



Dairy Products Judging



This publication is written to help you become a skilled judge of the quality of dairy products in a reasonable period of time. This unit includes lessons on the four major dairy products—milk, cheddar cheese, ice cream, and cottage cheese.

Through the evaluation of dairy products, you will develop a greater understanding of and appreciation for high-quality dairy products. You will become a wise and economical shopper for the dairy products that should be a part of your daily diet. And, after you graduate from high school, you may be able to continue your judging activities in college.

The quality of milk produced on the farm largely determines the quality of dairy products found in the dairy case. Flavors of milk and dairy products may be caused by one or more factors: the health of the cow, feed consumed by the cow, bacterial action, chemical changes, and absorption of foreign flavors after the milk is drawn. Because the consumption of dairy products depends

primarily upon flavor, dairy producers are cautious about feeding and milking practices.

For example, cows eating silage or grazing on pasture containing onions immediately before milking will have off-flavors in the freshly drawn milk. Milk from cows confined in close quarters without adequate ventilation will contain foul odors. Improper cleaning and sanitizing of equipment and improper cooling of milk contribute to off-flavors in milk and milk products.

The hauler evaluates milk in farm bulk tanks before pumping the milk into the tank truck. Critical evaluation begins at the dairy plant. Judging and scoring of milk and milk products are important parts of the quality control, which starts in the receiving department and continues throughout the processing operation. Milk processing plants have various points during the process where they check for **irregularities** that will affect product quality.

Normally, the quality control staff evaluates products as they come off the production line and after 7 to 10 days

of storage. They use the same procedures and scorecards you will use to measure the quality of the dairy products they produce. This evaluation is necessary if the company wishes to maintain a quality product.

Dairy products can be analyzed for chemical composition, **microorganisms**, color, and physical properties; but these do not measure the “eating quality” of the products. The “eating quality” includes the feel, taste, and smell a person experiences when the product is put into the mouth.

There are various standards for measuring product quality. A scorecard is used for evaluating and recording quality, and it is used in all dairy product judging contests. It is important that you become familiar with the scorecard for each product.

Before moving to a different product, work with one product until you can recognize its defects. Learn the proper identification of defects first and then the score rating. You will not become an expert judge overnight. This requires training that comes from actual work with prepared samples. You will use sight, smell, taste, and touch in judging dairy products. The extent to which you use each sense depends upon the product being judged. In general, the beginner should place most emphasis on smell and taste.

The sense of smell is important in determining flavor. You are influenced greatly by the sense of smell in making decisions about the flavor quality of the product. Odor and taste, combined with the feel of the product in the mouth, make up the concept called “flavor.” Since flavor has the greatest numerical value of any of the items on the scorecard, and since odor contributes largely to the flavor, the sense of smell has an especially important role in the judging of dairy products.

There are four primary taste sensations: sweet, sour, salty, and bitter. The taste **receptors** are located primarily on the sides and on the base of the tongue. The product, in a liquid form, must make contact with the taste buds before a taste sensation occurs.

The different taste sensations occur on different areas of the tongue. You will note the sour taste chiefly along the sides of the tongue; salty, along the side and tip; sweet, generally at the tip; and the bitter taste at the base of the tongue. For this reason, the sample being tasted should be **manipulated** in the mouth and rolled over the tongue in order to give the taste buds opportunity to come into contact with the product being evaluated.

To progress in learning to judge dairy products, you must learn to have confidence in your ability to taste and smell. The following rules should help you to make the best use of time, to develop concentration, to work effectively, and to gain confidence in judging dairy products.

1. **Be in physical and mental condition for scoring.** Just before judging, never eat a heavy meal or foods with strong flavors. Avoid hot drinks that might scald your tongue. Rinse out your mouth with plain water. Scrub your hands, using an unscented soap.
2. **Know the scorecard.** Learn all criticisms and the score value of each item. Learn the range of scores for each class of flavor quality for milk and other dairy products.
3. **Have the samples at the proper temperature.** You can determine the flavor and the body and texture best when the product is neither too cold nor too warm. Each product should be at its optimum temperature. Thus, cheese should be 50°F to 60°F for best judging. The best range for ice cream is 5°F to 10°F.
4. **Take a representative portion of the sample to be judged.** Mix milk samples before sampling. Before pouring the sample, raise the top of the container slightly and smell to detect any off-odors that may be present. If a **trier** for cheddar cheese is used, don't take the sample from near the edge. Never take a surface sample.
5. **Observe the aroma immediately.** Some aromas become less intense and disappear, in part at least, when exposed to air. So it is important that you smell the aroma of the sample immediately after you remove it.
6. **Take a sufficient volume into the mouth for tasting.** Do not pass judgment on a product without adequately tasting it. Hold each sample approximately the same length of time in the mouth, regardless of the quality of the product. Avoid holding the sample in the mouth past a count of five. **DO NOT SWALLOW THE SAMPLE.**
7. **Fix the proper quality ideal in mind.** You can do this best by working closely with a sample having superior quality. Learn in what respect a sample fails to compare favorably with the ideal. The sooner you learn the ideal quality of a product, the sooner you will become proficient in judging that dairy product.
8. **Recondition the mouth occasionally.** You should clean your mouth at intervals or when an aftertaste persists, especially after having examined a poor sample. This can be done by rinsing the mouth with clean, warm water.
9. **Concentrate upon the sample you are examining.** Close your eyes and mind to the world around you and practice self-examination so far as tasting

is concerned. Make a mental record of your taste and smell reactions. Relax briefly after scoring each sample before proceeding to the next.

