

# High School Agriscience Education - Food Science Technology

1. Safety
2. Economics
3. Quality and Assurance
4. Food Processing Technology
5. Food Preparation and Presentation
6. Careers in Food Science Technology

## Possible Food Science Technology Sequences:

### Suggested Introductory Courses:

Introductory Agriscience  
Animal Science  
Plant Science

### Suggested Intermediate Courses:

Food Science Technology

### Suggested Advanced Courses:

Agribusiness  
Meats Evaluation  
Agricultural Food Processing

## CONTENT STANDARD 1: SAFETY

### STUDENTS WILL BE ABLE TO IDENTIFY, EXPLAIN AND DEMONSTRATE SAFE PRACTICES AND PROCEDURES IN FOOD SCIENCE TECHNOLOGY

#### A. Indicators of Achievement: explain federal guidelines for food safety

##### Sample Skill Activities:

1. review national food and health safety guidelines
2. examine food labels, compare to the food nutrition pyramid and discuss
3. display, analyze and discuss industry standards and grades for agricultural commodity products
4. participate in the FFA Meats Evaluation and Dairy Products Career Development Events
5. guest speaker from USDA-Delaware Department of Agriculture or University of Delaware-Sea Grant Program to discuss food inspection,

##### Cross-Curricular

**Connections:**  
Science Standards 1,  
5-7

English Language  
Arts Standards 1-3

safety regulations and guidelines

6. demonstrate the application of the scientific method for the improvement of food processing safety

7. participate in the FFA Vegetable Selection and Agronomic Crops Career Development Events

### **B. demonstrate and analyze food handling safety and food borne diseases**

1. identify food borne microorganisms Science Standards 1-2, 6

2. conduct microorganism experiments English Language Arts  
Standards 1-3

3. chart or represent microscopic organisms

4. demonstrate how processing controls microorganisms

5. examine the role of pesticides, chemicals and preservatives on foods

6. prepare raw agricultural commodities for animal consumption

### **C. demonstrate food processing and preservation techniques and procedures**

1. conduct Food For America Program Science Standards 1-2, 6-7

2. demonstrate canning procedures English Language Arts  
Standards 1-3

3. guest visit from home economics extension personnel to demonstrate food safety techniques

4. dehydrate fruits and vegetables

5. visit local food processing facility, packing shed, grain elevator, storage facility or distribution center

6. research and examine agricultural products from field, forest or water to the table

7. debate the use of synthetic foods

## **CONTENT STANDARD 2: ECONOMICS**

### **STUDENTS WILL UNDERSTAND BASIC ECONOMICS OF FOOD SCIENCE TECHNOLOGY**

#### **A. Indicators of Achievement: identify global implications of food science technology**

##### **Sample Skill Activities:**

1. locate and map the major food producing areas of the world by products

##### **Cross-Curricular**

##### **Connections:**

Social Studies Geography  
Standards 1,3

- |                                                                                              |                                      |
|----------------------------------------------------------------------------------------------|--------------------------------------|
| 2. examine global supply and demand for agricultural products                                | Social Studies History Standards 1-4 |
| 3. discuss the historical importance of US agriculture                                       | Science Standards 1, 5-7             |
| 4. chart Delaware, US and global production figures of agricultural commodities and products | Mathematics Standards 1-2, 4         |
| 5. participate in the Chicago Board of Trade Commodity Marketing Activity                    |                                      |
| 6. display significant events in world food science technology advances                      |                                      |

**B. recognize value-added products and consumerism**

- |                                                                                     |                                                          |
|-------------------------------------------------------------------------------------|----------------------------------------------------------|
| 1. identify and display raw agricultural commodities and their value-added products | Science Standards 1, 6-7<br>Mathematics Standards 1, 4-7 |
| 2. determine the costs of food product processing to the consumer                   | Social Studies Economics Standard 4                      |
| 3. visit a vertically integrated agricultural food processing operation             |                                                          |
| 4. examine consumer food demands, now, and in the future                            |                                                          |
| 5. invite guest speakers from agricultural marketing organizations                  |                                                          |
| 6. develop agricultural product packaging displays                                  |                                                          |

