

# ***EASTERN REGIONAL FFA MILK QUALITY AND PRODUCTS CAREER DEVELOPMENT EVENT***

## **I. PURPOSE**

The purpose of the National FFA Milk Quality and Products Career Development Event is to promote practical learning activities in milk quality and dairy products, as well as assisting students in developing team decision-making skills.

The focus of the National FFA Milk Quality and Products Career Development Event is raw milk quality, federal milk marketing orders and attributes of selected milk products. The four general areas that contribute to milk quality and consumer demand are:

- Milk production.
- Milk quality and safety.
- Milk processing or manufacturing.
- Raw milk marketing.

For information about milk production and related careers, see the reference section at the end of this chapter.

## **II. OBJECTIVES**

### **A. Utilize knowledge of milk quality**

1. Producing quality milk
  - A. Regulations
  - B. Grades and classes of milk
  - C. Factors necessary to produce quality milk
2. Cleaning and sanitizing
  - A. General types of cleaners and sanitizers
  - B. Water hardness
  - C. Milkstone
  - D. Equipment, teats and udders
3. Cooling milk
4. Identifying diseases transmitted to consumers via milk
5. Recognizing causes of off flavors in milk

### **B. Utilize knowledge of milk pricing**

1. Marketing and marketing concepts
  - A. Pricing trends
  - B. Economics
  - C. Supply and demand
2. Federal milk marketing orders, economics and distribution
  - A. Transportation costs
  - B. Cooperatives
  - C. Pricing

### **C. Utilize knowledge of the composition and quality characteristics of raw and pasteurized milk and milk products**

1. Nonfat solids portion
2. Milkfat
3. Adulterants, including water
4. Bacterial standards and usual methods of estimating their numbers

### **D. Understand 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**

1. Causes
2. Prevention
3. Detection (California Mastitis Test and Direct Microscopic Somatic Cell Count)
4. Treatment
5. Regulatory programs

### **E. Identify cheese varieties and characterize properties**

### **F. Identify flavor defects and evaluate milk quality**

### III. Agriculture, Food and Natural Resources (AFNR) Career Cluster Content Standards

With the recommendation of the National FFA Board of Directors, all national FFA programs have incorporated these standards to guide the direction and content of program materials and activities. Refer to Appendix A in this chapter of the handbook for a complete list of the measurable activities that participants will carry out in this event. For details about the incorporation of AFNR standards, refer to the Introduction chapter of the CDE handbook.

### IV. EVENT RULES

- A. Team make-up- Teams will consist of four members. Team ranking is determined by combining the scores of all team participants. Teams that have fewer than four members are not eligible for team awards, but students may receive individual awards.
- B. It is highly recommended that all participants be in official FFA dress for this event.
- C. Participants will report for instructions to the event superintendent at the time and place shown in the current year's team orientation packet.
- D. Participants are not to use strong deodorant, perfume, chewing gum or other detractors to the taste and smell senses.
- E. Any participant in possession of an electronic device in the event area is subject to disqualification.

### V. EVENT FORMAT

#### A. Equipment

1. Materials to be provided by the student: two no. 2 pencils.
2. Optional - students may wish to bring a non-programmable calculator, bottled water and/ or palette cleanser.
3. Materials Provided: All paper and other supplies will be provided. Participants are not to bring clipboards, paper, etc., to the event. Participants are not to bring glass of any kind to the event.

#### B. Flow of Event

1. Milk Flavor Identification and Evaluation - 20 minutes
2. Fat Content Identification - 20 minutes
3. California Mastitis Test - 20 minutes
4. Cheese Identification - 20 minutes
5. Written Exam - 40 minutes
6. Problem Solving - 40 minutes
7. Team Activity - varied based on activities

### VI. TEAM ACTIVITY

Teams members will work together to determine producer milk acceptability based on some or all of the following tests. Teams may have to perform the acceptability tests or analyze test results given. Teamwork will be assessed during the completion of the acceptability tests.

Examples of acceptability tests include:

- A. Recent producer history
- B. Percent TA (acidity)
- C. DMC (Direct Microscopic Somatic Cell Count)
- D. SPC (Standard Plate Count)
- E. PI count (Preliminary Incubation Count)
- F. Antibiotic screening test
- G. Sample temperature
- H. Sample freezing point

Teams will present their test findings, acceptability solution and improvement recommendations to a panel of judges.

#### Team Activity Scoring

- Accuracy of report results - 200 points
- Content of comments - 100 points
- Presentation (written/oral) - 50 points
- Teamwork - 50 points

## VII. INDIVIDUAL ACTIVITIES

### A. Milk Flavor Identification and Evaluation (20 minutes) - 110 points

1. Ten milk samples will be scored on flavor (taste and odor) using the computerized scorecard. All samples of milk are prepared from pasteurized milk intended for table use and will score 1 to 10 (See Scoring Guide). Milk samples will be tempered to 60°F. Only those cups provided at the event may be used.
2. Participants are to use whole numbers when scoring "Flavor" of milk and to check only the most serious defect in a sample even if more than one flavor is detected. If no defect is noted, participants should check, "No defect" and score as a ten (See Scoring Guide).
3. Palette cleansers (e.g. apples 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/un-salable

Example:  
Milk Flavor

DEFECTS	SCORES*		
	<i>Slight</i>	<i>Definite</i>	<i>Pronounced</i>
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
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 4.

### B. Milk Fat Content of Fresh Milk Products (20 minutes) - 15 points

1. Five samples of fresh fluid milk products will be identified according to their content of milk fat.
2. The following products may be included among the samples: nonfat (skim) milk, reduced fat milk (2%), milk (3.3%), half and half (10.5%), coffee cream (18%) and whipping cream (30%).

