JUDGING OF DAIRY PRODUCTS

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Module 5. Fermented milk and milk products

Lesson 17
SENSORY ATTRIBUTES OF FRESH CHEESE

17.1 Introduction

Soft unripened cheeses are commonly known as "Fresh Cheese" and are made by coagulating the whole milk, partly skimmed milk, skim milk or cream; eliminating a large part of the liquid portion (whey) and retaining the coagulated milk solids. The amount of water retained in the curd greatly influences the relative softness of unripened cheese made from milk having/constant casein-to-fat ratio. Softness of cheese also depends on the extent of protein hydrolysis salt content and the amount of milk fat in cheese. Soft unripened cheese derives their flavour mainly from the culture and the cream dressing. Cottage cheese, cream cheese, Mozzarella cheese, Ricotta cheese etc. are some of the common varieties of fresh cheese. They differ from each other in their method of manufacture with respect to type of milk, treatment given to milk, type of culture, amount of culture, method of coagulation, cutting of curd, cooking of curd, pressing of curd etc.

Consequently, they differ in sensory as well as chemical attributes. The desirable sensory attributes of fresh cheeses, defects and their probable causes and remedies with special reference to cottage cheese are described in this lecture note.

17.2 Cottage Cheese

Cottage cheese is a fresh, soft, unripened cheese made from sweet, pasteurized skim milk by lactic culture with or without the addition of rennet. The curd is cut and cooked to facilitate whey expulsion and development of proper curd consistency. 'When the curd has attained the desired consistency, whey is drained off, curd is washed and salted. Subsequently, the curd is dressed with cream in the case of creamed cottage cheese which

contains 4% fat. Cottage cheese contains 80% moisture. The cheese is consumed whole fresh; consequently, the flavour of the product depends on the quality of skim milk, and the culture from which it is made.

Table 17.1 Score Card for Cottage Cheese

Score Card for Cottage Cheese	
Attributes	Maximum score
Flavour	45
Body and Texture	30
Appearance	20
Colour	05
Total	100

17.3 Desired Sensory Attributes

17.3.1 Appearance and colour

The curd particles of cottage cheese should be distinctly separate and uniform in size and shape. The cheese should possess moderately glossy sheen and creamy white colour. The cream dressing should be reasonably viscous and foam free,and bulk of it should adhere to the curd particles. The excess dressing should form only a uniform and smooth coating on the curd particles.

Free cream, free whey, lack of uniformity and the presence of lumps or curd dust are considered as common appearance defects in cottage cheese caused• mostly by faulty method of manufacture viz., excessive cooking, insufficient washing, cutting of curd at too high or too low pH, rapid cooking, uneven cutting or cutting with a faulty knife or aggressive stirring low TS milk, excessive heat treatment of skim milk, use of excessive coagulator, severe stirring or rough handling of curd during cooking etc. Appropriate corrective measures during manufacture of cottage cheese eliminate these defects.

17.3.2 Body and texture of cottage cheese

Ideally, creamed cottage cheese should have a tender body and smooth and meat like texture. Curd particles should maintain their shape and individual identity but should not be too firm, rubbery or too soft. Smooth, meaty and tender curd particles exhibit good capillary desired for complete absorption of cream dressing.

17.4 Body &Texture Defects

17.4.1 Too firm body

Firm or rubbery bodied curd panicles of cottage cheese resist crushing between tongue and roof of the mouth. This defect occurs due to over use of rennet orother milk coagulator; cooking of curd at too high temperature and for too long; or cutting of curd at a pH more than 4.7.

17.4.2 Mealy/Grainy/Gritty

Presence of this defect gives a corn meal like sensation in the mouth when masticated curd is pressed by the tongue against the roof. Also a dry rough and serrated curd mass is observed when the washed curd particles of creamed cottage cheese are kneaded and smeared between the fore finger and thumb. The defect may be caused by over developing the acid during curd formation; retention of too low moisture, non-uniform cutting of coagulum, uneven heating, too rapid cooking, inadequate stirring, and curd particles coming in contact milk extremely hot surfaces during cooking.

17.4.3 Gelatinous

Gelatinous cheese has a jelly-like and sticky character. Often this defect is associated with a bitter flavour and translucent appearance. This defect is caused by psychotropic bacteria.

17.4.4 Weak/soft/mushy

This defect is characteristic of high moisture, low-solid cottage cheese. It is caused by faulty manufacturing methods which flavour retention of whey in the curd. On storage such cheese may become pasty and bitter.

17.4.5 Over stabilized dressing

When this defect occurs the creamed cottage cheese appears dry and some individual curd particles are surrounded by a thick, pasty, coating. This isusually happens due to the use of excessive amount of non-fat dry milk, stabilizers and or emulsifiers.

17.5 Flavour

Cottage cheese should have a fresh, clean, pleasant delicate (balanced culture) flavour that cleans up well immediately after the sample has been eliminated from the mouth. This flavour is made up of characteristic curd flavour and its acidity, volatile products by lactic acid organisms. Addition of cream and salt enhance the flavour of creamed cottage cheese.

The probable cottage cheese being highly perishable product is prove to the development of specific flavour defects as:

17.5.1 Acid/ high acid/sour

Acid taste is clean and sharp while sour taste is pronounced and may be associated with

other bacterial defects like fruity, fermented etc. Excessive acid development and/or insufficient washings of the curd cause this defect. Such product is sometimes also criticized for flavour defect like "whey taint".

