

Butter

Revised 2018

Thermal Properties

	English	Metric
Moisture, %	17.94	--
Protein, %	0.85	--
Fat, %	81.11	--
Carbohydrate, %	0.06	--
Fiber, %	0.00	--
Ash, %	0.04	--
Specific Heat Above Freezing	0.57 Btu/lb*°F	2.40 kJ/(kg*K)
Specific Heat Below Freezing	0.63 Btu/lb*°F	2.65 kJ/(kg*K)
Latent Heat of Fusion	26 Btu/lb	60 kJ/kg

Storage Conditions

Temperature		Storage Period
°F	°C	
32	0	1 month or less
15	-9	8 weeks or less
0	-18	6 months
-10 or below	-23 or below	1 year, seldom over this
Relative Humidity		At 32°F (0°C), the relative humidity should be not less than 70% to prevent shrinkage and not over 75% to reduce the possibility of mold growth. At temperatures of 15°F (-9°C) or below, the relative humidity is of no known significance.
Freezing Point		Varies with salt concentration in brine and approximates 22°F (-5°C).

Storage Recommendations

Only high quality butter with good workmanship should be stored for extended periods of time. Good workmanship should never be under emphasized.

Butter is customarily stored in fiber cartons which are usually lined with "parchment," but laminated aluminum foil may also be used. Common weight is in the neighborhood of 60 to 68 pounds. Parchment liners must be heat treated in a 212°F (100°C) 15% to saturated butter grade salt solution to prevent mold growth. For overseas shipment to tropical countries, lacquered tin containers may be used. Any breaks in the enamel such as at seams or underneath raised letters are likely to result in severe local oxidation. Butter may also be stored in properly wrapped (aluminum foil) retail-size packages which, in turn, are placed in fiber boxes of the desirable commercial size.

Improper packaging and low relative humidity in the storage room will cause weight loss in storage.

Defects During Storage

Surface defects in flavor may come from containers with inferior linings or large headspaces with enough air to start oxidation.

Flavor changes throughout the butter may come from holding it too long in storage; this is most apt to occur if any inferior grade of butter is stored. Low grade cream, metallic contamination, over-neutralization, improper salting, high acidity and psychrophilic bacteria in the wash water are common causes of inferior butter.

Because of changes in handling of milk and cream, a flavor defect referred to as rancidity may develop in storage butter. Therefore, all butter used for storage should be made from cream that is pasteurized immediately after separation and has not been subjected to prolonged storage before or after pasteurization. Also, the Acid Degree Value (ADV) on this cream should not be above 0.8.

Butter readily absorbs foreign odors, particularly those of apples, citrus fruit, vegetables having a strong odor, cheese and fish.

Color changes, particularly on the surface, may be due to drying, surface oxidation or chlorine solution on liners. Molds or bacteria can produce surface discoloration.

Weight loss is caused by improper packaging or low relative humidity in the storage room. When butter is manufactured properly, the water is dispersed in small droplets. Water can leak out and evaporate from the leaky butter which is improperly worked. This is the chief cause of weight losses.

Freezing

There is no problem in freezing butter of good quality. However, leaky butter, the result of inferior workmanship, will lose weight after thawing and may result in surface discoloration.

Rapid freezing to 15°F (-9°C) and below is an especially effective method of improving the spreadability of butter, providing the butter is worked, printed at once, and then immediately frozen.

Handling

Do not store butter with apples, citrus fruits, vegetables, cheeses or any materials with strong odor.

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