



Milk Quality and Products

Purpose

The New Jersey FFA Milk Quality and Products Career Development Event aims to promote practical learning activities in milk quality and dairy products while assisting students in developing team decision-making skills.

The New Jersey FFA Milk Quality and Products CDE focuses on raw milk quality, dairy products, federal milk marketing orders and attributes of selected milk products. The five general areas that contribute to milk quality and consumer demand are:

- Milk production.
- Milk and dairy product quality and safety.
- Milk processing or manufacturing.
- Raw milk marketing.
- Facility operations:
 - Safety/sanitation.
 - Labor.

Objectives

This event will provide the participant with the ability to do the following:

Utilize knowledge of milk quality related to

- Producing quality milk:
 - Regulations.
 - Grades and classes of milk.
 - Factors necessary to produce quality milk.
- Cleaning and sanitizing:
 - General types of cleaners and sanitizers.
 - Water hardness.
 - Milkstone.
 - Approved milking equipment and design.
 - Proper milking procedures.
- Cooling milk.
- Identifying diseases transmitted to consumers via milk.
- Recognizing causes of off flavors in milk.

Utilize knowledge of milk pricing related to

- Marketing and marketing concepts:
 - Pricing trends.
 - Economics.
 - Supply and demand.
- Federal milk marketing orders, economics and distribution:
 - Transportation costs.
 - Cooperatives.
 - Pricing.

Utilize knowledge of the composition and quality characteristics of raw and pasteurized milk and milk products including

- Nonfat solids portion:
 - Milkfat.
 - Adulterants, including water.
 - Bacterial standards and testing.
 - Quality testing.
- Understanding 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, specifically including the following:
 - Causes.
 - Prevention.

- Detection (California Mastitis Test and Direct Microscopic Somatic Cell Count).
- Treatment.
- Regulatory programs.
- Identification of cheese varieties and characterize properties.
- Identification flavor defects and evaluate milk quality.
- Understanding the importance of dairy food safety programs.
- Identification and comparison of dairy vs. non-dairy products.

Event Rules

The complete rules, policies and procedures relevant to all New Jersey FFA Career and Leadership Development Events may be found in the CDE & LDE Event Participation Policy: https://nj.gov/agriculture/ag_ed/ffa/activity/CDE_LDE_Policy.pdf

- Teams will consist of four members, and all four scores will count toward the team score.
- The team score is comprised of the combined scores of each individual and the team activity in which all team members will participate.
- Official Dress is required for this event.
- Participants are not to use strong deodorant, perfume, chewing gum or other detractors to the taste and smell senses.
- Participants are NOT allowed to use (or have visible) electronic devices during the event, unless for medical reasons or a portion of the event requires usage. This includes cell phones, tablets, etc. Participants will be allowed to use calculators, if specified for that event; however, cell phone calculators and graphing calculators are not permitted! **Failure to adhere to these rules will result in disqualification.**
- All individuals participating will judge in a cooperative manner following the rules set forth by the event coordinator.
- No school/chapter will use Rutgers University or Delaware Valley University facilities or locations for the training of teams. Contact with University faculty and staff is permissible. **Penalty will be disqualification.**
- This event will be scored using “Scan-tron” sheets. It is important for students to listen to directions and fill out the sheets correctly in order to receive credit. Sample scan-tron sheets are available for practice on the State Activity Guide. This event uses the Forestry scan-tron sheet.
- There will be no separate alternate teams.
- A student may not compete in more than one event during the New Jersey FFA Fall Career Development Events.
- The State level competition fee of \$11 per contestant will be paid by the competing school. If a chapter is at least **blue** affiliated, registration to state FFA career development events is waived.
- **Allergy Information:** Food products used in this event may contain or come in contact with potential allergens. Any participant in need of a reasonable ADA accommodation(s) for their participation in the Milk Quality and Products CDE should complete the online Request for Reasonable accommodations Form: <https://form.jotform.com/NJFFA/accommodations-request> This form must be received 3 weeks prior to the start of the event. All requests will remain confidential, and the participant will be contacted by a New Jersey FFA staff member to gather additional information and/or discuss the reasonable accommodation(s) or assistance being requested. The event coordinator will make all reasonable efforts to accommodate students with food allergies.

Event Format

EQUIPMENT

Materials to be provided by the student:

- Two no. 2 pencils.
- Bottled water and/or palate cleanser.
- Calculator.
- Clipboard.

Participants are **not** to bring these items:

- Glass of any kind to the event
- Cell phones or other electronic devices.

EVENT SNAPSHOT

Below is a brief overview of the Milk Quality & Products CDE

This event consists of five (5) phases:

- Phase 1: Team Activity – 100 points (30 minutes)
- Phase 2: Written Exam - 120 points (30 minutes)
- Phase 3: Problem Solving – 72 points (30 minutes)
- Phase 4: Milk Flavor Identification and Evaluation: 120 points (15 minutes)
Product Identification: 100 points (15 minutes)
- Phase 5: Cheese Identification: 100 points (15 minutes)
California Mastitis Test: 40 points (15 minutes)

A chapter must have a team of four (4) for team awards. All four (4) scores are used in determining the team's rank.