**C. examine and analyze marketing and advertising of agricultural products**

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|----------------------------------------------------------------------------------------------------------|-------------------------------------|
| 1. examine advertising techniques for agricultural products                                              | English Language Arts Standards 1-4 |
| 2. identify methods of storage and transportation of agricultural food products                          | Science Standards 1-3, 6            |
| 3. prepare a Delaware State Fair Agricultural Product Display                                            |                                     |
| 4. attend the National FFA Career Fair                                                                   |                                     |
| 5. prepare student advertising and marketing plans for an agricultural food product                      |                                     |
| 6. prepare a collage of agricultural advertising campaigns                                               |                                     |
| 7. examine consumer preferences and develop a marketing strategy for a proposed value-added food product |                                     |

**CONTENT STANDARD 3: QUALITY AND ASSURANCE**

# STUDENTS WILL BE ABLE TO IDENTIFY THE CHARACTERISTICS OF SAFE QUALITY FOOD PRODUCTS

## A. understand food chemistry and nutrition

### Sample Skill Activities:

1. conduct experiments on food content
2. display and model the food nutritional pyramid
3. conduct experiments to determine food nutritional elements
4. process butter, ice cream, and cheese in class
5. field trip to food processor or restaurant to discuss nutrition
6. guest speaker from the food service industry to discuss nutrition
7. examine personal and cultural food habits
8. conduct canning and freezing activities

### Cross-Curricular Connections:

Science Standards 1-3, 6

Social Studies Geography  
Standard 3

## B. identify industry standards and grades

1. participate in the FFA Poultry, Meats, Livestock, Vegetable, Agronomic Crop, Dairy Products and Forestry Career Development Events
2. visit a granary, orchard or vegetable processing operation to discuss grades
3. examine the World Health Organization, USDA, and other international daily food guidelines
4. invite guest speaker from the Delaware Department of Agriculture, Inspection Services to explain standards
5. visit a local supermarket to observe product displays, labeling and marketing promotion techniques
6. conduct sensory analysis experiments for smell, taste and texture

Science Standards 1, 6-7

English Language Arts  
Standards 1-4

## C. analyze food labels, additives and enhancers

1. identify food additives and enhancers
2. examine commodity futures and their raw condition values
3. interpret agricultural product label and packaging comparisons for additives, enhancers and label information

Science Standards 1-2, 6-7

English Language  
Arts Standards 1-3

4. examine self-processing or home processing guidelines for vegetables and meats
5. conduct food product sampling and consumer evaluation activities
6. invite guest speaker from the Delaware Department of Agriculture, Division of Weights and Measures to explain and discuss label regulation enforcement
7. visit a local supermarket to discuss the display and sale of food products and store procedures for stock rotation, quality control and spoilage
8. discuss and debate regulatory issues

## **CONTENT STANDARD 4: FOOD PROCESSING TECHNOLOGY**

### **STUDENTS WILL BE ABLE TO EXPLAIN VARIOUS FOOD PROCESSING TECHNOLOGIES**

#### **A. Indicators of Achievement: identify and explain food processing techniques and procedures**

##### **Sample Skill Activities:**

1. construct a historical timeline of agricultural product processing and innovative developments
2. observe harvest and processing systems to determine physical condition of raw commodities
3. process school produced crops, fibers, vegetables, and aquaculture organisms
4. make paper from wood pulp
5. demonstrate home' food and fiber processing techniques: canning, aging, freezing, blanching, dehydrating, shearing, weaving, pickling, curing, fermenting and culturing

##### **Cross-Curricular**

##### **Connections:**

Social Studies History Standards 1-4

Science Standards 1-2, 6-7

#### **B. understand packaging and portioning**

1. package individual portions of school processed agricultural products for sale and distribution
2. display packaging and portioning containers
3. examine convenience food packaging
4. volunteer in school cafeteria as lunch portion servers
5. make food processing samples (i.e.: ice cream) available to non-agriscience students and teachers

Science Standards 1-2

#### **C. understand the use of biotechnology in food processing**

1. identify food products influenced by biotechnology and explain

Science Standards 1, 6-7

their benefit

English Language Arts  
Standards 1-3

2. research and present examples of emerging technologies in food processing and packaging
3. identify local outlets of biotechnology influenced food and fiber products
4. debate future uses of biotechnology in food and fiber production
5. host a guest speaker from agricultural commodity group to discuss the effect of biotechnology on their commodity