10. **Do not be too critical.** Carefully observe the taste and aroma of the sample, but do not form the questionable habit of trying to find objectionable flavors that may not be present. When in doubt, do not criticize.
11. **Check your own scoring occasionally.** This can be done by comparing the flavor of two or more identically scored samples and observing whether the flavors are scored consistently. Try rescored some samples without knowing their identities.
12. **Be honest with yourself.** Use independent judgment. Judge the sample itself. Do not be influenced by the name, the trademark on the package, or by the score previously given a like product from a particular processor. Make your own decisions, and, after arriving at a conclusion, believe in your own judgment until shown otherwise.
13. **Recognize the fact that you need practice and experience to develop judging ability.** You must practice judging if you are to develop the ability to taste, smell, and determine flavors of dairy products. Do not become discouraged. You will improve with practice.

Scorecard

A scorecard is a tabulated list of the components describing the quality of a product, with a numerical value assigned to each component. The components are arranged on the card in alphabetical order.

Criticisms are listed under each component and are helpful in pointing out the possible defects that may be found in each product.

A standard scorecard is not suitable for scoring the different dairy products, since each product differs in its characteristics. A list of criticisms and the score range for each criticism are included. **Memorize the score ranges for the major criticisms.** Note that some defects are more serious than others. These scorecards are the ones formulated and approved by the American Dairy Science Association and are used throughout the United States in college judging contests. In marking the product score, write down the points allowed rather than the deduction made. Dairy products usually are not given a perfect score. If flavor were scored perfect, then the highest quality would have been attained. The smallest deduction a contestant can make on any one item is one point. The maximum deduction depends on the degree and the

severity of the criticism or criticisms for that particular product. The score guide will give the normal range: 1 to 10 for flavor criticisms and 1 to 5 for appearance and body and texture criticisms.

In grading the scorecards, the more closely the contestants agree with the official judge, the fewer points added to their scores. The lowest score is considered the winner. For the flavor criticisms, the highest penalty is two points per sample. The grade for the product score is the mathematical difference between the judge's and the contestant's score.

For instance, if a contestant marks a sample of milk as being "cooked" and it is actually "oxidized," two points are added to his score. If he scored the product as an "8" and the official score is "4," then four points will be added to his score. On this one sample, he would have missed a total of six points.

Another example is if a sample of cheddar cheese is marked as being "bitter" and "sulfide" with a score of seven, and the official marked it as being "high acid" and "sulfide" with a score of eight; the contestant is charged with one point on the criticisms and one point difference on the score, for a total of two.

The milk samples you judge will be homogenized whole milk. Six samples must be properly identified and must be considered as one group. This number will apply to any other dairy product you judge. Study the milk score guide carefully, noting the items on it and their values. Milk must be judged on flavor only. The temperature of the milk sample at the time of judging should be between 60°F and 70°F (15.5°C and 21°C).

Mix the milk in the container, partially open the top, and take a couple of good sniffs. Note any abnormal odors you detect. Again, mix the milk well before the sample is poured into a cup; take a generous sip, roll it about the mouth, note the flavor sensation, and then **expectorate** it. After spitting, breathe in through your mouth and out through your nose. Notice only off-flavors or odors.

The flavor of normal whole milk is pleasantly sweet and leaves only a clean, pleasing sensation after the sample is expectorated. If an odor or aftertaste is detected, the milk has a flavor defect. A number of milk flavor defects, together with their probable causes, are listed below. By understanding its origin, you will have a better basis for identifying and recognizing each of these particular flavors.

Bitter—A bitter taste may occur in milk as a result of cows' eating strong feeds or weeds that can be absorbed into the milk. Bitterness may be present in milk from cows in late **lactation**. The growth of certain bacteria in milk held several days at low temperatures may be responsible

for bitter flavor. You will detect bitterness by taste and not by smell. It occurs at the back of your tongue and mouth.

Cooked—This flavor results from heating milk. It is present when the milk is heated too high or held too long at normal **pasteurization** temperatures. The higher the heating temperature above pasteurization, the more intense the cooked flavor. You can easily identify cooked flavors by taste and especially by the sense of smell. Most pasteurized milk has at least a slight cooked flavor.

Feed—Feeds that contain strong flavors, such as green grass, rye or wheat pasture in early spring, silage, turnips, or alfalfa hay, impart certain flavors to a cow's milk. The foreign odors are absorbed from the cow's stomach and lungs into the blood, then carried to the udder through the bloodstream. Certain feed flavors can be detected in milk from feed given to the cow 15 to 30 minutes before milking. In fact, if a cow inhales onion odor during milking, the onion flavor is present in the milk before milking is complete. Feed flavors in milk can be reduced or prevented by feeding cows immediately after milking and taking them off these types of feeds 3 to 4 hours before milking again.

Flat—Generally, water added to milk causes a flat flavor and diluted taste. The flavor may be described as tasteless. The characteristic flavor of normal milk is lacking, but the milk has no off-flavor. A flat flavor should not be confused with one lacking richness, which is associated with low-fat content. Milk lacking richness usually exhibits a sweetness, whereas milk with a flat taste does not.

Foreign—If cows breathe odors of such substances as fly spray, paint, oil, or kerosene, the odor is carried through the bloodstream to the udder; and the undesirable flavor is formed in the milk. Foreign flavors in milk may be caused by improper use of chemical **sanitizers**. After a sanitizer is used, it must be drained from the milking system before the milking operation starts. If any one of these flavors is pronounced in milk, it is considered unfit for human consumption and, therefore, merits a low score on flavor. Milk may absorb flavors, particularly if the container is left open in the home refrigerator.

