



Milk Quality and Products

Purpose

The Tennessee FFA Milk Quality and Products Career Development Event aims to promote practical learning activities in milk quality and dairy products while assisting students in developing team decision-making skills.

The Tennessee FFA Milk Quality and Products CDE focuses on raw milk quality, dairy products, federal milk marketing orders and attributes of selected milk products. The five general areas that contribute to milk quality and consumer demand are:

- Milk production
- Milk and dairy product quality and safety
- Milk processing or manufacturing
- Raw milk marketing
- Facility operations:
 - Safety/sanitation
 - Labor

Objectives

This event will provide the participant with the ability to do the following:

Utilize knowledge of milk quality related to

- Producing quality milk:
 - Regulations
 - Grades and classes of milk
 - Factors necessary to produce quality milk
- Cleaning and sanitizing:
 - General types of cleaners and sanitizers
 - Water hardness
 - Milk stone
 - Approved milking equipment and design
 - Proper milking procedures
- Cooling milk
- Identifying diseases transmitted to consumers via milk
- Recognizing causes of off-flavors in milk

Utilize knowledge of milk pricing related to

- Marketing and marketing concepts:
 - Pricing trends
 - Economics
 - Supply and demand
- Federal milk marketing orders, economics and distribution:

- Transportation costs
- Cooperatives
- Pricing

Utilize knowledge of the composition and quality characteristics of raw and pasteurized milk and milk products including

- Nonfat solids portion:
 - Milkfat
 - Adulterants, including water
 - Bacterial standards and testing
 - Quality testing
- Understanding the causes and control of mastitis, its influences on milk quality and cheese yield and the use of mastitis detection methods in controlling the disease, specifically including the following:
 - Causes
 - Prevention
 - Detection (California Mastitis Test and Direct Microscopic Somatic Cell Count)
 - Treatment
 - Regulatory programs
- Identification of cheese varieties and characterize properties
- Identification of flavor defects and evaluate milk quality
- Understanding the importance of dairy food safety programs
- Identification and comparison of dairy vs non-dairy products

Event Rules

- Teams will consist of four members.
- This is not a regional qualifying event, and it will be an open state contest.
- Official dress is NOT required for this event.
- Participants are not to use strong deodorant, perfume, chewing gum or other detractors to the taste and smell senses.
- **Allergy Information:** Food products used in this event may contain or come in contact with potential allergens. Any participant in need of a reasonable ADA accommodation(s) (including known allergies) for their participation in the Milk Quality and Products CDE should complete the online [Request for Accommodation Form \(ADA and other\)](#). **This form must be received 30 business days prior to the start of the event.** All requests will remain confidential, and the participant will be contacted by a Tennessee FFA staff member to gather additional information and/or discuss the reasonable accommodation(s) or assistance being requested. For questions regarding the ADA and/or other Accommodation Process, please email ryan.inman2@tn.gov. The event committee will make all reasonable efforts to accommodate students with food allergies.

Event Format

EQUIPMENT

- Materials to be provided by the student:
 - Two no. 2 pencils.
 - Bottled water and/or palate cleanser.
 - Clean clipboard
- Materials provided by National FFA:
 - Scantron
- Participants are **not** to bring these items:
 - Glass of any kind to the event.
 - Cell phones, calculators or other electronic devices.

FLOW OF EVENT

- Milk Flavor Identification and Evaluation: — 20 minutes
- Product Identification: — 20 minutes
- Cheese Identification: — 20 minutes
- Written Exam: — 40 minutes

INDIVIDUAL ACTIVITIES

Milk Flavor Identification and Evaluation (120 Points — 6 points for flavor ID, 6 points for intensity score)

- Ten milk samples will be scored on flavor defect (taste and odor) using the scorecard. Check only the most serious defect in a sample even if more than one flavor is detected (all samples of milk are prepared from pasteurized whole vitamin D milk intended for table use). Only those cups provided at the event may be used. (Six points per correct answer.)
- Participants are to use whole numbers when scoring “Defect Intensity.” If no defect is noted, participants should check “No defect” and score as a ten (See Scoring Guide below). (Six points per correct answer.)

Palate cleansers (e.g., apples, apple juice or soda crackers) will be allowed for refreshing.

SCORING GUIDE

Refer to the current scorecard being used at the national level.

