

JUDGING OF DAIRY PRODUCTS





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Module 10. Heat and acid coagulated milk products

Lesson 28

PANEER: DESIRABLE CHARACTERISTICS OF PANNER AND DEFECTS, JUDGING AND GRADING OF PANNER

28.1 Introduction

Paneer is an important, acid coagulated indigenous milk product, which is extensively used as an ingredient for preparing cooked vegetable dishes in Northern India. Paneer is preferentially made from buffalo milk (6% fat) by heating it to 82°C for 5 min., cooling to 70°C and coagulating with acid solution/ acid or sour whey. The whey is then drained and pressed for 15 - 20 min. The pressed paneer is then removed, cut into pieces and immersed in chilled water for 2 - 3 hours.

Although traditionally produced by small entrepreneurs, the organized dairies in northern India have recently taken to commercial production of paneer. With increase in large-scale production of paneer, it is necessary to have uniform chemical and sensory quality of the product. While the chemical aspects are well established, the systematic guidelines on sensory evaluation on paneer are discussed in this exercise.

28.2 Paneer Score Card

A score card is a tabulated list of the factors contributing towards the quality of the product with a numerical value assigned to each factor. It serves as a guide in determining the quality of paneer in terms of numerical values.

Table 28.1 Suggested score card for paneer

Name		Date & Time :					
Attribute	Perfect Score	Sample No.					
		1	2	3	4	5	6
Flavour	50						
Body and texture	35						
Colour and appearance	10						
Package	5						
Total Score	100						
Comments :							

28.2.1 Condition of judging room

The judging room should be well ventilated and free from any foreign odours. There should be plenty of light so that the uniformity and shade of colour can be readily determined.

28.2.2 Tempering the Paneer

The delicate aroma / flavour and body and texture characteristics of most of the dairy products can be best be determined when the products are neither too cold nor too warm and paneer is no exception. The paneer should, therefore, be tempered to 15.5°C to 20°C before judging.

28.2.3 Sequence of observations

When starting to judge the sample, the judge should note in sequence; first, the type and condition of the package i.e. for any package defects that may be present, Having noted the condition of the container, the judge should observe next the colour and appearance of the paneer. Note whether the hue is natural or dull and whether any visible dirt / foreign matter is present. Observe the surface more closely for any surface skin formation or for the dry or mouldy surface. After having made these observations the judge may then sample the paneer. A representative sample can be obtained with the help of sharp bladed knife. While cutting the paneer, the judge should note the "feel" of cutting; that is, the resistance offered and evenness of cutting. This furnishes the indications of possible body & texture defects.

After having secured a sample, examination of flavour and further body and texture characteristics may begin at once. Immediately after cutting the piece of paneer, pass the freshly cut surface slowly under the nose to ascertain the aroma. This is important as some aromas become less intensive and disappear when exposed to air. Observe then the nature and extent of opening in the paneer. Take small piece of paneer between the thumb and fingers and work it up, observing its resistance to pressure and the type of break. This gives idea about hardness/softness, crumbliness, etc. Place small portion of paneer into the mouth and chew it up to semi solid state. Note the resistance to crush during mastication of paneer. Roll it about in the mouth and observe the flavour and mouthfeel (mealiness, coarseness etc.). Expectorate the sample and note the aftertaste.

28.2.4 Desirable sensory characteristics of *Paneer*

The package of *paneer* should be neat and attractive. The *paneer* should have uniform, pleasing white colour with greenish tinge for buffalo milk paneer and light yellow for cow milk paneer.

The flavour of *paneer* is a characteristics blend of the flavour of heated milk curd and acid. The flavour of the high-grade paneer, should be pleasing mild acid, slight sweet and nutty. A desirable body of the paneer is the one that is neither too firm nor too soft. It should be sufficiently firm to hold its shape during cutting/slicing yet tender enough not to resist crushing during mastication. The texture of the high-grade paneer should be compact (close knit), smooth and velvety.

28.3 Undesirable Sensory Characteristics of *Paneer*

28.3.1 Flavour defects and their characteristics

1. **Acid/Sour:** This flavour defect results from use of either excessive acidic milk for paneer making or use of excessive amount of coagulating acid/sour whey. This flavour is usually very pronounced and may be detected by passing the freshly cut piece of paneer under the nose. When a portion is tasted, a "quick" flavour sensation is noted, which soon disappears, leaving the mouth free of any off-flavour sensations.

