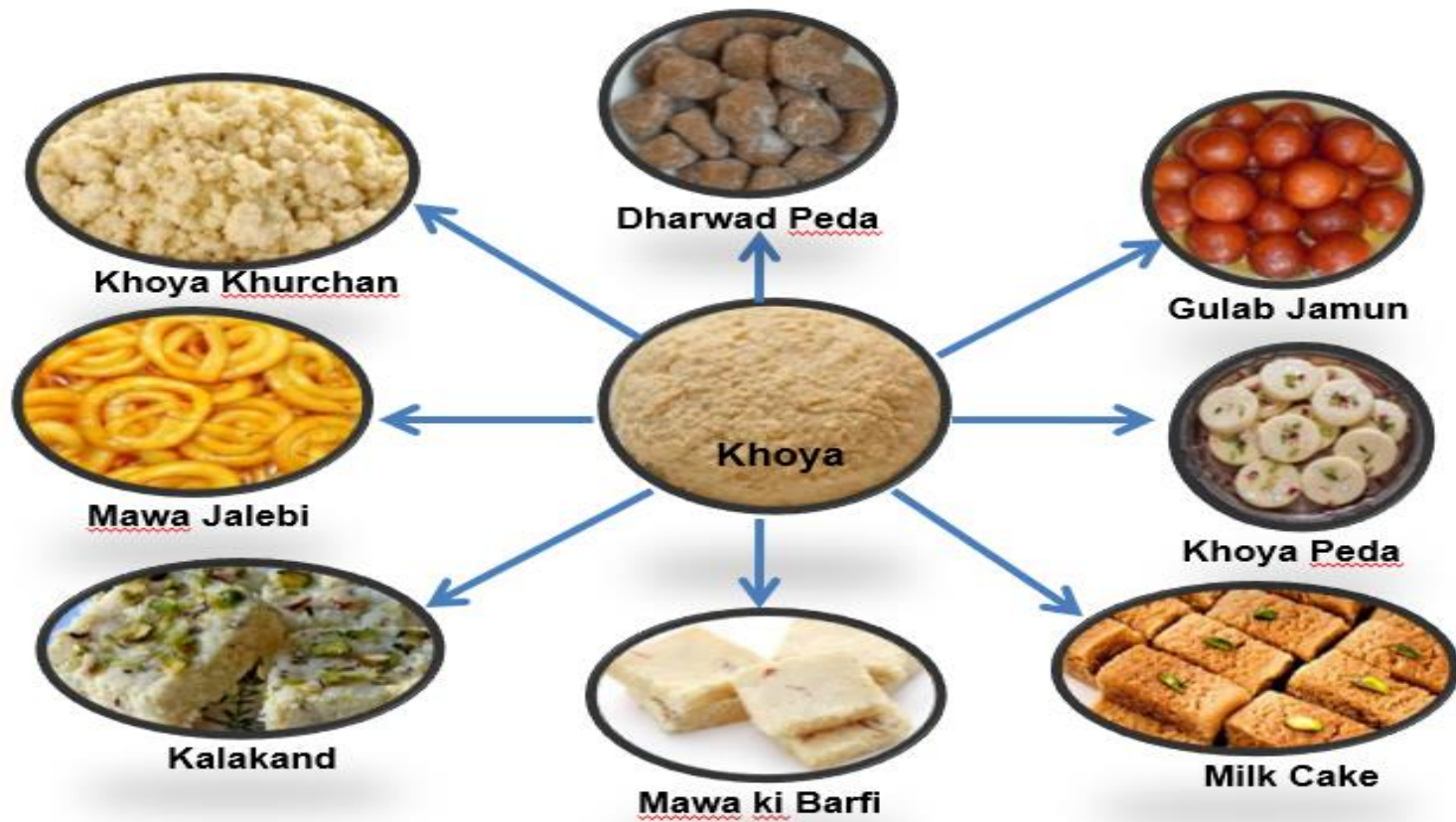
- Indian traditional sweetmeats (sweets / mithai) are very popular in our country and worldwide.
- Around 50% milk produced in India is converted to traditional Indian dairy products.
- Mostly, khoa and channa are used for the preparation of sweets.
- Khoa based sweets are product, burfi, kalakand, milk cake etc.
- Khoa is also used in the preparation of Gulab jamun, Gajar (carrot) halwa, Kheer, Paysam etc.