Garlic/onion—Garlic or onion flavors are imparted to milk when cows eat or smell wild garlic or onions. You can recognize these flavors by their distinctive tastes and odors. These flavors are objectionable in fluid milk, and you should give milk with this defect a low score.

Acid—You can easily detect the high-acid flavor by smell and taste. Acid milk results from bacterial growth (generally *Streptococcus lactis*). Acid flavor develops rapidly if raw milk is not properly cooled. Acid flavor is characterized by a sharp, sour taste on the tongue.

Lacks freshness—"Lacks freshness" flavor generally develops before a more serious flavor is detected. This deterioration in flavor is due to the growth of **psychrophilic** bacteria that are responsible for the slow change in flavor. It may be due also to an **enzymatic** or chemical action that occurs in old milk. Pasteurization kills psychrophiles; therefore, their presence in a pasteurized dairy product indicates **postpasteurization** contamination. The "lacks freshness" flavor may be described as lacking in clean flavor because of age.

Malty—This is not a common flavor but may be found in milk not properly cooled. Certain bacteria from improperly cleaned equipment, especially milking machines, cause the objectionable flavor, which can be described as a walnut or grape-nut flavor.

Oxidized—Oxidized milk has been described as tasting like wet cardboard. "Tallowy" is another term often used to describe this defect. It does not develop from bacterial growth in milk but from chemical reaction involving the milk fat primarily. This flavor develops when milk, placed in a glass or plastic container, is left in the sun for a short time or for a longer time under artificial light in a store cabinet.

Metallic—Contact with copper or iron causes this flavor. This is why stainless steel equipment is required in the production, handling, and processing of milk.

Rancid—Rancid flavor in milk is closely associated with bitter flavor, but unlike the common bitter flavor, it has an odor resembling spoiled nutmeats. Rancid flavor is caused by a chemical breakdown of milk fat.

Milk fat exists in milk as tiny globules, and they are surrounded by a protective layer of other substances. If this layer is disrupted, the enzyme lipase, present in the raw milk, gains access to the unprotected milk fat and chemically releases the **fatty acids**. Some of these fatty acids dissolve in the water portion of the milk, and this produces the rancid flavor.

Extreme agitation of warm, raw milk in the presence of air, causing foaming, results in a rancid-type flavor within a few hours. If cold, raw milk is warmed to 70°F to 90°F, and cooled back to 40°F, rancid flavor may occur. Rancid milk may also be caused by mistakes in processing. Rancid flavor develops if a small amount of raw milk is added to pasteurized, homogenized milk.

Unclean—The unclean flavor is seldom found, except in pasteurized milk that has been stored too long or at a slightly higher than normal refrigerator temperature. It may be caused by bacterial growth in milk or from milk contacting decomposed material on improperly washed equipment.

Preparing Milk Samples with Characteristic Flavors

To gain experience in judging milk, it may be necessary for you to prepare special samples. Therefore, methods for sample preparation are listed below. Intensity of the flavors may be adjusted by diluting the sample with untreated, high-quality pasteurized milk.

The following samples should be prepared from pasteurized milk intended for table use and tempered to 60°F before judging.

Bitter: Add a few drops of 1-percent solution of quinine sulfate.

Cooked: Heat milk to near boiling and cool, or heat to 160°F for 30 minutes and cool.

Feed: In a flask, boil a suspension of silage in water. Close the flask opening with a one-hole stopper to which a plastic or rubber tubing is attached. Place the open end of the hose in a container of milk so the gas that boils off will pass through the milk. Dilute to taste with good milk.

Foreign: Add a few drops of chlorine or a similar sanitizing solution having a distinctive flavor.

Garlic/onion: Add garlic powder or a few drops of juice from an onion, or put a piece of onion in the milk for a short time. When garlic and onion powders are used, only one or two granules will suffice if you store it overnight.

Acid: Add one-half cup of fresh, cultured buttermilk to a quart of pasteurized milk, previously warmed to 70°F to 80°F; mix and place in a refrigerator overnight.

Lacks freshness: Store high-quality pasteurized milk at refrigerated temperature for 7 to 10 days.

Malty: Add malt flavor purchased from your local grocer.

Oxidized (light-induced): Expose pasteurized, homogenized milk in a glass or plastic bottle to direct sunlight for 20 to 30 minutes or to indirect sunlight for 1 hour.

Metallic: Place two copper pennies in a sample of milk for a few hours. For more intensity, add additional pennies.

Rancid: Mix nine parts of pasteurized, homogenized milk with one part **raw milk**, and warm the mixture to about 98°F, then refrigerate it overnight.

Unclean: This flavor is difficult to reproduce. You can best obtain it by refrigerating several samples of pasteurized milk for several days and selecting samples with a somewhat putrid odor or bitter taste. Add this milk to good-quality milk to produce the unclean flavor at a lower intensity.

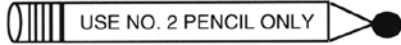
Samples are best judged or scored with only number identification. Score each sample on its own merits in comparison with the ideal. Depend on your own judgment, and do not let the comments or facial expressions of others influence you. If a sample reveals more than one flavor, record the flavor carrying the lowest rating.