2. **Putrid/Cheesy:** If paneer is held too long at warm temperature protein-splitting organisms may breakdown the protein resulting in a cheesy, putrid flavour. The presence of this flavour is easily detected from the very first, due both to its intensity and to its cheesy characteristics. From the placing of the sample and its later expectoration to the last taste, this flavour is noticeable. The flavour is persistent and the mouth fails to clean up.

3. **Rancid:** Rancid flavour is the result of fat hydrolysis due to lipase action in paneer during storage at room temperature or above. The rancid flavour resembles somewhat to the strong, bitter, disagreeable flavour of darkened, decayed nutmeats. The presence of this flavour is easily detected both by the sense of smell and by the sense of taste. The rancid sample gives characteristics aftertaste and mouth fails to clean up.

4. **Stale:** When paneer is held too long at low temperature (5°C) it often becomes stale. The stale flavour is easily detected both by the taste and smell. The flavour is very prominent and has characteristics after taste.
5. **Bitter:** The bitter flavour is normally associated with the rancidity. It may also be due to the impurities in the coagulating acid used. The bitter flavour can easily be detected by sense of taste. It persists even after sample has been expelled from the mouth.
6. **Musty:** Musty flavour may be caused by storing paneer in damp, musty smelling room; or due to mold growth. The flavour is prominent and is noticeable even when the sample has been expectorated.
7. **Yeasty:** The yeast contamination during cold water immersion of paneer or during packaging and excessive long storage at low temperature gives yeasty flavour to paneer. This flavour is easily detected by its typical fruity, yeasty and slightly fragrant aroma, which is apparent when the sample is first taken into the mouth.
8. **Flat:** Then paneer that lacks characteristics, pleasing mild-acid, slightly sweet nutty flavour is criticized as flat.
9. **Foreign:** The exposure of paneer to the fumes from the combustion or burning of kerosene, diesel or petrol or contamination of paneer with fly repellants, disinfectants, etc. may cause foreign flavour in the paneer.
10. **Smoky:** Smoky off-flavour in paneer is often encountered when smoky fire is used for boiling and simmering of milk.
11. **Feed/ Weed:** This off-flavour can be carried over to paneer if it is present in milk, feeding of aromatic feeds or obnoxious weeds shortly before milking often taints the milk. These flavours can easily be detected by smelling.
12. **Unclean/Utensil:** The unclean or utensil flavour is suggestive of uncleanliness or lack of freshness. It is caused by storing milk / paneer in improperly washed cans or utensils. The off flavour is apparent as soon as the sample reaches the palate. It also lingers a short time after the paneer is expectorated.

28.3.2 Body and texture defects

1. **Hard:** The too firm or hard body is caused due to the use of low fat milk or due to low moisture content of paneer as a result of faulty production techniques. The hard body is the one, which resists crushing during mastication.
2. **Soft:** The soft bodied paneer is due to high moisture content resulting from delayed straining, or use of low coagulation temperature.
3. **Pasty:** The excessive retention of moisture in the product often gives pasty texture. The

low coagulation temperature and lower coagulation pH often give fine curd particles which clog the pores of drain cloth and result in a product that has pasty texture. The presence colostrums in milk also tend to give pasty texture.

4. **Crumbly:** A crumbly-bodied paneer is the one, which tends to fall apart when sliced or pressed between the fingers. The defect is closely associated with the mealiness. The frozen storage of paneer often results in crumbly-bodied paneer.

5. **Rubbery/Chewy:** The rubbery bodied paneer is the one which resists pressure if squeezed between the thumb and forefingers and shows a slight tendency to spring back when the pressure is released. It also shows considerable resistance to crushing during mastication.

6. **Mealy/Coarse:** Mealy or coarse texture may be caused due to use of low fat, high acid milk, or use of too high coagulation temperature or too low coagulation pH. Frozen storage of paneer may also give a coarse texture. Mealy textured paneer gives com meal like sensation during chewing of paneer.

7. **Open:** Open or loose texture is manifest by mechanical holes which are characterized by their irregular, annular shape and size. These holes result from improper matting of curd due to insufficient pressing.

28.3.3 Defect of colour and appearance

1. **Dull:** This defect is easily recognized by its dead, unattractive appearance. Such a defect suggests uncleanliness in manufacture.

