IOWA
FFA ASSOCIATION

FOOD SCIENCE & TECHNOLOGY
Career Development Event
This is a Skills CDE

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AG SKILLS CAREER DEVELOPMENT EVENT
GENERAL POLICIES, RULES, RESULTS AND STANDARDS
***Violations of any of the following rules may be grounds for the disqualification of the participants.**

I. Board Policies

The following board policies (http://www.iowaffa.com/ffaboardpolicies.aspx) apply directly or in part to Skills CDEs:

- Board Policy #2: Changes in Judging Event Answer Keys
- Board Policy #3: Changes to Judging Event Results
- Board Policy #11: Substitution of Team Members
- Board Policy #25: Advancement of Teams to National FFA Competition
- Board Policy #27: Use of Electronic Storage/Transmission Devices

II. Eligibly of Chapters and Participants

1. Each state event is open to all FFA chapters in good standing with the Iowa FFA Association. (Exception: Soils Career Development Event is open to the top five teams from each district competition.)
2. Local FFA advisors or their designee entering teams in the state event must register their intent to have a team on Iowa FFA On-Line (http://anfmp01.dmacc.edu/fmi/webd#) by the due dates and registration fees listed below:
   a. Before 14 days prior to the event — No Charge
   b. Between 14 days prior and day of the event — $50.00

   An invoice will be sent to the chapter for the appropriate entry fees at the end of the season.
3. A chapter may enter a separate team in each event held on a particular day. However, no member may participate in more than one Ag Skills Career Development Event on a particular day.
4. After an FFA Advisor registers the chapter's intent to enter a team, the names of the team members are expected to be entered on the Iowa FFA On-Line (http://anfmp01.dmacc.edu/fmi/webd#) by noon three days prior to the event. Any member not listed on Iowa FFA On-Line will need to be registered as an FFA member using the National FFA MyFFA Account (https://www.ffa.org). Changes to online entries may be made the day of the event. State and National FFA Dues will be invoiced in accordance with Iowa FFA Association policies and by-laws.
5. A participant, at the time of his/her participation in the state event and selection as a national team member, must:
   a. Be a current bona fide dues paying FFA member in good standing with the local chapter, state FFA Association and the National FFA Organization at the time of the career development event in which he/she participates.
   b. Be a middle school or high school FFA member, (a graduating senior is considered eligible to compete in state and national career development events up to and including their first national convention following graduation). Middle school refers to students in grades 7-8 and high school refers to students in grades 9-12.
   c. Have been enrolled in high school Agricultural Education during the current/most recent school year with the following exceptions: Meats, Livestock, Dairy Cattle and Milk Quality & Products-must have been enrolled the previous school year or be in grades 8-12 for the current year.
   d. Currently be an active FFA member of the chapter making entry into the event.
6. A member may not participate in both a state 4-H and state FFA Career Development Event when said events are held on the same day.
7. Participation in one Ag Skills Career Development Event of its type will not exclude an active FFA member from participating in the future Ag Skills Career Development Event, if the participant still qualifies as a middle school or high school FFA member (Rule 5b) providing he/she was not on a state championship FFA CDE team or a national FFA participant in the said event.
8. No student may participate in more than one Career Development Event each year at the national level.

9. For the Soils Career Development Event, each district FFA advisor must email all results including a list of participants for each of the top five teams to the State FFA Executive Director within one business day of the district event.

III. Event Room Conditions

10. Accommodations for participants can be made upon request of the FFA Advisor. The accommodation form must be submitted no less than 14 days prior to the respective event.
11. Any communication, verbal or non-verbal between participants during a career development event will be sufficient cause to eliminate the team member involved from the career development event. The only exception to this would be communication between team members during the team activity portion of a given career development event.
12. Any assistance given to a team member from any source other than the career development event officials or assistants will be sufficient cause to eliminate the team from the career development event.
13. No extra FFA members or other persons are permitted to view the state event until the completion of the event. The only people allowed in the event area during the event are participants and designated event workers. Observers and FFA advisors who are not working with the event will not be permitted in the event area while the event is in progress. The following are exceptions to this rule: the presentation portions of the Marketing Plan CDE and Ag Communications CDE at the Iowa FFA Leadership Conference.

