Illinois Association of Vocational Agriculture Teachers
Food Science & Technology CDE

Purpose of the Event
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.

A. General Information
1. Team: A team shall consist of four (4) members, with all four scores counting towards the team score.
2. Awards: All scores will be added to calculate the team score. Individual awards will be based upon the total of the objective test score, the team product development project, a practicum in food safety and quality and a practicum in sensory evaluation.
3. Miscellaneous: Each participant must 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 and nonprogrammable. No other calculators are allowed to be used during the event. Teams and/or individuals will not be permitted to use electronic media during the event.
5. Registration: This event shall be open to any school desiring to participate. Pre-registration for this career development event is expected by a deadline to be announced in ITCS Instructional Materials News & Notes. Entry fees are not refundable.
6. Tiebreakers: Should a tie occur in the overall team placing, the tie will be broken by the highest team product development project score. If this score does not break the tie, then the highest number of total points earned from the objective test (adding all four team member scores) 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.

B. Career Development Event Format
The career development event shall consist of three parts: Objective Test, Individual Practicums and the Team Marketing Scenario.

C. Career Development Events Divisions
1. Objective Test: (100 points)
The objective test is designed to determine each team member’s understanding of the basic principles of food science and technology. It will encompass the knowledge required of the team event and the two practicums, i.e., food safety and quality and sensory evaluation, as well as material in the list of references.
a. Team members will work individually.
b. The test will consist of fifty (50) multiple-choice questions.
c. The test questions will be based on the attached list of required references.
d. Fifty (50) minutes will be allotted to complete the Objective Test, with each question worth two (2) points for a total of 100 points.

2. Practicums: (150 points each)
Each team member will compete in both practicums. Each practicum will be worth 150 points per individual. The event host will furnish all materials used in the practicums.

a. Food Safety and Quality Practicum
   Part I - Customer Complaint Letter (50 points)
   Each participant will be given a representative consumer complaint letter received by a food processing company. The participant must determine if the complaint involves a food quality or food safety problem and respond accordingly. If the complaint involves a food quality problem, the participant should ascertain the cause of the quality defect and identify a possible solution. If the complaint letter describes a food safety problem, the participant should determine whether the problem is biological, chemical or physical in nature and its possible mitigation. The possible solutions include:
   - Inform legal staff
   - Recall product if needed
   - Inform the packaging line of the problem
   - Write a letter to a customer
   - Offer a refund or replacement of the product
   Regardless of the problem each participant will write out his or her answer using paper provided.
   - Identification of Problem .................................................. 20 points
     ♦ Cause of Quality Defect (10 of the 20 points)
     ♦ Identify the Nature of the Problem (10 of the 20 points)
   - Solution to Problem ....................................................... 30 points
   Fifteen (15) minutes will be allowed for this part of the practicum.

   Part II - Food Safety/Sanitation (100 points)
   Ten (10) photos of potential food safety and/or sanitation problems will be displayed, with each photo serving as a separate station. Each participant will be given a numbered list of potential food safety and/or sanitation problems at the beginning of this practicum segment. The list will contain such standards as good manufacturing practices (GMP) and hazard analysis critical control point (HACCP). The list will contain more than ten (10) potential problems.
   The participant must identify the type of problem in the photo sheet by recording the number from the list on an answer card provided to each participant. Each participant will start at a station to view a photograph and record an answer. After one minute, the participants will be told to move to the next station. This will continue until each participant returns to his or her original station. Ten (10) minutes will be allowed for this part of the practicum.

b. Sensory Evaluation
   Each participant will be given one minute at each station before being told to move to a new station. When each person returns to his or her original station this practicum is completed
   Part I - Triangle Tests (45 points)
   Three different triangle tests will be conducted. Participants are expected to identify the different sample through aroma, visual cues or textural differences.
Answers will be given on the sheet provided. No list will be provided for this segment of the practicum. Each test is worth 15 points.

**Part II - Difference Testing (45 points)**

Three samples will be tasted. Participants will be expected to discern the different taste of each sample when compared to a control or normal sample.

Each station is worth 15 points.

**Part III - Aromas (60 points)**

Each participant will be asked to identify six (6) different aromas from vials provided at each station and record the answer on the sheet provided. A list of potential aromas will be provided to each person. Possible aromas include:

- 01. Almond
- 02. Banana
- 03. Basil
- 04. Butter
- 05. Cherry
- 06. Chocolate
- 07. Cinnamon
- 08. Clove
- 09. Coconut
- 10. Garlic
- 11. Ginger
- 12. Grape
- 13. Lemon
- 14. Licorice (anise)
- 15. Lime
- 16. Lilac
- 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

Each station is worth 10 points.

3. **Team Event: (300 points)**

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, economic considerations and potential target market segment to be served by the new product. It is the task of the team to design a new food product or reformulate an existing product.

