UNIT IV - FOOD SELECTION AND CONSUMER HEALTH

Lesson 1: Factors that Affect Consumer Choice

Objective

The student will be able to describe the factors that affect consumer choices of food.

I. Study Questions

A. What factors affect consumer choice of foods?

B. What sensory attributes influence consumer choice?

C. How does convenience influence consumer selection?

D. How does price affect consumer selection?

E. How does packaging affect consumer selection?

F. How does shelf life affect consumer choice?

G. How do consumer concerns about safety affect food product selection?

H. What nutritional concerns affect food product selection?

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 1.1: Comparing Snack Foods

UNIT IV - FOOD SELECTION AND CONSUMER HEALTH

Lesson 1: Factors that Affect Consumer Choice

TEACHING PROCEDURES

A. Introduction

This unit will look at food science and technology through the eyes of the consumer. Consumer choices, food labels, beverage nutrition, and the link between diet and health will be covered.

B. Motivation

1. Video tape a TV food advertisement. Show it to your class and have them answer the following questions: Is the food healthy? Does it appeal to your emotions? Does it make you hungry/thirsty? What age group does the ad target? Does it list the price?

2. Bring several different pieces of hard candy to class. Have each student select a piece of candy without looking at it. Have students pinch their nostrils closed while they put the candy in their mouths. They should not be able to taste the candy nor should they know what flavor of candy they are eating. Discuss how the senses are dependent on each other. Ask, "Do you eat with your mouth, your nose, or your eyes?" An onion and an apple work well for this activity.

C. Assignment

D. Supervised study

E. Discussion

1. Discuss what factors affect a consumer's choice of foods. Remind the students that everyone is a consumer.

What factors affect consumer choice of foods?

a. Location/supply
b. Cost
c. Time
d. Knowledge/skill
e. Energy
f. Other people

g. Emotions
h. Tools
i. Culture
j. Religion
k. Advertising
l. Lifestyle
m. Values

2. Discuss what sensory attributes influence the consumer's choice.

What sensory attributes influence consumer choice?

a. Eyesight
    1. Color
    2. Size/shape
b. Odor/smell
c. Sense of taste
    1. Sweet
    2. Sour
    3. Salty
    4. Bitter
d. Feel/touch

3. Discuss how convenience affects consumer selection.

How does convenience influence consumer selection?

a. Why convenience foods are purchased:
    1. Less time required
    2. Less energy required
    3. Less clean-up needed
    4. More variety
    5. Less equipment needed
b. Why convenience foods are not purchased:
    1. Desire to prepare their own food
    2. More costly to purchase convenience foods
    3. More packaging to dispose of

4. Discuss how the price affects consumer selection.

How does the price affect consumer selection?

a. Smart shoppers are influenced
b. Impulse buyers are influenced less

5. Discuss how packaging affects consumer selection. Have students complete AS 1.1.

   How does packaging affect consumer selection?

   a. Labeling
   b. Environmentally friendly
   c. Size
   d. Cost

6. Discuss how shelf life affects consumer choice.

   How does shelf life affect consumer choice?

   a. Longer shelf life is desired
   b. May cost more

7. Discuss how consumer safety concerns affect food selection.

   How do consumer concerns about safety affect food product selection?

   a. Many consumers show no concern
   b. Others examine food carefully

8. Discuss what nutritional concerns affect food product selection.

   What nutritional concerns affect food product selection?

   a. Fat content
   b. Calories
   c. Additives
   d. Vitamins and minerals present
   e. Fiber
   f. Cholesterol

F. Other activities

1. Have students examine at least two newspaper advertisements for food. Compare the products they are advertising, their price, their pictures, the seasonality of the specials, the percentage of food to non-food items, etc.

2. Tour a grocery store and locate the items targeted at impulse buyers.

3. Invite a grocer to speak to the class on how they manage shelf-life on perishable items and what part advertisement plays in sales.

4. Acquire copies of A Guide to the Meat Department from the Beef Industry Council, 444 N. Michigan Ave., Chicago, IL 60611, (312)467-5520. Have students survey the class, their families, or the school using pp. 4-10, 36-40, compare the results to comparable statistics in A guide to the Meat Department.