17.5.2 Bitter

Bitter flavour is characterized by its relatively slow reaction time; taste ator near the back of the tongue only; freedom from astringency; and persistence after expectorating the sample. The defect is most frequently encountered in old cottage cheese or in the sample stored at a temperature favourable for the growth of pseudomonas organisms.

17.5.3 Flat

Absence of characteristic flavour or aroma is termed as f1at flavour. A dry, unsalted and washed rennet curd yields a distinctly flat taste during the intermediary stages of oxidized flavour development.

17.5.4 Lacks freshness

The flavour of cottage cheese is its best immediately after manufacture. Cottage cheese progressively deteriorates in flavour during storage. Often this defect is referred as storage flavour because the aroma of cheese is similar to that of the refrigerator in which it was stored.

17.5.5 Fruity/ Fermented

This defect ischaracterized by the presence of a pleasant aromatic flavour suggestive of pineapple, apple, banana or strawberry and distinctive lingering after taste. The cottage cheese stored at elevated or favourable temperatures for the psychrotrophic bacteria may develop this defect.

17.5.6 Yeasty

Yeasty and vinegar like flavours have a peculiar aromatic quality in addition to high acidity. Yeasts and various other contaminants including psychrotrophic bacteria are generally responsible for causing this flavour defect.

Other flavour defects in cottage cheese include malty, musty. oxidized, rancid, salty and unclean flavours.

17.6 Cream Cheese

Cream cheese is a soft, unripened cheese made by coagulating cream (12-30% milk fat)either by lactic acid bacteria aided by milk coagulating enzymes or by direct acidification followed by removal of whey by centrifugation or pressing the curd in cloth hags. The fat content in the final product varies from 3 to 40%. Neufchatel cheese is a

similar product made from whole milk of high fat contents. It contains about 20-25% fat.

17.6.1 Desirable sensory attributes

17.6.1.1 Flavour

Cream cheese should have a full rich, clean and mild acidic flavour. Neufchatel type cheese may have a moderate acid taste. More common flavour defects in various types of cream cheese may be flat, sour or too high acid, metallic, yeasty and unclean after taste.

17.6.1.2 Body and texture

Soft yet sufficiently firm body to retain its shape is the characteristic of cream cheese. The texture should be somewhat buttery and silky smooth. It should possess both spreading as well as slicing characteristics. Cream cheese prepared from cream containing 16% fat exhibits most desirable body and texture properties. In such cheeses the moisture and fat content may vary in the ranges of 50-54% and 37-42%, respectively. Cream containing less fat yields a cream cheese which is criticized as having grainy texture and crumbly body. Increased fat content of cream (20%) results in excessive smoothness and stickiness. Other body and texture defects of cream cheese include coarse, grainy, too firm and too soft.

17.7 Mozzarella Cheese

It is a soft unripened variety of cheese of Italian origin. It is produced from whole or partly skimmed milk to which small amounts of starter or organic acids are added, followed by rennet extract. The curd is cut allowed to firm up inthe warm whey with occasional stirring and the whey is drained off. When the curd has developed the desired plasticity and fibrous texture and the whey acidity 0.65 - 0.70% LA, it is milded. The curd pieces are immersed in hot water kneaded, stretched and moulded. Salting of cheese is done by dipping the cheese in•brine solution for few days. The cheese can be consumed after the brim: treatment is complete.

17.7.1 Desirable sensory attributes

17.7.1.1 Colour and appearance

Mozzarella cheese should have a uniform white to light cream colour. Faulty manufacturing method and microbial contamination may sometimes cause colour defects in the product. Use of too high salt may cause discoloration. Development of browning may be caused by using starter culture containing only thermophilus. Contamination with Pseudomonas species causes development of superficial reddish marks.

17.7.1.2 Body and texture

Mozzarella cheese should have a soft, elastic, waxy and moist body with typical structure

of pulled curd cheese. It should have a fibrous texture with no gas holes. It should possess a good slicing as well as melting properties. Use of too high salt or growth of Lactobacillus caseimay cause poor melting quality. Undesirable microbial contamination may cause development of defects, like pigmentation, hole formation and other textural defects. Rapid evaporation of moisture from the surface leads to the development of granular texture.

17.7.1.3 Flavour

Bland, pleasant but mildly acidic with slightly salty taste is the characteristic of mozzarella cheese. Buffalo milk cheese is a more piquant and aromatic than cow milk cheese. Microbial contamination, particularly with Pseudomonas species may lead to the development of flavour defects like putrid smell, bitter flavour etc. Other flavour defects may be of absorbed or chemical nature as in the case of cottage cheese.

17.8 Ricotta Cheese

It is yet another variety of soft unripened cheese of Italian origin. In the manufacture of ricotta cheese, mixture of whey and skim milk is acidified to acritical pH with lactic acid, acetic acid or acid whey powder and then heated.The resulting curd is recovered and over filled in perforated tin containers,cooled and allowed to drain free whey. Cheese is now ready for consumption. Ricotta cheese made from whole milk is consumed directly while made from skimmilk or whey skim milk mixture is highly suited for pastry manufacture.

Ricotta cheese from whole milk resembles highly creamed cottage cheese but has a softer and more fragile texture. A mixture of skim milk whey yields a firmer and drier product which lacks its distinctive nutty flavour. In general ricotta cheese issoft and creamy with a delicate, pleasant and slight caramel flavour.

Ricotta cheese is highly susceptible to spoilage due to microbial contamination leading to flavour defects like sour, fermented, fruity etc. Excessive gas formation may also cause blowing of the lid of the container.

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