Scantron will be used to score this event. At the end of this document is a sample of the sheet used, highlighting where to enter answers. You can get practice sheets here:

https://nj.gov/agriculture/ag_ed/ffa/activity/479-6-MQP.pdf

INDIVIDUAL ACTIVITIES

Written exam (120 Points)

The written exam will be comprised of a total of 40 multiple-choice items. The exam will be given in two parts with one part consisting of twenty (20) questions on quality milk production and a second part of twenty (20) questions on milk marketing.

Problem Solving (72 Points)

The problem-solving test will consist of a total of 12 critical-thinking, multiple-choice questions. Topics may include, but are not limited to:

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

Product Identification — Dairy versus Non-Dairy (100 points — 6 points identification, 4 points fat content)

- A total of 10 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:
 - Dairy Products: nonfat (skim) milk (.05%), 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%).
 - 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 fat.

Milk Flavor Identification and Evaluation (120 Points — 6 points for flavor ID, 6 points for intensity score)

- Ten milk samples will be scored on flavor defect (taste and odor) using the computerized scorecard. Check only the most serious defect in a sample even if more than one flavor is detected (all samples of milk are prepared from pasteurized whole vitamin D milk intended for table use). Milk samples will be tempered to 60 degrees F. Only those cups provided at the event may be used. (Six points per correct answer.)
- Participants are to use whole numbers when scoring “Defect Intensity.” If no defect is noted, participants should check “No defect” and score as a ten (See Scoring Guide below). (Six points per correct answer.)

Palate cleansers (e.g., apples, apple juice or soda crackers) will be allowed for refreshing. Palate cleansers will NOT be provided by NJ FFA.

SCORING GUIDE

Refer to the current scorecard being used at the state 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/unsalable

EXAMPLE: MILK FLAVOR

Defects	Scores*		
	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 four.*

California Mastitis Test (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.
- Effective 2023, a bacterial culturing component will be added to CMT.
 - On-Farm Culture systems can provide dairy producers with a quick, simple, and inexpensive way to identify the likely bacterial cause of clinical mastitis and are becoming more commonly used in the industry. This information can then be used in guiding clinical mastitis treatment decisions. Participants will assess images of Tri-plates of the Minnesota Easy® Culture System to evaluate the sample as 1) Contaminated, 2) No Growth, 3) Gram Negative, 4) Staphylococcus species, 5) Staphylococcus aureus, 6) Streptococcus species, or 7) Streptococcus agalactiae. One image will be provided corresponding to each of the 5 CMT milk samples.

SCORING GUIDE

CMT Test Score	Appearance	Participant Score	* Somatic Cell Count
Negative	Mixture liquid, no precipitate	0	0
T	Slight precipitate tends to disappear with paddle movement	2	200–300,000
1	Distinct precipitate but does not gel	4	400–500,000
2	Distinct gel formation	6	1,200,000 – 1,500,000
3	Strong gel formation, which tends to adhere to paddle. Forms distinct central peak	8	Over 5,000,000

Reference*Cheese Identification (100 Points)**

- 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)
- 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 10 identified cheese samples. An example cheese characteristic problem can be found in the Reference section of this handbook. (60 points possible).

Cheese Characteristics Matrix

A description of major varieties of cheeses popular among American consumers.

Variety	Moisture (%) (Maximum) ¹	Fat (%) (Minimum) ²	Pasta Filata ³	Brine/Surface Salted	Ripened by	Origin
Blue/Bleu	46	50	no	yes	mold	France
Brie	52.5	20	no	no	bacteria and 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
Feta	60	42	no	yes	bacteria	Greece
Gouda/Edam	45	48	no	yes	bacteria	Netherlands
Havarti	54	30	no	no	bacteria	Denmark
Gruyere	39	45	no	yes	bacteria	Switzerland
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
Queso Fresco	59	18	no	no	unripened	Mexico
Ricotta	73	4	no	no	unripened	Italy
Swiss	41	43	no	yes	bacteria	Switzerland

¹Some cheeses have a range in moisture permitted, but these are the highest permitted amounts.

²Some cheese standards use percentage by weight of total solids (e.g., cheddar) while others use percentage by weight of the cheese (e.g., cream).

³Curd is stretched in hot water to align the protein molecules and provide stretch to the curd

CHEESE CHARACTERIZATION EXAMPLE PROBLEM

The six items in the “characteristics” column are based on the information found in the [Cheese Characterization Matrix](#) in this handbook.

Cheese samples are from the cheese identification activity. Participants will select all characteristics that apply to each sample. Answers will be recorded on the event-specific scan form. Characteristics in the problem can change each year.

