Milk Quality & Products CDE

Purpose

The purpose of the Milk Quality & Products Career Development Event is to enhance learning activities related to the quality production, processing, distribution, promotion, marketing, and consumption of dairy foods. Through participation in this event, members develop knowledge of milk production and marketing; characteristics of raw and pasteurized milk; and develop an understanding of milk quality and yield. Members evaluate the flavor quality of milk, differentiate the fat content of various milk products, and identify cheese varieties and characteristics.

Sponsor

The Milk Quality & Products Career Development Event is sponsored by the North Carolina Dairy Youth Foundation.

State Event Superintendent

State agricultural education staff will designate the superintendent for this event.
Comments or questions may also be directed to Dr. Jason Davis, State FFA Coordinator, Department of Agricultural and Extension Education, NCSU, Box 7654, Raleigh, NC 27695-7654. Phone: 919.515.0216; Fax: 919.513.3201; Email: jason_davis@ncsu.edu

Eligibility and General Guidelines

This event will be held during the North Carolina State FFA Convention and is open to all FFA chapters and FFA members in good standing. FFA members may not participate in a Career Development Event that leads to a state level event after July 1, following their high school graduation.

Teams shall consist of three or four members. Four scores will count towards the team total (a three-member team will earn a zero for the 4th score). No alternates are allowed in state events. Any alternate found participating in a state event will result in team disqualification.

FFA members in good standing may also participate as individuals in this event. A chapter may have up to two members participate as individuals as long as the chapter does not have a team participating in the event. Their scores will only count toward individual recognition and will not be tallied as a team score.

Members that have participated in a previous national event or previous state winning teams in this area are ineligible.

The use or possession of cellular phones or any other mobile electronic communication device is prohibited during any state-level career development event. Any violation of this rule by any team member will result in total team disqualification.

FFA members participating in career development events that require the use of calculators may only use non-programmable/graphing calculators that do not have the ability to communicate with other calculators. Calculators will be screened prior to the start of a CDE for acceptability. Students caught using data stored on a calculator or communicating with other calculators will result in a total team disqualification for the event.

Any member found cheating in any state-level career development event will result in total team disqualification for that event.

The North Carolina FFA Association, in keeping with the FFA mission and purposes, does not permit the use of tobacco products, e-cigarettes, vapes, or Juuls at any FFA facility or at any FFA activity.

At the North Carolina FFA State Convention, participation in more than one FFA CDE event is permitted as long as events are not being held concurrently and no special previsions are required to facilitate participation with the exception that

parliamentary procedure and public speaking and parliamentary procedure and Creed speaking which are held concurrently will allow dual participation and special provisions for flighting.

Dress Code

Participants are required to follow the North Carolina FFA Career Development Event Dress Code.

The North Carolina FFA Association strives to promote a positive image at all Official FFA Events. The dress code policy was established to address the issue of appropriate attire at all Official FFA Events. Members should adhere to this policy for all events. A ten percent reduction will be applied to all individual scores from a chapter if a participant from that chapter violates the dress code during that career event.

Procedures for Administering the Event

Written Test – 100 Points

The written test will be comprised of a total of 25 multiple-choice items designed to determine each team member's understanding of the dairy foods industry. The **reference** for the written test is: **Dairy Foods: Producing the Best**, Dr. Robert Marshall. Instructional Materials Laboratory. **http://dass.missouri.edu/aged/resources/dairy-foods-booklet.pdf**

Milk Sampling – 100 Points

Participants will identify the flavor (taste & odor) of ten milk samples by matching the sample number with the appropriate flavor on the Milk Sampling – Answer Sheet. The "Official Recipe" for making off flavors of milk is included as a reference at the end of this guide ***(Appendix A).***

Cheese Identification and Characteristics – 100 Points

- **Cheese Identification = 60 total points.** Participants will identify ten cheese samples by writing the sample number that matches the appropriate cheese listed on the *Cheese Identification and Characteristic Scorecard*. Each correctly identified cheese is worth 6 points for a total of 60 points if all ten samples are identified correctly. *Yellow or white varieties as well as smoked or fresh varieties may be used for this section.*
- **Cheese Characteristics = 40 total points.** Participants will also use the *Cheese Identification and Characteristic Scorecard* to classify four characteristics for each identified cheese. Each correct classification is worth one point for a total of 40 points if all characteristics are correctly classified for all 10 cheese samples.

