

JUDGING OF DAIRY PRODUCTS



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Module 8. Concentrated and dried products

Lesson 25

DRIED DAIRY PRODUCTS: DESIRABLE AND UNDESIRABLE CHARACTERISTICS OF DRIED DAIRY PRODUCTS. JUDGING AND GRADING OF DRIED DAIRY PRODUCTS

25.1 Introduction

Evaluation of milk powder, whole or skimmed, on the basis of its sensory characteristics plays an important role in its marketing. Those who buy milk powder give prime consideration to its sensory properties, such as flavour and appearance for its acceptability. The sensory examination of milk powder assumes great significance in our country in particular, not only because skim milk powder (SMP) is manufactured in large quantities at feeder balancing plants in the flush season for its subsequent reconstitution during the lean period so as to maintain the milk supply to the needy areas but also as it has become an important export commodity.

25.2 Dry Whole Milk

In judging whole milk powder (WMP) for flavour one first classifies the product for flavour as good, fair or poor.

25.2.1 Flavour

The flavour of dry whole milk should be clean, rich, sweet and pleasant. Frequently, dry milk may be unduly criticized as having a 'heated' or a 'cooked' taste. This may be expected or even desired. Often, dry milk gradually loses its sweet, fine, appetizing flavour upon aging, thus becoming more or less off flavoured. The more frequently occurring flavour defects of dry whole milk are

25.2.2 Stale, storage, old

This appears to be a characteristic age defect associated with protein. When the defect is intense it may be accompanied by a darkening of the product.

25.2.3 Rancid

Rancid dry whole milk has bitter, soapy, unclean taste which is persistent after the sample has

been expectorated. The reason may be insufficient fore warming temperature to inactive the lipase enzyme.

25.2.4 Oxidized/tallowy

It is the most troublesome flavour defect of dry whole milk. Many factors affect the development of this defect such as temperature, light, moisture, acidity, metallic salts, condensation and type of packaging.

25.2.5 Scorched

This flavour is produced in products which have been subjected to excessive heat during the drying stage or have been permitted to remain in the drying chamber for too long period of time. It is usually accompanied by a large number of scorched specks in the product and sometimes by a dark discolouration typical of overheating.

25.3 Physical Characteristics of WMP

25.3.1 Body and texture

Two defects pertaining to the body and texture of dry whole milk are lumpy and caked.

1. Lumpy: A lumpy powder definitely lacks homogeneity. Hard lumps ranging in size from a grain of wheat upwards may be interspersed throughout. This defect is found frequently in the spray process product. Lumps result from insufficient drying, dripping from spray nozzles or exposure to moisture laden air.

2. Caked: Usually this defect is not encountered in dry whole milk, when it does occur the product loses its powdery consistency and becomes a rock like solid. When the mass is broken up, it remains in chunks, thus failing to return to the original powder state. This defect is serious since such milk solids have lost their sales value for human consumption.

25.3.2 Colour of WMP

Normal dry whole milk is light yellow in colour but varies reasonably with the colour in the fat from a creamy white to a deep yellow. The defects of colour in dry whole milk as follows:

1. Browned or darkened: This defect is associated with age. When the defect is present, the normal creamy colour has been replaced by a distinct brown. The defect is usually associated with an old, stale flavour.

2. Scorched: Discolouration due to browning of the milk solids is usually associated to the roller process. The powder may vary from light to dark brown.

3. Lack of uniformity: This defect may be due to either partial discolouration (browning) after packaging or to partial scorching during the manufacturing process.

25.4 Skim Milk Powder (SMP)

25.4.1 Flavour

The flavour of high quality nonfat dry milk is similar, when reconstituted, to the fresh skim milk. Due to its low fat content, it does not possess the rich flavour of high milk powder. The flavour is clean, sweet and pleasant and may have a slightly cook~heated note. The chief flavour defects of nonfat dry milk are:

25.4.2 Stale, storage, old

This flavour defect is the chief one of nonfat dry milk. In this product the off-flavour is even more "quick" and distinct than in dry whole milk. Usually the flavour defect is accompanied by a darkening of the powder. The old, stale flavour develops usually more intensely in spray process than in roller process powder.

25.4.3 Scorched

As in dry whole milk, this flavour is produced in products which have been subjected to abnormally high heat during processing.