Milk Flavor Scoring Guide			
Suggested flavor scores* with designated intensities of flavor defects			
Flavor criticisms	Intensity of defect		
	Slight	Definite	Pronounced
Acid	3	1	..**
Bitter	5	3	1
Cooked	9	8	6
Feed	9	8	5
Fermented/fruity	5	3	1
Flat	9	8	7
Foreign	5	3	1
Garlic/onion	5	3	1
Lacks freshness	8	7	6
Malty	5	3	1
Metallic	5	3	1
Oxidized (light-induced)	6	4	1
Rancid	4	1	-
Salty	8	6	4
Unclean	3	1	-

*Range of scores for each class of flavor quality: Excellent 10 (no criticism), Good 8–9, Fair 6–7, Poor 5 or less. Normal range 1–10.
 **Dash (-) indicates product of unsalable quality. Official rules prohibit use of such products in contest.



MARKING INSTRUCTIONS



IMPROPER MARKS

- ERASE CHANGES CLEANLY AND COMPLETELY



PROPER MARKS

- DO NOT MAKE ANY STRAY MARKS

4-H Dairy Products Judging Scorecard
MILK

PR	CONTESTANT NO.						DATE					
	1	2	3	4	5	6	M	M	D	D	Y	Y
1	0	0	0	0	0	0	0	0	0	0	0	0
2	1	1	1	1	1	1	1	1	1	1	1	1
3	2	2	2	2	2	2	2	2	2	2	2	2
4	3	3	3	3	3	3	3	3	3	3	3	3
5	4	4	4	4	4	4	4	4	4	4	4	4
6	5	5	5	5	5	5	5	5	5	5	5	5
7	6	6	6	6	6	6	6	6	6	6	6	6
8	7	7	7	7	7	7	7	7	7	7	7	7
9	8	8	8	8	8	8	8	8	8	8	8	8
10	9	9	9	9	9	9	9	9	9	9	9	9

CRITICISMS		SAMPLE NUMBER							
		1	2	3	4	5	6	7	8
FLAVOR									
NO CRITICISMS 10	1. ACID								
	2. BITTER								
	3. COOKED								
	4. FEED								
	5. FERMENTED/FRUITY								
	6. FLAT								
	7. FOREIGN								
	8. GARLIC/ONION								
	9. LACKS FRESHNESS								
	10. MALTY								
	11. METALLIC								
	12. OXIDIZED (LIGHT-INDUCED)								
	13. RANCID								
	14. SALTY								
	15. UNCLEAN								
BODY AND TEXTURE									
NO CRITICISMS 5		1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
NORMAL RANGE 1-5									
APPEARANCE AND COLOR									
NO CRITICISMS 5		1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
NORMAL RANGE 1-5									

Judging Cheddar Cheese

Cheddar cheese is a firm, ripened cheese, usually made from pasteurized whole milk. Many of the points covered in milk judging apply to cheese judging; therefore, only points not covered in milk judging are covered here.

The cheddar cheese scorecard is divided into two areas: flavor, and body and texture. You score each part separately. Many of the flavors listed on the cheddar cheese scorecard are the same as those listed on the milk scorecard, but the reason for a similar flavor in the two products may or may not be related.

Sample cheeses must be brought to a temperature of 50°F to 60°F to secure a uniform temperature throughout all parts of the cheese. This requires a few hours for the smaller styles and several hours for the larger ones. The body and texture must be evaluated before the flavor is evaluated.

Body

The term “body” is used to designate the physical properties, including firmness, cohesiveness, elasticity, and plasticity. These characteristics are called consistency. Physical properties of cheese are affected by the methods of processing and by the composition of cheese. The physical properties describe the appearance and feeling of the cheese when a plug of it is removed from the cheese with a trier.

A normal plug of ripened cheddar cheese shows a smooth, uniform surface; it feels solid and firm; it does not crumble when cut or pressed; it bends before breaking; it feels smooth and waxy, like cold butter when rubbed between the thumb and fingers.

Some of the common defects in the body of cheddar cheese include:

Corky body—Cheese with a firm, hard, tough body that is difficult to crush with the fingers is described as corky. This condition is caused by one or more defects: 1) low fat content, 2) lack of acid development in making, 3) overheating during the cooking operation, 4) low moisture content, and 5) excessive salt content.

Crumbly body—With this defect, the cheese falls apart when sliced; a full plug is difficult to remove from the cheese with a cheese trier; and it crumbles when crushed between the thumb and fingers. There are many reasons for crumbly body, such as allowing curd to cool to too low a temperature before pressing, insufficient pressing, and low moisture.

Mealy body—This characteristic appears when cheese is crushed and rubbed between the thumb and fingers; the structure of the curd feels rough, like cornmeal, on the tongue. This defect is almost always associated with a high-acid condition during the cheese-making operation.

Pasty body—Cheese with this defect is soft in consistency; when pressed and rubbed between the fingers, it quickly becomes sticky and clings to the fingers. This problem is usually caused by a high-moisture content.

Short body—The plug may be dense but is rather fragile. The plug shows little elasticity and breaks easily when bent. This defect is associated with insufficient cheddaring, cheddaring at too low a temperature, or the development of too much acid before the curd has firmed properly.

Weak body—A weak-bodied cheese is soft due to high moisture and/or high fat and often is associated with fermented flavor defects.

Texture

Texture is the term used to describe the manner in which the cheese particles are bound together. Close texture shows only a few openings between the particles, whereas open texture shows spaces between the particles.

The two defects in texture most commonly found in cheddar cheese are:

Gassy—Small gas holes about the size of a pinhead or somewhat larger are caused by undesirable microorganisms growing within the cheese. The holes are fairly uniform in distribution, regular in shape, and shiny on their inside surfaces. Generally, an objectionable fruity or unclean flavor is formed along with this texture defect.

Open—Mechanical openings are characterized by their irregular, angular shapes and sizes and by the dullness of their inside surfaces. These holes result from incomplete matting and pressing of the curd. There is little or no relationship between their presence and the flavor.

