Milk Quality and Dairy Foods

Revised 6/2018

Purpose and Standards

To enhance learning activities related to milk quality, federal milk marketing, attributes of milk products and substitutes for them.

The focus of this Career Development Event is on achievement of high quality raw milk, federal milk marketing orders and attributes of selected products of milk.

There are four general areas or functions in the network of persons who make possible the enjoyment of high quality dairy foods by consumers.

These are:

1. Milk production.
2. Milk quality and safety.
3. Milk processing or manufacturing.
4. Marketing of either raw milk or finished products.

The production of high quality raw milk requires the following:

* Clean and healthy cows.
* Equipment that is constructed appropriately from approved materials.
* Proper installation and operation of the equipment.
* Rapid cooling of the milk to not more than 41°F (3°C).
* Delivery of the milk to the processor within 48 hours.
* Prevention of contamination of the milk with added water, antibiotics, pesticides, cleaning and sanitizing chemicals, medicinal agents and any other foreign matter.

Fresh raw milk should possess a sweet bland flavor, be free of flavors from the feeds the cows eat and be low in numbers of somatic cells and bacteria. Mixed milk from several cows (herd milk) is expected to contain at least 3.5% milk fat, 3.1% protein and 4.8% lactose, the main characterizing constituents. It is the most important source of calcium in the diet of the average American, supplying approximately 75% of the dietary calcium.

Young persons considering a career related to the subject matter in this CDE may wish to consider that persons of the following groups contribute to the successful production of high quality milk and milk products:

* **Dairy farmers**: own, manage and milk the cows and prepare milk for dealers.
* **Field representatives** of the buying and/ or selling organizations: provide advice to producers and promote milk quality for buyers.
* **Milk sanitarians**: enforce public health regulations.
* **Food technologists**: apply chemical, physical, microbiological and sensory tests to determine the quality and safety of milk and milk products.
* **Manufacturers and dealers** of dairy equipment: supply equipment and service it.
* **Suppliers of chemicals** used in cleaning and sanitizing: provide chemicals and advice on their proper use.
* **Veterinarians**: treat diseased animals and advise producers on disease prevention.
* **Officials and technicians** of the USDA Federal Milk Marketing Orders: sample, test and account for milk marketed under Federal orders; apply regulations to marketing of raw milk.
* **U. S. Food and Drug Administration**: manages the regulation of grade A milk.
* **U. S. Department of Agriculture**: manages the regulation of manufacturing grade milk; provides grading services to manufacturers of butter, cheese and nonfat dry milk.
* **State departments of agriculture and/or public health:** manage the public health regulations applied to milk at the state level.
* **State Dairy Extension Agents**: provide advice to dairymen regarding production and sale of milk.

Foundation Standards: Technology – 4.1, 4.2, 4.5, 4.6. Problem Solving and Critical Thinking – 5.1, 5.3. Health and Safety – 6.1, 6.2, 6.4. Responsibility and Flexibility – 7.1, 7.2, 7.3, 7.4, 7.5, 7.6. Ethics and Legal Responsibilities – 8.3, 8.4. Leadership and teamwork – 9.1, 9.2, 9.3, 9.4, 9.5, 9.6. Technical Knowledge and Skills – 10.1.

Agricultural Standards: Agricultural Business Pathway A2.1, A5.2, A5.3, A6.1. Agriscience Pathway C1.0, C4.0, C6.0, C8.0. Animal Science Pathway D2.0, D3.0, D6.0, D10.0, D12.0

Contestants

Teams consist of four members, with all four individual scores counting as the team score. All team members are eligible for individual awards. Teams with less than four individuals are considered individual alternates.

Classes

|  |  |  |
| --- | --- | --- |
| Class | Individual Points\* | Team Points\* |
| Milk A | 60 | 240 |
| Milk B | 60 | 240 |
| Milk C | 60 | 240 |
| Milk D | 60 | 240 |
| Cheese ID | 20 | 80 |
| Dairy vs Non-Dairy | 40 | 160 |
| Written Test\*\* | 25 | 100 |
| Total Points Possible | 325 | 1,300 |

\*High score is the winner. \*\*Points are subtracted for incorrect answers.

Sub Contest Awards

Team and individual awards will be given for the following areas: Milk (4 classes), Cheese, Dairy vs Non- Dairy, and the written test.

Tie Breaker

In the event of a tie between individuals or teams, the ties shall be broken in favor of the contestant or team having the highest TOTAL combined milk scores from ALL classes (A, B, C, and D), and then, if necessary, on the other samples in the order in which they appear on the score cards. 325 points are possible per contestant.

