

UNIT II - FOOD PROCESSING

Lesson 11: Fruit, Vegetable, and Nut Products

Objective

The student will be able to identify fruit, vegetable, and nut products and factors that determine quality.

I. Study Questions

- A. What are the major classes of fruits, vegetables, and nuts?
- B. What are the products from fruits, vegetables, and nuts?
- C. What factors determine quality of fruits, vegetables, and nuts?
- D. What are the by-products of fruits, vegetables, and nuts?
- E. What crop characteristics influence how they are used?

II. References

- A. Martin, Phillip R. *Food Science and Technology* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1994. Unit II.
- B. Activity Sheet
AS 11.1: Nut Butter

UNIT II - FOOD PROCESSING

Lesson 11: Fruit, Vegetable, and Nut Products

TEACHING PROCEDURES

A. Review

Grain crops are graded for quality. Similarly, fruits, vegetables, and nuts are graded. Review the variables that are examined when grading grain, and relate them to the variables examined for grading fruits and vegetables.

B. Motivation

1. Display examples or illustrations of different varieties of fruits, vegetables, and nuts (i.e., pear tomatoes, cherry tomatoes, slicing tomatoes). Have students explain why each variety is important. Relate variety types to market niche.
2. Have a grocery store produce manager give a presentation (pear tomatoes - ketchup tomato, cherry-color and size, slicing tomatoes-shape).

C. Assignment

D. Supervised study

E. Discussion

1. Discuss the major classes of fruits, vegetables, and nuts.

What are the major classes of fruits, vegetables, and nuts?

a. Fruits

1. Melons - cantaloupes, watermelons
2. Drupes (single pits) - apricots, cherries, peaches, plums
3. Berries - grapes, cranberries
4. Pomes (many pits) - apples, pears
5. Citrus - oranges, grapefruits, lemons
6. Tropical - bananas, dates, figs, pineapples, mangos, papayas

b. Vegetables

1. Earth vegetables - sweet potatoes, onions, potatoes
2. Herbage vegetables - cabbage, spinach, lettuce, celery, rhubarb
3. Fruit vegetables - peas, green beans, sweet corn, squash, tomato

c. Nuts

Unit – Introduction to Animal Products: Lesson 1

1. Cultivated tree nuts
 2. Wild nuts
2. Discuss the products from fruits, vegetables, and nuts. Have students complete AS 11.1.

What are the products from fruits, vegetables, and nuts?

- a. Fresh - melons, bananas
 - b. Frozen - corn, lima beans, strawberries
 - c. Juices - apple, grape, orange
 - d. Canned - peaches, peas
 - e. Purees - baby food, tomato sauce
 - f. Processed - applesauce, cranberry sauce
 - g. Jellies/jams
 - h. Dried fruits and vegetables
 - i. Nut meats
 - j. Shell nuts
 - k. Cracked nuts
 - l. Roasted nuts
3. Discuss the factors that affect quality grades.

What factors determine quality of fruits, vegetables, and nuts?

1. Maturity
 2. Instrumental evaluation
 3. Color
 4. Size
 5. Shape
 6. Firmness/texture
 7. Aroma
 8. Variety
 9. Harvesting method
 10. Acid concentration
 11. Sugar to acid ratio
 12. Physical damage/disease
4. Discuss fruit, vegetable, and nut by-products.

What are the by-products of fruits, vegetables, and nuts?

- a. Rinds/peels/shells
 - b. Pits
 - c. Non-juice solids

5. Discuss the crop characteristics that influence how the produce is used.

What crop characteristics influence how they are used?

- a. Time of maturity and yield
- b. Weather response
- c. Pest and disease resistance
- d. Shape
- e. Size
- f. Resistance to physical damage
- g. Storage stability
- h. Suitability to certain processing methods
- i. Color of flesh
- j. Firmness when cooked and raw
- k. Amount of juice
- l. Acidity level
- m. Solids content

F. Other activities

Canning grape juice - Remove grapes from stems. Wash sound, ripe grapes. Cover them with water and heat slowly to a simmer - do not boil. Cook slowly until the fruit is very soft. Then strain the grapes through a bag - separating the juice from the pulp. Add 1/2 cup of sugar to each quart of juice. Pour juice into sterile jars and process 15 minutes (pressure cook or retort) in boiling water bath.

G. Conclusion

Classification of fruits, vegetables, and nuts is based on their origin, anatomy, and/or how they are eaten. These produce types are quality graded and create a variety of by-products.

H. Competency

Identify fruit, vegetable, and nut products and factors that determine quality.

Related Missouri Core Competencies and Key Skills: None

I. Answers to Evaluation

- 1. h
- 2. f
- 3. g
- 4. a

Unit – Introduction to Animal Products: Lesson 1

5. c
6. d
7. e
8. i
9. b
10. In-shell, cracked, nut meats, roasted
11. Rinds, peels, shells, non-juice solids
12. Instructor's discretion

J. Answers to Activity Sheet

AS 11.1

1. To remove the skin
2. Answers will vary
3. Answers will vary

UNIT II - FOOD PROCESSING

Name _____

Lesson 11: Fruit, Vegetable, and Nut Products

Date _____

EVALUATION

Match the class of fruit, vegetable, or nut on the left with an example on the right.

- | | |
|-------------------------|---------------|
| ___1. Earth vegetable | a. Honeydew |
| ___2. Herbage vegetable | b. Banana |
| ___3. Fruit vegetable | c. Cherry |
| ___4. Melons | d. Blackberry |
| ___5. Drupes | e. Apple |
| ___6. Berry | f. Celery |
| ___7. Pomes | g. Pea |
| ___8. Citrus | g. Pea |
| ___9. Tropical | h. Onion |
| | i. Grapefruit |

Complete the following short answer questions.

10. Name three products from nuts.
11. List two by-products of fruit, vegetable, and nut processing.

Unit – Introduction to Animal Products: Lesson 1

12. Essay - Assume you live near a tomato juice processing plant. You have contracted to raise tomatoes for this plant next year. Write a paragraph using each of the following characteristics: shape, size, color, juice, content, and storage stability to describe the variety of tomatoes you will likely raise.

UNIT II - FOOD PROCESSING

AS 11.1

Lesson 11: Fruit, Vegetable, and Nut Products

Name _____

Making Nut Butter

Objective: To process a nut by pressing out its oil and producing a nut butter.

Activity Length: 1 period

Materials and Equipment:

¼ c. Pecans, walnuts, almonds, etc. (raw)

Nut grinder

Rolling pin

Plastic bags

Knife

Water

Small pan used to heat almonds

Salt

Procedure:

1. Select one type of nut to process.
2. Grind or crush nut meats.
 - a. If using pecans or walnuts, dice nuts and place through a nut grinder or use a double plastic bag and rolling pin to reduce the particle size.
 - b. If using almonds or peanuts, place in pan, cover with water, and boil for 5 minutes. Then remove skin. Grind with a nut grinder or crush with a rolling pin while in a double plastic bag.
3. Place in a plastic-bag and roll with rolling pin exerting as much pressure as possible to squeeze out oils.
4. As oil is pressed out, nut particles will cling together to form a "butter."
5. Lightly salt.

Unit – Introduction to Animal Products: Lesson 1

6. Examine your butter and complete Table 9.1. Also, check with students who processed different nuts and record your opinions in the table.

Table 11.1 Nut Butter Qualities

Type of Nut	Color of Butter	Rank in order of Oil Content	Spreading Qualities	Taste Preference

Key Questions:

1. Why do you need to boil the almonds or peanuts before they are crushed?
2. How do the different nut butters compare?
3. Which nut butter had the best flavor?