The Cheese Characteristic Information Matrix ***(Appendix B)*** is a reference and study guide to help participants prepare for the *Cheese Characteristics* section of the *Milk Quality CDE*. While participants may not bring the matrix to the event, they should memorize the codes identified in the matrix to abbreviate their answers on the *Cheese Identification and Characteristic Scorecard*. A sample-completed scorecard is provided to help participants understand how the scorecard will be used ***(Appendix C)***.

Fat Content Identification – 100 points

Students will differentiate the fat content in five samples of milk or milk products. Students will then identify each sample by product based on the criteria listed below.

Product	Fat Content
Nonfat Milk	<0.5%
Reduced Fat Milk	2%
Whole Milk	3.25%
Yogurt (Plain)	3.25%
Cottage Cheese	4%
Ice Cream (Vanilla)	10%
Half & Half	10.5%
Sour Cream	18%
Light Whipping Cream	30%
Heavy Whipping Cream	35%
Butter	80%

Milk Quality Team Activity – 50 points
Each team will solve five problems valued at ten points each. Problems may include:

1. Reading and interpreting data.
2. Answering questions pertaining to charts and tables.
3. Using given formulas related to milk and component prices to make calculations.
4. Determining percent increase and decrease as related to chart and table data.

The **reference** for the team activity are:

1. **"Dairy Business"** is available from online at dairybusiness.com. Only information from January through May of the current calendar year will be used. Sample questions using material from "Dairy Business" are found in ***Appendix D.***
2. Formula calculations used in "Federal Milk Market Orders." Sample problems using formula calculations are found in ***Appendix E.***

Scoring

Written Test	100
Milk Sampling	100
Cheese Identification	100
Fat Content Identification	100
Milk Quality Team Activity	50

Procedure for Determining the State Event Winner When Scores are Tied

In the event a tie score exists, the following methods will be applied in sequential order until the tie is broken:

1. Compare the total team scores for the written test and the higher scoring team is the winner.
2. Compare the total team scores for the milk sampling and the higher scoring team is the winner.
3. Compare the total team score on cheese identification and the higher scoring team is the winner.
4. If these methods fail to break the tie, co-winners will be declared and a run-off event will be held to determine which team will represent North Carolina at the National FFA Convention. The run-off event will follow the same rules as the state event.

Procedure for Determining the State Event High Scorer When Scores are Tied for individual Participants

In the event a tie score exists, apply the following methods in sequential order until the tie is broken.

1. Compare the individual scores on the written test and the high scoring individual is the winner.
2. Compare the individual scores on milk sampling and the high scoring individual is the winner.
3. Compare the individual score on cheese identification and the high scoring individual is the winner.
4. If a tie still exists for individuals, co-high scorers will be declared and all tied individuals will be recognized.

State Awards

The awards for the state event will be presented annually at the state FFA convention to include a team 1st, 2nd and 3rd place plaque and a travel monetary award.

National Career Development Event Participation

State winning teams advancing to the national career development event will be automatically registered for the national event. It is the responsibility of the FFA chapter advisor to complete all necessary national certification and waiver forms and return them to the Sate FFA Coordinator by the assigned due date.

State winning CDE Teams that choose not to participate at the national level should contact the state office by September 1 prior to national convention. Teams that fail to inform the state office prior to September 1 will be ineligible to participate in that same CDE for the next year (chapters may appeal to the State FFA Board of

Directors). Teams that do not compete at the National Convention will be required to pay back the travel award.

NORTH CAROLINA FFA ASSOCIATION
MILK QUALITY AND PROUCTS
CAREER DEVELOPMENT EVENT

Milk Sampling - ANSWER SHEET
Maximum Points = 100

Name: _____

Chapter: _____

Participant Number: _____

Score = Number Right _____x 10 = _____

<u>Instructions:</u> Identify the flavor (taste and odor) of the ten milk samples provided. Write the sample number beside the appropriate flavor description.