5. Acquire copies of A Legitimate Beef, Pitman-Moore, Inc. 421 E. Hawley St., Mundelein, IL 60060, (800)541-7459. Have students ask two other people questions, at least one outside of their household. Have questionees write a brief statement on their reactions.

G. Conclusion

Consumers are influenced by a myriad of factors that affect their food selections. Location, time, cost, and religion are a few of these factors. In addition, sensory appeal, convenience, price, packaging, shelf life, safety risk, and nutritional content are all factors that play a major role in consumer selection.

H. Competency

Describe the factors that affect consumer choices of food.
Related Missouri Core Competencies and Key Skills: None

I. Answers to Evaluation

1. c
2. b
3. Advantages:
   less time required
   less energy required
   less clean-up
   more variety is possible
   requires less equipment

   Disadvantages:
   more costly
   consumers desire to prepare their own food
   more packaging to dispose of

4. They are making decisions based on emotions, not necessarily intellect.
5. Fat content, calories, additives, vitamins and minerals present, fiber, cholesterol

6. Teacher's discretion

J. Answers to Activity Sheet

AS 1.1 - Teacher's discretion

UNIT IV - FOOD SELECTION AND CONSUMER HEALTH Name _____

Lesson 1:Factors that Affect Consumer Choice Date _____

EVALUATION

Circle the letter that corresponds to the best answer

1. Which of the following is the most economical choice when purchasing for a large family?

   a. Large packages, extended shelf life, low cost, blemished cans
   b. Small packages, short shelf life, high cost, no blemishes
   c. Large packages, average shelf life, low cost, no blemishes
   d. Large packages, short shelf life, high cost, no blemishes

2. A one-person family usually shops for:

   a. Large packages, short shelf life, bright packages, low value
   b. Small packages, long shelf life, fresh to touch, low cost
   c. Small packages, short shelf life, attractive odor, low cost
   d. Large packages, long shelf life, dull package color, high cost

Complete the following short answer questions.

3. Compare/contrast the advantages and disadvantages of convenience foods.

4. Why are impulse buyers less price influenced than shoppers who have planned ahead?

5. List five nutritional concerns consumers exhibit.

6. Use these words in an essay describing a consumer's choice of foods: energy, knowledge/skill, cost, time, location, family size, advertising, religion, values, emotions, tools. (Use the back of this page if necessary.)

UNIT IV - FOOD SELECTION AND CONSUMER HEALTH AS 1.1

Lesson 1:Factors that Affect Consumer Choice Name _____

Comparing Snack Foods

Objective: To compare different brands of snack foods

Activity Length: 20 minutes

Materials and Equipment:

*4 different snack foods in individual packages (potato chips, pretzels, banana chips, sunchips, corn chips, etc.)
Bowls
Scale

*If snack foods are not in individual packages, put a serving size for each food into a separate bowl.

Procedure:

1. Record the type of snack food in the top row in the columns under "Types of Snack Foods."

2. Compare the "Nutrition Facts" on the label of each snack food. Record your findings in Table 1.1.

3. Taste each snack food and record your preferences in Table 1.1.

Table 1.1

	Types of Snack Foods			
Serving size				
Weight of product in bag				
Fat				
Saturated Fat				
Calories				
Carbohydrates				
Fiber				
Protein				
Sugar (g)				
Sodium (mg)				
Vitamin C				
Taste preference*				

*(for taste preference, rank 1 thru 4 with 1 being the most preferred.)

Key Questions:

1. Which snack food is the most nutritious? Which do you prefer?

2. Which contains the most salt?

3. Which contains the most fat?

4. Which one did you think tasted the best?

UNIT IV - FOOD SELECTION AND CONSUMER HEALTH

Lesson 2: Interpreting Food Labels

Objective

The student will be able to interpret a food label.

