Milk Quality and Products Career Development Event

Contestants will be allowed two hours forty minutes for the CDE
1. Milk Flavor Identification and Evaluation - 20 minutes
2. Product Identification - 20 minutes
3. California Mastitis Test - 20 minutes
4. Cheese Identification - 20 minutes
5. Written Exam - 40 minutes
6. Problem Solving - 40 minutes

*We will not have a Team Activity at the state Level. The winning Chapter will need to prepare for this at the National Level.

A. Milk Flavor Identification and Evaluation (20 minutes) - 120 points
* 6 pts for Milk Defect Identification and 6pts for Milk Defect Intensity

1. Ten whole milk samples will be scored on flavor (taste and odor) using the scorecard.

Scoring Guide – Refer to the current scorecard. Correct flavor defect is worth one point. Defect scores for the off flavor 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

SCORES DEFECTS	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 4.

B. Product Identification-Dairy versus Non-Dairy (20 Minutes) -100points (6pts Identification, 4pts Fat Content)

- A total of ten 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:
    - o Dairy Products: Nonfat (Skim) Milk (0.5%), 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%)
    - o 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 variable fat.

C. California Mastitis Test (20 minutes) - 40 points

- 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.)

- Five 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. Distinct central peak.	8

D. Cheese Identification (20 Minutes) - 100 points
1. 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)
2. 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 ten identified cheese samples. An example cheese characteristic problem can be found in the reference section of this handbook. One point per characteristic=60 points total.

CHEESE CHARACTERISTICS MATRIX: A description of major varieties of cheeses popular among American consumers.

Variety	Moisture (%) (Maximum)[1]	Fat (%) (Minimum)	Pasta Filata[3]	Brine/surface Salted	Ripened By	Origin
Blue/Bleu	46	50	no	yes	mold	France
Brie	52.5	20	no	no	bacteria & 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
Gouda	45	48	no	yes	bacteria	Netherlands
Havarti	54	30	no	no	bacteria	Denmark
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
Swiss	41	43	no	yes	bacteria	Switzerland

[1]Some cheeses have a range in moisture permitted, but these are the highest permitted amounts.
[2]Some cheese standards use percentage by weight of total solids (e.g., Cheddar) while others use percentage by weight of the cheese (e.g., Cream).
[3]Curd is stretched in hot water to align the protein molecules and provide stretch to the curd.

CHEESE CHARACTERIIZATION EXAMPLE PROBLEM

The six items in the "characteristics" column are based on the information found in the Cheese Characterization Matrix on page 2 of these rules. Cheese samples are from the cheese identification activity. Participants will select all characteristics that apply to each sample. Characteristics in the problem can change each year. One point per characteristic for 60 total points.

Characteristics	Sample Numbers				
	1 (Cheddar)	2 (Cream)	3 (Swiss)	4 (Mozzarella)	5 (Provolone)
A. Maximum Moisture= 39%	X				
B. Minimum fat in the solids= 33%		X			
C. Receives "pasta filata treatment"				X	X
D. Salted in the brine				X	X
E. Ripened by bacteria	X	X	X	X	X
F. Originated in Italy				X	X

*There will be ten samples, not five as shown in the example

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.

The event will be worth 1,740 total points based on positive-type scoring.

Activity	Points/Sample Samples	Points
Milk Flavor ID and Evaluation	12 points/sample 10 samples	120
Product Identification	10 points/sample 10 samples	100
California Mastitis Test	8 points/sample 5 samples	40
Cheese type identification	4 points/sample 10 samples	40
Cheese characteristic ID	6 point/sample 10 samples	60
Problem Solving	Up to twenty questions	100
Written Exam	60 questions	120
	Total Possible Individual Points	**580**

G. Tiebreakers

If ties occur, the following events will be used in order to determine award recipients:
- Milk Identification
- Cheese Identification
- Product Identification
- Problem Solving

H. Reference Materials

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.

- **National FFA Core Catalog; National Career Development Event Questions and Answers**—http://shop.ffa.org/cde-qas-c1413.aspx

- **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.

- **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).

- **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.

- **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.