Cheddar Cheese Body and Texture Scoring Guide			
Suggested body and texture scores* with designated intensities of defects			
Body and texture criticisms	Intensity of defect		
	Slight	Definite	Pronounced
Corky	4	3	2
Crumbly	4	3	2
Curdy	4	3	2
Gassy	3	2	1
Mealy	4	3	2
Open	4	3	2
Pasty	4	3	1
Short	4	3	2
Weak	4	3	2*

Range of scores for each class of body and texture quality: Excellent 5 (no criticism), Good 3–4, Poor to Fair 1–2, Normal range 1–5.

Flavor

High-quality cheddar cheese has a flavor described as clean, fine, nutty, and pleasantly sweet. How close the cheese flavor comes to this ideal flavor depends on the type of bacterial activity and chemical changes that occur during the manufacturing and curing processes.

Often a body and texture defect is associated with a specific flavor defect. After you have examined the body and texture of the cheese carefully, you will then determine the flavor. You can do this by: (1) noting the odor of the freshly drawn plug as you pass it slowly under your nose; (2) working a portion of the plug between your thumb and forefingers, then smelling for odors; and (3) tasting a small piece of the cheese.

The most common flavor defects you will find in cheddar cheese are the following:

High acid—Acid flavor results from the development of too much acid at any stage of cheese making or curing. You can detect it by smell and taste. High-acid cheese generally develops a bitter flavor with aging.

Bitter—A true bitter flavor is distasteful and resembles quinine. It is picked up by the back of the tongue and mouth. Bitter flavor almost always results from high acid, causing excess **proteolysis**. You can detect this flavor by the sense of taste, and the sensation persists for some time. Do not confuse the sharpness of aged cheese with bitter flavor. A slight bitter flavor is not too serious in aged cheese.

Feed—This flavor is associated with strong feeds eaten by the cows. You can detect it by the sense of taste and smell.

Fermented/fruity—Fruity flavor suggests the peculiar fruit store or pineapple odor. The taste is generally sweet, and the odor resembles that of fermenting or overripe fruit. Fermented cheese has the alcohol smell associated with some brands of bread. The flavor is often associated with high moisture, resulting in a weak, pasty body; but the cause is usually inadequate acid development. Odor may be more important than taste in detecting this flavor.

Garlic/onion—This odor results from cows' grazing on pastures infested with wild onions or garlic.

Rancid—The rancid flavor is soapy and disagreeable. It is caused by the activity of the enzyme lipase that yields butyric acid. It is more likely that you will find this defect in aged cheese.

Sulfide—This odor results from hydrogen sulfide being released as a by-product of bacterial fermentation or enzymatic action on the protein. You can detect sulfide odor readily by passing the freshly drawn plug of cheese under your nose. The odor is similar to that of boiled eggs.

Unclean—This is a term used to describe odors and tastes that are mildly offensive but cannot be identified. This criticism suggests unclean conditions of milk production or of cheese manufacturing.

Yeasty—The odor resembles that of a yeasty fermentation, such as **fresh bread** dough. This flavor results from the growth of yeast organisms in low-acid, high-moisture, or low-salt cheese.

Again, you are encouraged to study and follow the flavor scoring guide in evaluating cheddar cheese.

Cheddar Cheese Flavor Scoring Guide			
Suggested flavor scores* with designated intensities of defects			
Flavor criticisms	Intensity of defect		
	Slight	Definite	Pronounced
Bitter	9	7	4
Feed	9	8	6
Fermented/fruity	8	6	5
Flat	9	8	7
Garlic/onion	6	4	1
Heated	9	8	7
High acid	9	7	5
Moldy	9	5	3
Rancid	6	4	1
Sulfide	9	7	4
Unclean	8	6	3
Whey taint	8	7	5
Yeasty	6	4	1

*Range of scores for each class of flavor quality: Excellent 10 (no criticism), Good 8–9, Fair 6–7, Poor 5 or less. Normal range 1–10.



Judging Ice Cream

The technique for judging ice cream is different in many respects from the scoring of other dairy products. Only vanilla ice cream is judged.

The ice cream scorecard is divided into two parts: flavor, and body and texture. An ice cream sample is seldom given a perfect score on flavor or body and texture.

Ice cream is stored between -10°F and -25°F and must be brought to a temperature of 5°F to 10°F for judging. At this temperature, the product is still partially frozen, which allows for the evaluation of the body and texture.

You can get a fairly accurate impression of its body and texture characteristics by dipping the ice cream. Notice the way it cuts and the feel of the dipper or spoon as its cutting edge passes through the ice cream. It is important to note whether the ice cream tends to curl up behind the dipper, indicating excessive gumminess or stickiness.

After you take the sample from the container, begin at once to examine it for further body and texture characteristics and for flavor. You will need to make several determinations **simultaneously** when you take a sample into your mouth.

When the sample warms to body temperature, it will not be difficult for you to judge the flavor. To evaluate the flavor, place a small amount of the frozen ice cream directly into your mouth, quickly manipulate the sample between your tongue and **palate**, and note the taste and odor sensation. Press a small portion of the frozen ice cream against the roof of your mouth to determine the smoothness, the coarseness, the sandiness, and the relative size of the ice crystals.

After you have noted the flavor and body and texture, expectorate the sample. (Do not swallow the sample.)

Description of the Major Body and Texture Defects

Coarse/icy—This defect is perhaps the most common texture defect of ice cream. Such ice cream is characterized by its rough appearance, large ice crystals, its feeling of unusual coldness in the mouth, and by its general lack of a smooth, velvety feeling. Icy texture is easy to detect. You can feel the ice crystals easily between your teeth or with your tongue. The defect is due primarily to slow freezing of the sugar-water solution in the freezer, or to the frozen ice cream's having been exposed to temperature fluctuation.

