

Food Science and Technology Career Development Event

Effective September 15, 2022

Important Note:

This document includes the complete contest information, as well as the differences from the National contest that have been implemented at the state level.

Michigan FFA Career Development Events general rules apply.

Purpose

To stimulate learning activities in food science and technology related to the food industry and to assist students in developing a good working knowledge of sound principles used in a team decision-making process.

Objectives

1. To encourage FFA members to gain an awareness of career and professional opportunities in the field of food science and technology, marketing and management occupations.
2. To give FFA members the opportunity to experience group participation and leadership responsibilities in a competitive food science and technology program.
3. To help FFA members develop technical competence and personal initiative in a food science and technology occupation.
4. To provide opportunities for FFA members to participate in activities where they gain an appreciation for cooperative effort in the food industry.

Event Rules

1. The contest will be limited to 24 teams. The first 24 teams, (one per Chapter), on a first come first serve basis will be accepted. If there are not 24 teams registered by the registration deadline, chapters will be allowed to send an additional team. Again, first come first serve. Please use the online registration form that will be time and date stamped. Registrations via email or phone or fax will not be accepted.
2. The team will consist of three (3) or four (4) team members with the overall top three (3) team members' scores being totaled.
3. Students who have diabetes or any food allergies are highly discouraged from participating. Samples may contain food allergens, including but not limited to: milk, eggs, peanuts, tree nuts, fish, and shellfish, soy, and wheat. **Any persons in need of accommodations related to allergies for this contest must inform the state office by the skills registration deadline. The event committee will make all reasonable efforts to accommodate students with food allergies. If an allergy accommodation is made, all teams participating in the contest will be notified before the contest.**

Event Format

This career development event will consist of a four-person team activity and several individual scored activities in which the top three team member scores are combined for a team total score. All team members will participate in all of the activities. This career development event will involve 1,075 total points per team. Individual scores will not include the product development team score. The food science and technology career development event will consist of five areas of focus:

1. An objective test (100 points / individual)
2. A team product development project (400 points / team)
3. A practicum in food safety and quality (60 points / individual)
4. A practicum in sensory evaluation (40 points / individual)
5. A practicum of situational math calculations (25 points / individual)

Equipment

1. Materials student must provide
 - A. Two sharpened No. 2 pencils.
 - B. Each individual must have an electronic calculator. Calculators must be silent, battery operated, and non-programmable. No other calculators are allowed to be used during the event, including cell phones.
 - C. Each student MAY bring a clean, free of notes, clip board
2. Materials provided to student
 - A. Colored pencils or markers will be provided for the product development activity.
 - B. Water will be provided for taste testing.
3. Materials not permitted
 - A. No consumer products are allowed at the contest this includes, gum, bottled water, candy, etc.
 - B. No scissors, tape, glue, markers, etc. will be allowed.
 - C. Students are not permitted to bring coffee, saltines, water, etc. for use during sensory evaluation.
 - D. Teams and/or individuals will NOT be permitted to use electronic media during the event. This includes but is not limited to cell phones, mp3 players, cameras, etc. Any participant in possession of an electronic device, except a calculator, in the event area is subject to disqualification.

Note: Participants should not use cologne or fragrant lotions before or during the contest. Violators may be removed from the activity and/or disqualified.

Team Activities

1. Team Product Development Project (400 points)
 - A. Each team will receive a marketing scenario describing a need for a new or redesigned product that would appeal to a potential market segment. This scenario will contain a description of the existing marketing situation, competition, and potential target market segment to be served by the new product. It is the task of the team to design a new or reformulated food product or reformulate an existing product.

- B. The team will be responsible for understanding and using the following concepts:
 - ❖ Formulation of product to meet specified market requirements.
 - ❖ New package design to reflect developed product.
 - ❖ Nutritional label development and adjustments.
 - ❖ Processes and equipment used to produce and package the product.
 - ❖ Provide quality and safety control programs (i.e. quality tests, good manufacturing practices (GMP), and hazard analysis critical control point analysis (HACCP)).
- C. Each team will be provided with materials and necessary information to create the principal display panel and information panel of the product's package.
- D. The team will have 60 minutes to respond to the marketing scenario and reformulate or develop a new product, calculate nutritional data, develop a label that includes the principal display panel, nutritional label, and ingredient statement. At the end of the time period, the team will turn in a written summary of answers to the questions asked in the scenario, as well as, portions of the label previously mentioned.
- E. The general topic of the product development activity will be provided to the eligible teams approximately one week prior to the state competition.
- F. The written answers to the questions are worth 300 points and will cover the following topics formulation, marketing, nutrition, quality control, product processing/packaging, food safety, economics.
- G. The label components are worth 100 points and need to include:
 - ❖ Principal Display Panel – includes all necessary elements, conveys information, and contains elements that appeal to the consumer.
 - ❖ Information Panel – includes all necessary elements and correct calculations of nutrition facts (%DV not necessary for nutrients; vitamins and minerals should just be reported as weight (not %DV)).

Individual Activities

1. Objective Test
 - 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. *Questions will be based on material covered in the previous four years of the National FFA Food Science and Technology CDE Objective Test.*
 - B. Team members will work individually to answer each of the 50 questions. Each person will have 40 minutes to complete the examination. Each question will be worth 2 points. Points will only be awarded for correct answers. The total number of points possible for this activity will be 100 points per individual.
2. Practicums - Each team member will compete individually in all practicums.
 - A. Food Safety and Quality
 - ❖ Customer Inquiries

Each participant will be given five (5) scenarios representing general consumer inquiries. Participants must determine if the consumer inquiry reflects a quality

or safety issue (3 points each) and determine if the concern or hazard is biological, chemical, or physical in nature (3 points each). Refer to the explanation document for additional information. Participants will be given approximately 10 minutes to complete this activity. The total number of points for this activity will be 30 points per individual.