Characteristics	Sample Numbers				
	1 (Cheddar)	2 (Cream)	3 (Swiss)	4 (Mozzarella)	5 (Bleu)
A. Maximum moisture = 39%	X				
B. Minimum fat in the solids = 33%		X			
C. Receives “pasta filata treatment”				X	
D. Salted in brine				X	
E. Ripened by molds					X
F. Originated in England	X				

TEAM ACTIVITY

Team members will work together to determine producer milk acceptability based on some or all of the tests listed below. Teams may have to perform the acceptability tests or analyze test results given.

Examples of acceptability tests include the following:

- Recent producer history
- Percent TA (acidity)
- DMSCC (Direct Microscopic Somatic Cell Count)
- SPC (Standard Plate Count)
- PI count (Preliminary Incubation Count)
- Antibiotic screening test
- Sample temperature
- Sample freezing point
- Equipment
- Sanitation
- Food safety

Scoring

The event will be worth 2,448 total points based on positive-type scoring.

Activity	Points/Sample	Samples	Individual Points	Team Points
Milk flavor identification and evaluation	12 points/sample (6 points for flavor defect 6 points for intensity)	10 samples	120	480
Product identification	10 points/sample (6 points for identification 4 points for milk fat)	10 samples	100	400
California Mastitis Test (CMT)	8 points/sample (2 points per increment**)	5 samples	40	160
Minnesota Easy® Culture	7 points/sample	5 samples	35	140
Cheese type identification	10 points/sample (4 points per type 6 points for characteristics)	10 samples	100	400
Problem solving	6 points/question	12 questions	72	288
Written exam	3 points/question	40 questions	120	480
<i>Total Possible Individual Points</i>			587	2,348
<i>Team Activity</i>				100
TOTAL POINTS PER TEAM				2,448

**CMT Samples are scored 0-8 in 2 point increments. Individual results are compared to official results to determine final score. A deduction of 2 points is assigned for each increment deviation from the official score.

TIEBREAKERS

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

TEAM

1. Team Activity
2. Milk identification total score of all team members.
3. Cheese identification score for all team

INDIVIDUAL

1. Milk Identification
2. Cheese Identification
3. Product Identification
4. Problem Solving

Awards

Awards will be presented to individuals and the first team based on their rankings at the CDE awards ceremony at the New Jersey State FFA Convention. Awards are sponsored by the New Jersey FFA Foundation, Inc., the New Jersey State FFA Association, and/or the National FFA Organization.

Individual

- Overall Medals
 - Medals – Top three individuals
- H.O. Sampson Certificates (hands-on practicum areas ONLY)
 - Certificate – Top five individuals

Team

- Plaque Sponsored by the National FFA Organization - 1st place

Awards will be presented to individuals and the first team based on their rankings at the CDE awards ceremony at the New Jersey State FFA Convention. The awards are sponsored by the National FFA Foundation and the New Jersey FFA Association.

The 1st place team will represent New Jersey at the National FFA Convention in October.

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.

- National FFA National Career Development Event Questions and Answers, [FFA.org, Event Resources, Past exams and practicums](https://www.ffa.org/EventResources/PastExamsandPracticums)
- Hoard's Dairyman, P.O. Box 801, Fort Atkinson, Wisconsin 53538. Phone (414) 563-5551. Issues used are from November of previous year to May of current year.
- 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). <https://extension.missouri.edu/publications/g3653>
- California Mastitis Test kit can be ordered from NASCO. <https://www.nascoeducation.com/> Toll free 1-800-558-9595 or toll call, 1-414-563-2446. NASCO, 901 Janesville Avenue, Fort Atkinson, WI 53538.
- Dairy Business <http://dairybusiness.com/> 7. Agricultural Marketing Service, <http://www.ams.usda.gov/AMSv1.0/%20search%20Dairy> , search Dairy. Issues used are from November of previous year to May of current year.
- Dairy Foods: Producing the Best, Dr. Robert Marshall; Instructional Materials Laboratory, <https://ffa.box.com/s/fgsmenihogdq83atiyvexlqjdmwb0u>
- The Dairy Practices Council: Guidelines, <http://www.dairypractices.org/>
 - #21 – Raw Milk Quality Tests
 - #24 – Troubleshooting High Bacteria Counts of Raw Milk
 - #38 – Preventing Off-Flavors in Milk
 - #71 - Prevention of and Testing for Added Water in Milk
 - #98 – Milking Procedures for Dairy Cattle
- Pasteurized Milk Ordinance, <https://www.fda.gov/media/114169/download>
 - 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 while 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.gov/scripts/cdrh/cfdocs/cfcr/CFRSearch.cfm?CFRPart=133>
- Code of Federal Regulations Title 21, Part 131 – Milk and Cream, <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcr/CFRSearch.cfm?CFRPart=131>
- Swab Procurement: Hygiena PRO-Clean Rapid Protein Residue Test. 25 of the swabs come in a sealed aluminum foil envelope. <https://www.hygiena.com/food-and-beverage-sales/united-states.html> .Web site that a teacher can resource to obtain the sanitation swabs (Hygiena PRO-Clean Rapid Protein Residue Test), obtain a product brochure, and watch a video demonstration on use of the swabs. Updated for 2019. <https://www.hygiena.com/pro-clean-food-and-beverage.html> . Another possibility is to contact a local dairy processing plant laboratory and ask the lab tech if they would either have some available or be able to order them for the school.