_____ Acid

_____ Bitter

_____ Feed

_____ Flat/Watery

_____ Foreign

_____ Garlic/Onion

_____ Malty

_____ Oxidized

_____ Rancid

_____ Salty

_____ No Defect

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Score = Number Right _____x 10 = _____

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_____ Malty

_____ Oxidized

_____ Rancid

_____ Salty

_____ No Defect

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Scoring Use Only	Number Correct				
Cheese ID		x	6	=	
Characteristics		x	1	=	
			Total Points		

Cheese Identification and Characteristics Scorecard
Maximum Point Value = 100 points
Identification = 60 points
Characteristics = 40 points

Name: _____ Chapter: _____

Participant Number: _____

Cheese Identification: Write the correct sample number in the left column that matches the correct cheese sample.		**For each cheese sample identified, give the information for the four characteristics for that sample. One may use the codes supplied in the reference for this activity when answering these questions.**				
Sample Number	**Variety 6 points each**	**Receives Pasta Filata Treatment (Yes or NO) 1 point each**	**Salted in Brine (Yes or No) 1 point each**	**Method of Ripening 1 point each**	**Place of Origin 1 point each**	**Total Number Correct For Characteristics (Scoring Use Only)**
	Blue/Bleu					
	Brie					
	Cheddar, Mild					
	Cheddar, Sharp					
	Colby					
	Cream					
	Feta					
	Gouda					
	Havarti					
	Gruyere					
	Monterey Jack					
	Mozzarella					
	Munster					
	Parmesan					
	Processed American					
	Provolone					
	Queso Fresco					
	Ricotto					
	Romano					
	Swiss					

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Fat Content Identification – ANSWER SHEET
Maximum Points = 100

Name: _____

Chapter: _____

Participant Number: _____

Score = Number Right _____ x 20 = _____

Instructions: Identify each sample by product type using the table below along with visual observation and/or taste. Write the appropriate product name beside the sample number.

Product	Fat Content
Nonfat Milk	<0.5%
Reduced Fat Milk	2%
Whole Milk	3.25%
Yogurt (Plain)	3.25%
Cottage Cheese	4%
Ice Cream (Vanilla)	10%
Half & Half	10.5%
Sour Cream	18%
Light Whipping Cream	30%
Heavy Whipping Cream	35%
Butter	80%

Sample 1: _____

Sample 2: _____

Sample 3: _____

Sample 4: _____

Sample 5: _____

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Fat Content Identification – ANSWER SHEET
Maximum Points = 100

Name: _____

Chapter: _____

Participant Number: _____

Score = Number Right _____ x 20 = _____

Instructions: Identify each sample by product type using the table below along with visual observation and/or taste. Write the appropriate product name beside the sample number.

Product	Fat Content
Nonfat Milk	<0.5%
Reduced Fat Milk	2%
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Ice Cream (Vanilla)	10%
Half & Half	10.5%
Sour Cream	18%
Light Whipping Cream	30%
Heavy Whipping Cream	35%
Butter	80%

Sample 1: _____

Sample 2: _____

Sample 3: _____

Sample 4: _____

Sample 5: _____

Official Recipe for Preparing Off-Flavors of Milk *(Appendix A)*

North Carolina FFA Association

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- **One may achieve various intensities by diluting the sample with high-quality <u>pasteurized, homogenized milk</u> intended for table use.**
- **<u>The goal is to get students to be able to detect the slightest variation from normal fresh pasteurized/homogenized milk with no defect.</u>**
- **For tasting, samples should be tempered at 60°F (16°C).**
- **For more detailed information, see <u>Judging, Identifying, and Scoring Dairy Products</u> by Jan L. Allen, Vocational Agriculture Service, University of Illinois at Urbana-Champaign.**

