# UNIT IV - FOOD SELECTION AND CONSUMER HEALTH

## Lesson 3: Nutritional Value of Beverages

### Objective

The student will be able to compare the nutritional value of beverages.

I. Study Questions

A. What are the nutritional benefits of beverages in the human diet?

B. How does the body utilize the fluids consumed?

C. What are the nutritional qualities of common beverages?

D. Why is milk considered nature's most nearly perfect food?

II. References

A. Martin, Phillip R. *Food Science and Technology* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1994. Unit IV.

B. Activity Sheet

AS 3.1: A Test for Vitamin C

# UNIT IV - FOOD SELECTION AND CONSUMER HEALTH

## Lesson 3: Nutritional Value of Beverages

### TEACHING PROCEDURES

A. Review

Review what can be learned from a food label. Re-emphasize the information that is required on a label: the identity statement, net contents, and the manufacturer's name and address. Relate how beverages have labels on them too. What are differences on the labels for milk, orange juice, coffee, and soda?

B. Motivation

1. Explain the origin of soda pop. Soda pop goes back to Greek and Roman times. "Medicinal" or natural mineral waters were valued for their refreshing qualities. In 1767, British scientist Joseph Priestly artificially carbonated water. An early method of obtaining the carbon dioxide was by acidification of sodium bicarbonate or sodium carbonate. From the use of these sodium salts, the name "soda" was given to these drinks. Gradually, fruit juices and extracts were added for flavor.

2. Bring a variety of soda cans, juice bottles, etc., to class. Examine the nutrients and ingredients.

C. Assignment

D. Supervised study

E. Discussion

1. Discuss the nutritional benefits of beverages.

**What are the nutritional benefits of beverages in the human diet?**

a. Water source/fluid source
b. Protein, carbohydrates
c. Fat and minerals
d. Vitamins

2. Discuss how the body utilizes the fluids people consume.

**How does the body utilize the fluids consumed?**

a. Medium for carrying nutrients via body fluids
b. Solvent for organic and inorganic chemicals essential for life
c. Carries nitrogenous waste products
d. Controls and maintains body temperature

3. Discuss the nutritional qualities of some common beverages.

**What are the nutritional qualities of common beverages?**

a. Milk - fat, protein, carbohydrates, minerals, vitamins, water
b. Carbonated soft drinks - water, carbohydrates, some provide Na and /or vitamins
c. Coffee/tea - water and very little else
d. Juices - water, vitamins, carbohydrates, minerals, and some proteins

4. Discuss why milk is considered nature's most nearly perfect food.

**Why is milk considered nature's most nearly perfect food?**

a. Premium quality protein - containing all essential amino acids
b. Carbohydrate - only natural source of lactose
c. Milk fat - easily digested
d. Calcium and phosphorus
e. Vitamins - milk contains all vitamins known to man

F. Other activities

Complete one or more of the following labs from The Chemistry of Beverages, Flinn Scientific, Inc., P.O. Box 219, Batavia, IL 60510, (708) 879-6900.

a. Lab #1: Testing Milk for Calcium
b. Lab #2: Density and Carbonated Beverages
c. Lab #3: Caffeine Drinks
d. Lab #4: The Juices

G. Conclusion

Beverages are a necessary part of a healthy diet. Because the human body is 60-65 percent water, water intake is vital. Water comes disguised in other beverages that may supply food nutrients as well. Milk is the most complete beverage.

H. Competency

Compare the nutritional value of beverages

Related Missouri Core Competencies and Key Skills: None

I. Answers to Evaluation

1. b
2. a
3. c
4. b
5. Medium for nutrient transport, solvent for chemicals, carry waste products, controls body temperature

6. Alcohol is a toxic substance that, when broken down by the liver, produces extra hydrogen atoms. These in turn allow normal breakdown of sugars, amino acids and fatty acids to be incomplete. These incompletely digestive molecules are converted to fat globules which swell the liver and cause cirrhosis

UNIT IV - FOOD SELECTION AND CONSUMER HEALTH Name_____

Lesson 3:Nutritional Value of Beverages Date _____

EVALUATION

**Circle the letter that corresponds to the best answer.**

1. Which common beverage contains the least nutrition?

   a. Soda
   b. Coffee
   c. Milk
   d. Apple juice

2. Which minerals are not found in milk?

   a. Iron and copper
   b. Calcium and phosphorus
   c. Potassium and chlorine
   d. Sodium and sulfur

3. What percentage of your body is water?

   a. 40 percent
   b. 50 percent
   c. 60 percent
   d. 75 percent

4. Which statement is NOT true about milk, nature's most perfect food?

   a. Milk contains all essential amino acids.
   b. Milk contains all necessary minerals.
   c. Milk contains all vitamins.
   d. Milk is the only food in nature that contains lactose.

**Complete the following short answer questions.**

5. List three functions of fluids in your body.

6. Describe how alcohol negatively affects your health.

UNIT IV - FOOD SELECTION AND CONSUMER HEALTH AS 3.1

Lesson 3:Nutritional Value of Beverages Name _____

## A Test for Vitamin C

**Objective:** To identify beverages that contain vitamin C and to determine the relative amount of vitamin C in a beverage when compared to another beverage or another brand.

**Activity Length:** One class period

**Materials and Equipment:**

Milk - 2 different milk fat percentages - whole and skim
Orange juice - 2 brands - Brand A and Brand B
Soda pop - 2 brands - Brand X and Brand Y
Coffee - 2 brands - Brand P and Brand Q
Calibrated measuring beaker
4 beakers
120 ml distilled water
Indophenol blue dye
Eyedropper
4 test tubes
Test tube rack
Labels (masking tape will work)

**Procedure:**

Part 1

1. Label beakers A, B, C, and D
2. Measure 30 ml of whole milk into beaker A.
3. Measure 30 ml of brand A orange juice into beaker B.
4. Measure 30 ml of brand X soda into beaker C.
5. Measure 30 ml of brand P coffee into beaker C.
6. Add 30 ml distilled $H_2O$ to each beaker (A, B, C, and D).
7. Gently swirl each beaker to mix liquids.
8. Using the eyedropper, measure 10 drops of indophenol blue dye into 4 test tubes. Label test tubes A, B, C, and D.
9. Carefully add contents of beaker A into test tube A one drop at a time, counting the number of drops needed to make the blue color disappear. Stop adding

drops when the color disappears. Record the number of drops added to the test tube.

10. Clean eyedropper before moving to next beaker.
11. Repeat steps 8 and 9, using beaker B with test tube B, so on, with beakers C and D.
12. Vitamin C bleaches the blue color out of indophenol blue. This lab will make qualitative distinctions between beverages based on the amount of vitamin C they possess. The fewer the number of drops needed to make the blue color disappear, the greater the percentage of vitamin C in that beverage. If the blue color does not disappear, the beverage is said to contain no vitamin C.

Part 2

1. Choose to test either the two types of milk, or the two brands of orange juice, soda, or coffee.
2. Clean beakers and test tubes.
3. Repeat steps 1-12 of part 1, using only 2 beakers and 2 test tubes.

| Part 1 | # drops | rank in order of vit. C content |
|---|---|---|
| beaker A _____ | | |
| beaker B _____ | | |
| beaker C _____ | | |
| beaker D _____ | | |
| Part 2 | | |
| beaker A _____ | | |
| beaker B _____ | | |

**Key Questions:**

1. Which beverage contains the most Vitamin C?

2. In Part 2, was there a difference in Vitamin C levels?