2. **Dry Surface:** Use of milk containing excessive amount of fat gives paneer with dry surface such a product has unattractive appearance.

3. **Surface skin:** A long time exposure of paneer to atmosphere air results into drying of surface and formation of surface skin.

4. **Visible dirt / foreign matter:** The defect occurs due to several reasons such as incorrect or no straining of milk, dirty utensils, dirty/windy surroundings during manufacture or handling of paneer and transportation aunpacked / poorly packed product.

5. **Mouldy surface :** Long storage of paneer in humid atmosphere coupled with higher moisture content flavours mold growth on the surface. The product with such a defect is inedible and should be rejected.

28.3.4 Defect of packaging

The paneer produced in unorganized sector is normally sold, at present, in an unpacked condition. The paneer produced by organized sector is packed in modempackages such as polyethylene pouches, laminated pouches, etc. Some defects in packaging encountered are

soiled / greasy packages or damaged packages. These defects are obvious.

28.3.5 Guide for scoring grading of paneer

Even if the above-mentioned defects are accurately identified or recognized, it is often difficult to describe proper score to them. It is especially true for the beginners. A compilation of evaluation of various defects of paneer made on the basis of intensity of defect and their relative importance in relation to paneer quality is given in Table-28.2. While these scores are not infallible or ultimate and are subject to change, it is believed that they serve as a good guide for the evaluation of various defects of paneer.

After having done the scoring of paneer, it can be graded into different classes either according to the total score (Table-28.3) or according to the score of different i.e. flavour body and texture etc. (Table-28.4). The Table -4 gives their classification of various defects that can be tolerated for different classes of paneer.

Table 28.2 Guidelines for deducting score for various defects in Paneer

Attribute	Defect	Degree of defect		
		Slight	Definite	Pronounced
Flavour (50) Normal range 36-47	Sour / acid	45	40	35
	Putrid / cheesy	37	33	*
	Rancid	37	33	*
	Stale	38	35	32
	Bitter	38	35	32
	Musty	37	33	*
	Yeasty	37	33	*
	Flat	44	42	40
	Foreign	38	35	30
	Smoky	43	40	35
	Feed / weed	38	35	32
	Unclean / utensil	38	35	32
	Body and Texture (35) Normal range 25 to 34	Hard	32	28
Crumbly		32	28	24
Weak / soft		30	25	20
Pasty		24	22	*
Rubbery / chewy		27	23	19
mealy / coarse		28	23	20
Colour and appearance	Open	32	27	22
	Dull	9.5	9	8.5
	Dry surface	9	8	7
	Visible dirt / foreign matter	7	6	5
	Mouldy surface	*	*	*
Package (5) Normal range, 4-5	Soiled / Greasy	4.5	4	3
	Damaged	4.5	4	3

Table 28.3 Guide for grading of Paneer on the basis of attribute

Grade	Total Score
Excellent	92 - 100
Good	82 - 91
Fair	72 - 81
Poor	61 - 71
Bad	below 60

Table 28.4 Guideline for grading of Paneer on the basis of flavour and body & texture

Attribute	Grade of paneer	Range in score	Specific description of criticism
Flavour	Excellent	46-50	No criticism
	Good	41-45	Slightly: sour, smoky, slightly to definite flat.
	Fair	36-40	Slight : bitter, stale, unclean, foreign, rancid yeasty, musty, feed/ weed/ putrid, Distinct : acid smoky Pronounced: flat.
Body and texture	Poor	31-35	Distinct : Putrid, unclean, foreign weed / feed, yeasty, musty, state, butter, Pronounced: acid, smoky:
	Bad	0-30	Pronounced : Putrid, rancid, musty, yeasty, weedy, unclean, stale, bitter, foreign
	Excellent	33-35	No criticism
Body and texture	Good	29-32	Slight: hard, soft crumbly body and slight open texture.
	Fair	25-28	Slight : rubber / chewy, pasty Distinct: hard, soft, crumbly body and open texture. Slight Mealy or coarse texture.
	Poor	21-24	Distinct: rubber/ chew, pasty body and mealy texture. Pronounced: hard, crumbly, soft body and open texture.
	Bad	Below 20	Pronounced: Pasty, soft, chewy / rubbery and pronounced coarse / mealy texture.

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