Crumbly—Crumbly body in ice cream is shown by a tendency of the ice cream to fall apart when it is dipped. As the ice cream melts in your mouth, a comparatively small amount of liquid results. This condition is associated with low solids, low stabilizer, and high overrun.

Gummy—A sticky or gummy body is the exact opposite of crumbly body. It tends to stick to the teeth when chewed. Gummy ice cream curls up behind the dipper, leaving coarse, deep, irregular waves. The defect is closely associated with the excessive use of stabilizer, sweetener, or both.

Sandy—Sandy texture in ice cream is one of the most objectionable texture defects and one of the easiest to detect. To detect sandiness, press a thin layer of ice cream against the roof of your mouth with your tongue. Hard, uniform particles, which are crystals of **lactose** and feel like fine sand, indicate a sandy texture in ice cream. Do not confuse the sandy and the coarse texture defects in ice cream. The lactose crystals dissolve more slowly than do the ice crystals. This defect is caused by high total solids, age, and heat shocking.

Vanilla ice cream should be pleasantly sweet and have a creamy, delicate vanilla flavor that cleans up well, leaving only a pleasant aftertaste. When you first taste the sample, you should not find the flavor of any one ingredient so strong that it predominates over the flavors of the other ingredients.

Due to the sweetness, it is difficult to observe other flavors that may be present in ice cream. In scoring flavor, this ability to taste beyond the sweetness is important. Do the flavor evaluation from a scooped sample and not directly from the original container.

Ice Cream Body and Texture Scoring Guide			
Suggested body and texture scores* with designated intensities of defects			
Body and texture criticisms	Intensity of defect		
	Slight	Definite	Pronounced
Coarse/icy	4	2	1
Crumbly	4	3	1
Fluffy	3	2	1
Gummy	4	2	1
Sandy	2	1	- **
Soggy	4	3	2
Weak	4	2	1

*Range of scores for each class of **body and texture** quality: Excellent 5 (no criticism), Good 3–4, Poor to Fair 1–2. Normal Range 1–5.
**Dash (-) indicates product of unsalable quality. Official rules prohibit use of such products in contest.

Flavor Defects

Cooked—Cooked flavor in ice cream occurs when the mix is heated too high and held too long at that temperature. The lactose caramelizes, giving the cooked flavor. The use of condensed milk or dried milk powder to build the total solids in the mix may contribute to the cooked flavor.

Unnatural—The presence of unnatural flavoring gives the sensation of synthetic vanillin, which produces a quick, sharp, burning sensation on the sides of the tongue. To determine unnatural flavor, keep in mind the desired flavor of ice cream, containing natural, high-quality vanilla.

High acid—You can distinguish a high acid easily by a sour taste sensation. The high-acid flavor may have resulted from the development of lactic acid in one or more of the dairy products used. Such ice cream merits a low score.

Lacks fine flavor—This condition exists when the ice cream fails by a small degree to measure up to the ideal vanilla ice cream flavor. Such a sample merits a high score.

Oxidized—This is the same defect as in oxidized (light-induced) milk. It is caused by using oxidized dairy ingredients or allowing the mix to become oxidized. It will have the same cardboard flavor as oxidized milk.

Rancid—Rancid flavor is difficult to detect in ice cream, but if present, it will give a slight soapy taste.

Old ingredient—You will not note this defect when you first place the sample in your mouth, but it persists for some time as an aftertaste. The old ingredient flavor suggests uncleanness and stale ingredients.

Storage—Storage flavor reveals a lack of freshness, and you will generally observe it during the latter part of the tasting period. Ice cream held in cold storage for a considerable length of time may gradually undergo decomposition of some of the protein, resulting in a storage flavor. This is especially true of ice cream made from low-quality cream.

Syrup flavor—Syrup flavor resembles the taste of an ice cream cone. If strong enough, it could resemble a marshmallow flavor. It is caused by adding too much corn syrup solids to a mix.

Whey—This defect leaves an aftertaste resembling graham crackers in the mouth. It is caused by the excessive use of whey powder to build solids.

Ice Cream Flavor Scoring Guide			
Suggested flavor scores* with designated intensities of defects			
Flavor criticisms	Intensity of defect		
	Slight	Definite	Pronounced
Acid	4	2	- **
Cooked	9	7	5
Lacks fine flavor	9	8	7
Lacks flavoring	8	6	4
Lacks freshness	8	7	6
Lacks sweetness	9	8	6
Metallic	6	4	2
Old ingredient	6	4	2
Oxidized	6	4	1
Rancid	4	2	- **
Salty	8	7	5
Storage	7	6	4
Syrup flavor	9	7	5
Too high flavor	9	8	7
Too sweet	9	8	7
Unnatural flavor	8	6	4
Whey	7	6	4

*Range of scores for each class of flavor quality: Excellent 10 (no criticism), Good 8–9, Fair 6–7, Poor 5 or less. Normal Range 1–10.
 **Dash (-) indicates product of unsalable quality. Official rules prohibit use of such products in contest.



Judging Cottage Cheese

Although you can purchase cottage cheese as dry curd or low-fat cottage cheese, only small curd, creamed cottage cheese is used in a judging contest. The ideal creamed cottage cheese flavor will be similar to fresh, clean, skim milk or cream and will have a slightly acid, salty taste with the delicate flavor and aroma of a good **lactic starter culture**.