I. Study Questions

A. What are the parts of a food label?

B. What are the daily dietary requirements for people?

C. How does the food label reflect the nutritional content of foods?

D. What is the significance of "nutrient content claims" and "health claims"?

II. References

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

B. Transparency Master

TM 2.1: Nutrition Labels

C. Activity Sheets

AS 2.1: Nutritional Status
AS 2.2: Identifying Information on a Food Label

UNIT IV - FOOD SELECTION AND CONSUMER HEALTH

Lesson 2: Interpreting Food Label

TEACHING PROCEDURES

A. Review

Lesson 1 of Unit IV discussed how sensory attributes of a package can influence consumer choice. This lesson looks specifically at one part of the package, the label. How does the label, its location or its contents, affect consumer selection?

B. Motivation

Bring to class labels from a cereal box, mayonnaise jar, orange juice container, and lunch meat package. Copy all labels so that the product name is covered up. Ask students to guess what these labels came from. Follow with a listing of what information is common for each product.

C. Assignment

D. Supervised study

E. Discussion

1. Discuss the parts of a food label.

What are the parts of a food label?

a. Principal display panel (PDP)
    1. It must identify the food, either by real name (e.g., green beans) or a made-up name (e.g., Cheerios®).
    2. If picture appears, it must look like the food.
    3. Net contents or net weight must be included.
b. Information panel (IP)
    1. The IP must include the name and address of the manufacturer.
    2. A list of ingredients must be in order by descending weight.
    3. Nutritional facts panel must be included except in a few instances.

2. Discuss the daily dietary requirements for people. The human body is composed of 60 percent water, 20 percent fat, and 20 percent carbohydrates, proteins, vitamins, and minerals.

What are the daily dietary requirements for people?

a. Bread, Cereal, Rice, Pasta Group - 6-11 servings
b. Fruit Group - 2-4 servings
c. Vegetable Group - 3-5 servings
d. Meat, Poultry, Fish, Dry Beans, Eggs, Nuts Group - 2-3 servings
e. Milk, Yogurt, Cheese Group - 2-3 servings
f. Fats, Oils, Sweets - use sparingly

3. Discuss how food labels reflect the nutritional content of foods.

How does the food label reflect the nutritional content of foods?

a. Total calories
b. Calories from fat
c. Total fat - grams and percent daily value
d. Saturated fat - grams and percent daily value
e. Cholesterol - grams and percent daily value
f. Sodium - grams and percent daily value
g. Total carbohydrate - grams and percent daily value
h. Dietary fiber - grams and percent daily value
i. Sugars - grams
j. Protein - grams
k. Vitamin A - percent daily value
l. Vitamin C - percent daily value
m. Calcium - percent daily value
n. Iron - percent daily value
o. Serving size - determined by comparison to a standard serving size; not necessarily the same serving size that is used in the "Food Pyramid"

4. Discuss with students the significance of nutrient content claims and health claims. Point out that before 1990 there were no standards for what the terms meant.

What is the significance of "nutrient content claims" and "health claims"?

In 1990 standards were established to define 'nutrient content claims' and 'health claims.'

a. Nutrient content claims - Words such as "lite," "high," and "low" are clearly defined.
b. Health claims
    1. phrases that remind consumers that certain nutrients are important
    2. monitored by government scientists
    3. currently only seven different types of claims are allowed

F. Other activities

Collect several food labels. Make an answer key for each label based on its identity statement, net contents, and manufacturer's name and address. List on key, the product's ingredients and its nutritional information. Students then select a label and complete AS 2.1.

G. Conclusion

The daily dietary requirements include servings from the groups of bread, fruit, vegetables, meat, and milk. Fats and sweets should be consumed sparingly. While the number of servings may vary, all groups are necessary for a balanced diet. Food labels reflect the nutritional content of foods. Food labels contain the principal display panel and the information panel.

H. Competency

Interpret a food label.

Related Missouri Core Competencies and Key Skills: None

I. Answers to Evaluation

1. c
2. d
3. c
4. a
5. b
6. a
7. d
8. e
9. b
10. d
11. a
12. e
13. c

J. Answers to Activity Sheets

AS 2.1 - Instructor's discretion
AS 2.2 - Instructor's discretion

UNIT IV - FOOD SELECTION AND CONSUMER HEALTH Name_____

Lesson 2: Interpreting Food Labels Date _____

EVALUATION

Circle the letter of the best answer.