IV. Participant Assignments

14. Each participant will be given an individual ID number by which he/she will be designated throughout the event. Contestant badges with identification numbers may be issued.
15. Teams will be divided into groups for individual activities. When possible, groups will be assigned to avoid having two participants on the same team in the same group.
16. Each participant will work on an individual basis throughout the event except during the FFA chapter team activity. Each team will submit one score card or product per team for the team activity.

V. Equipment and Dress Code

17. Participants are urged to bring and use clipboards during events to facilitate the holding of placing and grading cards. The clipboards are to be clean and free of markings. A few sheets of blank paper will be permitted for taking notes and recording results.
18. Calculators may be used with the Career Development Events. They must be battery or solar operated, non-programmable and silent, unless otherwise listed in the specific Career Development Event rules.
19. Items needed for specific phases of a Career Development Event will be noted under their specific rules.
20. Participants are expected to observe the National FFA Code of Ethics and the Proper Use of the FFA Jacket during the career development events found in the Official FFA Manual (https://www.ffa.org/about/who-we-are/official-manual).
21. Official FFA dress is expected for all participants when appropriate. If official dress is not appropriate, official casual dress should be worn. Official casual dress shall consist of 1) FFA t-shirt or polo shirt and 2) khaki or nice denim pants or shorts.

VI. Event Results

22. In the event that ALL participants' scores are incorrect the board reserves the right to correct the results.
23. Each FFA advisor will receive the judging cards, score cards, answer sheets and results following a career development event and the presentation of awards. FFA advisors are not permitted to pick up event packets until after the awards presentation.

VII. AFNR Career Cluster Content Standards

AFNR Content Standards are specifically outlined within each respective Skills CDE.

Food Science & Technology

2020 Chairperson: Brad Taylor, Story City
Coordinator: Dr. Terri Boylston, Iowa State University
Committee Personnel: Alaina Imhoff, Mediapolis; Amber Samson, Monroe
Scoring Coordinator: TBA

I. Overview

A. Encourage FFA members to gain an awareness of vocational and professional opportunities in the field of food science and technology, marketing and management occupations.
B. Help FFA members develop technical competence and personal initiative in a food science and technology occupation.

II. AFNR Content Standards

ABS.05. *Standard*: Use sales and marketing principles to accomplish AFNR business objectives.
ABS.05.02. *Indicator*: Assess and apply sales principles and skills to accomplish AFNR business objectives.
FPP.04. *Standard*: Explain the scope of the food industry and the historical and current developments of food product and processing.
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.01. *Standard*: Develop and implement procedures to ensure safety, sanitation and quality in food product and processing facilities.
FPP.01.02. *Indicator*: Apply food safety and sanitation procedures in the handling and processing of food products to ensure food quality.
FPP.01.01. *Indicator*: Analyze and manage operational and safety procedures in food products and processing facilities.
FPP.02. *Standard*: Design and apply techniques of food processing, preservation, packaging and presentation for distribution and consumption of food products.
FPP.02.01. *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.03. *Standard*: Select and process food products for storage, distribution and consumption.
FPP.03.02. *Indicator*: Design and apply techniques of food processing, preservation, packaging and presentation for distribution and consumption of food products.

III. Event Rules

A. The Iowa FFA Food Science & Technology Career Development Event will be limited to one team per chapter.
B. The Iowa Board of Directors will be in charge of this event.
C. Each school shall enter a team composed of three or four participants. The **top three** individual total score will be added to the team event score to determine the team score.
D. Team members must all be members of the same FFA chapter.
E. Each contestant will participate in three phases of the event: an individual test, a team product development project and proposal, and individual practicums.

IV. Equipment

A. Each participant should have a clean, free of notes clipboard, two sharpened No. 2 pencils, and an electronic calculator. Calculators used in this event should be battery operated, non-programmable, silent with large keys and large displays. Calculators should have only these functions- addition, subtraction, multiplication, division, equals, percent, square root, +/- key, and one memory register. No other calculators will be allowed during the event.

B. The presentation rooms will be equipped with TV/Monitor that utilizes a HDMI connection. Chapters may bring along their own projectors and/or a HDMI converter.