The body should be uniform, smooth, and meaty. The curd particles should be uniform in size and of a natural creamy to white color. Creamed cottage cheese should have a uniform layer of cream around the curd particles with a minimum of free cream.

The cottage cheese scorecard is divided into three sections: flavor, body and texture, and appearance and color.

To start the judging, place samples identified only by numbers on plain plates. This allows you to evaluate the product on its own merits rather than the manufacturer's brand. Normally, you should evaluate the appearance and color first, because you will make these evaluations by observation. By careful observation, you can detect such defects as **free cream**, **free whey**, **lacks cream**, and **matted**.

Curd particles that are stuck together are said to be **matted**.

Shattered curd is the most common defect. Shattered curd contains small broken particles throughout the container of cheese. Shattered curd is usually the result of rough handling during cutting, cooking, and washing, and breakage during creaming, pumping, and packaging.

Free cream denotes excess dressing in the curd. When put on a plate, the cream will seep away from the curd. It should be pulled out from the curd at least one-fourth of an inch before being marked as a defect.

Free whey looks like water in the cottage cheese and also should be pulled away from the curd one-fourth of an inch before being considered a defect.

Cottage Cheese Appearance and Color Scoring Guide

Suggested appearance and color scores* with designated intensities of defects			
Appearance and color criticisms	Intensity of defect		
	Slight	Definite	Pronounced
Free cream	4	2	1
Free whey	3	2	1
Lacks cream	4	3	2
Matted	4	2	1
Shattered curd	4	3	2

*Range of scores for each class of **appearance and color** quality: Excellent 5 (no criticism), Good 3–4, Poor to Fair 1–2. Normal Range 1–5.

Defects of Flavor, Body, and Texture

These defects are normally determined simultaneously while the sample is in your mouth. These are some of the defects that occur most often:

Firm/rubbery—These defects are similar and result from overheating the curd during the cooking operation. Sometimes, you will notice free cream in the container, since the curd particles will be too hard to absorb the cream properly. When pressed against the roof of the mouth, the curds will be overly firm and resist breaking.

Mealy—This defect resembles the feel of cornmeal in the mouth after chewing. Mealiness can be caused by the type of lactic starter used or by cooking the curd too quickly.

Overstabilized—This defect is caused by simply adding too much stabilizer to the cream dressing. The curds will slide in your mouth and will have a slick feel.

Weak or pasty—These defects are sometimes related. They can be caused by cooking the curd at too low a temperature, by excessive acid development during the make operation, or by using skim milk, pasteurized at higher than normal temperatures. The curd particles are not uniform and smooth but will easily stick together and become mush.

Only those flavors of cottage cheese that do not pertain to milk are described below. For the other flavors, consult the previous sections on judging.

High acid—Bacteria used in manufacturing cottage cheese cause a strong, tart acid flavor. Excessive production of acid is considered a defect. You can expect a mild acid flavor, since lactic acid is produced by the starter that is used to make cottage cheese.

Diacetyl—Too much **diacetyl** causes a coarse flavor. The proper concentration of this compound is an essential part of the normal flavor of cottage cheese. Diacetyl is produced by bacteria or by adding a concentrated flavor ingredient to the cheese or to the cream dressing. Too high a concentration makes the cheese taste somewhat bitter and similar to the flavor of English walnuts.

Fermented/fruity—This flavor resembles vinegar, pineapple, or other fruit. Bacteria and yeasts are primarily responsible for development of this off-flavor, which you can easily detect by smell.

Flat—This defect occurs when the milk acid, rich cream, and salt flavors are not present in the finished product. Dry-curd cottage cheese will have this flat characteristic.

Lacks freshness—This flavor is usually the forerunner of more serious off-flavors produced by microorganisms, by absorption of odors, or by chemical reactions, such as oxidation. The fresh, delicate flavor of desirable cottage cheese is missing.

Musty/yeasty—These flavors are grouped together, because molds and yeasts grow under the same conditions and are particularly adapted to growth in the acid environment provided by cottage cheese. You can best detect the true musty defect by an odor that resembles the odor of a poorly ventilated cellar or damp basement room. The yeasty defect is similar to the flavor of baker’s yeast or of yeast bread.

Cottage Cheese Body and Texture Scoring Guide			
Suggested body and texture scores* with designated intensities of defects			
Body and texture criticisms	Intensity of defect		
	Slight	Definite	Pronounced
Firm/rubbery	4	2	1
Gelatinous	3	2	1
Mealy/grainy	4	2	1
Overstabilized	4	3	2
Pasty	3	2	1
Weak/soft	4	3	2

*Range of scores for each class of **body and texture** quality: Excellent 5 (no criticism), Good 3–4, Poor to Fair 1–2. Normal Range 1–5.

Cottage Cheese Flavor Scoring Guide			
Suggested flavor scores* with designated intensities of defects			
Flavor criticisms	Intensity of defect		
	Slight	Definite	Pronounced
Bitter	7	5	1
Cooked	9	8	6
Diacetyl	9	7	6
Feed	9	7	5
Fermented/fruity	5	3	1
Flat	9	8	7
Foreign	7	4	1
High acid	9	7	5
High salt	9	8	7
Lacks fine flavor	9	7	6
Lacks freshness	8	7	6
Malty	6	4	1
Metallic	5	3	1
Musty	5	3	1
Oxidized	5	3	1
Rancid	4	2	1
Unclean	6	3	1
Yeasty	4	2	1

*Range of scores for each class of flavor quality: Excellent 10 (no criticism), Good 8–9, Fair 6–7, Poor 5 or less. Normal Range 1–10.

