Development and Validation of a High School Agricultural Literacy Assessment

[High School 9-12th Grade]

Agricultural Literacy Instruments

Citation:

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Instrument 1

1. Determine if the statement is true or false: *Sustainable agriculture is the practice of producing food, fiber, and fuel in a way that is profitable to the producer, supports quality of life, and protects natural resources.*
    - ☐ The statement is true
    - ☐ The statement is false

2. Determine if the statement is true or false: *Agriculturists have few incentives to protect the environment and natural resources.*
    - ☐ The statement is true
    - ☐ The statement is false

3. **Select all** the potential outcomes of practicing sustainable agriculture.
    - ☐ Reduction of world hunger
    - ☐ Protection of food supply
    - ☐ Wildlife habitat loss
    - ☐ Conservation of natural resources

4. **Select all** the examples of organic nutrients.
    - ☐ Dead/decaying animals
    - ☐ Synthetic nitrogen
    - ☐ Lawn/grass clippings
    - ☐ Manure
    - ☐ Silt

5. **Select all** the factors that affect food choices for people.
   - ☐ Cost
   - ☐ Culture
   - ☐ Convenience
   - ☐ Access and/or availability
   - ☐ Taste

6. **Select all** the following practices that provide the best balance for agricultural production while maintaining balance with natural resources.
   - ☐ Integrated pest management
   - ☐ Using robots, drones, and global positioning systems
   - ☐ Using radio frequency identification chips
   - ☐ Using advertising strategies

7. Interpret the information given on this food label. Match the correct answer with the correct description.

INGREDIENTS: WHOLE CORN, VEGETABLE OIL (CONTAINS ONE OR MORE OF THE FOLLOWING: CORN, SOYBEAN, AND/OR SUNFLOWER OIL), SALT, CHEDDAR CHEESE (MILK, CHEESE CULTURES, SALT, ENZYMES), MALTODEXTRIN, WHEAT FLOUR, WHEY, MONOSODIUM GLUTAMATE, BUTTERMILK SOLIDS, ROMANO CHEESE FROM COW'S MILK (PART-SKIM COW'S MILK, CHEESE CULTURES, SALT, ENZYMES), WHEY PROTEIN CONCENTRATE, ONION POWDER, PARTIALLY HYDROGENATED SOYBEAN AND COTTONSEED OIL, CORN FLOUR, DISODIUM PHOSPHATE, LACTOSE, NATURAL AND ARTIFICIAL FLAVOR, DEXTROSE, TOMATO POWDER, SPICES, LACTIC ACID, ARTIFICIAL COLOR (INCLUDING YELLOW 6, YELLOW 5, RED 40), CITRIC ACID, SUGAR, GARLIC POWDER, RED AND GREEN BELL PEPPER POWDER, SODIUM CASEINATE, DISODIUM INOSINATE, DISODIUM GUANYLATE, NONFAT MILK SOLIDS, WHEY PROTEIN ISOLATE, AND CORN SYRUP SOLIDS.
CONTAINS MILK AND WHEAT INGREDIENTS.

Nutrition Facts

Serving Size 1 package

Amount Per Serving	
Calories 150	Calories from Fat 70
	% Daily Value*
Total Fat 8g	**12%**
Saturated Fat 1.5g	**7%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 180mg	**7%**
Total Carbohydrate 17g	**6%**
Dietary Fiber 1g	**6%**
Sugars 1g	
Protein 2g	

Vitamin A 0%	•	Vitamin C 0%
Calcium 2%	•	Iron 0%
Thiamin 4%	•	Vitamin B6 2%
Phosphorus 6%		

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

Items	***Description***
150	Grams of protein in two servings
2%	Percent of the daily requirement of Calcium per serving
4	Number of calories per serving
1	Number of servings in this package

8. **Select all** the ways that consumers can prevent food-borne illness.
   - ☐ Washing hands
   - ☐ Cooking meat thoroughly
   - ☐ Keeping most food products at room temperature
   - ☐ Using the same knife for cutting meat and vegetables
   - ☐ Thawing frozen meat on the kitchen counter

9. Determine if the statement is true or false: *The American food supply is among the safest in the world.*
    - □ The statement is true
    - □ The statement is false

10. Determine if the statement is true or false: *An adequate global food supply depends on the continued development and appropriate use of science, technology, and engineering*.
    - □ The statement is true
    - □ The statement is false

11. Determine if the statement is true or false: *All types of scientific discoveries and applications of technology are accepted by consumers if they increase food production.*
    - □ This statement is true
    - □ This statement is false

12. **Select all** the technological advancements in agriculture that contribute to the ability to feed a growing population with a smaller number of producers.
    - □ Biotechnology
    - □ Availability of organic labeling
    - □ Genetic engineering
    - □ Animal-powered equipment
    - □ Refrigeration
    - □ Mechanization of equipment and implements
    - □ Reduction of conservation practices

13. Determine if the statement is true or false: *The geographic location of your food source plays a part in determining the price of the food.*
    - □ The statement is true
    - □ The statement is false