INTRODUCTION

- As per Food Safety and Standards Regulations (FSSR), 2011 Khoa by whatever name it is sold such as Khoa or Mawa or any other region-specific popular name means the product obtained by partial removal of water from any variant of milk with or without added milk solids by heating under controlled conditions.
- Khoa is a heat desiccated products and is the base material for most of the sweets prepared by halwai



PRODUCTS MADE FROM KHOA



TYPES OF KHOA



Dhap

Suitable for burfi, peda
Total solid varies from 56 to 63%



Pindi

Suitable for Gulabjamun, pantua
Total solid varies from 67 to 69%



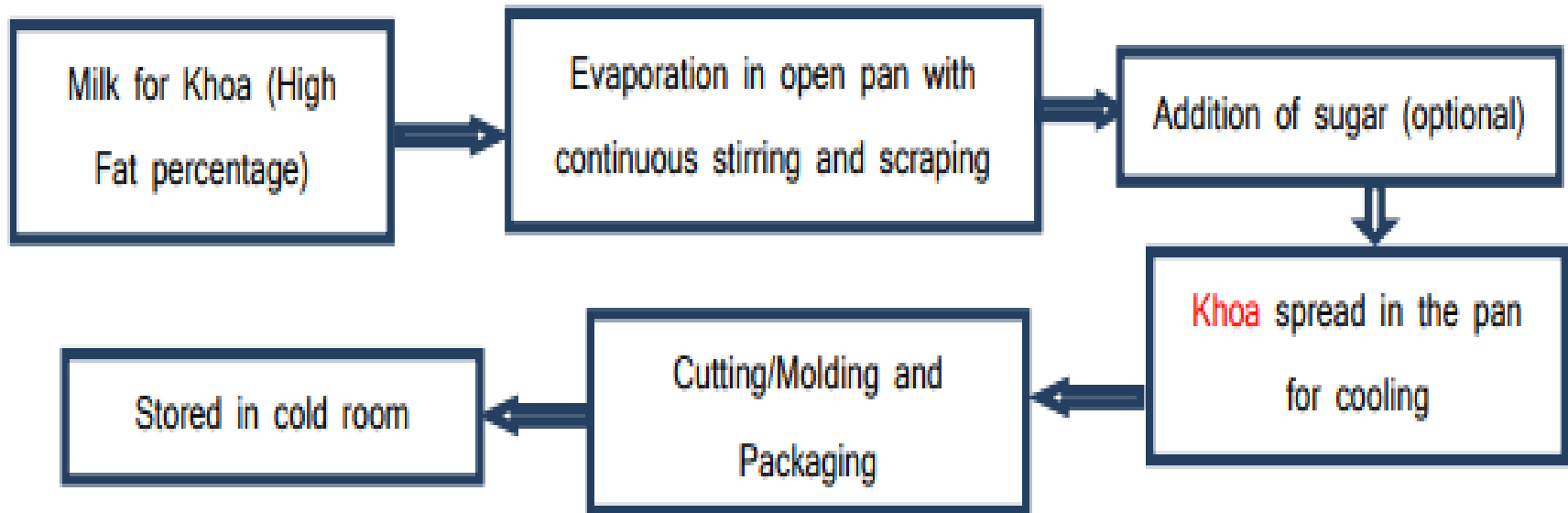
Danedar

Suitable for Kalakand, milk cake
Total solid varies from 60 to 65%

BUREAU OF INDIAN STANDARDS (BIS) REQUIREMENTS FOR KHOA

Characteristic	Requirement		
	Pindi	Danedar	Dhap
Total solids percent by mass, Minimum	65	60	55
Fat, percent by mass (on dry basis), Minimum	37	37	37
Total ash, percent by mass (on dry basis), Maximum	6.0	6.0	6.0
Titratable acidity, (as lactic acid) per cent by mass basis, Maximum	0.8	0.9	0.6
Coliform count per gram, Maximum	90	90	90
Yeast and Mould count per gram, Maximum	50	50	50

KHOA MANUFACTURING PROCESS



Traditional method for Khoa



Limitation (traditional process)

