

Lesson 20**BUTTER: SPECIFIC REQUIREMENTS OF HIGH GRADE BUTTER, UNDESIRABLE ATTRIBUTES OF BUTTER, BUTTER SCORE CARD, SENSORY EVALUATION OF BUTTER****20.1 Introduction**

Butter has a very mild and delicate flavour which however is an important contributor to the product's acceptability. Texture of butter is very typical and its defects highly characteristic. Appearance is relatively less important but cannot be ignored.

20.2 Desirable Sensory Characteristics of Butter**20.2.1 Flavour**

High quality butter is expected to possess' mild, sweet, clean and pleasant flavour and a delicate aroma-which is due to the composite effect of flavour of butterfat and the flavour of the serum. To manufacture butter with most desired flavour the raw material used must definitely be free from objectionable flavour defects. This is also true of cultured cream butter, which should have a distinct, starter flavour aroma (diacetyl as the principal component)

20.2.2 Body and texture

Body and texture of butter is affected markedly by temperature. It is necessary, therefore to define the temperature at which these properties are evaluated. The tactile properties of butter should be evaluated at a product temperature between 7 and 13°C. Within this temperature range the body of the butter should be firm, waxy and consist of such closely knit granules that it appears as a uniform mass. Water and air, in proper amounts should be uniformly distributed and closely bound. The ideal butter should cut easily and evenly when sliced and be readily spreadable.

20.2.3 Colour and appearance

The colour of butter may vary from light creamy white to dark creamy yellow or orange. While moderately high colour may be preferred in one region, a lighter colour may be considered more desirable in another. A uniform light straw colour may be the most acceptable to the consumer. The primary feature to observe in sensory evaluation of butter for colour is uniformity of colour.

Salt

Salt renders the flavour of butter to be more attractive. Preference for the amount of salt in butter may differ with individuals. Some consumers prefer a highly salted butter (> 2%), some desire a lightly salted (<1.5%) while others prefer exclusively unsalted butter. Salt is not generally criticized in butter grading regardless of whether the butter is high or low in salt provided salt is completely dissolved (is not gritty) and it is not too 'sharp'.

20.3 Package

Package serves to adequately protect the product. Butter package, whether for retail or wholesale, should be neat, clean and tidy in appearance. It should have good finish and should appear fresh and unsoiled.

20.4 Tempering of Butter

The temperature of butter at the time of grading is quite important for determining the true body & texture characteristic and to readily detect the delicate aroma of butters. Temperature of sample should be maintained between 7-13 °C. Butter should be placed in the tempering room well in advance to allow tempering to about 10 °C. (the required time will depend on relative size & temperature of butter sample).

A butter trier should be used for drawing samples from butter block or package. Facilities for cleaning the trier (soft tissue or absorbent paper) and disposal of waste butter should also be provided. Use of hot water for cleaning the trier must be avoided.

20.4 Sequence of Observation

- a. Observe the cleanliness and neatness of the package.
- b. Remove the cover/packaging material and observe the sample for its evenness and/or squareness of the wrapping material.
- c. Insert the butter trier diagonally near the centre of the package and draw a sample plug of butter.
- d. Immediately after withdrawing the plug pass the trier slowly under the nose, through the nose very slowly and notice the odour or aroma present.
- e. Examine the colour for uniformity through.
- f. Examine the body & texture by pressing the ball of the thumb against the sides of the plug until it shows a break (observe the presence or absence of free moisture and their relative clarity and also the nature of the break)
- g. Break off approximately 0.5 to 1 inch piece from the end of the butter plug and place it into the mouth. Chew it until it melts and then roll the melted sample around the mouth till it reaches body temperature. Meanwhile examine the presence of 'grit' (undissolved salt) and the manner in which butter, melts. Also notice the various sensations of taste and smell.
- h. Expectorate the sample and carefully observe for the occurrence of possible after taste and persistence of any off-flavour.
- i. After judging each sample rinse the mouth frequently with 1.0% warm saline water.
- j. With the help of butter scoring guide record the assigned sensory score of the product.

20.5 Undesirable Characteristics

Some of the common flavour defects associated with butter is discussed below:

20.5.1 Flavour defects

1. **Acid or sour:** An acid off-flavour in butter is characterized by a sharp sour taste on the tip of the tongue.
2. **Aged:** Butter lacks freshness, can easily be detected by smelling the sample or by noticing a moderately

persistent aftertaste. The defect is caused by either holding butter too long at relatively low temperature or for short periods at relatively high temperatures.