Request for Reasonable Accommodations

The New Jersey FFA Association is committed to providing equal access to our events and activities for all people. Use this form to request a reasonable accommodation or assistance at least 3 weeks before any state-level events: <https://form.jotform.com/NJFFA/accommodations-request>. A new form will need to be submitted for each event in which a reasonable accommodation is being requested. This information will be kept confidential and will be used only to process the request. Our staff will review the request upon receipt and contact the requestor with additional information. The association cannot guarantee accommodations or assistance if a form is received less than 3 weeks before an event. Accommodations being requested that require the assistance of another person (nurse, interpreter, scribe, reader, etc.) is the responsibility of the school/requestor. It is also the school/requestor's responsibility to provide any approved equipment to aide in the accommodation process, if applicable.

Milk Production and Related Careers

Fresh raw milk should possess a sweet bland flavor, be free of feed flavors and contain a low number of somatic cells and bacteria. Mixed milk from several cows (herd milk) is expected to contain approximately 3.5 percent milk fat, 3.1 percent protein and 4.8 percent lactose, the main characterizing constituents. Milk is the most important source of calcium in the diet of the average American, supplying approximately 70 percent of the dietary calcium. The production of high-quality raw milk requires the following:

- Clean and healthy cows.
- Equipment that is constructed appropriately from approved materials.
- Proper installation, cleaning, sanitizing and operation of the equipment.
- Rapid cooling of milk in compliance with regulatory requirements.
- Delivery of milk to the processor within 48 hours.
- Prevention of milk adulterants such as water, antibiotics, pesticides, cleaning and sanitizing chemicals, medicinal agents and any other extraneous materials.
- Application of tests for acceptability of milk.

Students 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 and herd managers manage and milk 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 and service equipment.
- Suppliers of chemicals used in cleaning and sanitizing provide chemicals and advice on proper use.
- Veterinarians treat diseased animals and advise producers on disease prevention.
- Milk plant operators process milk into the finished product for consumers.
- 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 and provides grading services to manufacturers of butter, cheese and nonfat dry milk.
- Officials and technicians of the USDA Federal Milk Marketing Orders sample, test and account for milk marketed under federal orders. They also apply regulations to marketing raw 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.
- Accountants and financial advisors with knowledge of the milk industry.
- Dairy food scientists.
- Agricultural economists with a knowledge of milk pricing, exporting and milking procedures of dairy cattle.
- Dairy food nutritionist international marketing specialist with bilingual abilities
- Feed nutritionists.
- Information technologists.
- Milk haulers.

Teamwork Accuracy of Results

100 POINTS

Five of the eight possible tests may be selected with a value of 20 points each.

Indicator	Total Points
Standard Plate Count (SPC) <i>15 for count 5 dilution</i>	
Preliminary Incubation Count (PIC) <i>15 for count 5 dilution</i>	
Somatic Cell Count (SCC)	
Temperature	
Beta-lactam Antibiotic test	
Freezing point	
Titratable Acidity (%TA)	
Sanitation Swab	
TOTAL POINTS EARNED OUT OF 100 POSSIBLE	

Milk Quality and Products Form #479-6

Team Name _____

This sheet is for demonstration and practice
only. You must use a real scan sheet for actual
competition.

Incorrect Marks Correct Mark

Team #

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Last Name		First Name	
A	A	A	A
B	B	B	B
C	C	C	C
D	D	D	D
E	E	E	E
F	F	F	F
G	G	G	G
H	H	H	H
I	I	I	I
J	J	J	J
K	K	K	K
L	L	L	L
M	M	M	M
N	N	N	N
O	O	O	O
P	P	P	P
Q	Q	Q	Q
R	R	R	R
S	S	S	S
T	T	T	T
U	U	U	U
V	V	V	V
W	W	W	W
X	X	X	X
Y	Y	Y	Y
Z	Z	Z	Z

Code

0	0
1	1
2	2
3	3
4	4
5	5
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9	9

Written Exam A / Milk Production

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
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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

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
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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

1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
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7	A	B	C	D	E
8	A	B	C	D	E
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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

