



MICHIGAN FFA

To view additional contest details, see the contest clarification sheet on the Michigan FFA Website

FOOD SCIENCE AND TECHNOLOGY

Career Development Event

PURPOSE

The purpose of the Food Science and Technology CDE is 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

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.

To give FFA members the opportunity to experience group participation and leadership responsibilities in a competitive food science and technology program.

To help FFA members develop technical competence and personal initiative in a food science and technology occupation.

To provide opportunities for FFA members to participate in activities where they gain an appreciation for cooperative effort in the food industry.

EDUCATIONAL STANDARDS

For educational standards, please refer to the Food Science and Technology Handbook located at <https://www.ffa.org/participate/cdes/food-science-and->

TEAM MAKE-UP/ELIGIBILITY

Number of Teams

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.

Accommodations

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.

Equipment

Students are to **bring their own**:

- Two sharpened No. 2 pencils.
- 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.
- Each student **MAY** bring a clean, free of notes, clip board

Students will be **provided** with the following:

- Colored pencils or markers for the product development activity
- Water for taste testing

The following materials are **not** permitted:

- Consumer products including gum, bottled water, candy, etc.
- Scissors, tape, glue, markers, etc.

- Coffee, saltines, water, etc. for use during sensory evaluation.
- Electronic media
 - 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.

Official Dress

Official dress for an FFA member includes:

1. An official FFA jacket zipped to the top
2. Black slacks and black socks/nylons or black skirt and black nylons
 - a. *Skirt should be a minimum of knee length*
 - b. *Slacks should be full length*
3. White collared blouse or white collared shirt
4. Official FFA tie or official FFA scarf
5. Black dress shoes with closed heel and toe

*Note: Medical or cultural adjustments to required official dress may be made with prior approval of contest/event chair. Also, appropriate personal protective equipment may be used with Official Dress. **Junior high FFA members are allowed to wear FFA jackets, but it is optional. Participants in junior high contests should not be judged differently for wearing or not wearing a jacket.***

If warranted, deductions for non-compliance with official dress guidelines will be determined by the contest chair and enforced equally by all judges. The chair may make a deduction of 0, 2, 5, 7, or 10 points.

PROCEDURE

Contest Procedures

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. Product development project (400 points / team)
2. Objective test (100 points / individual)
3. Food safety and quality practicum (60 points / individual)
4. Sensory evaluation practicum (40 points / individual)
5. Situational math calculations practicum (25 points / individual)

Team Product Development Project

60 minutes | 400 points | Team Activity

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.

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 developed product.
- C. Nutritional label development and adjustments.
- D. Processes and equipment used to produce and package the product.
- E. Provide quality and safety control programs (i.e. quality tests, good manufacturing practices (GMP), and hazard analysis critical control point analysis (HACCP).

Each team will be provided with materials and necessary information to create the principal display panel and information panel of the product's package.

The team will have **60 minutes** to:

1. Respond to the marketing scenario
2. Reformulate or develop a new product
3. Calculate nutritional data
4. 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.

The written answers to the questions are worth **300 points** and will cover the

following topics:

- A. Formulation
- B. Marketing
- C. Nutrition
- D. Quality control
- E. Product processing/packaging
- F. Food safety
- G. Economics.

The label components are worth **100 points** and need to include:

- A. **Principal Display Panel** – includes all necessary elements, conveys information, and contains elements that appeal to the consumer.
- B. **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).

The general topic of the product development activity will be provided to the eligible teams approximately one week prior to the state competition.

Objective Test

40 minutes | 100 points | Individual Activity

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.

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**.

Food Safety and Quality Practicum

25 minutes | 60 points | Individual Activity

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

Problem Solving/Situational Math Practicum

25 minutes | 25 points | Individual Activity

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.

Sensory Evaluation Practicum

20 minutes | 40 points | Individual Activity

Triangle Taste Test

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		

SCORES

The **individual** score will be calculated as follows:

Objective Test		100 points
Food Safety & Quality Practicum		60 points
Customer Inquiry (5 scenarios x 6 pts each)	30 points	
Food Safety/Sanitation ID (6 picts x 5 pts each)	30 points	
Math Practicum (5 questions x 5 pts each)	25 points	25 points
Sensory Evaluation Practicum		40 points
Triangle Tests (3 sets x 5 pts each)	15 points	
Aroma Identification (5 aromas x 3 pts each)	15 points	
Total Individual Points		225 points

The **team** score will be calculated as follows:

Individual Points – Top 3 team member scores		675 points
Team Product Development Project		400 points
Written Proposal	300 points	
Label Design	100 points	
Total Team Points		1075 points

Determining Awards

Gold and Silver awards will be determined by the Michigan FFA Association Executive Secretary.

Tie Breaker

In event of a **team** tie, the placing will be determined in the order of:

1. Team Product Development Score
2. Objective test (the three team members who are scored are added together)

In event of an **individual** tie, the placing will be determined in the order of:

1. Examination score
2. Food Safety and Quality Practicum score

ADDITIONAL MATERIALS

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.

Product Development - Test and teacher's resource binder

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.

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

Utilize the materials from the National FFA website from previous practicums.

- <https://ffa.app.box.com/s/sqqt3t5y92lv0cbk3e6k4jalktma2gxn/folder/50521482627>

General

Introduction to Food Science, 2001, Parker, Delmar Learning

Food Science and Safety, 2nd ed., 2004, George J. Seperich, Prentice Hall Publishers.

Principles of Food Sanitation, 5th ed., 2006, Norman G. Marriott and Robert B. Gravani, Springer Science + Business Media, Inc.

Institute of Food Technologists website, <http://www.ift.org/knowledge-center/learn-about-food-science.aspx>

USDA Food Safety and Inspection Service website, http://www.fsis.usda.gov/Food_Safety_Education/index.asp

Penn State Cooperative Extension Food Safety website, <http://extension.psu.edu/food-safety>

- Check out sections for Processors, Entrepreneurs, and Educators.

Principles of Food Science, Janet Ward, 2007, The Goodheart-Willcox Company, Inc. (lab workbook available)

Understanding Food Science and Technology, Peter Murano, 2003, Wadsworth, Cengage Learning.

Teacher Reference

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