Rules

1. Contestants will be allowed 20 minutes per class (round). If all contestants have finished the round being judged, the Contest Chair may end the judging of the round early and commence the next 20-minute round.
2. Contest will include:
   1. Four (4) classes consisting of five (5) milk samples each to be scored on flavor (taste and odor).
   2. One (1) class of ten (10) cheese samples to be identified.
   3. One (1) class of non-dairy product identification, ten (10) samples to be identified.
   4. One (1) written test consisting of 25 multiple-choice questions.
3. Milk samples will be scored using Form 1. All samples of milk are prepared from pasteurized or raw milk intended for table use and will score 1 to 10 (see Scoring Guide). Milk samples will be tempered to 60o F.
4. Each class will have a key. Each key will be one of the following defects only. Samples will not be scored higher than the key(s) utilized in the contest (key does not have to be in the class). The keys are as follows:
   1. Feed 9 or 8
   2. No Defect 10
5. Cheese samples for identification will be selected from those listed below and on the score sheet Form 2. Cubes of the cheese will be available for testing. Duplicates may be used. Must be the same brand.
   1. Blue
   2. Brie/Camembert
   3. Cheddar (mild)
   4. Cheddar (sharp)
   5. Cotija (Mexican)
   6. Cream/Neufchatel
   7. Edam/Gouda
   8. Monterey (Jack)
   9. Mozzarella/Pizza
   10. Munster
   11. Processed American
   12. Provolone
   13. Swiss
6. A total of 10 samples consisting of dairy and non-dairy products will be identified and assigned a milkfat content score. The following products may be included among the samples:
   1. Dairy Products
      1. Nonfat (skim) milk (.05%)
      2. Lowfat milk (1.0%)
      3. Reduced fat milk (2.0%)
      4. Milk (3.25%)
      5. Half and half (10.5%)
      6. Butter (80%)
      7. Sour cream (18%)
      8. Flavored milk (.05% - 3.25%)
      9. Light whipped cream (30%)
      10. Heavy cream (36%)
   2. Non-Dairy Products (All of these are to be categorized as non-dairy fat)
      1. Margarine
      2. Non-dairy creamer
      3. Non-dairy sour cream
      4. Non-dairy milk
      5. Non-dairy flavored beverage
      6. Non-dairy whipped topping
7. Contestants are to use whole numbers when scoring "Flavor" of milk. Check only the most serious defect in a sample even if more than one flavor is detected. If no defect is noted check "No defect". See scoring guide.
8. Utensils for sampling will be provided - cups, spoons, tooth picks, etc.
9. A contestant's score on a milk sample shall be the sum of the grades on "difference" and "defects" of the milk sample, minus a deduction of two points for every defect missed and an additional deduction will be made for the difference of the milk scores. The final milk score shall be the sum of the grades on all milk samples. The team score shall be the sum of the grades of its members. The contestant with the highest score shall be the winner and the team with the highest score shall be the winning team. Contestant standings in each product shall be obtained by arranging the score of all contestants in that product in order from the highest to the lowest. Team standings shall be obtained the same way.
10. Contestants' scores on each milk sample on the score card will be given a grade expressed by the difference between his/her score and the official score. For example, if a contestant scores "flavor" 7 and the judges' score is 5, the contestant shall receive a grade difference of two points. Subtract two points for the wrong milk defect. If, however, a contestant recognized that the milk sample scores perfect but fails to indicate that score on the score card or write in any score outside the range of scores for the sample or indicates the score by a dash (-) he/she shall receive a grade difference equivalent to the maximum cut of 10 points. The contestant's grade difference, therefore, shall be 10 when he/she fails to write in the numerical score for that sample. This rule holds regardless of the official score. Each unscored milk sample will be assessed a score of twelve (12) points.
11. Milk Fat Content of Fresh Milk Products - 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%).
12. Prior to the start of the state qualifying finals, the top five coaches representing the previous year’s state qualifying finals will assess/confirm the scoring of the four state qualifying milk classes. Final official scores will be determined by a majority consensus of the top five coaches represented, the CATA approved contest consultant, and the host facility contest chair.

Scoring Guide

MILK

Scores may range from 1 to 10. On a quality basis 10 = excellent, 8 to 9 = good, 5 to 7 = fair, 2 to 4 = poor, and 1 = unacceptable.

|  |  |
| --- | --- |
| **OFF FLAVOR** | **SCORES** |
|  | **S D P** |
| Bitter | 5 3 1 |
| Feed | 9 8 5 |
| Flat/Watery | 9 8 7 |
| Foreign | 5 3 1 |
| Garlic/Onion | 5 3 1 |
| High Acid | 3 2 1 |
| Malty | 5 3 1 |
| Metallic/Oxidized | 6 4 1 |
| Rancid | 4 1 - |
| Salty | 8 6 4 |
| Unclean | 3 2 1 |
| No defect | l0c |

* + 1. Suggested scores are given for three intensities of flavor: S - slight, D - definite, and P - pronounced. Intermediate numbers may also be used, for example, a bitter sample of milk may score 4.
    2. Where a dash is entered a product with that intensity of off flavor would be unsalable.
    3. Where a sample is identified as No defect, a score of 10 is entered.

Written Test

The test will be multiple choice consisting of 25 questions to be worth 1 point each. (Subtract 1 point per question missed to each individual score). Questions will only come from the most current published IDFA Dairy Facts edition/publication.

200 Question Test Bank – Once the test bank is created it will be up to the committee to keep the test bank current with changing facts and updated by January 31, of each year. It will be the responsibility of the top five teams at the state contest, with the state winning team coach, as the chairperson to be in charge of the test bank. After the test bank is updated, it will be forwarded to the Asst. State FFA Advisor to be placed on the calaged.org website for the contest coordinator to then choose their 25 questions.

REFERENCE: IDFA, 1250 H Street, NW, Suite 900, Washington DC, 20005 – Main phone: (202) 737-4332, FAX (202) 331-7820, Website: [www.idfa.org](http://www.idfa.org).

Identification of Cheeses

A score of plus two (2) points is given for each variety correctly identified.

Dairy vs Non-Dairy Products

A score of plus two (2) points is given for each sample correctly identified.

A score of plus two (2) points is given for each sample’s fat content correctly identified.

Scorecards

See CDE General Rules for Milk Quality Scorecards.

Awards

The winning team of this contest with the highest score will be eligible to represent the state at the National FFA CDE. If the winning team is unable to participate in the national finals, the second place team may represent California.