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## SMALL-SCALE BUTTER MAKING

Butter can be made from fresh or fermented milk. If fresh milk is used, it must first be separated into skim milk and cream. The cream is churned and the final product is known as sweet butter.

The milk used to make lactic butter does not require separation into skim and cream. Instead milk is fermented to form yoghurt, and lactic butter is produced directly from churning of the yoghurt.

### **Sweet cream butter**

Raw milk is first separated into skim and cream in a centrifugal separator (electrically or manually powered). Milk with a high fat content gives a higher butter yield.

The fat content in the cream is determined using a Gerbera cream butyrometer. The cream should then be standardized to approximately 40% fat content using the separated skim milk. Standardization of cream to the correct fat content is important, because it affects the churning efficiency and thus butter yield.

Standardized cream is then pasteurized at 72C for 15 seconds or 63C for 30 minutes. These are minimum pasteurization requirements, and for improved keeping quality of the butter, especially where the process is not automated and thus temperature holding times are only approximate, it is advisable to exceed the minimum heat treatment, e.g. 75C for one minute.

The cream should be continually stirred during heating to ensure even heat distribution, and timing started when it reaches the correct



urning started when it reaches the correct temperature.

Pasteurized cream is then chilled below 4C for several hours (or overnight). This 'ages' the cream and improves its churning efficiency and butter yield.

The next day, aged cream is churned either in a butter churn or a small mixer, (eg Kenwood Chef). It is important to keep the temperature as low as possible during churning. During churning, cream viscosity increases, and finally the cream 'breaks'. This is a clear separation of cream into butter grains and buttermilk. Churning should be continued until butter grains adhere together into one lump.

The buttermilk is drained off and clean, chilled water added to the butter. Slow churning cleans the butter from residual buttermilk, which reduces the keeping quality of the butter if allowed to remain. The water is drained off, and 1-2% salt (of butter weight) is added to the butter during continued slow churning, to achieve even salt distribution.

The butter is then packaged into grease-proof paper, and stored below 4C.

### **Lactic butter**

Whole fresh milk is pasteurised (see pasteurisation process for sweet cream butter), and then cooled to 37C before adding a starter culture (this may be a small amount of yoghurt left over from a previous batch). The milk is then incubated for several hours (or overnight) in a warm place (30-37C) until set. The resulting yoghurt is chilled for several hours, and then churned (see churning process for sweet cream butter). The lactic butter is salted and packaged in the same way as sweet butter. Due to the fermentation process, the keeping quality of lactic butter is not as good as that of sweet butter.

### **Quality control**

Butter can be made without a refrigerator or the use of chilled water, but this leads to the following problems:

If the cream is not allowed to age at a low temperature the fat globules will not develop the

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## Making Butter

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crystalline structure necessary for good separation of cream into butter and buttermilk. A high temperature during the churning process reduces the butter yield, as some of the butterfat liquefies, and is lost with the buttermilk.

The keeping quality of butter will be reduced if stored without refrigeration. At refrigeration temperatures, butter will keep for several months, but at ambient temperatures off-odours develop after only a few days. However, in many countries, a slightly rancid flavour in butter is found quite acceptable.

The water used for 'washing' butter after the buttermilk has been drained off must be potable, as otherwise it will re-contaminate the pasteurised butter, and reduce its keeping quality.

An anti-oxidant such as BHA (butylated hydroxy anisole) or BHT (butylated hydroxy toluene) may be added to butter to extend its keeping quality at concentration not exceeding 0.02%, but this may not be readily available, and may be expensive.

Lactic butter can be made more easily than sweet cream butter on a small scale, as it does not require the use of a separator or butyrometer, and the chilling stage is less important

### Equipment required

Cream butyrometer

Centrifugal separator (manual)

Thermometer

Heater

Stirrer

brief

Stirrer

Churn or high speed blender (eg Kenwood chef)

Grease-proof paper

Chiller or refrigerator

### **Equipment suppliers**

*Note: This is a selective list of suppliers and does not imply ITDG endorsement.*

Cream butyrometer

Gallenkamp Limited

Bishops Meadow Road

Loughborough

Leicestershire

LE11 0RG United Kingdom

Centrifugal separator (manual), butter churns and other dairy equipment

Smallholding Supplies

Pikes Farmhouse

East Pennard

Shepton Mallet

Somerset

BA4 6RR United Kingdom

Kenwood chef

Kenwood Limited

New Lane

Havant

Hants PO9 2NH United Kingdom

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