I. Identification	Sample Number										
	1	2	3	4	5	6	7	8	9	10	
1 Butter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2 Flavored Milk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3 Half and Half	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4 Heavy Cream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5 Light Whipped Cream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6 Milk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7 Sour Cream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8 Margarine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9 Non Dairy Creamer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10 Non Dairy Flavored Beverage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11 Non Dairy Milk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12 Non Dairy Sour Cream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13 Non Dairy Whipped Topping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Fat Content		1	2	3	4	5	6	7	8	9	10
1 0.05% - 0.5%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 1% - 2%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 3.25% - 3.5%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 10.5%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 18%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 30%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 36%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 80%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 Non Dairy Variable Fat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Identification and Characteristics of Cheeses										
I. Identification	Sample Number									
	1	2	3	4	5	6	7	8	9	10
1 Blue/Bleu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 Brie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 Cheddar Mild	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 Cheddar Sharp	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 Cream/Neufchatel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 Edam/Gouda	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 Monterey Jack	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8 Mozzarella	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9 Processed American	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10 Provolone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11 Swiss	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12 Colby	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13 Feta	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14 Havarti	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15 Gruyere	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16 Muenster	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17 Parmesan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18 Queso Fresco	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19 Ricotta	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20 Romano	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
II. Characteristics	1	2	3	4	5	6	7	8	9	10
	A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	E	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	F	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

CMT					
Score	Sample Number				
	1	2	3	4	5
0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Mark one answer in each column!

Natural / Imitation										
Food Identification	Sample Number									
	1	2	3	4	5	6	7	8	9	10
1 Natural	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 Imitation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Mark one answer in each column!

Milk Flavor										
I. Defect	Sample Number									
	1	2	3	4	5	6	7	8	9	10
1 Acid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 Bitter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 Feed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 Flat-watery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 Foreign	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 Garlic or onion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 Malty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8 No defect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9 Oxidized	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10 Rancid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11 Salty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
II. Score	1	2	3	4	5	6	7	8	9	10
	1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Agriculture, Food and Natural Resources Content Standards

Measurements Assessed	Event Activities Addressing Measurements	Related Academic Standards
AS.01.01. Performance Indicator: Evaluate the development and implications of animal origin, domestication and distribution on production practices and the environment.		
AS.01.01.01.c. Evaluate the implications of animal adaptations on production practices and the environment.	Written exam	HS-LS4-3
AS.01.02.02.c. Devise and evaluate marketing plans for an animal agriculture product or service.	Problem solving Written exam	HS-LS4-3
AS.02.02. Performance Indicator: Analyze procedures to ensure that animal products are safe for consumption.		
AS.02.02.02.c. Research and evaluate programs to assure the safety of animal products for consumption.	Written exam	AFNR Career Cluster, Statement 1 AFNR Career Cluster – Animal Systems Pathway, Statement 3 STEM Career Cluster, Statement 1 Buying Goods and Services, Benchmarks: Grade 12, Statement 1 Buying Goods and Services, Benchmarks: Grade 12, Statement 3
AS.03.02 Performance Indicator: Analyze feed rations and assess if they meet the nutritional needs of animals.		
AS.03.02.01.c. Select appropriate feedstuffs for animals based on a variety of factors (e.g., economics, digestive system and nutritional needs, etc.).	Written exam	
AS.03.02.02.c. Select and utilize animal feeds based on nutritional requirements, using rations for maximum nutrition and optimal economic production.	Written exam	
BS.02.02. Performance Indicator: Implement standard operating procedures for the proper maintenance, use and sterilization of equipment in a laboratory.		
BS.02.02.02.b. Manipulate basic laboratory equipment and measurement devices (e.g., water bath, electrophoresis equipment, micropipettes, laminar flow hood, etc.).	California Mastitis Test Team activity Written exam	
BS.02.02.03.b. Create a plan for sterilizing equipment in a laboratory according to standard operating procedures.	Exam Problem solving	
FPP.01.01. Performance Indicator: Analyze and manage operational and safety procedures in food products and processing facilities.		
FPP.01.01.01.b. Analyze and document attributes and procedures of current safety programs in food products and processing facilities.	Problem solving Team activity Written exam	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 AFNR Career Cluster, Statement 6 Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 2

Measurements Assessed	Event Activities Addressing Measurements	Related Academic Standards
		Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 4 Manufacturing Career Cluster – Production Pathway 2 Manufacturing Career Cluster – Production Pathway 3
FPP.01.01.02.c. Devise strategies to maintain equipment and facilities for food products and processing systems.	Team activity Written exam	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 AFNR Career Cluster, Statement 6 Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 2 Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 4 Manufacturing Career Cluster – Production Pathway 2 Manufacturing Career Cluster – Production Pathway 3
FPP.01.02. Performance Indicator: Apply food safety and sanitation procedures in the handling and processing of food products to ensure food quality.		
FPP.01.02.01.c. Identify sources of contamination in food products and/or processing facilities and develop ways to eliminate contamination.	Milk flavor Team activity Written exam	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2
FPP.01.02.02.c. Examine, interpret and report outcomes from safe handling procedures and results from quality assurance tests.	California Mastitis Test Milk flavor Team activity	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2
FPP.01.02.03.c. Interpret and evaluate results of quality assurance tests on food products and examine steps to implement corrective procedures.	California Mastitis Test Team activity Milk flavor Problem solving Exam	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2
FPP.01.02.04.c. Conduct and interpret microbiological tests for foodborne pathogens.	California Mastitis Test Team activity	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2
FPP.01.03. Performance Indicator: Apply food safety procedures when storing food products to ensure food quality.		
FPP.01.03.01.c. Prepare plans that ensure implementation of proper food storage procedures.	Team activity Exam	
FPP.01.03.02.c. Evaluate the effectiveness of a current documentation procedure used within a food products and processing facility and recommend improvements.	Team activity Problem solving	
FPP.02.01. Performance Indicator: Apply principles of nutrition and biology to develop food products that provide a safe, wholesome and nutritious food supply for local and global food systems.		
FPP.02.01.01.c. Analyze the properties of food products to identify food constituents and evaluate nutritional value.	Milk flavor Cheese type identification Problem solving	