    - **Dairy Facts** – International Dairy Foods Association, 1250 H Street, N.W. Suite 900, Washington, DC 20005. Phone – 202-732-4332– www.idfa.org
    - **Dairy Business** http://dairybusiness.com/7. Agricultural Marketing Service-http://www.ams.usda.gov/AMSv1.0/DairyLandingPage
    - **Dairy Foods**: Producing the Best, Dr. Robert Marshall; Instructional Materials Laboratory http://dass/missouri.edu/aged/resources/dairy-foods-booklet.pdf

  - **The Dairy Practices Council: Guidelines www.dairypc.org**
    - #21 – Raw Milk Quality Tests
    - #24 – Troubleshooting High Bacteria Counts of Raw Milk
    - #38 – Preventing Off-Flavors and Rancid Flavors in Milk
    - #71 – Prevention of and Testing for Added Water in Milk
    - #98 – Milking Procedures for Dairy Cattle
    -

  - **Pasteurized Milk Ordinance** – http://www.idfa.org/docs/default-source/news-files/2013-pmo-final.pdf?sfvrsn=0
    - Section 1. Definitions
    - Section 6. The examination of Milk and/or Milk Products
    - Section 7. Standards for Grade "A" Milk and/or Milk Products
    - Item 15p. Protection from Contamination
    - Appendix E. Examples of 3-out-of-5 Compliance enforcement procedures
    - Appendix G. Chemical and Bacteriological Tests
    - Appendix K. HACCP Program
    - Appendix N. Drug Residue Testing and Farm Surveillance
    - **Note:** In the document items followed by a "p" referred to the Pasteurized side, items followed by an "r" refer to the Raw side.
- Code of Federal Regulations Title 21, Part 133-Cheeses and Related Cheese Products
  http://www.accessdata.fda.gove/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?CFRPart=133
- Code of Federal Regulations Title 21, Part 131- Milk and Cream
  http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?CFRPaart=131

Contestant Name _____   Contestant Number _____   Chapter _____

Write Scores only on the line marked for contestant's score. Mark X in the space opposite the defect noted and in proper sample column. Do NOT write in space indicating official score, grade difference, and grade on defects.

MILK FLAVOR
IDENTIFICATION
AND
EVALUATION

Defect Score Range
1-10

Milk Defect ID:
6 Points Each

Milk Defect Intensity:
6 Points Each

(120 Points Possible)

DEFECTS	SAMPLE NUMBER									
	1	2	3	4	5	6	7	8	9	10
Contestants Score										
Official Score										
Grade Difference										
Grade on Defects										
Acid										
Bitter										
Feed										
Flat/Watery										
Foreign										
Garlic/Onion										
Malty										
No Defect										
Oxidized										
Rancid										
Salty										

Total
Grades

Contestant Name _____   Contestant Number _____   Chapter _____

For Identification of Cheese, mark X in the space opposite the variety of cheese in proper sample number column. For Characteristics of Cheese, mark X in the space for each characteristic that applies in the proper number column (Mark all that apply for each sample).

IDENTIFICATION OF CHEESES

Correct Identification
(4 Points Each)
(40 Points Possible)

Varieties		SAMPLE NUMBER								
	1	2	3	4	5	6	7	8	9	10
Grade on Identification										
Blue/Bleu										
Brie										
Mild Cheddar										
Sharp Cheddar										
Colby										
Cream										
Gouda										
Havarti										
Monterrey Jack										
Mozzarella										
Muenster										
Parmesan										
Processed American										
Provolone										
Swiss										

CHARACTERISTICS OF CHEESES

6 Points Each
(60 Points Possible)

Characteristic		SAMPLE NUMBER								
	1	2	3	4	5	6	7	8	9	10
A										
B										
C										
D										
E										
F										

Mark X in the space opposite the product name AND opposite fat content percentage noted and in proper sample column. <u>There should be two X's per column.</u>

Dairy/Non-Dairy Identification and Fat Content

Dairy/Non-Dairy Identification: 6 Points Each

Fat Content: 4 Points Each

(100 Points Possible)

Sample Number

IDENTIFICATION	1	2	3	4	5	6	7	8	9	10
Butter										
Flavored Milk										
Half and Half										
Heavy Cream										
Light Whipped Cream										
Milk										
Sour Cream										
Margarine										
Non Dairy Creamer										
Non Dairy Flavored Beverage										
Non Dairy Milk										
Non Dairy Sour Cream										
Non Dairy Whipped Topping										

Fat Content	1	2	3	4	5	6	7	8	9	10
0.05%-0.5%										
1%-2%										
3.25%-3.5%										
10.5%										
18%										
30%										
36%										
80%										
Non Dairy Variable Fat										

Write Scores only on the line marked for contestant's score.