V. Event Format

A. Individual Activities:
   1. Written Exam: (150 points possible per individual)
      a. The objective questions administered during the food science and technology examination will be designed to determine each team member's understanding of the basic principles of food science and technology.
      b. The test will be 80% listed from the past 10 years National FFA Exams, with the remaining 20% listed from textbooks and websites specified in the reference section.
      c. Team members will work individually to answer each of the 50 questions. Each person will have 50 minutes to complete the examination. Each question will be worth three points, for a total of 150 points.
   2. Problem Solving/Math Practicum: (25 points per individual)
      a. Participants will answer a series of five mathematical calculations based on common food science themes. Questions may include nutrition calculations, ingredient quantity, cost benefit analysis, estimation of cost/margin of goods sold, conversions, processing conditions, etc.
      b. Example Question: The perfect glass of sweet tea is 20 percent sugar. Jim is making a one-gallon container of sweet tea. How many cups of sugar should he add? (a) 2.4 cups (b) 3.2 cups (c) 3.4 cups (d) 4 cups
   3. Food Safety and Quality Practicums
      a. Food Safety and Quality Practicum (50 points per individual)
         i. Team members will work individually to evaluate ten (10) photos. The contestant will evaluate the situations presented and select from a list of possible misuses of GMP's and HACCP.
      b. Customer Inquiry Practicum (25 points per individual)
         i. Each participant will be given five scenarios representing general consumer inquiries.
         ii. Participants must determine if the consumer inquiry reflects a quality or safety issue (two points per scenario) and determine if it is a biological, chemical or physical concern or hazard (three points per scenario).
         iii. Each Customer Inquiry is worth five points each for a total of twenty-five points.
   j. Sensory Evaluation Practicums
      a. Triangle Tests: (30 points per individual)
         iv. Two different triangle tests will be conducted. Participants are expected to identify the different samples through flavor, aroma, visual cues and/or textural differences.
         v. Answers will be given on the sheet provided. No list will be provided for this segment of the practicum. Each triangle test is worth 15 points. (30 pts)
      b. Aromas (100 points per individual)
         vi. Each participant will be asked to identify ten different aromas from vials provided at each station and record the answer on the sheet provided.
         vii. A list of potential aromas will be provided to each person. Each sample is worth 10 points.

B. Team Product Development Activity and Presentation: (400 points per team)
   1. Each team will receive a marketing scenario describing a need for a new or redesigned product that would appeal to a potential market segment.
   2. <u>This scenario will be sent out to all participating schools at least two (2) weeks prior to the contest and will contain a description of the existing marketing situation, competition and potential target market segment to be served by the new product</u>.
   3. It is the task of the team to design a new or reformulated food product or reformulate an existing product. The team will be responsible for understanding and using the following concepts:
      a. Formulation of product to meet specified market requirements

b. New package design to reflect the developed product
c. Nutritional label development and adjustments

4. Possible Products - A rotational list is being developed. The list will be sent out in advance of the contest and currently includes:
   a. Ready-to-Eat Cereal
   b. Breakfast Bars/sports bar
   c. Candy
   d. Beverages (Sports Drinks)
   e. Pizza
   f. Processed Fruit Snacks
   g. Stir-Fried Vegetables
   h. Sandwich (RTE)
5. Evaluation Criteria for Product Development Presentation:
   a. Objective met – development of a product.
   b. All required parts of the principal display panel (PDP).
   c. All required elements on the Information Panel.
   d. Correct relative placement of PDP and Information Panel.
   e. Reasonably close nutritional panel.
   f. Communication skills and oral presentation.
   g. Ability to answer questions about the product
   h. All team members contribute during presentation.
6. Time Frame:
   a. (A maximum of 15-minute presentation, which includes 10 minutes for presenting and 5 minutes for questions). Those schools that bring in computers/projectors will receive a maximum of 5 minutes set up time. If presentations have not started within the time frame, they will receive a 'participation rating'. *Deduction of 5 points per minute over the 10-minute mark for the presentation.* Screens will be provided; however, no computers, projectors, electric cords, and technical support will be provided.