Measurements Assessed	Event Activities Addressing Measurements	Related Academic Standards
	Written exam	
FPP.02.01.02.b. Compare and contrast the nutritional needs of different human diets.	Written exam	
FPP.02.02. Performance Indicator: Apply principles of microbiology and chemistry to develop food products to provide a safe, wholesome and nutritious food supply for local and global food systems.		
FPP.02.02.01.c. Design and conduct experiments to determine the chemical and physical properties of food products.	California Mastitis Test Team activity	
FPP.02.03. Performance Indicator: Apply principles of human behavior to develop food products to provide a safe, wholesome and nutritious food supply for local and global food systems.		
FPP.02.03.01.b. Examine, interpret and explain the meaning of required components on a food label.	Problem solving Product identification	
FPP.02.03.02.b. Determine consumer preference and market potential for a new food product.	Problem solving Written exam	
FPP.03.01. Performance Indicator: Implement selection, evaluation and inspection techniques to ensure safe and quality food products.		
FPP.03.01.01.c. Outline procedures to assign quality and yield grades to food products according to industry standards.	Product identification Written exam	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 Buying Goods and Services, Benchmarks: Grade 12, Statement 7
FPP.03.01.02.c. Develop care and handling procedures to maintain original food quality and yield.	Problem solving Team activity Written exam	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 Buying Goods and Services, Benchmarks: Grade 12, Statement 7
FPP.03.01.04.c. Evaluate and grade food products from different classifications of food products.	Cheese identification Milk flavor Product identification	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 Buying Goods and Services, Benchmarks: Grade 12, Statement 7
FPP.03.02. Performance Indicator: Design and apply techniques of food processing, preservation, packaging and presentation for distribution and consumption of food products.		
FPP.03.02.01.b. Compare weights and measurements of products and perform conversions between units of measure.	Problem solving Team activity Written exam	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3
FPP.03.02.02.c. Evaluate food quality factors on foods prepared for different markets (e.g., shelf life, shrinkage, appearance, weight, etc.).	Cheese identification Milk flavor	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3

Measurements Assessed	Event Activities Addressing Measurements	Related Academic Standards
	Product identification Written exam	
FPP.03.02.04.b. Analyze the degree of desirable food qualities of foods stored in various packaging.	Cheese identification Milk flavor Problem solving Product identification	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3
FPP.03.03. Performance Indicator: Create food distribution plans and procedures to ensure safe delivery of food products.		
FPP.03.03.01.c. Devise a strategy to determine ways for food distribution to reduce environmental impacts.	Product identification Exam Problem solving	AFNR Career Cluster, Statement 7 AFNR Career Cluster – Food Products and Processing Pathway, Statement 3 Manufacturing Career Cluster – Logistics and Inventory Control, Pathway 2 Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 1 Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 2 Transportation, Distribution and Logistics Career Cluster, Statement 3 CCSS.ELA-Literacy.W.9-10.2 CCSS.ELA-Literacy.W.11-12.2 HS-ETS1-2
FPP.03.03.02.c. Make recommendations to improve safety procedures used in food distribution scenarios to ensure a safe product is being delivered to consumers.	Problem solving Team activity Written exam	AFNR Career Cluster, Statement 7 AFNR Career Cluster – Food Products and Processing Pathway, Statement 3 Manufacturing Career Cluster – Logistics and Inventory Control, Pathway 2 Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 1 Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 2 Transportation, Distribution and Logistics Career Cluster, Statement 3 CCSS.ELA-Literacy.W.9-10.2 CCSS.ELA-Literacy.W.11-12.2 HS-ETS1-2
FPP.03.03.03.b. Assess how market demand for food products influences the distribution of food products.	Problem solving Written exam	AFNR Career Cluster, Statement 7 AFNR Career Cluster – Food Products and Processing Pathway, Statement 3 Manufacturing Career Cluster – Logistics and Inventory Control, Pathway 2 Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 1 Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 2 Transportation, Distribution and Logistics Career Cluster, Statement 3 CCSS.ELA-Literacy.W.9-10.2 CCSS.ELA-Literacy.W.11-12.2 HS-ETS1-2