❖ Food Safety/Sanitation Problem Identification

Each participant will be shown six (6) pictures. The pictures may or may not show a violation of good manufacturing practices (GMPs), sanitation, food handling/storage and other pre-requisite programs. A list of violation categories including the option of no violation will be provided. Participants will identify which category best describes each picture. Participants will be given 15 minutes to complete this activity. The total number of points for this activity will be 30 points per individual.

GMP Violation Categories

- improper personal hygiene
- improper sanitation
- improper food handling
- improper chemical use/storage
- improper pest management
- no violation

B. Problem Solving/Situational Math Practicum – Participants will answer a series of mathematical calculations based on common food science themes, totaling 25 points per individual. Questions may include nutrition calculations, ingredient quantity, cost benefit analysis, estimation of cost/margin of goods sold, conversions, processing conditions, etc.

C. Sensory Evaluation

❖ Triangle Taste Tests

Three (3) different triangle tests will be conducted. Participants are expected to evaluate the three samples provided and identify which one is different through flavor, aroma, visual cues and/or textural differences. Participants are not required to consume (swallow) samples. Samples may be any of the following: food, beverage, prepared solutions (sweet, sour, salty, etc.). Samples may contain food allergens, including but not limited to milk, eggs, peanuts, tree nuts, fish, shellfish, soy, and wheat. Participants will be given approximately 10 minutes to complete this activity. The total number of points for this activity will be 15 points per individual.

❖ Aroma Identification

Each participant will be asked to identify the aroma in each of the 5 sample vials. A list of all 31 possible aromas will be provided. Participants will be given approximately 10 minutes to complete this activity. The total number of points for this activity will be 25 points per individual.

Aromas		
Apple	Smoke	Banana
Chocolate	Cherry	Coconut
Maple	Butter	Strawberry
Oregano	Sage	Licorice (anise)
Basil	Grape	Peach
Lemon	Garlic	Onion
Lime	Peppermint	Raspberry
Orange	Clove	Molasses
Vanilla	Nutmeg	Watermelon
Coffee	Ginger	Wintergreen
Cinnamon		

Scoring

Section	Section Points	Total Points
Individual Activities		
Objective Test		100
Food Safety & Quality Practicum		60
Customer Inquiry (5 scenarios x 6 pts each)	30	
Food Safety/Sanitation ID (6 picts x 5 pts each)	30	
Math Practicum (5 questions x 5 pts each)	25	25
Sensory Evaluation Practicum		40
Triangle Tests (3 sets x 5 pts each)	15	
Aroma Identification (5 aromas x 3 pts each)	25	
Total Individual Points		225
Individual Points (225 pts x 3 members)		675
Team Product Development Project		400
Written Proposal	300	
Label Design	100	
TOTAL TEAM POINTS		1075

Tiebreakers

Should a tie occur in the overall team placing, the highest team product development score will break the tie. If this score does not break the tie, then the highest number of total points earned from the objective test (the three team members who are scored are added together) will break the tie. To identify the high individual for this event in case of a tie, the highest examination score will be used as the first tiebreaker, followed by the highest Food Safety and Quality Practicum score, as the second tiebreaker.

References

This list of references is not intended to be 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.

Test and teacher's resource binder - Product Development

1. Food Science: The Biochemistry of Food and Nutrition, 2006, Mehas & Rodgers
This curriculum contains a student test, student lab manual, teacher's annotated lab manual, and teacher's resource binder.
2. *A Food Labeling Guide*, 2008, Food and Drug Administration Center for Food Safety and Applied Nutrition, www.fda.gov/FoodLabelingGuide
Section III. General Food Labeling Requirements - Focus on different parts of label, location of each part, and elements required on each part. Exact dimensions, type size, etc. are not important.

Math Practicum

1. Utilize the materials from the National FFA website from previous practicums.
<https://ffa.app.box.com/s/sqqt3t5y921v0cbk3e6k4jalktma2gxn/folder/50521482627>

General

2. *Introduction to Food Science*, 2001, Parker, Delmar Learning
3. *Food Science and Safety*, 2nd ed., 2004, George J. Seperich, Prentice Hall Publishers.
4. *Principles of Food Sanitation*, 5th ed., 2006, Norman G. Marriott and Robert B. Gravani, Springer Science + Business Media, Inc.
5. Institute of Food Technologists website, <http://www.ift.org/knowledge-center/learn-about-food-science.aspx>
6. USDA Food Safety and Inspection Service website, http://www.fsis.usda.gov/Food_Safety_Education/index.asp
7. Penn State Cooperative Extension Food Safety website, <http://extension.psu.edu/food-safety> Check out sections for Processors, Entrepreneurs, and Educators.
8. Principles of Food Science, Janet Ward, 2007, The Goodheart-Willcox Company, Inc. (lab workbook available)
9. Understanding Food Science and Technology, Peter Murano, 2003, Wadsworth, Cengage Learning.

Teacher Reference

1. Elementary Food Science, 4th ed., 1996. Ernest Vieira, Chapman & Hall.
(Good reference for information on different processing operations.)