1. What are the two major parts of the food label?

   a. Ingredients and net weight
   b. Nutrition facts and percent daily value
   c. Principal display panel and information panel
   d. Weight and manufacturer's name

2. The net weight and name of the food appear on what location?

   a. Side panel
   b. Nutritional facts panel
   c. Information panel
   d. Principal display panel

3. On which panel do nutritional facts, ingredients, and name and address of manufacturer appear?

   a. Side panel
   b. Nutritional facts panel
   c. Information panel
   d. Principal display panel

4. What types of information are included on the nutritional facts panel?

   a. Percent daily value and grams
   b. Weight and manufacturer's name
   b. Ingredients and net weight
   c. Ingredients and grams

5. Of the food groups listed, which has the highest number of recommended servings?

   a. Fruit group
   b. Breads, cereal, rice, pasta group

c. Meat group
d. Vegetable group

6. Which ingredient is listed first on the food label?

a. The ingredient that weighs the most
b. The ingredient with the largest volume
c. The primary ingredient
d. The order of the listing of ingredients doesn't matter.

7. The Nutritional Labeling and Education Act of 1990 made changes in the food label. Which of the following statements is <u>not</u> correct?

a. The types of information included on the nutritional panel was changed.
b. Terms such as "lite" and "low fat" can only be used if the food product meets certain guidelines.
c. Guidelines for health claims were defined.
d. The food label must give the cost of the food product.

Match the group on the left with the correct number of servings on the right. One answer is used twice.

<u>Food Group</u>	<u>Daily Servings (number of)</u>
____8. Dairy group	a. 3-5
____9. Bread group	b. 6-11
____10. Fruit group	c. Sparingly
____11. Vegetable group	d. 2-4
____12. Meat group	e. 2-3
____13. Fats group	

TM 2.1

Nutrition Labels

Spaghetti Noodle Pasta-Enriched-Dry

MANDATORY LABEL

Nutrition Facts

Serving Size 2 oz. (60 g)
Servings Per Container 8

Amount Per Serving

Calories 220 Calories from Fat 10

	% Daily Value*
Total Fat 1g	**1%**
Saturated Fat 0g	**0%**
Cholesterol 0mg	**0%**
Sodium 0mg	**0%**
Total Carbohydrate 45g	**15%**
Dietary Fiber 1g	**6%**
Sugars 2g	
Protein 8g	

Vitamin A 0% • Vitamin C 0%

Calcium 2% • Iron 15%

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

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

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

Spaghetti Noodle Pasta-Enriched-Dry

VOLUNTARY LABEL

Nutrition Facts

Serving Size 2 oz. (60 g)
Servings Per Container 8

Amount Per Serving

Calories 220 Calories from Fat 10

	% Daily Value*
Total Fat 1g	**1%**
Saturated Fat 0g	**0%**
Cholesterol 0mg	**0%**
Sodium 0mg	**0%**
Total Carbohydrate 45g	**15%**
Dietary Fiber 1g	**6%**
Sugars 2g	
Protein 8g	

Vitamin A 0% • Vitamin C 0%

Calcium 2% • Iron 15%

Thiamin 40% • Riboflavin 15%

Niacin 25% • Vitamin B6 4%

Folate 2% • Vitamin B12 0%

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

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

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

Unit IV - FOOD SELECTION AND CONSUMER HEALTH AS 2.1

Lesson 2: Interpreting Food Labels Name_____

Nutritional Status

Objective: To illustrate the differences between a single day's diet and a five-day diet on overall nutritional status.

Activity Length: 30 minutes of class time to tabulate results

Materials and Equipment:

Nutritional labels from food consumed in one day
This should be gathered out of class. Each student should collect the "Nutrition Facts" panel from foods that would be eaten at breakfast, lunch, dinner and a snack (or two).
Calculator
Copy of USDA Handbook 8 (*Composition of foods: raw, processed, prepared*) or a nutrition textbook with food composition charts. Several fast food companies also have nutritional information on their products available at each store.