VI. Event Resources

A. Reference for Test: Introduction to Food Science by Rick Parker. Published by Delmar Cengage Learning Search and request a copy at http://school.cengage.com/index.html
B. USDA Food Safety and Inspections Service Fact Sheets: http://www.fsis.usda.gov/Fact_Sheets/index.asp
C. USDA Food Safety and Inspections Service: http://www.fsis.usda.gov/Home/index.asp
D. Photographs to study via internet: (some sites with photos) University of Iowa, Visuals Unlimited, Flicker, Google searches, Yahoo searches, World Health Organization

VII. Scoring and Ranking of Teams and Individuals

Phases	Individual Points	Team Points
Team Product Development		400
Written Test	150	
Problem Solving/Math	25	
Food Safety & Quality	50	
Customer Inquiry	25	
Sensory Evaluations		
Triangle Test	30	
Aroma Identification	100	
TOTALS	380	400
OVERALL POINTS		1540

A. Tie Breakers – Team
   1. 1st Tie Breaker: Highest Team Activity score

2. 2nd Tie Breaker: Highest total points earned from General Knowledge Test (adding all three team member scores)
3. 3rd Tie Breaker: Judges response to the Team Question period from the Team Activity

B. Tie Breaker – Individual
1. 1st Tie Breaker: Highest General Knowledge Test score
2. 2nd Tie Breaker: Highest Problem Solving, Food Safety & Quality and Customer Inquiry scores.

VIII. Awards

Awards Sponsored through the Iowa FFA Foundation

Champion Team	Cash Award for travel to National Convention
Reserve Champion Team	Plaque
Top 10 Teams	Rosettes
Members of Top 10 Teams	Rosettes
Top 10 Individuals	Rosettes
1st and 2nd Place Individuals	Plaques
Practicums Top Team/Individual	Plaques
General Knowledge Test Top Team/Individual	Plaques
Product Development Team Activity Top Team	Plaque
All Teams/Individuals	Certificates

Awards Sponsored through the Iowa State University Food Science Department.

Top Individual	$500 Scholarship Provided the Student enrolls in Food Science at ISU

All awards subject to available sponsorship.

IX. Event Materials

A. Aromas Identification List
B. Safety & Sanitation List
C. Product Development Scenario
D. Team Product Development Scorecard

Aromas:

1. Almond
2. Anise (Licorice)
3. Banana
4. Basil
5. Butter
6. Cherry
7. Chocolate
8. Cinnamon
9. Clove
10. Coconut
11. Garlic
12. Ginger
13. Grape
14. Lemon
15. Lilac
16. Lime
17. Maple
18. Menthol
19. Molasses
20. Nutmeg
21. Onion
22. Orange
23. Oregano
24. Peanut Butter
25. Peppermint
26. Pine
27. Raspberry
28. Smoke (liquid)
29. Strawberry
30. Vanilla
31. Wintergreen

List of Potential Food Safety and sanitation problems
Iowa FFA Food Science CDE

- Botulism
- E Coli
- Cross Contamination problems
- Salmonella
- Campylobacter
- Listeria
- Staphylococcus
- Norovirus
- Parasites
- Employee hygiene
- Metal contamination in ground beef
- Rodent control
- Antibiotics in food
- Food product labeling

Format for this practicum:

There will be 10 sets – each set will have colored photographs depicting a potential food safety/sanitation problem. Each set will have two questions over it. (1) identify the problem, and (2) identify solution to the problem. All questions will be in multiple choice formats with each set valued at 5 points for a total of 50 possible points.

2020 Iowa FFA Marketing Scenario
Food Science CDE – Food Product Development

Memorandum to: Product Development Team
From: Marketing Research and Development
Subject: Development of a convenience breakfast product

Task/Objective: Your team is to design a convenience breakfast product to meet the needs of the target market described below. It should include pricing and nutritional information. In addition, the targets for the product are (per serving): 400 to 600 calories, > 12 grams protein, < 20 grams total fat and < 80 grams carbohydrates.