California Mastitis Test

8 Points Each

(40 Points Possible)

SAMPLE NUMBER	1	2	3	4	5
Contestants Score					
Official Score					
Grade Difference					

CONTESTANTS SCORE

Score on Problem Solving- 20 Questions @ 5 Points Each _____ /100 PTS

Score on Written Exam Milk Production-30 Questions @ 2 Points Each _____ /60 PTS

Score on Written Exam Milk Marketing-30 Questions @ 2 Points Each _____ /60 PTS

Score on Cheese Identification _____ /40 PTS

Score on Cheese Matrix _____ /60 PTS

Score on Milk ID _____ /60 PTS

Score on Milk Intensity Score _____ /60 PTS

Score on Dairy/Non-Dairy ID _____ /60 PTS

Score on Fat Content _____ /40 PTS

Score on CMT _____ /40 PTS

TOTAL _____ /580 PTS

Milk Quality and Products
Form #479-6

Incorrect Marks ✓ ✗ ⊖ ⊙ **Correct Mark** ●

Team #

Last Name

First Name

Letter/number grids for Team #, Code, Last Name, and First Name (0–9, A–Z)

Written Exam A / Milk Production

#	Answer
1	A B C D E
2	A B C D E
3	A B C D E
4	A B C D E
5	A B C D E
6	A B C D E
7	A B C D E
8	A B C D E
9	A B C D E
10	A B C D E
11	A B C D E
12	A B C D E
13	A B C D E
14	A B C D E
15	A B C D E
16	A B C D E
17	A B C D E
18	A B C D E
19	A B C D E
20	A B C D E
21	A B C D E
22	A B C D E
23	A B C D E
24	A B C D E
25	A B C D E
26	A B C D E
27	A B C D E
28	A B C D E
29	A B C D E
30	A B C D E

Written Exam B / Milk Marketing

#	Answer
31	A B C D E
32	A B C D E
33	A B C D E
34	A B C D E
35	A B C D E
36	A B C D E
37	A B C D E
38	A B C D E
39	A B C D E
40	A B C D E
41	A B C D E
42	A B C D E
43	A B C D E
44	A B C D E
45	A B C D E
46	A B C D E
47	A B C D E
48	A B C D E
49	A B C D E
50	A B C D E
51	A B C D E
52	A B C D E
53	A B C D E
54	A B C D E
55	A B C D E
56	A B C D E
57	A B C D E
58	A B C D E
59	A B C D E
60	A B C D E

Problem Solving

#	Answer
1	A B C D E
2	A B C D E
3	A B C D E
4	A B C D E
5	A B C D E
6	A B C D E
7	A B C D E
8	A B C D E
9	A B C D E
10	A B C D E
11	A B C D E
12	A B C D E
13	A B C D E
14	A B C D E
15	A B C D E
16	A B C D E
17	A B C D E
18	A B C D E
19	A B C D E
20	A B C D E

Dairy / Non-Dairy Identification and Fat Content

Sample Number — Mark one answer in each column!

I. Identification

	1	2	3	4	5	6	7	8	9	10
1 Butter	○	○	○	○	○	○	○	○	○	○
2 Flavored Milk	○	○	○	○	○	○	○	○	○	○
3 Half and Half	○	○	○	○	○	○	○	○	○	○
4 Heavy Cream	○	○	○	○	○	○	○	○	○	○
5 Light Whipped Cream	○	○	○	○	○	○	○	○	○	○
6 Milk	○	○	○	○	○	○	○	○	○	○
7 Sour Cream	○	○	○	○	○	○	○	○	○	○
8 Margarine	○	○	○	○	○	○	○	○	○	○
9 Non Dairy Creamer	○	○	○	○	○	○	○	○	○	○
10 Non Dairy Flavored Beverage	○	○	○	○	○	○	○	○	○	○
11 Non Dairy Milk	○	○	○	○	○	○	○	○	○	○
12 Non Dairy Sour Cream	○	○	○	○	○	○	○	○	○	○
13 Non Dairy Whipped Topping	○	○	○	○	○	○	○	○	○	○