Glossary

If you encounter unfamiliar words not found in this glossary, look them up in a dictionary.

Diacetyl—a desirable flavor substance formed by certain bacteria in a starter culture.

Enzymatic action—the action of chemicals produced by living cells, which brings about a reaction without the chemicals themselves undergoing a change in the process.

Expectorate—to spit out or discharge a substance from the mouth.

Fatty acids—a group of acids combined with glycerol to form the milk fat. Milk fat contains 17 or more fatty acids.

Irregularities—practices not conforming to the uniformity in method or practice, which is essential to produce a high-quality product.

Lactation—the milking period, normally 10 months.

Lactic starter culture—a prepared culture of bacteria, which is added to pasteurized milk for the purpose of making cheese, yogurt, and other cultured dairy products.

Lactose—milk sugar; yields lactic acid on fermentation.

Manipulate—to move a substance around.

Microorganisms—simple, one-celled microscopic plants or animals.

Palate—the roof of the mouth.

Pasteurization—exposing a substance (as a fluid) to a temperature that destroys objectionable organisms without major chemical changes in the substance.

Postpasteurization—following, after pasteurization.

Proteolysis—a breakdown of protein.

Psychrophilic—bacteria that grow best at refrigerated temperature.

Raw milk—milk as it comes from the cow (not pasteurized).

Receptors—a group of cells that receives flavors.

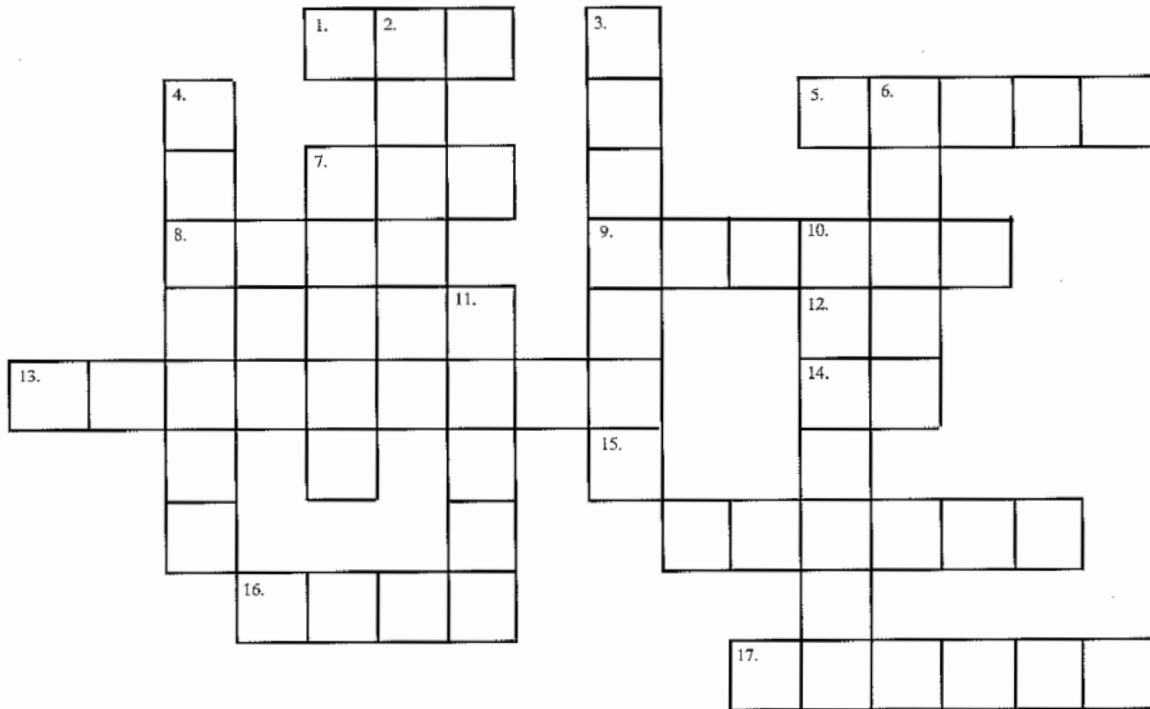
Sanitizer—a substance that has the ability to lower bacterial count.

Simultaneously—occurring at the same time.

Trier—an instrument used to obtain a sample of cheddar cheese.

Answers to crossword puzzle on back page:
Across: 1 raw 5 gassy 7 hp 8 curd 9 flavor 12 am 13 scorecard 14 na 15 palate 16 body 17 hauler: Down: 2 acid 3 sulfide 4 lactose 6 aroma 7 trier 10 vanilla 11 malty

Crossword Puzzle



Across

1. Milk as it comes from the cow (not pasteurized).
5. A texture defect of cheese.
7. Where the "sweet" taste is sensed on the tongue.
8. Cottage cheese texture is defective if this is shattered.
9. The odor, taste, and feel of the product in the mouth make up this concept.
12. Abbreviation for morning.
13. A tabulated list of the components describing the quality of a product, with a numerical value assigned to each component.
14. Abbreviation for the continent on which we live.
15. The roof of the mouth.
16. A term used to designate the physical properties of cheese.
17. Someone who evaluates milk in farm bulk tanks.

Down

2. This flavor defect develops rapidly if raw milk is not properly cooled; is characterized by a sharp, sour taste.
3. A flavor defect of cheese that causes it to smell like boiled eggs.
4. Milk sugar.
6. You should smell this immediately when judging any sample.
7. An instrument used to get a cheddar cheese sample.
10. This is the only flavor of ice cream that is judged.
11. A flavor defect of milk that causes it to taste like walnuts.

Answers on page 14.

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