25.4.4 Oxidized/ tallowy

Nonfat dry milk contains a small percentage of fat which oxidizes under some conditions yielding the oxidized or tallowy flavour. A tallowy product has a pronounced odour whereas stale powder does not have a very intense odour.

25.5 Physical Characteristics of SMP

Non fat dry milk prepared by spray process is very fine in particle size and uniform throughout. Instead of being flour like in texture, instant SMP is more or Less granular. The product pours readily somewhat like that of corn meal. The highly hygroscopic, light, air-borne dust of normal spray process SMP is lacking.

25.5.1 Colour of SMP

Non fat dry milk should be uniform in colour through showing the absence of foreign specks and burnt solids. The product should have a creamy white or light yellow colour which varies slightly in intensity with the season of the year. Upon ageing under certain conditions SMP tends to darken. When this defect occurs the light yellow colour has given way to a definite brown. Spray process powder appear to be more susceptible to age darkening and to a greater intensity than roller-process powder.

25.5.2 Malted milk

25.5.2.1 Flavour

Malted milk, being composed in large part of maltose and dextrose, has a definitely sweet taste. It should have a distinct flavour of malt. The product should be judged for its lack of malt flavour and for oxidized flavour defect.

25.5.2.2 *Body and texture*

Malted milk has a coarse and grainy texture unlike the fine texture of spray dried milk. While judging, product must be examined for possible stickiness and formation of cakes because of its affinity for water.

25.5.2.3 *Industry standards for grades of dry milk*

The American dry milk industry has adopted standards for dry whole milk and non fat dry milk. These are based on product quantity and provide two grades for each process as follows:

Table 25.1 Industry standards for grades of dry milk

Process		Grades
	Dry whole milk	
Spray		
Gas packed		Premium, extra
Bulk		Extra, standard
Roller		
Bulk		Extra, standard
	Nonfat dry milk	
Spray		Extra, standard
Roller		Extra, standard

The tolerances permitted for flavour and appearance in Premium and Extra Grades areas follows: "Premium and Extra grade dry whole milk shall be free from lumps except those that break up readily under slight pressure. There constituted product shall have a sweet and desirable flavour but may possess the following flavour to a slight degree: Chalky, cooked and feed".

The tolerance for the standard grade is "Standard grade dry whole milk shall be free from lumps except those that break up readily under slight pressure. The reconstituted product shall

possess a fairly desirable flavour but may possess a bitter, oxidized, stale, storage, utensil and scorched flavour to as light degree and a chalky and feed flavour to a definite degree."

25.5.3 Method of reconstituting dry milk for flavour examination

Generally in examining dry milk for odour and taste, the product is reconstituted one the basis of the original concentration. The American Dry Milk Institute (ADMI) recommends examination of dry milk odour immediately after the containers are opened and again for flavour approximately one hour after the sample has been reconstituted. The judge must be mindful of, the fact that freshly prepared fluid milk made from water and food quality dry whole milk often possesses as lightly chalky, watery or slightly cooked taste. Hence permitting a short storage period for blending of flavours after reconstituting the product should aid the judge in determining more accurately the true flavour.

Table 25.2 Score card for Milk Powder

Name _____

Date _____

Code No. _____

Time _____

A) Score the sample for different characteristics. Indicate the degree of defects, if any, encircling the applicable one and deduct accordingly from the attribute score.

Characteristic	Maximum	Minimum score for each attribute	Sample Score
(1)	(2)	(3)	(4)
Package appearance	5	3	
Appearance of Dry product	15	9	
Appearance of reconstituted milk	15	9	
Body and Texture of reconstituted milk	20	17	
Flavour of reconstituted milk	45	27	

NOTE: If the sample scores less than the minimum for any characteristic, it is to be rejected.

B) Degree of defects

Table 25.3 Degree of defects

Characteristic	Defect	Degree of defect		
		Suspicion	Definite	Pronounced
(1)	(2)	(3)	(4)	(5)
Appearance of package	Soiled surface Unsealed	1	2	3
Appearance of Dry product	Caked/brown particles	2	5	10
Appearance of reconstituted milk	Lumpy brown	1	2	5
Flavour	Oxidized/stale/rancid	2	3	10
	Chalky/acid/neutralizer/salty	2	5	10
	Metallic/cooked/scorched	1	2	5
	weird/bitter/foreign	5	10	15

Source: Method for Sensory Evaluation of Milk Powder Indian Standard IS:10030-1981

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