### C. California Mastitis Test (20 minutes) - 64 points

1. The California Mastitis Test will be scored using even numbers from 0 to 8 inclusive. (See below for the Scoring Guide for the California Mastitis Test.)
2. Eight samples of milk will be evaluated for abnormality, using the California Mastitis Test method.

#### Scoring Guide

CMT Test Score	Appearance	Participant Score
Negative	Mixture liquid, no precipitate	0
T	Slight precipitate tends to disappear with paddle movement	2
1	Distinct precipitate but does not gel	4
2	Distinct gel formation	6
3	Strong gel formation, which tends to adhere to paddle. Forms distinct central peak	8

#### D. Cheese Identification (20 Minutes) - 50 points

1. Five cheese samples for identification will be selected. Cubes of the cheeses will be available for tasting. Note: More than one sample of a given cheese may be used. A score of 3 points is given for each variety correctly identified. Uncolored cheeses may be used. (See cheese matrix on page 5 of the National FFA Milk Quality and Products CDE (online))

2. In addition to identifying cheese samples, participants will classify characteristics of identified cheeses using the following matrix. Participants will have seven characteristics to select based on the five identified cheese samples (35 points possible). An example cheese characteristic problem can be found in the reference section of this handbook.

#### E. Problem Solving (40 Minutes) - 100 Points

The problem solving test will consist of critical-thinking, multiple choice questions.

Topics may include, but are not limited to:

1. Decisions about the quality and acceptability of milk.
2. Calculations of the value of milk and components of milk.
3. Decisions about components of milk and milk products (including processing procedures).
4. Decisions about the use of chemicals in cleaning and sanitizing operations.

#### F. Written Test (40 Minutes) - 120 points

The written test will be comprised of a total of 60 multiple choice items. The test will be given in two parts with one part consisting of thirty (30) questions on quality milk production and a second part of thirty (30) questions on milk marketing.

### VIII. TIEBREAKERS

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

Team

1. Team activity
2. Exam score totals
3. Problem solving totals

Individual

1. Exam
2. Problem solving
3. Sum of milk flavors, fat ID, CMT and cheese ID

### IX. SCORING

The event will be worth 2,240 total points.

Activity	Points/Sample	Samples	Points
Milk Flavor Identification and Evaluation	11 points/sample	10 samples	110
Fat identification	3 points/sample	5 samples	15
California Mastitis Test (*Includes one free point)	8 points/sample	8 samples	65*
Cheese type identification	3 points/sample	5 samples	15
Cheese characteristic identification	7 point/sample	5 samples	35
Problem Solving	100		
Written Exam		60 questions	120
<b>Total Possible Individual Points</b>			<b>460</b>
Team Activity			400
<b>Total Points per team</b>			<b>2,240</b>

### X. AWARDS

Awards will be presented at the awards ceremony. Awards are presented to teams as well as individuals based upon their rankings. Awards are sponsored by a cooperating industry sponsor(s) as a special project, and/or by the general fund of the National FFA Foundation.

## XI. REFERENCES

This list of references is not intended to be all-inclusive. Other sources may be utilized and teachers are encouraged to make use of the very best instructional materials available. The following list contains references that may prove helpful during event preparation.

1. National FFA Core Catalog; National Career Development Event Questions and Answers—  
<http://shop.ffa.org/cde-qas-c1413.aspx>
2. Hoard's Dairyman, PO Box 801, Fort Atkinson, Wisconsin 53538. Phone (414) 563-5551. Issues used are from September of previous year to August of current year.
3. Using the California Mastitis Test published by the University of Missouri-Columbia Extension Division, Columbia, Missouri 65211. (Single copy free, write for price quote for multiple copies).
4. California Mastitis Test can be ordered from NASCO. Toll free 1-800-558-9595 or toll call, 1-414-563-2446. NASCO, 901 Janesville Avenue, Fort Atkinson, WI 53538.
5. The Cheese Reporter (Publication Number: ISSN 0009-2142), published weekly by Cheese Reporter Publishing Co., Inc. 4210 Washington Ave., Madison, WI 53704. Phone (608) 246 -8430, Fax (608) 246-8431.
6. Dairy Facts – International Dairy Foods Association, 1250 H Street, N.W. Suite 900, Washington, DC 20005. Phone – 202-732-4332– [www.idfa.org](http://www.idfa.org)
7. Agricultural Marketing Service – [www.ams.USDA.gov](http://www.ams.USDA.gov)
8. Judging and Scoring Milk and Cheese, Farmers bulletin # 2259, United States Department of Agriculture, Washington DC, 20250. Phone 202-447-7473.
9. Judging, Identifying and Scoring Dairy Products – Bulletin J250c, University of Illinois, 1401 S. Maryland Drive, Urbana, IL 61801; Phone – 217-333-3871.
10. Dairy Foods: Producing the Best, Dr. Robert Marshall; Instructional Materials Laboratory, 1400 Rock Quarry Road, Q139, University of Missouri; Columbia, MO 65211
11. The Dairy Practices Council: Guidelines – [www.dairypc.org](http://www.dairypc.org)
  1. #21 – Raw Milk Quality Tests (\$4)
  2. #24 – Troubleshooting High Bacteria Counts of Raw Milk (\$5)
  3. #38 – Preventing Off-Flavors and Rancid Flavors in Milk (\$6)
12. Pasteurized Milk Ordinance – <http://www.fda.gov/Food/FoodSafety/Product-SpecificInformation/MilkSafety/NationalConferenceonInterstateMilkShipmentsNCIMSMoIModelDocuments/default.htm>
13. Code of Federal Regulations Title 21, Part 133 – Cheeses and Related Cheese Products – <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcr/CFRSearch.cfm?CFRPart=133>