Scores may range from 1 to 10 on a quality basis:

10	Excellent (no defect)
8 to 9	Good
5 to 7	Fair
2 to 4	Poor
1	Unacceptable/unsalable

EXAMPLE: MILK FLAVOR

Defects	Scores*		
	Slight	Definite	Pronounced
Acid	3	2	1
Bitter	5	3	1
Feed	9	8	5
Flat/Watery	9	8	7
Foreign	5	3	1
Garlic/Onion	5	3	1
Malty	5	3	1
No defect	10	10	10
Oxidized	6	4	1
Rancid	4	2	1
Salty	8	6	4

**Suggested scores are given for three intensities of flavor. All numbers within the range may be used. Intermediate numbers may also be used; for example, a bitter sample of milk may score four.*

Product Identification — Dairy versus Non-Dairy (100 points — 6 points identification, 4 points fat content)

- A total of 10 samples consisting of dairy and non-dairy products will be identified and assigned a milk-fat content score.
- The following products may be included among the samples:
 - Dairy Products: nonfat (skim) milk (.05%), lowfat milk (1.0%), reduced fat milk (2%), milk (3.25%), half and half (10.5%), butter (80%), sour cream (18%), flavored milk (0.05%–3.25%) light whipped cream (30%), heavy cream (36%).
 - Non-Dairy Products: margarine, non-dairy creamer, non-dairy sour cream, non-dairy milk, non-dairy flavored beverage and non-dairy whipped topping. All of these are to be categorized as non-dairy fat.

Cheese Identification (100 Points)

- Ten cheese samples for identification will be selected from those listed. Cubes of the cheeses will be available for tasting. **Note:** More than one sample of a given cheese may be used. A score of four points is given for each variety correctly identified. Uncolored cheeses may be used. (40 points possible)
- In addition to identifying cheese samples, participants will classify characteristics of identified cheeses using the following matrix. Participants will have six characteristics to select based on the 10 identified cheese samples. An example cheese characteristic problem can be found in the Reference section of this handbook. (60 points possible).

Cheese Characteristics Matrix

A description of major varieties of cheeses popular among American consumers.

Variety	Moisture (%) (Maximum) ¹	Fat (%) (Minimum) ²	Pasta Filata ³	Brine/Surface Salted	Ripened by	Origin
Blue/Bleu	46	50	no	yes	mold	France
Brie	52.5	20	no	no	bacteria and mold	France
Cheddar Mild	39	50	no	no	bacteria	England
Cheddar Sharp	39	50	no	no	bacteria	England
Colby	40	50	no	no	bacteria	US
Cream	55	33	no	no	unripened	US
Feta	60	42	no	yes	bacteria	Greece
Gouda/Edam	45	48	no	yes	bacteria	Netherlands
Havarti	54	30	no	no	bacteria	Denmark
Gruyere	39	45	no	yes	bacteria	Switzerland
Monterey Jack	44	50	no	no	bacteria	US
Mozzarella	60	45	yes	yes	bacteria	Italy
Muenster	46	50	no	no	bacteria	France
Parmesan	32	32	no	yes	bacteria	Italy
Processed American	40	50	no	no	bacteria	US
Provolone	45	45	yes	yes	bacteria	Italy
Queso Fresco	59	18	no	no	unripened	Mexico
Ricotta	73	4	no	no	unripened	Italy
Swiss	41	43	no	yes	bacteria	Switzerland

¹Some cheeses have a range in moisture permitted, but these are the highest permitted amounts.

²Some cheese standards use percentage by weight of total solids (e.g., cheddar) while others use percentage by weight of the cheese (e.g., cream).

³Curd is stretched in hot water to align the protein molecules and provide stretch to the curd

CHEESE CHARACTERIZATION EXAMPLE PROBLEM

The six items in the “characteristics” column are based on the information found in the [Cheese Characterization Matrix](#) in this handbook.

Cheese samples are from the cheese identification activity. Participants will select all characteristics that apply to each sample. Answers will be recorded on the event-specific scan form. Characteristics in the problem can change each year.

Characteristics	Sample Numbers				
	1 (Cheddar)	2 (Cream)	3 (Swiss)	4 (Mozzarella)	5 (Bleu)
A. Maximum moisture = 39%	X				
B. Minimum fat in the solids = 33%		X			
C. Receives “pasta filata treatment”				X	
D. Salted in brine				X	
E. Ripened by molds					X
F. Originated in England	X				

Written exam (120 Points)

The written exam will be comprised of a total of 40 multiple-choice items. The exam will come from the last five years of National FFA exams from the National Milk Quality and Products CDE.

Scoring

Activity	Points/Sample	Samples	Individual Points	Team Points
Milk flavor identification and evaluation	12 points/sample (6 points for flavor defect 6 points for intensity)	10 samples	120	480
Product identification	10 points/sample (6 points for identification 4 points for milk fat)	10 samples	100	400
Cheese type identification	10 points/sample (4 points per type 6 points for characteristics)	10 samples	100	400
Written exam	3 points/ question	40 questions	120	480
<i>Total Possible Individual Points</i>			440	
TOTAL POINTS PER TEAM				1760

TIEBREAKERS

If ties occur, the following events, in this order, will be used to determine award recipients:

Team

1. Milk identification total score of all team members.
2. Cheese identification score for all team members.
3. Test scores combined from all members

Individual

1. Milk identification
2. Cheese identification
3. Product identification