Acid	Add 1 to 1.5 ounces of fresh cultured buttermilk to a quart of fresh pasteurized/homogenized milk.	Prepared 24 to 48 hours prior to use.
Bitter	Add 1 (NoDoz®) or similar brand caffeine tablet to about 1 oz. of water and let it dissolve for 30 minutes. Then you add the "caffeine solution" to a quart of fresh pasteurized/homogenized milk.	**Note:** One may increase the (NoDoz®) or similar brand caffeine tablets in the solution to begin with or add the "caffeine solution" to a smaller volume of water to help students get the taste.
Feed	Add 1/2 ounce (1 tablespoon or 15.0 ml) of molasses and mix with one quart of pasteurized/homogenized milk.	**Important: There are ways to do this with roughages, but for the sake of simplicity we are using molasses.**
Flat/Watery	Add 4 to 6 ounces of distilled water to a quart of fresh pasteurized/homogenized milk.	Good quality tap water will work but may have some additional flavors. You may wish to use approximately 10% volume for the quart of milk.
Foreign	Add 1-teaspoon (5 to 6 ml of 2-fold or double) vanilla extract per quart of milk.	
Garlic/Onion	Add about 0.2 grams of garlic or onion salt or 3 drops of garlic or onion extract to a quart of pasteurized/homogenized milk.	**Optional:** Use garlic powder or cut up onion. If cut-up onion is used filter through a coffee filter or cheesecloth and allow sitting for 30 minutes.
Malty	Add ½ ounce (15 grams) Grape Nuts® or Grape Nuts Flakes® breakfast cereal to 3 ounces (about 100 ml) of milk <u>and</u> allow to sit for 20 to 30 minutes to create a stock solution. This stock solution should then be strained through cheesecloth, a coffee filter, etc. (in a funnel) into another container. *Add 1 ounce of the stock solution to a quart of milk.*	Add 1 to 1.5 teaspoons (5 – 7 ml) of unflavored malted milk powder (available at some grocery stores) to a quart of pasteurized/homogenized milk.
Oxidized	Expose one quart of pasteurized/homogenized milk in a clear glass or plastic (polyethylene) milk container to direct sunlight for 30 minutes to one hour. **Note:** <u>This is the most common form of oxidized milk found in homogenized milk.</u> **Do not use a container that is colored (yellow)** and keep the milk cool by placing in ice. Samples prepared in this way will probably develop the generic (metal-induced) off-flavor within 36 to 48 hours after light exposure.	Metal-induced oxidized samples may be prepared by preparing 100 ml of 1 percent $CuSO_4.5H_2O$ as a "stock copper solution" and keep refrigerated. Add 0.5 to 1 ml of the "stock copper solution" to a quart of pasteurized/homogenized milk. **Note:** Prepare 24 to 48 hours prior to use.
Rancid	Add ½ ounce (15 grams) of blue cheese to a quart of pasteurized/homogenized milk and allow it to sit for 30 minutes.	Filter for the final sample using coffee filter or cheesecloth and funnel.
Salty	Add common table salt to a quart of fresh pasteurized/homogenized milk.	Determine the degree of saltiness by the amount of salt added to the milk.
NO DEFECT	Use fresh pasteurized/homogenized milk that has not been exposed to any of the treatments named.	

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Cheese Identification and Characteristics Information Matrix *(Appendix B)*

Participants will be required to know the information within this matrix in order to complete the cheese characteristic section on the scorecard. Participants will use the answer codes identified in this matrix by parenthesis ( ) to complete the cheese characteristics.

Variety 6 points each	Receives Pasta Filata Treatment	Salted in Brine	Method of Ripening	Place of Origin
Blue/Bleu	(N) No	(Y) Yes	(M) Mold	(F) France
Brie	(N) No	(N) No	(B/M) Bacteria/Mold	(F) France
Cheddar, Mild	(N) No	(N) No	(B) Bacteria	(E) England
Cheddar, Sharp	(N) No	(N) No	(B) Bacteria	(E) England
Colby	(N) No	(N) No	(B) Bacteria	(U) United States
Cream	(N) No	(N) No	(U) Unripened	(U) United States
Feta	(N) No	(Y) Yes	(B) Bacteria	(G) Greece
Gouda	(N) No	(Y) Yes	(B) Bacteria	(N) Netherlands
Havarti	(N) No	(N) No	(B) Bacteria	(D) Denmark
Gruyere	(N) No	(Y) Yes	(B) Bacteria	(S) Switzerland
Monterey Jack	(N) No	(N) No	(B) Bacteria	(U) United States
Mozzarella	(Y) Yes	(Y) Yes	(B) Bacteria	(I) Italy
Munster	(N) No	(N) No	(B) Bacteria	(F) France
Parmesan	(N) No	(Y) Yes	(B) Bacteria	(I) Italy
Processed American	(N) No	(N) No	(B) Bacteria	(U) United States
Provolone	(Y) Yes	(Y) Yes	(B) Bacteria	(I) Italy
Queso Fresco	(N) No	(N) No	(U) Unripened	(M) Mexico
Ricotto	(N) No	(N) No	(U) Unripened	(I) Italy
Romano	(N) No	(Y) Yes	(B) Bacteria	(I) Italy
Swiss	(N) No	(Y) Yes	(B) Bacteria	(S) Switzerland

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Scoring Use Only	Number Correct	
Cheese ID		x 6 =

Sample Cheese Identification and Characteristics Scorecard *(Appendix C)*

Maximum Point Value = 100 points
Identification = 60 points
Characteristics = 40 points

Name: _____ Chapter: _____

Participant Number: _____