Several limitations of this method such as

- 1) Time and labor consuming
- 2) Large variation in quality
- 3) Poor keeping quality
- 4) Small scale production
- 5) Smoky smell

Advance

- Inclined Scraped Surface Heat Exchanger (ISSHE) for continuous manufacture of khoa by National Dairy Development Board (NDDB). Concentrated milk of 42 to 45% total solids is used as feed in this machine and its inclination permits the formation of a pool of boiling milk critical to formation of khoa.
- Thin Film Scraped Surface Heat Exchanger (TSSHE) system has developed at NDRI for the continuous manufacture of khoa and it consists of two Scraped Surface Heat Exchangers (SSHE) which are arranged in a cascade fashion. In this machine milk is concentrated in first SSHE to about 40-45% Total Solids and finally to khoa in the second SSHE.

Khoa Production (Machineries)

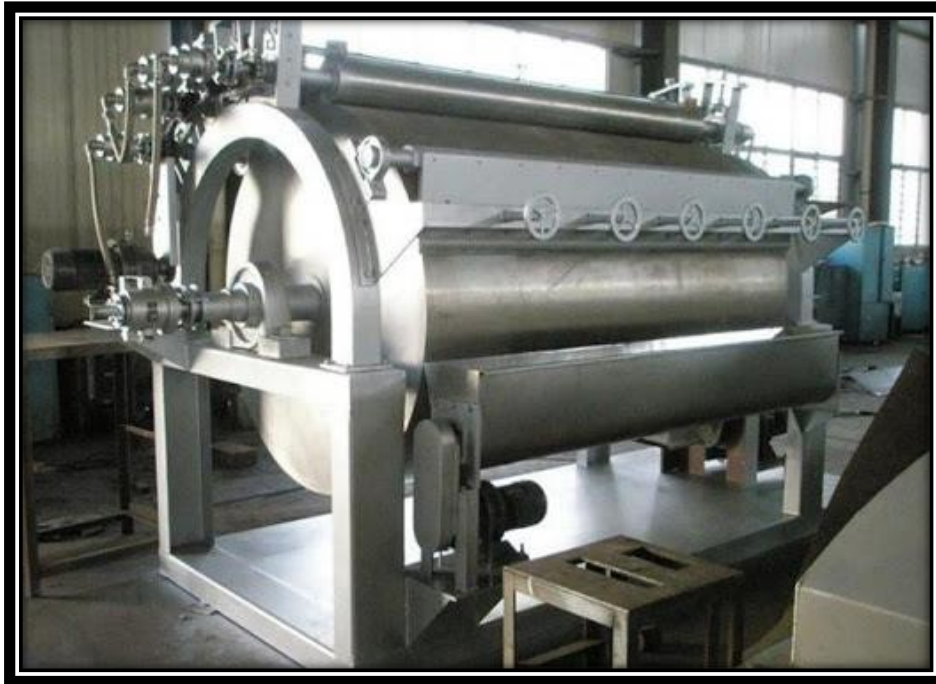


Steam jacketed kettle



**Multipurpose VAT
(Rotating type / rotary scraper)**

Khoa Production (Advanced Machineries)