14. **Select all** factors that affect a country's production and distribution of food.
    - □ Economics
    - □ Geography
    - □ Population size

15. A farmer has 50 acres of land to grow a crop; which factors would need to be considered before making a choice about what to plant? **Select all** the correct choices.
    - □ Geographic location
    - □ Soil composition
    - □ Consumer demand
    - □ Climate change

Instrument 2

1. Determine if the statement is true or false: *Sustainable agriculture is the practice of producing food, fiber, and fuel in a way that is profitable to the producer, supports quality of life, and protects natural resources.*
    - ☐ The statement is true
    - ☐ The statement is false

2. Drag and drop the natural resource into the box with the corresponding sustainability practice.
    - ☐ Water
    - ☐ Soil
    - ☐ Air

Selecting drought-tolerant crop species

Using a methane digester

Reduce tillage

3. **Select all** examples of sustainable agricultural practices.
    - ☐ Unregulated water use
    - ☐ Intensive grazing along stream banks
    - ☐ Continuous planting of the same crop
    - ☐ Eliminate or reduce soil tillage

4. Determine if the statement is true or false: *The inspection of meat and poultry for wholesomeness is mandatory in the United States of America.*
    - ☐ The statement is true
    - ☐ The statement is false

5. Match the name of the production system with its appropriate description.

Production System	***Description***
Local food system	Consumers share the benefits and risks of food production by purchasing shares of a farm operation.
Community-supported agriculture	The prevailing agricultural production system uses technological innovation for maximum efficiency.
Organic food system	Food produced, processed, and distributed in a limited geographic area often connects farms and consumers at the point of sale.
Conventional food system	Production promotes biodiversity; food is grown and processed using little or no synthetic fertilizers or pesticides.

6. **Select all** the following practices that provide the best balance for agricultural production while maintaining balance with natural resources.
   - □ Integrated pest management
   - □ Using robots, drones, and global positioning systems
   - □ Using radio frequency identification chips
   - □ Using advertising strategies

7. Interpret the information given on this food label. Match the correct answer with the correct description.

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8. **Select all** the processed foods.
   - ☐ Chocolate
   - ☐ Apple
   - ☐ Peanut butter
   - ☐ Artichoke
   - ☐ Yogurt

9. **Select all** the marketing terms used to influence consumer choices.
   - ☐ Barn-free
   - ☐ Non-vaccinated
   - ☐ Cage-free
   - ☐ Non-GMO

10. Determine if the statement is true or false: *An adequate global food supply depends on the continued development and appropriate use of science, technology, and engineering*.
    - ☐ The statement is true
    - ☐ The statement is false

11. **Select all** the following technologies frequently used in agricultural production systems.
    - Unmanned aerial systems (drones)
    - Robotics
    - Global positioning systems
    - Cloning

12. **Select all:** Which of the following practices benefits from precision agriculture?
    - Wildlife levels
    - Determining topsoil depth
    - Variable-rate pesticide application
    - Animal stocking rates

13. Determine if the statement is true or false: *The geographic location of your food source plays a part in determining the price of the food.*
    - The statement is true
    - The statement is false

14. **Select all** factors that affect a country's production and distribution of food.
    - Economics
    - Geography
    - Population size

15. **Select all** the following jobs related to agriculture.
    - Bioengineer
    - Timber grader
    - Mechanic
    - Biologist
    - Nutritionist

Answer Key

Instrument 1

1. T
2. F
3. Reduction of world hunger; Protection of food supply; Conservation of natural resources
4. Dead/decaying animals; Lawn/grass clippings; Manure
5. All answers
6. Integrated pest management; Using robots, drones, and GPS; Using radio frequency identification chips
7. 150 = calories; 2% = Calcium; 4 = Grams of protein in two servings; 1 = Number of servings in this package
8. Washing hands; Cooking meat thoroughly
9. T
10. T
11. F
12. Biotechnology; Genetic engineering; Refrigeration; Mechanization of equipment and implements
13. T
14. All answers
15. All answers

Instrument 2

1. T
2. Selecting drought-tolerant crop species:
   Water Using a methane digester: Air
   Reduce tillage: Soil
3. Eliminate or reduce soil tillage
4. T
5. Local food system: Food produced, processed, and distributed in a limited geographic area, often connects farms and consumers at the point of sale.
   Community-supported agriculture: Consumers share the benefits and risks of food production by purchasing shares of a farm operation.
   Organic food system: Production promotes biodiversity, food is grown and processed using little or no synthetic fertilizers or pesticides.
   Conventional food system: The prevailing agricultural production system uses technological innovation for maximum efficiency.
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7. 150 = calories; 2% = Calcium; 4 = Grams of protein in two servings; 1 = Number of servings in this package
8. Chocolate; Peanut butter; Yogurt
9. Cage-free; Non-GMO
10. T
11. All answers
12. Determining topsoil depth; Variable-rate pesticide application
13. T
14. All answers
15. All answers