

Manufacture of butteroil, packaging and storage



**Huge Market
Potential**



**Overcomes
storage
difficulties**

**Overcomes
cost of low
temperature
storage**

**Stored at
ambient
temperature
for longer
duration**

**Less storage
space
compared to
butter**

Anhydrous milk fat(AMF)/ Anhydrous Butter oil is the other term for butter oil, that contains less moisture (around 0.1%) than butter oil (around 0.4%).



Definition

According to FSSR-2011, Butter oil and Anhydrous Milk fat /Anhydrous Butter oil are fatty products derived exclusively from milk and/or products obtained from milk by means of process which result in almost total removal of water and milk solids not fat.

- Pleasant taste and flavour free from off odour and rancidity.
- Free from vegetable oil/fat, animal body fat, mineral oil, added flavour and any other substance foreign to milk.
- May contain permitted food additives such as antioxidant ascorbyl stearate (500 mg/kg maximum), Propyl gallate, Octyl gallate, Ethyl gallate (1000 mg/kg maximum for each) and Butylated hydroxy anisole (175 mg/kg maximum).

FSSR-2011 Standards for butter milk

Parameter	Butter oil	Anhydrous milk fat/ Anhydrous Butter oil
B.R reading at 40°C	40-44	40-44
Moisture m/m	Not more than 0.4%	Not more than 0.1%
Milk Fat m/m	Not less than 99.6%	Not less than 99.8%
Reichert Value	Not less than 24	Not less than 24
F.F.A as oleic acid	Not more than 0.4%	Not more than 0.3%
Peroxide Value (milli equivalent of Oxygen/ Kg fat)	Not more than 0.6%	Not more than 0.3%
Boudouins Test	Negative	Negative

Requirements of High Grade Butter oil:

Fat should be pure

**Stable against
oxidation**

**Moisture content
should not exceed
0.1%**

**Deep yellow colour
(cow milk fat) and
white with green tinge
(buffalo milk fat)**

**Characteristic bland
smell**

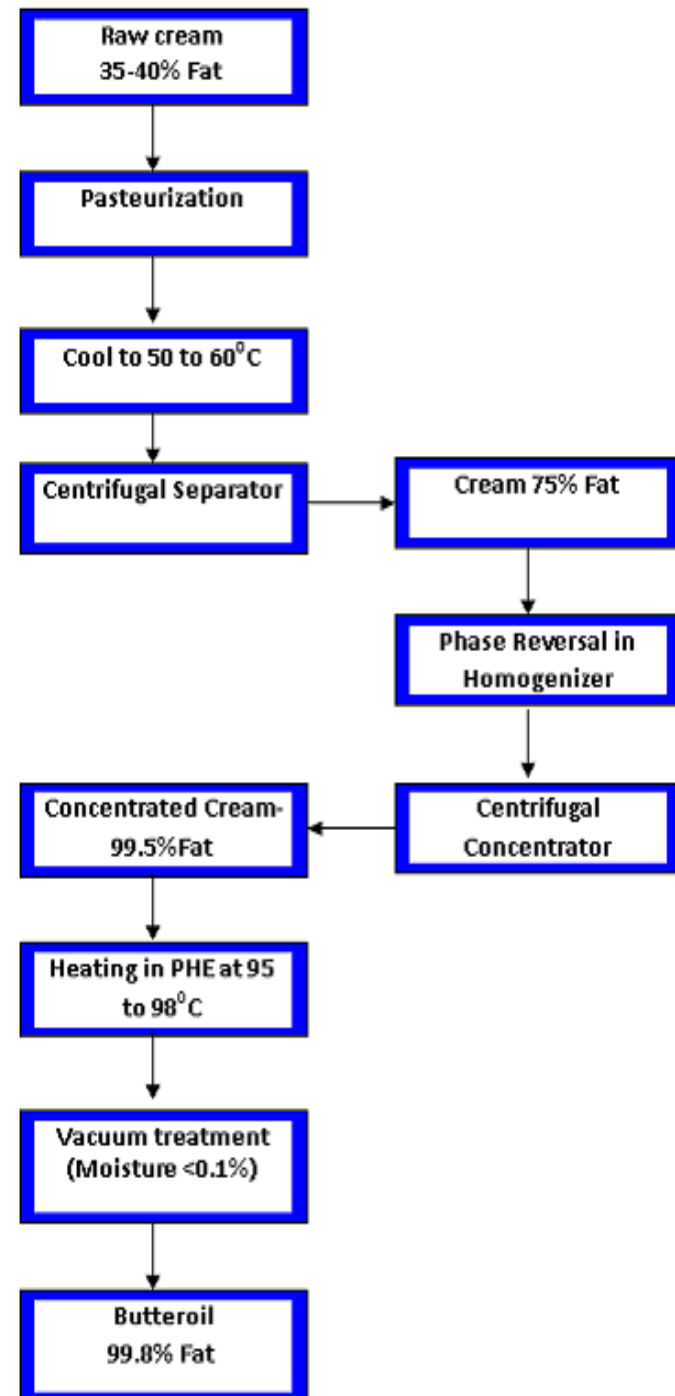
**Fine crystalline
texture**

**Packed in suitable
container/laminate
and packaging
material**

Methods of Preparation

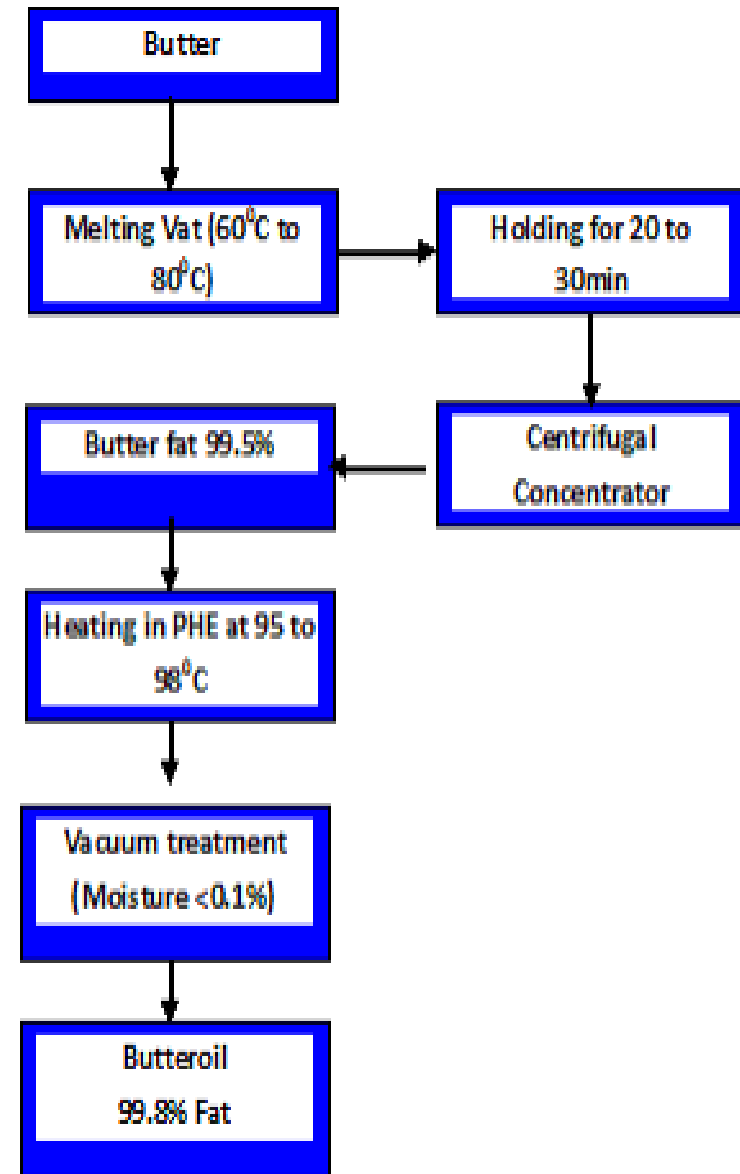
Industrial production of butter oil from cream (By demulsification):

- ❖ Raw cream (35-40% fat content) is pasteurized through plate/tubular heat exchanger.
- ❖ Then it passes through cream concentrator (cream separator) to achieve fat % level of around 75%.
- ❖ Cream then fed to homogenizer for phase inversion (breaks fat globule membrane to release fat).
- ❖ Then product again pass through centrifugal concentrator where cream fat level rise to 99.5%.
- ❖ Heating at 95-98 C in plate heat exchanger.
- ❖ Reduce moisture content of product to 0.1% in vacuum chamber followed cooling to ambient temperature through PHE.



Industrial production of butter oil from butter:

- ❖ Butter is transferred to butter melting vat, where heated to 60-80 C.
- ❖ Transferred to holding tank, where it is hold for 20-30 min to facilitate protein aggregation.
- ❖ Butter melt is transferred to centrifugal concentrator, where light phase is concentrated to 99.5% fat.
- ❖ Concentrated light phase is then pumped through PHE where it is heated to 90-95 C.
- ❖ Then to vacuum chamber for final moisture adjustment then back to PHE for cooling to 35-40 C for packing.



Packaging and Storage

- ❖ Butter oil is filled in containers of various sizes.
- ❖ Filling should be done up to brim in container in such a manner to exclude maximum oxygen. For households and restaurants, containers of 1-20 kg are available. For industrial uses, drums of minimum 180 kg are also available.
- ❖ Nitrogen is used for packing to prevent oxidation.
- ❖ Butter oil can be stored at ambient temperature since it contains very low amount of moisture. Expected shelf-life of product at this storage temperature is about one year.



Judging

Score card may be used for judging

Score card for butter oil

Parameter	Perfect Score
Flavour	45
Texture	25
Acidity(Oleic)	15
Colour	10
Package	5
Total	100

Procedure of examination

1. Examine container for cleanliness
2. Open container and examine for aroma and colour
3. Pour small sample and observe the texture
4. Taste the sample and record
5. Determine the acidity (% oleic acid) and record

Defects

Attribute	Defect	Cause(s)	Prevention
Colour	Brownish	Presence of over-heated curd particle	Adapt proper clarification & filtration
Texture	Coarse	Slow rate of cooling	Increase the rate of cooling
Flavour	Rancid	Fat hydrolysis due to lipase action	Inactivate lipase by adopting proper pasteurization temperature for cream
	Oxidized/oily/metallic	Contamination with copper or iron, exposure to sunlight	Avoid contact surfaces of iron/copper containers and exposure to direct sunlight

Uses of Butter Oil

- Used in production of recombined milk.
- Can also be used in manufacture of ice cream and confectionery industry.
- Utilized in production of various types of fat spreads.