II. Fat Content — Mark one answer in each column!

	1	2	3	4	5	6	7	8	9	10
1 0.05% - 0.5%	○	○	○	○	○	○	○	○	○	○
2 1% - 2%	○	○	○	○	○	○	○	○	○	○
3 3.25% - 3.5%	○	○	○	○	○	○	○	○	○	○
4 10.5%	○	○	○	○	○	○	○	○	○	○
5 18%	○	○	○	○	○	○	○	○	○	○
6 30%	○	○	○	○	○	○	○	○	○	○
7 36%	○	○	○	○	○	○	○	○	○	○
8 80%	○	○	○	○	○	○	○	○	○	○
9 Non Dairy Variable Fat	○	○	○	○	○	○	○	○	○	○

Identification and Characteristics of Cheeses

I. Identification

	Sample Number 1	2	3	4	5	6	7	8	9	10
1 Blue/Bleu	○	○	○	○	○	○	○	○	○	○
2 Brie	○	○	○	○	○	○	○	○	○	○
3 Cheddar Mild	○	○	○	○	○	○	○	○	○	○
4 Cheddar Sharp	○	○	○	○	○	○	○	○	○	○
5 Cream/Neufchatel	○	○	○	○	○	○	○	○	○	○
6 Edam/Gouda	○	○	○	○	○	○	○	○	○	○
7 Monterey Jack	○	○	○	○	○	○	○	○	○	○
8 Mozzarella	○	○	○	○	○	○	○	○	○	○
9 Processed American	○	○	○	○	○	○	○	○	○	○
10 Provolone	○	○	○	○	○	○	○	○	○	○
11 Swiss	○	○	○	○	○	○	○	○	○	○
12 Colby	○	○	○	○	○	○	○	○	○	○
13 Feta	○	○	○	○	○	○	○	○	○	○
14 Havarti	○	○	○	○	○	○	○	○	○	○
15 Gruyere	○	○	○	○	○	○	○	○	○	○
16 Muenster	○	○	○	○	○	○	○	○	○	○
17 Parmesan	○	○	○	○	○	○	○	○	○	○
18 Queso Fresco	○	○	○	○	○	○	○	○	○	○
19 Ricotta	○	○	○	○	○	○	○	○	○	○
20 Romano	○	○	○	○	○	○	○	○	○	○

Mark one answer in each column!

II. Characteristics

	1	2	3	4	5	6	7	8	9	10
A	○	○	○	○	○	○	○	○	○	○
B	○	○	○	○	○	○	○	○	○	○
C	○	○	○	○	○	○	○	○	○	○
D	○	○	○	○	○	○	○	○	○	○
E	○	○	○	○	○	○	○	○	○	○
F	○	○	○	○	○	○	○	○	○	○

Mark all that apply!

CMT

Score	Sample Number 1	2	3	4	5
0	○	○	○	○	○
2	○	○	○	○	○
4	○	○	○	○	○
6	○	○	○	○	○
8	○	○	○	○	○

Mark one answer in each column!

Natural / Imitation

Food Identification	Sample Number 1 2 3 4 5	6 7 8 9 10
1 Natural	○○○○○	○○○○○
2 Imitation	○○○○○	○○○○○

Mark one answer in each column!

Milk Flavor

I. Defect

	Sample Number 1	2	3	4	5	6	7	8	9	10
1 Acid	○	○	○	○	○	○	○	○	○	○
2 Bitter	○	○	○	○	○	○	○	○	○	○
3 Feed	○	○	○	○	○	○	○	○	○	○
4 Flat-watery	○	○	○	○	○	○	○	○	○	○
5 Foreign	○	○	○	○	○	○	○	○	○	○
6 Garlic or onion	○	○	○	○	○	○	○	○	○	○
7 Malty	○	○	○	○	○	○	○	○	○	○
8 No defect	○	○	○	○	○	○	○	○	○	○
9 Oxidized	○	○	○	○	○	○	○	○	○	○
10 Rancid	○	○	○	○	○	○	○	○	○	○
11 Salty	○	○	○	○	○	○	○	○	○	○

Mark one answer in each column!

II. Score

	1	2	3	4	5	6	7	8	9	10
1	○	○	○	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○	○	○	○
4	○	○	○	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○
9	○	○	○	○	○	○	○	○	○	○
10	○	○	○	○	○	○	○	○	○	○

Mark one answer in each column!