

2007 State 4-H Dairy Products Evaluation Contest Procedures and Training of Contestants

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The State Dairy Products Evaluation Contest will be held on Saturday, October 13. Contestants will be asked to evaluate 2% milk (5 samples), Cheddar Cheese (5 samples), identify 5 frozen desserts, and identify 4 samples as real or artificial.

Changes have been made in the contest in an attempt to make the procedures less complicated for the contestants and to make training of 4-H members easier by agents and volunteer leaders. The information below is presented to explain the contest and provide information for training 4-H'ers. Score sheets are in Appendix 3. The scoring has been modified so that the high score wins.

MILK, 2% FAT

Five samples will be presented to the contestants. Each sample will have only one defect. It is important to emphasize that only one defect should be marked. It also is important to emphasize that more than one sample of a defect may be included in a set of samples.

Product defects for training and tested are listed below. Appendix 1 includes definitions of these defects. A web site for more information on Dairy Products Judging is listed.

For training, samples may be prepared using the following formulas. All formulas are for approximately 1 quart of 2% milk.

- A. **Cooked**--Heat milk to 176°F and hold for 1 minute. Cool rapidly.
- B. **Lacks Freshness**--Add 1-2 tablespoons nonfat dry milk powder.
- C. **Acid**--Add 1-2 tablespoons cultured buttermilk. Prepare at least 24 hours ahead.
- D. **Oxidized**--Purchase milk in white plastic containers or expose milk in clear containers to sunlight for 8 to 15 minutes. Use within 24 hours.
- E. **Fermented/Fruity**--add 1-2 teaspoons of pineapple juice.
- F. **Flat**--add 5-10% water
- G. **Garlic/Onion**--add garlic powder or onion juice.
- H. **Malty**--place 2 teaspoons of Grape Nuts or similar cereal in a coffee filter. Place in 1 cup of milk for about 45 minutes. Remove filter and cereal. Add enough milk to make the quart.
- G. **No defect**--fresh 2% milk from an opaque container.

Milk samples should be set out up to 15-20 minutes prior to tasting so that it is not ice cold. Cold makes it harder to taste defects.

For scoring, 5 points will be given for a correct answer and 0 points for an incorrect response. No points will be given if more than one defect is marked.

CHEDDAR CHEESE

There will be 5 cheddar cheese samples. Possible defects will be limited to bitter, fermented/fruity, flat, high acid, rancid, sulfide, rancid, unclean, and whey. Definitions of these defects are in Appendix 2. More than one defect may be present in a sample. Scoring will be based a 5-point per sample basis. The formula for calculating the score is shown on the score card in Appendix 3.

Concentrating on differences among mild, medium and sharp cheddar cheese samples can help the contestants learn flat (as in most milds), whey taint (mild usually), sulfide (many sharps), acid (many sharps), and bitter (some sharps). Mediums will fall somewhere between. Extra sharp samples will have higher degrees of bitter, acid, and sulfide and may be fermented fruity. The other attributes on the list may or may not be found in market samples. Understanding the definitions will help the contestant identify the samples if they should be present in the contest samples. Please make sure that your 4-Hers know that Cheddar cheese may be white! It would be good to use a white sample in training as these are usually extra sharp and may be high in acid, sulfide, and bitterness.

NOTE: we will not be testing body and texture as these attributes are more difficult to teach than flavor.

FROZEN DESSERT IDENTIFICATION

In this portion of the contest, 4Hers are expected to detect the difference between different types of ice cream samples. There are five categories as shown below. Note that the first and the second are the same.