Measurements Assessed	Event Activities Addressing Measurements	Related Academic Standards
FPP.04.01. Performance Indicator: Examine the scope of the food industry by evaluating local and global policies, trends and customs for food production.		
FPP.04.01.01.b. Analyze the similarities and differences amongst policies and legislation that affect the food products and processing system in the U.S. or around the world.	Team activity Written exam	HS-ETS1-3 Buying Goods and Services, Benchmarks: Grade 12, Statement 1 Buying Goods and Services, Benchmarks: Grade 12, Statement 2
FPP.04.01.02.a. Examine the impact of consumer trends on food products and processing practices (e.g., health and nutrition, organic, information about food products, local food movements, etc.).	Written exam	HS-ETS1-3 Buying Goods and Services, Benchmarks: Grade 12, Statement 1 Buying Goods and Services, Benchmarks: Grade 12, Statement 2
FPP.04.02. Performance Indicator: Evaluate the significance and implications of changes and trends in the food products and processing industry in the local and global food systems.		
FPP.04.02.01.b. Analyze and document significant changes and trends in the food products and processing industry.	Problem solving Team activity Written exam	Buying Goods and Services, Benchmarks: Grade 12, Statement 1
FPP.04.02.02.b. Assess the issues of safety and environmental concerns about foods and food processing (e.g., GMOs, irradiation, microorganisms, contamination, etc.).	Problem solving Team activity Written exam	Buying Goods and Services, Benchmarks: Grade 12, Statement 1
FPP.04.02.03.b. Evaluate desirable and undesirable outcomes of emerging technologies used in the food products and processing systems.	Problem solving Team activity	Buying Goods and Services, Benchmarks: Grade 12, Statement 1
FPP.04.03. Performance Indicator: Identify and explain the purpose of industry organizations, groups and regulatory agencies that influence the local and global food systems.		
FPP.04.03.01.b. Evaluate the changes in the food products and processing industry brought about by industry organizations or regulatory agencies.	Problem solving Written exam	Transportation, Distribution and Logistics Career Cluster – Transportation Systems/Infrastructure Planning, Management and Regulation Pathway, Statement 4 Buying Goods and Services, Benchmarks: Grade 12, Statement 7
FPP.04.03.02.c. Construct plans that ensure implementation of industry standards for food products and processing facilities.	Team activity	Transportation, Distribution and Logistics Career Cluster – Transportation Systems/Infrastructure Planning, Management and Regulation Pathway, Statement 4 Buying Goods and Services, Benchmarks: Grade 12, Statement 7
CS.01.01. Performance Indicator: Examine issues and trends that impact AFNR systems on local, state, national and global levels.		
CS.01.01.02.c. Evaluate emerging trends and the opportunities they may create within the AFNR systems.	Problem solving Written exam	
CS.02.01.01.c. Evaluate geographic data and select necessary data sets to solve problems within AFNR systems.	Problem solving Written exam	

Measurements Assessed	Event Activities Addressing Measurements	Related Academic Standards
CS.02.02. Performance Indicator: Examine the components of the AFNR systems and their impact on the local, state, national and global society and economy.		
CS.02.02.03.c. Evaluate how positive or negative changes in the local, state, national or global economy impacts AFNR systems.	Written exam	
CS.03.01. Performance Indicator: Identify required regulations to maintain and improve safety, health and environmental management systems.		
CS.03.01.01.c. Evaluate how AFNR organizations/businesses promote improved health, safety and environmental management.	Written exam	
CS.03.04. Performance Indicator: Use appropriate protective equipment and demonstrate safe and proper use of AFNR tools and equipment.		
CS.03.04.03.b. Assess and demonstrate appropriate operation, storage and maintenance techniques for AFNR tools and equipment.	Written exam	
CRP.01.01. Performance Indicator: Model personal responsibility in the workplace and community.		
CRP.01.01.01.b. Analyze and predict how personal responsibility impacts the workplace and community.	Team activity	
CRP.01.01.02.b. Assess personal level of responsibility and examine opportunities for improvement.	Team activity	
CRP.02.01. Performance Indicator: Use strategic thinking to connect and apply academic learning, knowledge and skills to solve problems in the workplace and community.		
CRP.02.01.01.a. Distinguish opportunities to apply academic learning to solve problems in the workplace (e.g., identify how to: increase productivity, reduce costs, lower inputs, etc.).	Team activity	
CRP.02.01.01.b. Assess workplace problems and identify the most appropriate academic knowledge and skills to apply.	Team activity	
CRP.02.01.01.c. Apply academic knowledge and skills to solve problems in the workplace and reflect upon the results achieved.	Team activity	
CRP.02.02. Performance Indicator: Use strategic thinking to connect and apply technical concepts to solve problems in the workplace and community.		
CRP.02.02.01.c. Apply technical concepts to solve problems in the workplace and reflect upon the results achieved.	Team activity	