Procedure:

1. Fill in the blanks for chart 1 from the nutritional labels, information from Handbook 8, nutrition textbook, or other sources.
2. Fill in the information from labels for one day. Total the percentages for each nutrient. Determine the percentage of calories by dividing your number by 2000, and multiply the result by 100.
3. Get the nutritional information from five to seven other students. Fill in chart 2. Total the columns and average the percentages for each nutrient.

Key Questions:

1. In the single day analysis, what nutrients did you consume in excess amounts? What nutrients did you need to consume more of?

2. What happened when you combined the data from other students with yours? If you had eaten all of these meals, would your nutritional status be better or worse?

3. Using your single day analysis, choose one nutrient you consumed in excess amounts? What foods should you avoid in order to decrease your consumption of this nutrient?

4. Still using the single day analysis, choose one nutrient that you did not get enough of. What foods are good sources of this nutrient. (Use other nutritional labels or handbooks to get this information.)

Chart 1 - Your Values

Food	Calories	Total Fat	Cholesterol	Sodium	Total Carbohydrates	Dietary Fiber
Total						

Chart 2 - Nutrient Percentages From Other Students

	Calories	Total Fat	Cholesterol	Sodium	Total Carbohydrates	Dietary Fiber
Your values						
Total						
Average						

Developed by Douglas L. Holt, Assistant Professor, Food Science and Human Nutrition, University of Missouri-Columbia

UNIT IV - FOOD SELECTION AND CONSUMER HEALTH AS 2.2

Lesson 2: Interpreting Food Label Name _____

Identifying Information on a Food Label

Objective: To identify information on a food label.

Product Name: _____

List the following information obtained from your food label.

1. Identification statement:_____
2. Net contents:_____
3. Name and address of manufacturer:_____
4. List of ingredients:_____
5. Nutritional information:_____
6. Which ingredient occurs in the greatest amount? _____
7. If additives are used, what are they?_____
8. List any artificial flavor(s).____

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?

UNIT IV - FOOD SELECTION AND CONSUMER HEALTH

Lesson 4: Relationship Between Diet and Health

Objective

The student will be able to describe the relationship between diet and health.

I. Study Questions

A. How does cholesterol affect human health?

B. Why is the composition of fat in food important?

C. What is the relationship between dietary fiber and health?

D. What are major health issues affected by nutrition?

E. How can health problems be minimized through proper nutrition?

II. Reference

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

UNIT IV - FOOD SELECTION AND CONSUMER HEALTH

Lesson 4: Relationship Between Diet and Health

TEACHING PROCEDURES

A. Review

Review the value of beverages to a person's diet. Concentrate on milk. You may want to briefly discuss the fact that calcium is a necessary mineral which is readily available in dairy products. Research indicates that calcium uptake from a person's diet is significantly reduced around age 30-35.

B. Motivation

1. Fry potatoes with saturated (coconut, palm, lard), monounsaturated (canola, olive, peanut), and polyunsaturated (sunflower, safflower, corn, soybean, sesame) fats. Do a taste test. Question students about different fat types to determine how much they know about fat.

2. Have students keep a weekly diet journal. At the end of the week, discuss whether their diets were balanced.

C. Assignment

D. Supervised study

E. Discussion

1. Discuss how cholesterol affects human health.

How does cholesterol affect human health?

a. Necessary for building membranes, manufacture of hormones and vitamin D, and other body functions. The liver produces cholesterol when diet intake is insufficient.
b. High total blood cholesterol level is a major risk factor in the development of coronary heart disease
c. Low-Density Lipoprotein is called bad cholesterol
d. High-Density Lipoprotein is called good cholesterol

2. Discuss why the composition of fat is important.

Why is the composition of fat in food important?