1. Ice cream (full fat or premium) vs. Low or no fat ice cream
2. Ice cream (full fat or premium) vs. Low or no fat ice cream
3. Ice cream (full fat or premium) vs. Low or no fat frozen yogurt
4. Natural flavored vanilla ice cream vs artificially flavored vanilla ice cream
5. Natural flavored vanilla ice cream vs artificially flavored vanilla ice cream

For training, you have MANY options with this area. In fact, if you find a naturally flavored premium vanilla ice cream, you could actually use it for ALL five categories. This is not recommended, but it is possible. For the first two, try to buy one ice cream that isn't labeled as "low fat or nonfat" and a second that is labeled as such. For the third sample, low-fat frozen yogurt may be used. If you can't find it, use the same ice cream you used in the first set. For the final two, you may use either ice cream that contains natural and artificial vanilla flavors for the "artificially flavored" or, more

preferably, just artificial flavor. The combination of natural and artificial can make it very confusing. Often, you can use the same two types in the last two that you used for the first two samples, i.e., many premium ice creams have natural vanilla while many of the low fat ice creams have artificial vanilla. Adding natural and artificial vanilla flavorings to milk and allowing the 4Hers to sample them is a good way to help them differentiate the two.

When training, keep the ice cream hard frozen until about 30 minutes prior to the session and then bring it out so it is easier to scoop.

On the score sheet, if the contestant is correct on a particular product, they get 3 points and if they are incorrect, they get 0 points.

REAL VS. ARTIFICIAL

The 4Hers must identify a product as a “real” versus “artificial” product for four types of products. The following is a list of the types to use for training. (Real listed first)

- A. 80% Fat Spread. Butter or margarine. When you purchase margarine, try to buy the better brands to make it a little more challenging.
- B. Whipped Topping. Whipped cream and non-dairy whipped topping in aerosol cans.
- C. Creamer. Half-and-half and non-dairy creamer.
- D. Cheese Product. “Pasteurized process cheese” or “pasteurized process cheese spread or food. You will find the type of cheese somewhere on the package. Buy the sliced type. Velveeta cheese is called something like a pasteurized process cheese food product. It is OK to use for the latter. Pasteurized process cheese is always the most expensive of the sliced cheeses. Cut the slices into fourths and have tooth picks for the contestants to sample the product.

In the Real vs. Artificial section, a correct answer is worth 3 points and an incorrect answer is worth 0 points.

APPENDIX 1--DESCRIPTIONS OF MILK DEFECTS

(From Dairy Products Judging. Revised by Dr. Reuben Moore, Extension Dairy Science Specialist, and Julie Wilson, Research Assistant, Food Science and Technology. Publication 1423. Extension Service of Mississippi State University
<http://msucares.com/pubs/publications/p1423.htm>)

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.

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--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.

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. (Note: contestants should be instructed to smell samples before tasting. If garlic/onion is detected by smell, they may not want to taste as the residual flavor may make it difficult for them to detect other flavors.)

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 psychrotrophic or cold-loving bacteria; 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.

APPENDIX 2--DESCRIPTIONS OF CHEDDAR CHEESE DEFECTS

(Adapted from Dairy Products Judging. Revised by Dr. Reuben Moore, Extension Dairy Science Specialist, and Julie Wilson, Research Assistant, Food Science and Technology. Publication 1423. Extension Service of Mississippi State University <http://msucares.com/pubs/publications/p1423.htm>) and training materials for University of Tennessee Collegiate Dairy Products Evaluation Team).

High Acid--Acid flavor results from the development of too much acid at any stage of cheese making or curing. High acid is noted quickly when you first bite into the cheese. The taste quickly disappears.

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.

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.

Flat--Lacks typical flavor of aged cheddar cheese.

High Acid--Acid flavor results from the development of too much acid at any stage of cheese making or curing. High acid is noted quickly when you first bite into the cheese. The taste quickly disappears.

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.

Whey or Whey Taint--This flavor is described as a slightly dirty, sweet-acid taste. It is sometimes confused with high acid. Whey taint lasts longer than acid taste which disappears rapidly.