Measurements Assessed	Event Activities Addressing Measurements	Related Academic Standards
CRP.04.01. Performance Indicator: Speak using strategies that ensure clarity, logic, purpose and professionalism in formal and informal settings.		
CRP.04.01.01.a. Identify and categorize strategies for ensuring clarity, logic, purpose and professionalism in verbal and non-verbal communication (e.g., vocal tone, organization of thoughts, eye contact, preparation, etc.).	Team activity	
CRP.04.01.01.c. Evaluate other’s verbal and non-verbal communications (e.g., speeches, presentations, oral reports, etc.) and propose recommendations for improvement in clarity, logic, purpose and professionalism.	Team activity	
CRP.04.01.02.a. Examine and assess personal ability to speak with clarity, logic, purpose and professionalism in formal and informal settings (e.g., speeches, interviews, presentations, oral reports, etc.).	Team activity	
CRP.04.01.02.b. Apply strategies for speaking with clarity, logic, purpose and professionalism in a variety of situations in formal and informal settings.	Team activity	
CRP.05.01. Performance Indicator: Assess, identify and synthesize the information and resources needed to make decisions that positively impact the workplace and community.		
CRP.05.01.01.c. Evaluate workplace and community decision-making processes and devise strategies for improvement.	Team activity	
CRP.05.01.02.c. Evaluate workplace and community situations and recommend the information and resources needed to support good decisions.	Team activity	
CRP.05.01.03.a. Classify the types of information (e.g., data, research, procedures, regulations, etc.) and resources (e.g., human, financial, technology, time, etc.) that may be used to make workplace and community decisions.	Team activity	
CRP.05.01.03.b. Analyze workplace and community decisions and assess the information and resources used to make those decisions.	Team activity	
CRP.05.01.03.c. Synthesize information and resources and apply to workplace and community situations to make positive decisions.	Team activity	
CRP.05.02. Performance Indicator: Make, defend and evaluate decisions at work and in the community using information about the potential environmental, social and economic impacts.		
CRP.05.02.01.c. Evaluate and defend decisions applied in the workplace and community situations.	Team activity	

Measurements Assessed	Event Activities Addressing Measurements	Related Academic Standards
CRP.05.02.02.c. Evaluate workplace and community situations and propose decisions to be made based upon the positive impact made on environment, social and economic areas.	Team activity	
CRP.06.01. Performance Indicator: Synthesize information, knowledge and experience to generate original ideas and challenge assumptions in the workplace and community.		
CRP.06.01.02.c. Devise strategies (e.g., ask questions, brainstorm ideas, present facts and information, etc.) to challenge common assumptions in workplace and community situations.	Team activity	
CRP.06.02. Performance Indicator: Assess a variety of workplace and community situations to identify ways to add value and improve the efficiency of processes and procedures.		
CRP.06.02.01.c. Evaluate past workplace and community situations and determine how processes and procedures impacted outcomes.	Team activity	
CRP.07.02. Performance Indicator: Evaluate the validity of sources and data used when considering the adoption of new technologies, practices and ideas in the workplace and community.		
CRP.07.02.01.c. Propose valid and reliable data sources to use when considering the adoption of new technologies, practices and ideas.	Team activity	
CRP.07.02.02.c. Create and defend proposals for new technologies, practices and ideas using valid and reliable data sources.	Team activity	
CRP.08.01. Performance Indicator: Apply reason and logic to evaluate workplace and community situations from multiple perspectives.		
CRP.08.01.01.c. Evaluate how applying critical thinking skills can impact workplace and community situations.	Team activity	
CRP.08.01.02.c. Devise strategies to apply reason, logic and input from multiple perspectives to solve workplace and community problems.	Team activity	
CRP.08.02. Performance Indicator: Investigate, prioritize and select solutions to solve problems in the workplace and community.		
CRP.08.02.01.c. Devise strategies to evaluate the effectiveness of solutions for resolving workplace and community problems.	Team activity	
CRP.08.02.02.c. Evaluate and select solutions with greatest potential for success to solve workplace and community problems.	Team activity	

Measurements Assessed	Event Activities Addressing Measurements	Related Academic Standards
CRP.12.01. Performance Indicator: Contribute to team-oriented projects and build consensus to accomplish results using cultural global competence in the workplace and community.		
CRP.12.01.02.a. Identify and summarize techniques to build consensus in a team situation.	Team activity	
CRP.12.01.02.b. Apply consensus building techniques to accomplish results in team-oriented situations.	Team activity	
CRP.12.01.02.c. Devise and implement methods to obtain feedback from team members on their experiences after completing workplace and community projects.	Written exam	
CRP.12.01.03.c. Evaluate personal level of cultural and global competence and implement plans for growth and improvement in workplace and community situations.	Problem solving	
CRP.12.02. Performance Indicator: Create and implement strategies to engage team members to work toward team and organizational goals in a variety of workplace and community situations (e.g., meetings, presentations, etc.).		
CRP.12.02.02.a. Examine and summarize workplace and community situations where it is important to engage team members to meet team and organizational goals (e.g., meetings, presentations, etc.).	Team activity	
CRP.12.02.02.b. Select strategies to engage team members and apply in a variety of situations.	Team activity	
CRP.12.02.02.c. Evaluate the effectiveness of strategies to engage team members in a variety of workplace and community situations.	Team activity	