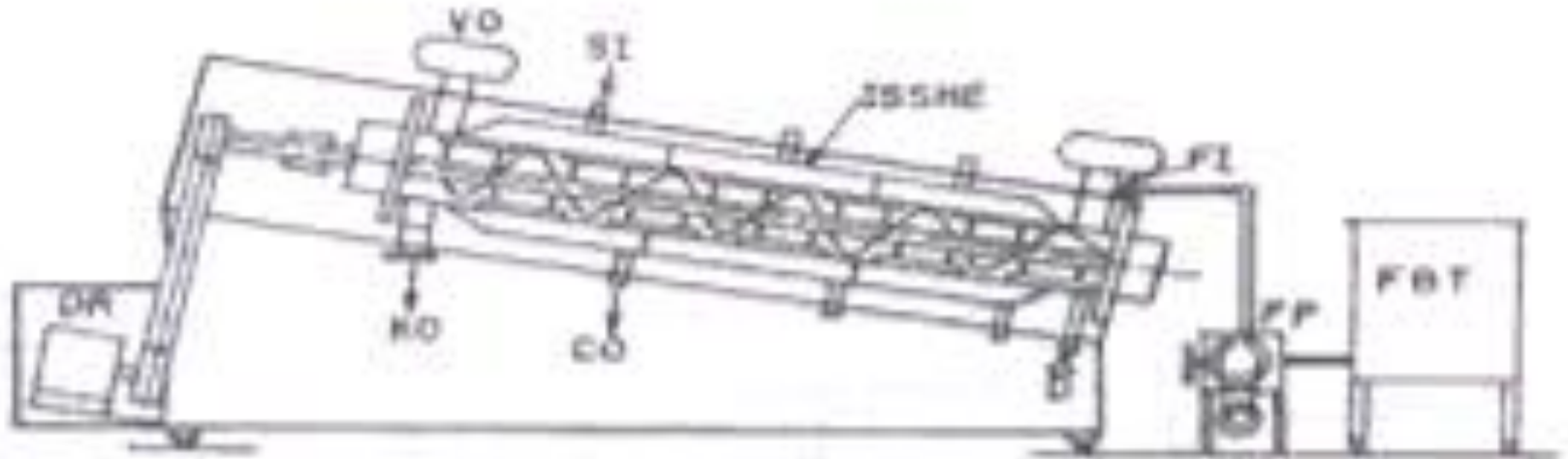


Roller dryer machine



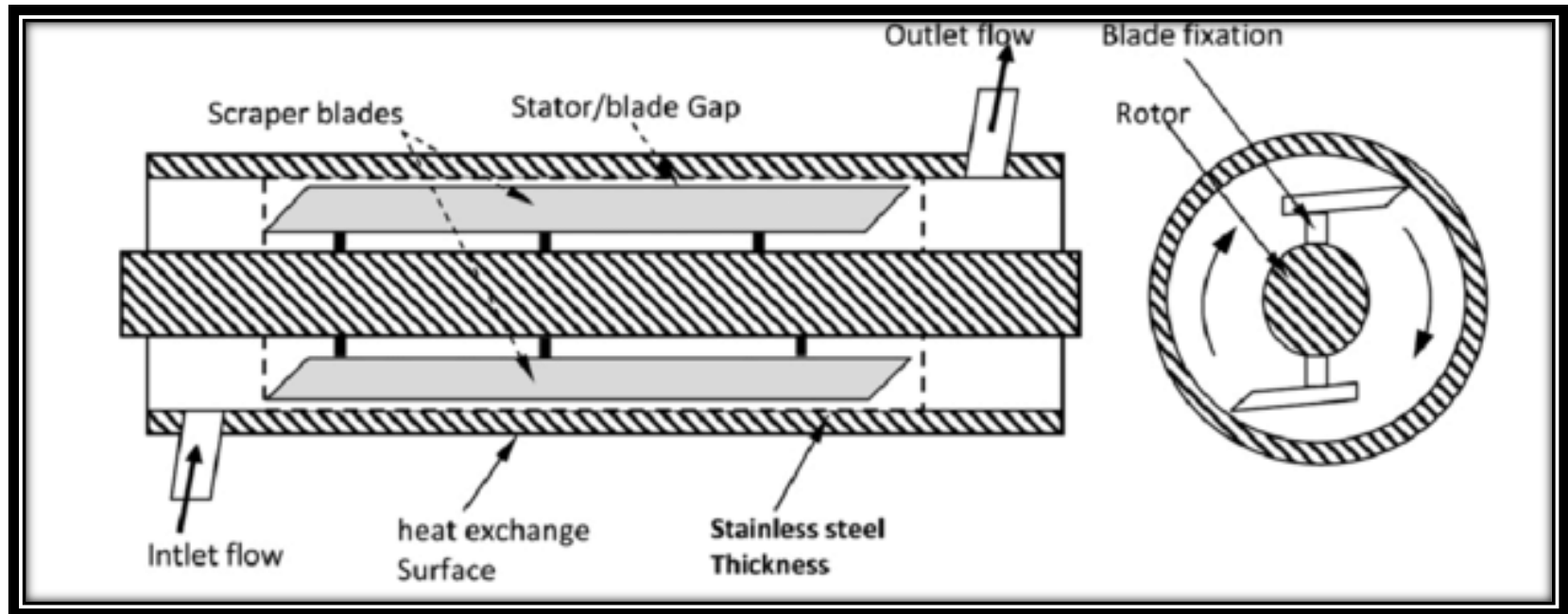
Scraped surface conical vat

Khoa Production (Advanced Machineries)