3. **Bitter:** Bitterness resembles the taste sensation similar to 'quinine'. It persists as a distinct, lingering aftertaste, even after the sample has been expelled from the mouth. To detect it the sample should be melted in the mouth and rolled to the back centre of the tongue where taste buds sensitive to bitterness are located.
4. **Cheesy:** Flavour resembling to that of cheddar cheese. From the instant of placing the sample in the mouth, through manipulation of the sample and subsequent expectoration to the last lingering aftertaste, this flavour defect is readily noticeable.
5. **Briny/ High salt:** A distinct 'Salty' taste that is beyond a range of ordinary acceptability.
6. **Coarse:** Butter that lacks the pleasant flavour sensation or the balanced taste and aroma that is anticipated in high quality product is referred to as 'coarse'. In fact, a coarse flavoured butter has reasonably good sensory properties but just seems to fall short of the top or best quality product.
7. **Cooked:** Cooked flavour is generally associated with high quality (best grade) butter. This flavour is readily recognized when the core sample (within the trier) is passed under the nose or when a portion of the sample is first placed into the mouth.
8. **Feed:** Presence of different feed (hay, silage etc.) flavours. It can easily be detected in the aroma and verified on the palate when the butter is melted.
9. **Fishy:** Butter may have a flavour and aroma similar to codfish, cod-liver oil or fish - meal. This is one of the most serious. Most pronounced and objectionable flavour defects of butter. It is an off flavour which is persistent and the mouth distinctly fails to clean up.
10. **Flat:** Butter that simply lacks a characteristic full, pleasing 'buttery' flavour is criticized as being 'flat'. The absence of typical butter flavour is noted when the butter is first placed into the mouth.
11. **Foreign:** As described for milk and cream.
12. **Garlic or onion:** These off-flavours, occasionally found in butter, are easily detected from characteristic smell.
13. **Malty:** As described for milk and cream.
14. **Musty:** The 'musty' Off-flavour in butter resembles the odour of a poorly ventilated musty smelling space or room. It is also attributed to the growth of a specific spoilage micro-organism (*Pseudomonas tactrolens*).
15. **Oxidized:** Oxidized flavour is frequently noticed as surface taint in butter.
16. **Rancid:** Rancidity resembles the pungent, rasping taste and odour of darkened, decayed nut-means.
17. **Tallowy:** This off-flavour is caused by an extensive degree of oxidation of the unsaturated fatty acids in milk fact. It resembles tallow.
18. **Yeasty:** A 'yeasty' off-flavour is detected in the early stages of development by the typical fruity, vinegary, and slightly fragrant aroma, which is apparent when the sample is first taken into the mouth.

20.5.2 Body and texture defects

1. **Crumbly or brittle:** Butter particles lack cohesiveness and do not hold together. Some of the butter usually adhere to the trier and reflects rough appearance. Butter cannot be cut into neat portions for table use: it appears dry and readily falls apart.
2. **Greasy:** Greasy butter consistency may be noted by the evidence of extreme smoothness and immediate melting when a sample of such butter is placed into mouth. The defect may be suggested by the extreme ease with which a trierful of sample may be removed from the product.
3. **Gummy:** Butter does not melt readily when tasted, but adheres to the root of the mouth. This defect is more prevalent in cotton seed fed area. The defect is due to higher percentage of high melting point glycerides. This defect markedly interferes with the spreadability of butter.
4. **Leaky:** Butter shows beads or droplets of moisture on the plug and/ or the back of the butter trier.
5. **Mealy or Grainy:** Butter shows ragged surface on the trier plug and does not spread or cut well. When taken into the mouth and compressed between the tongue and palate, a distinct 'grainy' sensation is perceived.
6. **Sticky:** Butter sticks to the trier and appears to be quite dry. Usually it is difficult to secure a uniform, smooth surfaced plug from such butter, it appears 'ragged or rough'. This is particularly true when the trier is cold. This butter is difficult to slice or spread.
7. **Weak or Spongy:** The defect is typically indicated by a quick meltdown and excessive softness of butter.

20.5.3 Defects in colour & appearance

Faulty workmanship, particularly over and under working of butter during manufacture is responsible for most colour & appearance defects. The size, number and distribution of moisture and air droplets, markedly influence the colour of butter.

1. **Mottled:** Butter with spots of lighter and deeper shades of yellow.
2. **Wavy or streaky:** Butter with distinct waves of different shades of yellow, with colour in each wave more or less uniform.
3. **Speckled:** Butter with coloured specks of foreign matter scattered through it.
4. **Primrose or high colour surface:** This is deepening of colour of the exposed surface of butter.
5. **Mould discoloration:** Moulds growing on the surface of butter may produce wide range of colours.

20.6 Score-Card

Butter score card and scoring guides (Tables 20.1) are useful instruments for the butter grader. It assists him in the quality assurance endeavor of the organization.

Table 20.1 Score card for butter

SCORE CARD FOR BUTTER	
Name :	Date :
Batch or Code No.	Time :

A. Assign score for each sample for different characteristics. First go through Section B.

Characteristics	Maximum score	Sample Score
Flavour	50	
Body and Texture	30	
Colour and appearance	15	
Package finish	05	
Total	100	

B. Indicate, if any, the degree of defects such as the following. Encircle the one applicable and deduct from the appropriate attribute.

CHARACTERISTICS	DEFECT	DEGREE OF DEFECT		
		Suspicion	Slight	Pronounced
Flavour	Rancid	5	7	15
	Tallowy	5	7	15
	Neutralizer	1	3	5
	Other	1	3	5
Body & Texture	Leaky	3	5	10
	Greasy	1	3	10
	Oily	1	3	10
	Crumbly	1	3	10
Colour, Appearance and Finish	Mottled and wavy	2	4	6
	Wavy appearance	3	5	7
	Mouldy and dull finish	1	4	6
	White specks	1	2	4

Grading

After computation of data recorded in Table 20.1 by the panelist the following gradation should be specified:

Table 20.2 Grading of butter

Quality of table butter	Scores obtained	Grade of butter
Excellent	90 and above	A
Good	80 - 89	B
Fair	60 - 79	C
Poor	59 and below	D