## **CONTENT STANDARD 5: FOOD PREPARATION AND PRESENTATION**

### **STUDENTS WILL BE ABLE TO SAFELY PREPARE AND PRESENT FOODS IN CLASS**

#### **A. Indicators of Achievement: identify global foods and food customs**

##### **Sample Skill Activities:**

1. survey community restaurants and categorize types of foods served
2. map global and national specialty food and ethnic preferences
3. survey students, parents and grandparents concerning ethnic or cultural food habits
4. sponsor an international foods day at school and integrate food lessons with world language students
5. prepare traditional, regional American food specialties in class and discuss relationship between ethnic preferences and the development of niche markets

##### **Cross-Curricular Connections:**

Social Studies History Standards  
1-2

Social Studies Geography  
Standards 1-4

Foreign Language Standards 3-5

#### **B. demonstrate safe food preparation techniques**

1. construct a nutritionally sound menu and prepare a food budget for a meal
2. utilize the school foods laboratory, cafeteria or FFA barbecue area to prepare or serve foods
3. organize and prepare the FFA Parent-Member Banquet
4. prepare an all organic foods lunch
5. conduct a goodwill barbecue for the Agriscience Advisory Committee, the School Board and Administration or non-agriculture students and teachers
6. prepare and serve agricultural crops produced from school-site labs such as the FFA greenhouse, production areas, or aquaculture lab
7. utilize hydroponically grown crops from the school greenhouse or aquaculture laboratory

8. plan and prepare a wild game lunch or dinner
9. organize and conduct a food collection for the community food bank
10. work with home economics and consumer science students to plan and prepare a meal

## **CONTENT STANDARD 6: CAREERS IN FOOD SCIENCE TECHNOLOGY**

### **STUDENTS WILL INVESTIGATE FOOD SCIENCE TECHNOLOGY CAREERS**

#### **A. Indicators of Achievement: explore food science technology careers**

1. investigate the diversity of careers in the food science industry      English Language Arts Standards 1-4
2. make job-site visits
3. host guest speakers from the food science technology areas
4. engage in career guidance counseling
5. conduct student interest inventories
6. attend career or job fairs
7. contact food science industry professional organizations

#### **B. identify advanced training and post-secondary educational opportunities in food science technology**

1. attend college information fairs      English Language Arts Standards 3
2. examine labor market information
3. request post-secondary information
4. contact food science industry and technology professional organizations
5. investigate Tech-Prep articulation agreements
6. access post-secondary institutions via electronic communications

#### **C. demonstrate leadership skills**

1. become a member of the FFA      English Language Arts Standards 1-3
2. participate in parliamentary procedure and meeting management
3. set personal and career goals

4. participate in FFA Chapter meetings
5. attend State FFA leadership events
6. participate in National FFA leadership events
7. establish, maintain and complete an FFA SAE project
8. plan, prepare and present a speech
9. participate in FFA committee work
10. review **National FFA Student Manual**
11. review the **FFA Student Handbook**
12. view and discuss FFA Leadership videos
13. participate in FFA community service activities
14. establish FFA Degree applications
15. identify and list personal attributes that contribute to a sound work ethic
16. work with others to solve problems
17. demonstrate self-motivation and time management
18. interact with diverse personalities

**D. complete SAE, projects, research and agriscience experiences**

1. examine entrepreneurship experiences
2. investigate wage-earning experiences
3. participate in school-to-work training
4. participate in cooperative learning
5. engage in shadowing experiences
6. participate in school-site experiences
7. conduct an agriscience research project
8. prepare a senior project or portfolio
9. complete integrated learning projects
10. prepare for student graduation reviews

English Language Arts Standards 1-4

11. participate in FFA community service activities

**E. develop communication and interpersonal skills**

1. use computer software applications

2. participate in the FFA Public and Extemporaneous Speaking Events

3. write a job resume´

4. complete reports and records

5. conduct and present technical reviews

6. use telephone and fax communications

7. send e-mail communications

8. complete integrated writing assignments

9. prepare and practice job interviews

10. complete conflict resolution exercises

11. participate in team and group learning

12. recognize cultural diversity and equity