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 the developed product.
- Nutritional label development and adjustments.
- Equipment used to produce and package the product.
- Provide quality control and safety programs, i.e., good manufacturing practices (GMP) and hazard analysis critical control points (HACCP).

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**Sample Nutrition Label**

**Nutrition Facts**

<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>Calories</th>
<th>Calories from Fat</th>
<th>% Daily Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

|                  | Total Fat | Saturated Fat | %         |
|                  |          |               | %         |

|                  | Cholesterol | %         |
|                  |             | %         |

|                  | Sodium | %         |
|                  |        | %         |

|                  | Total Carbohydrate | %         |
|                  |                    | %         |

|                  | Dietary Fiber | %         |
|                  |              | %         |

|                  | Sugars |            |
|                  |        |            |

|                  | Protein | %         | Vitamin A | %         |
|                  |         | %         | Vitamin C | %         |

|                  | Calcium | %         | Iron | % |
|                  |         | %         |      | % |

*Percent Daily Values are based on a 2,000 calorie diet.*
Each team will be provided with packaging materials, ingredients and information necessary on each ingredient in order to develop a final product label. The team will respond to the marketing scenario and reformulate or develop a new product, calculate a nutritional label, develop the ingredient statement and educational panel and develop the front or principal display panel to reflect the new product and its market.

Possible products to include, but are not limited to:
- Cereal
- Breakfast Bars
- Candy
- Snack Mixes
- Dairy Products
- Desserts
- Beverages
- Pizza
- Processed Fruit Snacks
- Sandwich
- Convenience Meals
- Stir-Fried Vegetables

Total time involved for each team will be sixty (60) minutes. Total number of points possible for this activity will be 300 points.

D. Required References


Institute of Food Technology website, http://www.ift.org

Additional References


Food Science: The Biochemistry of Food and Nutrition, 2002, Mehas & Rogers.
This curriculum contains a student text, student lab manual, teacher’s annotated lab manual, and teacher’s resource binder. All materials are available through the Glencoe Secondary Catalog: Family & Consumer Sciences.


Penn State Food Entrepreneur Resources Website, http://www.foodscience.psu.edu/Outreach/Fun_Food_Science.html
FFA Chapter: ____________________

Contestant Name: ____________________

Team Number: ____________________

Food Science and Technology Career Development Event

SENSORY EVALUATION - AROMAS
(60 points)

You are asked to identify 6 aromas taken from the list below. Write the NUMBER AND NAME of the aroma in the blanks provided.

Aromas

11. Ginger

AROMA #1 _________________________
AROMA #2 _________________________
AROMA #3 _________________________
AROMA #4 _________________________
AROMA #5 _________________________
AROMA #6 _________________________

FFA Chapter: ____________________

Contestant Name: ____________________

Team Number: ____________________

Food Science and Technology Career Development Event

FOOD SAFETY & QUALITY - CUSTOMER COMPLAINT LETTER
(50 points)

Assume you are responsible for Food Safety and Food Quality in a food processing company. Study the letter and decide your answers to the questions below.

Questions #1 and #2 relate to “Identification of a Food Safety-or-Quality Problem” and count 10 points for each correct answer. Question #3 relates to “Solution of a Food Safety or Quality Problem” and counts a maximum of 30 points.

Question #1: Does the complaint indicate (Check only one)
   - a FOOD SAFETY PROBLEM? (a) ______
   - or-
   - a FOOD QUALITY PROBLEM? (b) ______

Question #2 Is the problem primarily? (Check one)
   - Biological (a) ______
   - Chemical (b) ______
   - Physical (c) ______
   - None of the above (d) ______

Question #3 Describe briefly a POSSIBLE SOLUTION to the Food Safety or Food Quality Problem indicated in the letter. Use the back of this card if necessary.
Food Science and Technology Career Development Event

Inspection List

FOOD AND FOOD PROTECTION
1. Approved source free from spoilage
2. No home prepared or canned food
3. Original container properly labeled
4. Consumer advisory, date and time on PHF’s
5. Food at proper temperatures during storage, display, service, transport, and holding
6. No under-cooked food served to vulnerable populations. Food properly cooked and cooled
7. Facilities to maintain product temperatures
8. Thermometers provided and conspicuously placed
9. Potentially hazardous foods properly thawed
10. No raw meat stored over ready to eat foods
11. Storage practices, damaged food segregated
12. Unwrapped food not re-served
13. Food protection during storage, preparation display, service, transportation
14. Foods handled with minimal manual contact
15. Bare hand contact minimized
16. In-use food and ice dispensing utensils properly stored

PERSONNEL
17. Personnel with infections restricted
18. Hands washed, good hygienic practices
19. Eating and smoking prohibited
20. Clean clothes, hair restraints

