

Milk Quality and Products

Revised: 1/28/20

PURPOSE

The New Mexico FFA Milk Quality & Products Career Development Event is designed to enhance learning activities related to quality production, processing, distribution, promotion, marketing and consumption of dairy foods, as well help students develop a sound perspective for using the decision-making process.

OBJECTIVES

- FFA members will be able to use knowledge of high-quality milk production and marketing.
- FFA members will be able to use knowledge of the composition and quality characteristics of pasteurized milk.
- FFA members will be able to develop an understanding that clean cows and a clean environment are necessary to produce quality milk.
- FFA members will be able to identify cheese varieties.
- FFA members will be able to identify and evaluate the flavor quality of milk.
- FFA members will be able to differentiate dairy products from nondairy products (imitations and substitutes).
- FFA members will be able to identify milk fat content of fresh milk products.

COMMON CORE REFERENCE

7th Grade

MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

8th Grade

CCSS.ELA-Literacy.RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

9-10th Grade

HS-PS1-5. Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.

11-12th Grade

CCSS.ELA-Literacy.RI.11-12.7 Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.

SECTIONS OF THE MILK QUALITY & PRODUCTS

- a. Milk Flavor Identification and Evaluation
- b. Milk Fat Content identification/Pearson's Square
- c. Identification of Cheeses
- d. Problem Solving - Identification of Real Vs. Artificial
- e. Cheese Characteristics
- f. Dairy Products Identification List 10 of 50 at contests, 5 points each

FORMAT OF EVENT

- a. Milk Flavor Identification and Evaluation
 - 10 samples to be scored on taste and odor
 - Milk samples will be 60 degrees F.
 - All samples of milk are prepared from pasteurized milk intended for table use and will score 1 to 10.
 - Using whole numbers, mark only the most serious defect
 - If no defect is noted, mark "NO DEFECT."
 - Only apples or apple juice will be allowed for taste-bud refreshing. NO OTHER taste comparison products will be allowed.

- b. Milk Fat Content of Fresh Milk Products



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

- c. Identification of Cheeses

- 10 cheese samples to be identified
- Cubes of cheese will be available for tasting
- Apples or apple juice will be allowed for taste-bud refreshing
- More than one sample of a given cheese may be used (cheese ID list can be found on page 6 - reference lists)

- d. Cheese characteristics

- 10 samples will be provided will be the same cheeses used in the identification portion,. The seven items in the "characteristics" column are based on the information found in the Cheese Characterization Matrix below: Participants will select all characteristics that apply to each sample. Answers will be recorded on the event-specific scan form.

CHEESE CHARACTERISTICS MATRIX: A description of major varieties of cheeses popular

Variety	Moisture (%) Maximum ¹	Fat (%) Minimum ²	Gas Holes (expected)	Pasta Filata ³	Brine/Surface Salted	Ripened by	Origin
Bleu	46	50	no	no	yes	mold	France
Brie	52.5	20	no	no	no	bacteria & mold	France
Cheddar	39	50	no	no	no	bacteria	England
Gouda/Edam	45	40	no	no	yes	bacteria	Netherlands
Cream	55	33	no	no	no	unripened	US
Monterrey Jack	44	50	no	no	no	bacteria	US
Mozzarella	60	45	no	yes	yes	bacteria	Italy
Neufchatel	65	20	no	no	no	unripened	France
parmesan	32	32	no	no	yes	bacteria	Italy
Processed American	40	50	no	no	no	bacteria	US
Provolone	45	45	no	yes	yes	bacteria	Italy
Swiss	41	43	yes	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.

e. Natural/Imitation - Identification of Real vs. Artificial Dairy Foods / Products

- Will be selected from those available in stores
- A score of 5 points is given for each correctly identified
- 10 samples to be identified
- Natural and/or artificial dairy foods / products will be selected from those available
- Standards for what constitutes natural & imitation dairy are similar to USDA and FDA Standards of Identity and Grading: If the first ingredient listed is not milk or a dairy cream product, it is considered an imitation dairy product
- Dairy and/or non-dairy food products will be selected from the following ID List

Dairy Product & Non-Dairy Product Identification List

Butter	3.3% Whole Milk
Margarine	Plain Soy Milk
Real Shredded Mozzarella Cheeses	Half and Half
Real Shredded Cheddar Cheeses	Plain Coffee Whitener
Imitation Cheddar Cheeses	Chocolate Milk
Imitation Mozzarella Cheeses	Chocolate Drink
Cottage Cheese	Real Whipping Cream
Smoked Cheese	Non-Dairy Whip Topping
Spreadable Cheese Products	Plain Yogurt
Non-Fat Milk	Soy Yogurt
Buttermilk	Sour Cream
Cultured Milk	Vanilla Ice Cream
2% Milk	Coconut Milk
Almond Milk	Rice Milk
Cashew Milk	

DAIRY FOODS REFERENCE MATERIALS

- # 5017 Judging Miler Unit Parts and Cheese ID (6 color slides w/s) IMS
- # 0408 Questions and Answers on Federal Marketing USDA
- # 0409 Judging and Scoring Milk and Cheese (19 pages) USDA

- Instructional Materials Service
Texas A&M University
F.E. Box 2588
College Station, TX 77843-2588
Office: (979) 845-6601 FAX: (979) 845-6608