a. Fats add flavor, aroma, texture, and satisfaction (satiety) to a meal
b. High energy source - 9 calories/gram
c. Transport and absorb fat-soluble vitamins A, D, E, and K
d. Composed of fatty acids - a fat may contain two or more types of fatty acids. Classification is based on the predominant type of acid structure.
    1. Saturated fatty acids
        a. Come from animal sources and coconut, palm, palm kernel, and vegetable oils
        b. Should compose 1/3 or less of total fat intake
        c. Can raise blood cholesterol
    2. Monounsaturated fatty acids
        a. Found in animal and plant fats especially olive, canola, and peanut oils
        b. Should compose 1/3 or less of total fat intake
        c. May help lower blood cholesterol
    3. Polyunsaturated fatty acids
        a. Come from sunflower, safflower, corn, sesame, and soybean oils
        b. Can help lower blood cholesterol
        c. Linoleic acid is an essential fatty acid needed for normal growth
e. Should contribute no more than 30 percent of caloric intake
f. Triglycerides - edible oils and fats composed of three fatty acids attached to glycerol

3. Discuss the relationship between dietary fiber and health.

What is the relationship between dietary fiber and health?

a. Fiber provides bulk and roughage which contribute to a healthy intestine.
b. Fiber holds water, loosens stool, and decreases transit time through colon.
c. It can lower serum cholesterol, decrease incidence of colon cancer, and lower the insulin requirements of diabetics.
d. Excessive fiber can bind minerals making them unavailable for absorption.

4. Discuss the major health issues affected by nutrition.

What are major health issues affected by nutrition?

a. Starvation
b. Obesity

c. Heart disease
d. Bulimia and anorexia
e. Cancer
f. Malnourishment - osteoporosis, night blindness, dermatitis, beri-beri, neuritis, photophobia, anemia, pellagra, scurvy, rickets, hemophilia
g. Diverticulitis
h. Ulcers
i. Decreased recovery time after illness or surgery

5. Discuss how health problems can be minimized through proper nutrition.

How can health problems be minimized through proper nutrition?

a. Balanced diet plus exercise
b. Meet RDA's
c. Remain in weight range/caloric intake
d. Diet modification if necessary

F. Other activities

1. Have a Red Cross employee or school nurse speak about or demonstrate a blood iron and cholesterol test.

2. Invite a dietician to speak about his/her job.

3. Each student should monitor food intake for one day and determine if daily values were met, at what level, and what the caloric intake was.

4. Assign students to examine the type of cooking oil(s) used at school, their home, and a local cafe or restaurant. Determine if oils are saturated, monounsaturated, or polyunsaturated fats.

G. Conclusion

This lesson should remind students that their health is directly related to their diet. Issues such as cholesterol, fat, fiber, and dietary diseases are very prevalent. A closer examination of one's diet is always a desirable action.

H. Competency

Describe the relationship between diet and health.

Related Missouri Core Competencies and Key Skills: None

I. Answers to Evaluation

1. natural
2. necessary
3. different than
4. LDL
5. increase
6. c
7. b
8. a
9. age, heredity, gender
10. Retains water, loosens stool, and decreases transit time through colon. Possibly lowers serum cholesterol, decreases colon cancer, and lowers diabetic insulin requirements.
11. Three of the following: starvation, obesity, heart disease, bulimia and anorexia, cancer, malnourishment
12. Three of the following: balanced diet, follow RDA's, exercise, appropriate caloric intake, proper diet modification

UNIT IV - FOOD SELECTION AND CONSUMER HEALTH Name _____

Lesson 4:Relationship Between Diet and Health Date _____

EVALUATION

Circle the word in parentheses to complete the sentence correctly.

1. Cholesterol is a (synthetic, natural) compound.

2. Cholesterol is a (necessary, unnecessary) component of cell membranes, and hormone and bile production.

3. Blood cholesterol is (identical to, different than) dietary cholesterol.

4. (High-Density Lipoprotein, Low-Density Lipoprotein) is referred to as "bad" cholesterol.

5. Diets high in total and saturated fats tend to (increase, decrease) cholesterol levels.

Match the types of oil with their appropriate molecular structure description.

____6.Palm and coconut oils	a.	Polyunsaturated
____7.Olive, peanut, and canola oils	b.	Monounsaturated
____8.Soybean and sunflower oils	c.	Saturated

Complete the following short answer questions.

9. Name two factors, other than diet, that affect a person's cholesterol level.

10. How can dietary fiber aid nutrition?

11. List three diseases/disorders caused by poor nutrition.

12. What are three keys to minimizing health problems?