TENNESSEE 4-H DAIRY
PRODUCTS EVALUATION

MILK

Contestant No: _____
County/Team No: _____
Division: Jr/Sr _____
Date: ____ / ____ / ____

		Sample Number				
		1	2	3	4	5
FLAVOR PUT A CHECK IN THE BOX OF THE FLAVOR CRITICISMS THAT YOU DETECT	<i>PROCESSING</i>					
	COOKED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	FLAT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	MALTY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>ABSORBED</i>					
	GARLIC/ONION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>BACTERIAL</i>					
	ACID	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	FERMENTED/FRUITY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>CHEMICAL</i>					
	LACKS FRESHNESS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	OXIDIZED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	SCORE (5 points for 1 correct mark, 0 points if any incorrect mark is present)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TOTAL SCORE						

TENNESSEE 4-H DAIRY
PRODUCTS EVALUATION

CHEDDAR CHEESE

Contestant No: _____
County/Team No: _____
Division: Jr/Sr _____
Date: ____ / ____ / ____

POSSIBLE CRITICISMS		Sample Number				
		1	2	3	4	5
FLAVOR	<i>CULTURE SYSTEM</i>					
	ACID	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	BITTER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	FERMENTED/FRUITY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	FLAT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>PROCESS RELATED</i>					
	WHEY TAIN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>STORAGE DEFECTS</i>					
	RANCID	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	SULFIDE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	SCORING	Number of correct attributes marked (A)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Number of attributes in product + incorrect marks by contestant (B)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Score = (A/B) X 5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TOTAL SCORE						

Examples

- | | |
|--------------------------------------------------------------------------------|-----------------------------|
| 1. Cheese is flat and whey. Panelist marks flat. | Score: $1/2 \times 5 = 2.5$ |
| 2. Cheese is flat. Panelist marks whey and flat. | Score: $1/2 \times 5 = 2.5$ |
| 3. Cheese is flat and whey. Panelist marks flat and sulfide. | Score: $1/3 \times 5 = 1.7$ |
| 4. Cheese is acid, bitter, and sulfide. Panelist marks acid and bitter | Score: $2/3 \times 5 = 3.3$ |
| 5. Cheese is acid, bitter, and sulfide. Panelist marks acid, bitter, and whey. | Score: $2/4 \times 5 = 2.5$ |

TENNESSEE 4-H DAIRY
PRODUCTS EVALUATION

**FROZEN DESSERT
IDENTIFICATION**

Contestant No: _____
County/Team No: _____
Division: Jr/Sr _____
Date: ____ / ____ / ____

PRODUCT (3 POINTS PER PRODUCT)				
1	ICE CREAM (FULL FAT OR PREMIUM)	_____	LOW OR NO FAT ICE CREAM	_____
2	ICE CREAM (FULL FAT OR PREMIUM)	_____	LOW OR NO FAT ICE CREAM	_____
3	ICE CREAM (FULL FAT OR PREMIUM)	_____	LOW OR NO FAT FROZEN YOGURT	_____
4	NATURAL FLAVORED VANILLA ICE CREAM	_____	ARTIFICIALLY FLAVORED VANILLA ICE CREAM	_____
5	NATURAL FLAVORED VANILLA ICE CREAM	_____	ARTIFICIALLY FLAVORED VANILLA ICE CREAM	_____
TOTAL SCORE _____				
PERFECT SCORE = 15				

TENNESSEE 4-H DAIRY
PRODUCTS EVALUATION

Contestant No: _____
County/Team No: _____

REAL VS ARTIFICIAL

Division: Jr/Sr _____

Date: ____ / ____ / ____

PRODUCT (3 POINTS PER PRODUCT)

80% FAT SPREAD

BUTTER

MARGARINE

WHIPPED TOPPING

ARTIFICIAL

WHIPPED CREAM

CREAMER

ARTIFICIAL

HALF AND HALF

CHEESE PRODUCT

PASTEURIZED
PROCESS
CHEESE

PASTEURIZED
PROCESS CHEESE
SPREAD/FOOD

TOTAL SCORE

PERFECT SCORE = 12