- # 9381P3 COMPUTER SOFTWARE - Milk and Milk Quality and Related Review, HOBAR

- # 9381M3 COMPUTER SOFTWARE - Milk and Milk Quality and Related Review, HOBAR

- HOBAR PUBLICATIONS
1234 Tiller Lane
St. Paul, Minnesota 55112
Office: (612) 633-3170 FAX: (612) 633-2020

REFERENCES FOR NATIONAL DAIRY FOODS CDE

- NCQ-###Written test used in National FFA CDE: available for sale through the National FFA Catalog effective January following each career development event; (### = year)

OTHER FOOD TECHNOLOGY TEACHING REFERENCES

- *Food Science* - Potter, Norman, Fourth Edition; AVI Publishing Co 250 Post Road East, P.O. Cox 831, Westport, Connecticut 06881
- #8673 - Complete Set Ag. Sc. 241 Food Technology; IMS
- *Food Science, Safety & Nutrition* - National FFA Foundation
P.O. Box 45205
Madison, Wisconsin 53744
Office: (608) 829-3105
FAX: (608) 829-3195
- The Council
Wisconsin Milk Marketing Board
P.O. Box 15035, 5632 Mt. Vernon Memorial Hwy
Alexandria, VA 22309-0035 Office: (703) 360-8832
- *Hoard's Dairyman*, P.O. Box 801, Fort Atkinson, Wisconsin 53538
Office: (414) 563-5551
> Issues used are from September of previous year to August of current year.
- *Milk Facts* (updated annually) available from Milk Industry Foundation
888 16th Street, N.W.
Washington, D.C. 20006
> One copy may be obtained free by request. Use previous year's issue.
- *Using the California Mastitis Test* published by the University of Missouri -
Columbia Extension Division, Columbus, Missouri, 65211.
> Single copy free, write for price quote for multiple copies.
- *California Mastitis Test* can be ordered from NASCO
901 Janesville Avenue
Fort Atkinson, WI 53538
Office: (800) 558-9595
> Tests are \$11.00 each, catalog number 06059N.
- *Dairy Handbook*, TETRA Pak Processing Systems
8101 Corporate Woods Parkway
Vernon Hills, IL 60061
- *The Cheese Reporter* (Publication Number: ISSN 0009-2142), published
weekly by Cheese Reporter Publishing Co., Inc.
4210 Washington Ave.
Madison, WI 53704
Office: (608) 246-8430
FAX: (608) 246-8431
- *USDA Sediment Standards*, No. 7CFR58.2731. U.S.
Department of Agriculture, Agriculture Marketing Service
Dairy Division, P.O. Box 96456, Washington, DC 20250

SCORING

- a. Milk flavor Identification
Participants will receive 5 point for each milk defect correctly identified and 5 points for each flavor intensity correctly identified. (3 points are awarded for being one bubble away, and 1 point for two bubbles away.)
- b. Milk Fat Content of Fresh Milk Products Identification
Participants will receive 3 points for each product correctly identified.
- c. Identification of Cheeses
Participants will receive 3 points for each product correctly identified.
- d. Identification of Real vs. Artificial

Participants will receive 5 points for each product correctly identified.
- e. Cheese Characteristics
10 Samples
- f. Dairy Industry Id of tools, supplies and equipment
- g. Identification- (50 points) The identification portion will consist of equipment/materials that relate to the milk quality career area. There will be 10 stations with items taken from all applicable identification sheets. (5 points each) The equipment will come from a file on the Milk Quality & Products CDE link located at nmffa.org. Materials and equipment may be high quality pictures or real equipment and materials.

Reference Lists for Milk Quality and Products

Milk Intensity Scores

<i>DEFECTS</i>	<i>Slight</i>	<i>SCORES</i>	
		<i>Definite</i>	<i>Pronounced</i>
Acid	3	2	1
Bitter	5	3	1
Feed	9	8	5
Flat/Watery	9	8	7
Foregin	5	3	1
Garlic/Onion	5	3	1
Malty	5	3	1
Oxidized	6	4	1
Rancid	4	2	1
Salty	8	6	4
No Defect	10		

Cheese ID List

- 1 Bleu
- 2 Brie
- 3 Cheddar (Mild)
- 4 Cheddar (Sharp)
- 5 Cream
- 6 Edam/Gouda
- 7 Monterey Jack
- 8 Mozzarella
- 9 Neufchatel
- 10 Parmesan
- 11 Processed American
- 12 Provolone
- 13 Swiss

Dairy Product & Non-Dairy Product Identification List

Butter
Margarine
Real Shredded Mozzarella Cheeses
Real Shredded Cheddar Cheeses
Imitation Cheddar Cheeses
Imitation Mozzarella Cheeses
Cottage Cheese
Smoked Cheese

Reference Lists for Milk Quality and Products

Spreadable Cheese Products

Non-Fat Milk

Buttermilk

Cultured Milk

2% Milk

3.3% Whole Milk

Plain Soy Milk

Half and Half

Plain Coffee Whitener

Chocolate Milk

Chocolate Drink

Real Whipping Cream

Non-Dairy Whip Topping

Plain Yogurt

Soy Yogurt

Sour Cream

Vanilla Ice Cream

Soy Vanilla Ice Cream

Almond Milk

Cashew Milk

Rice Milk