Inclined scraped surface heat exchanger (ISSHE). Developed by NDDDB

Khoa Production (Advanced Machineries)



Thin film scraped surface heat exchanger (TSSHE)

KHOA MANUFACTURING

1. Milk Reception and evaporation:

- ✓ High fat percentage of milk should be taken in a open pan for evaporation
- ✓ Continuous scrapping mechanism must be attach with the pan.
- ✓ It may be steam jacketed or gas fired.



KHOA MANUFACTURING

2. Addition of Sugar and grinded cardamom (OPTIONAL)

- ✓ Evaporate the milk till the volume get reduced by one third
- ✓ Addition of sugar and grinded cardamom as per final product taste.
- ✓ Continuous scrapping.



KHOA MANUFACTURING

3. Unloading and shaping of khoa mass

Unloading the khoa mass in a tray for cooling and shaping.



SENSORY QUALITY OF KHOA

- **FLAVOUR:**

A typical fresh, pleasant, caramelized and mildly cooked flavour similar to that of boiled milk is not acceptable. The taste should be preferably sweet.

- **BODY & TEXTURE:**

Soft but firm, uniform body and granular texture is most desirable. Pindi Khoa shall have smooth, compact, homogenous texture with very fine grains. Dhap khoa shall have granular texture and slightly soft body. In Danedar khoa, presence of big grains with brown colour is desirable.

SENSORY QUALITY OF KHOA

- **COLOUR & APPERANCE:**

- A good quality khoa, in general, should have uniform whitish colour with perhaps a tinge of brown colour.
- Khoa made from cow milk, however, has light yellow to deep yellow colour.
- The surface should be slightly oily/greasy i.e., showing the signs of little free fat. It should not have any foreign matter

SHELF LIFE AND YIELD OF KHOA

- **Shelf life:** The shelf life of khoa is 2-4 days at ambient temperature and 3 weeks under refrigerant conditions. The shelf life can be enhanced by using vegetable parchment wrappers, plastic (Polyethylene) film bags/pouches, laminated (Preferably aluminum coated) pouches, tin plates or cans.
- **Yield:** The yield of khoa mainly depends upon the type of milk used and TS content of milk. It is about 19% from cow milk, 21% from buffalo milk and 20% from standardized milk.

KHOA PRODUCTION (Defect and Adulteration)

Defect/Adulteration	Solution
Smoky color	Use of LPG cylinder
Sour and Acidic	Use fresh milk
Rancid	Store in 5 to 10 degree C
Hard body	Use of milk of optimum fat percentage
Brown and burnt particle	Optimum heating temperature
Starch	Use of Iodine test: Deep blue color will appear

CHEMICAL QUALITY OF KHOA

The chemical quality of Khoa depends on the following factors:

- a) The type of milk and its quality
- b) Quality of milk used
- c) Method of condensing/heating/evaporation
- d) The process and method of manufacture
- e) The other ingredients and flavors if added
- f) The Storage conditions of finished product

PACKAGING MATERIAL FOR KHOA

- Packaging of khoa and its products is mainly done to protect the products from outside environment especially after the completion of process so that products can retain moisture, flavor, freshness for a longer period of time.
- Generally, khoa has shelf life of 2-3 days at room temperature and for a week under refrigerated storage conditions when packed in parchment paper and paper board box.
- Shelf life of khoa is in increasing order, open tray < parchment paper < LDPE < Food grade HDPE < Laminates < Tins

Few manufactures (Machineries) *listed on www.indiamart.com*

- Tirth Engineering, Shivane, Pune, Maharashtra
- Sunshine Industries, Sector 10, Noida, Gautam Budh Nagar, Uttar Pradesh.
- Jackson Machine, Odhav Industrial Estate, Ahmedabad, Gujarat
- Ambica Engineering Works, Bengaluru, Karnataka
- Deokali Engineering Works, Ashok Nagar, New Delhi
- Nexgen (india) Food Machine Industries, Rajpura, Patiala, Punjab
- Indian Machine Mart, Patparganj, New Delhi



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