FOOD EQUIPMENT AND UTENSILS
21. Dishwashing facilities designed, constructed operated
22. Food (ice) contact surfaces designed, constructed, maintained, installed & located Non-food contact surfaces designed, constructed, maintained, located
23. Accurate thermometers, gauges, test kits provided
24. Pre-flushed, scraped, soaked
25. Wash, clear rinse, proper temperature
26. Sanitizing concentration, temperature
27. Wiping cloths clean, used properly, stored correctly
28. Food contact surfaces cleaned as required
29. Storage/handling of clean equipment: utensils inverted, high chairs sanitized
30. Single-service articles, storage, dispensing
31. No re-use of single-service article(s)

GARBAGE & REFUSE DISPOSAL
32. Containers/receptacles: covered, adequate number, insect/rodent proof, clean
33. Outside storage area enclosures properly constructed, clean; controlled incineration

INSECT, RODENT, ANIMAL CONTROL
34. Presence of insects/rodents - no birds, turtles, other animals
35. Openings to outside tight-fitting with screens; self closing doors

OTHER OPERATIONS
36. Toxic items properly stored, labeled and used
37. Premises maintained free of litter, unnecessary articles
38. Cleaning/maintenance equipment properly stored
Food Science and Technology Career Development Event

FOOD SAFETY AND QUALITY PRACTICUM

FOOD SAFETY AND SANITATION PROBLEM IDENTIFICATION

(100 points)

Each participant will observe 10 photos of different food processing operations. The photos MAY OR MAY NOT show ONE actual or potential food safety and/or sanitation problem.

Record your answers for each photo. You will be allowed 1 minute to observe each photo and answer the two statements. You will be told when to move to the next photo.

In the first question, select the most correct answer. In the second question, identify the type of problem by recording the correct number from the inspection list.

PHOTO #1
1) Is this primarily a:  
   ____ Food Safety Problem  
   ____ Food Sanitation Problem  
   ____ No Problem  

2) Inspection list number that applies to this photo. ____

PHOTO #2
1) Is this primarily a:  
   ____ Food Safety Problem  
   ____ Food Sanitation Problem  
   ____ No Problem  

2) Inspection list number that applies to this photo. ____

PHOTO #3
1) Is this primarily a:  
   ____ Food Safety Problem  
   ____ Food Sanitation Problem  
   ____ No Problem  

2) Inspection list number that applies to this photo. ____

PHOTO #4
1) Is this primarily a:  
   ____ Food Safety Problem  
   ____ Food Sanitation Problem  
   ____ No Problem  

2) Inspection list number that applies to this photo. ____

PHOTO #5
1) Is this primarily a:  
   ____ Food Safety Problem  
   ____ Food Sanitation Problem  
   ____ No Problem  

2) Inspection list number that applies to this photo. ____

PHOTO #6
1) Is this primarily a:  
   ____ Food Safety Problem  
   ____ Food Sanitation Problem  
   ____ No Problem  

2) Inspection list number that applies to this photo. ____

PHOTO #7
1) Is this primarily a:  
   ____ Food Safety Problem  
   ____ Food Sanitation Problem  
   ____ No Problem  

2) Inspection list number that applies to this photo. ____

PHOTO #8
1) Is this primarily a:  
   ____ Food Safety Problem  
   ____ Food Sanitation Problem  
   ____ No Problem  

2) Inspection list number that applies to this photo. ____

PHOTO #9
1) Is this primarily a:  
   ____ Food Safety Problem  
   ____ Food Sanitation Problem  
   ____ No Problem  

2) Inspection list number that applies to this photo. ____

PHOTO #10
1) Is this primarily a:  
   ____ Food Safety Problem  
   ____ Food Sanitation Problem  
   ____ No Problem  

2) Inspection list number that applies to this photo. ____
Food Science and Technology Career Development Event

**TRIANGLE TESTS**
(90 points)

You will be provided a sample of food that serves as a control. You will then be provided with three (3) samples of a similar food. You are to identify which one of the three is identical to the control. Circle the letter of the correct answer on this answer sheet.

**TASTE**

1. A  B  C
2. A  B  C
3. A  B  C

**VISUAL**

4. A  B  C
5. A  B  C
6. A  B  C

Food Science and Technology Career Development Event

**OBJECTIVE TEST**
(100 points)

Write the letter of the correct answer in the space provided.

1. ____  18. ____  35. ____
2. ____  19. ____  36. ____
3. ____  20. ____  37. ____
4. ____  21. ____  38. ____
5. ____  22. ____  39. ____
6. ____  23. ____  40. ____
7. ____  24. ____  41. ____
8. ____  25. ____  42. ____
9. ____  26. ____  43. ____
10. ____  27. ____  44. ____
11. ____  28. ____  45. ____
12. ____  29. ____  46. ____
13. ____  30. ____  47. ____
14. ____  31. ____  48. ____
15. ____  32. ____  49. ____
16. ____  33. ____  50. ____
17. ____  34. ____