The newly-issued Dietary Guidelines for Americans emphasizes choosing healthier, nutritionally-balanced foods for all meals and snacks, particularly breakfast. An important group of consumers is the teenage (13-17 years old) customer. According to the National Institute of Health, 62% of all teenagers begin the day without eating breakfast, or with a poor choice of high fat breakfast foods with little nutritional value. With the demands of schoolwork, extracurricular activities, and too little sleep, many teenagers cite being in a hurry or having too little time to eat as the reasons for failure to eat breakfast. One of the most serious consequences due to failure to eat breakfast is a decreased metabolism resulting in an inability to concentrate during the school day.

Since it is extremely unlikely that teenagers' schedules will become less demanding, a tremendous market potential exists for a highly convenient breakfast product that tastes good. Also, because teenagers tend to eat what is readily available, the successful product will appeal to the primary food purchaser of the household–typically adult women.

Since the typical teenager consumes over $1,300 in "convenience foods" per year, a well - developed highly appealing product presents excellent potential for an increase in total sales and profit for the company. Focus group research indicates show the ideal final price of such a product should be somewhere between $2.00-$3.50 per item. In addition to the cost of producing the breakfast product based on the ingredients of the product, there is a cost of $.30 per serving associated with packaging, labeling, marketing, and distributing the product. The company needs to make at least a 20% profit, on top of the cost of production, packaging, labeling, marketing, and distribution, to be competitive in this market. While accomplishing this, we expect the product to include a minimum of four main components. However, your team may choose to include more than four components.

Your team needs to develop a nutritious and delicious convenience breakfast product to improve the breakfast eating habits of teenagers. Remember, your team needs to address concerns such as: economics, nutrition, quality control, product safety, equipment, distribution, and formulations. In other words, explain why you chose to create the product you created and how such a product meets the needs described above. You also need to identify a catchy name for this product and design the front label so as to attract the target audience. This is a team event and it is very important for your group to equally present material and provide answers to the judge's questions.

Teams should also prepare a reasonably accurate nutritional analysis label for their product.

Nutritional and Price Information

Food Item	Unit serving size (oz. mass)	Calories	Fat (g)	Sodium (mg)	Carbs (g)	Potassium (mg)	Sugar (g)	Protein (g)	Price (per serving)
Bagel	3.6	310	3	440	58	0	5	11	$0.72
Waffle	1.2	105	4.5	230	13	0	2	2	$0.12
Pancake	1	70	1.1	200	13	0	2.7	2	$0.14
French Toast	2	120	3	170	20	0	3	4	$0.32
Tortilla	1	140	3	450	24	0	0	4	$0.20
Vegetable sausage	1.75	135	6.5	310	6	0	1.5	15	$0.63
Ham	2	180	16	620	1	0	1	7	$0.36
Sausage	1.2	120	11	130	0	0	1	4.5	$0.37
Bacon	1.6	55	4.5	230	0	0	0	3.5	$0.50
Egg	2.4	70	4.5	65	1	0	0	6	$0.12
Cheddar Cheese	1	110	9	180	1	0	0	7	$0.21
Mozzarella cheese	1	80	6	170	1	0	0	8	$0.21
Hummus	1.5	70	0	20	23	0	0	9	$0.15
Red Pepper Strips	1	6	0	0	1	55	1	0	$0.13
Jalapeno Pepper	1	5	0	410	0	0	0	0	$0.25
Green Onion	1	10	0	5	2	70	1	0	$0.13
Black Olives	.5	25	2.5	125	1	0	0	0	$0.17
Salsa	1	10	0	250	2	0	2	0	$0.19
Syrup	2	210	0	140	52	0	31	0	$0.22

Conversion factors: 16 oz. (mass) = 1 lb = 454 gram

2020 Iowa FFA Food Science Product Development Information

Chapter name: _____

Criterion	Points Possible	Points Earned
Objective met – to develop a convenience breakfast product	50	
All required parts of the principle display panel (PDP) are present.	50	
All required elements are on the Information Panel.	50	
Relatively correct placement of PDP and Information Panel.	50	
Reasonability close nutritional panel.	50	
Communication skills/oral presentation (clear, logical, easy to understand, confidence in presentation and of the information presented).	50	
Ability to answer questions about the product.	50	
Did all team members contribute?	50	
Overall Score	400	