

Lesson C5–2

Identifying Foods and Environmental Requirements

Unit C. Animal Wildlife Management

Problem Area 5. Game Animals Management

Lesson 2. Identifying Foods and Environmental Requirements

New Mexico Content Standard:

Pathway Strand: Natural Resources and Environmental Systems

Standard: I: Recognize importance of resource and human interrelations to conduct management activities in natural habitats.

Benchmark: I-D: Employ environmental and wildlife knowledge to demonstrate natural resource enhancement techniques.

Performance Standard: 4. Demonstrate range enhancement techniques.

Student Learning Objectives. Instruction in this lesson should result in students achieving the following objectives:

1. Describe essential nutrients needed by animals.
2. Identify food sources of plant origin.
3. Identify environmental factors that affect the food supply.
4. Describe ways that humans can supplement the natural food supply.

List of Resources. The following resources may be useful in teaching this lesson:

Recommended Resources. One of the following resources should be selected to accompany the lesson:

Porter, Lynn, et al. *Environmental Science and Technology*. 2nd ed. Upper Saddle River, New Jersey: Prentice Hall Interstate, 2003. (Textbook and Activity Manual)

Lee, Jasper S. *Natural Resources and Environmental Technology*. Danville, Illinois: Interstate Publishers, Inc., 2000. (Chapter 8)

Stutzenbaker, Charles D. et al. *Wildlife Management Science and Technology*. 2nd ed. Upper Saddle River, New Jersey: Prentice Hall Interstate, 2003. (Chapters 8 and 9)

List of Equipment, Tools, Supplies, and Facilities

Writing surface
Overhead projector
Transparencies from attached masters
Food nutritional label

Terms. The following terms are presented in this lesson (shown in bold italics):

Drought
Energy nutrients
Flowers
Fruit
Leaves
Proteins
Minerals
Nematodes
Nuts
Pods
Roots
Vitamins
Water

Interest Approach. Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situations. A possible approach is included here.

Distribute or display a copy of a food nutritional label from a food item intended for human consumption to the students. Discuss the nutrients (fat, carbohydrates, protein, vitamins, and minerals) provided by

that food. Now pose the question, “What nutrients do animals need?” Use this to lead into the first objective of this lesson.

Summary of Content and Teaching Strategies

Objective 1: Describe essential nutrients needed by animals.

Anticipated Problem: What are the essential nutrients needed by animals?

- I. Essential nutrients are needed by animals to sustain life. The nutrient requirements vary during the life cycle of the animal. Mature animals need nutrients to provide for their activity, maintenance of their body, and reproduction. Additionally, lactating females have increased need for nutrients. Nutrients can be divided into energy nutrients, proteins, minerals, vitamins, and water.
 - A. **Energy nutrients** are carbohydrates and fats. Energy is needed for the animal to maintain its body and to provide for its activities. Sugars, starches, and oils provide energy nutrients.
 - B. **Proteins** are needed for animal growth, maintenance, and reproduction. More protein is needed during periods of active growth and during lactation. Some animals (such as carnivores) get protein from eating other animals. Plant eating animals can get protein from eating seeds and young, tender vegetation.
 - C. **Minerals** are needed for growth, reproduction, and other life functions. They are very important for bones, hooves, teeth, horns, and other similar body parts. Minerals are available in the food and water that animals consume.
 - D. **Vitamins** regulate body processes and can be found in the foods animals eat. Vitamins A, D, E, K, and B complex are important for animal health.
 - E. **Water** is a nutrient that is very important for animal health. Animal consumption of water varies by species and location. As much as 40 percent of an animal's body is water. A good source of clean, non-polluted water is essential for animal health.

There are many techniques that can be used to assist students in mastering this material. Students need text material to aid in describing essential nutrients needed by animals. Chapter 9 in Wildlife Management Science and Technology, 2nd ed. text is recommended. Use TM: C5–2A to aid in discussion on this topic.

Objective 2: Identify food sources of plant origin.

Anticipated Problem: What are animal food sources that come from plants?

- II. Plants provide many sources of food for animals. Different animals utilize different parts of plants. These plant parts include: leaves, flowers, fruit, nuts, seeds, twigs and bark, and roots.

- A. **Leaves** are the green, vegetative part of the plant. Ruminant animals, such as deer and bison, utilize them extensively.
- B. **Flowers** provide nectar for insects, such as bees and butterflies. Other animals and insects also eat flowers.
- C. **Fruit** contains seeds and other edible parts. Fruit grows on plants after it has flowered. Berries are one example of fruit.
- D. Nuts grow on trees and contain the seed from the trees. **Nuts** usually have a hard outer shell. Acorns and pecans are examples of nuts.
- E. Some plants produce seeds that are not part of fruit or nuts. Seed from these plants are in **Pods**.
- F. Some animals and insects utilize twigs and bark. Insects burrow into the bark of some trees and sometimes deer will eat the bark and twigs off trees.
- G. Rodents and some animals eat the roots of plants. **Roots** are the underground portion of the plant. **Nematodes**, small worms, also eat roots.

There are many techniques that can be used to assist students in mastering this material. Students need text material to aid in identifying food sources of plant origin. Chapter 8 in Natural Resources and Environmental Technology text is recommended. Use TM: C5–2B to aid in discussion on this topic.

Objective 3: Identify environmental factors that affect the food supply.

Anticipated Problem: What environmental factors can affect the food supply for animals?

- III. Several environmental factors can affect the food supply. These can include weather, pests, and fire.
 - A. Several weather related problems can adversely affect that natural food supply. These include drought, severe storms, floods, and freezes.
 - 1. **Drought** is a prolonged period without enough rain. Mild droughts can cause a decrease in production of plant material. In severe cases, large amounts of plant material can be killed, thus drastically affecting the food supply for wildlife.
 - 2. Storms can remove vegetation, fruits, nuts, and seeds from plants. Severe storms, such as tornados and hurricanes can blow down trees and other plant life. Ice storms can cause severe plant damage.
 - 3. Floods can smother plant life and kill it by preventing respiration and photosynthesis.
 - 4. Untimely freezes can kill vegetation prematurely, or cause early season fruits to drop to the ground.
 - B. Pest outbreaks can severely affect the food production of some plant species. These can include insects and diseases. In some cases, insects and diseases can destroy whole plant communities.
 - C. Each year, thousands of acres of forest are destroyed by fire. Sometimes these fires are caused naturally by lightening, while other fires are caused by human carelessness.

There are many techniques that can be used to assist students in mastering this material. Students need text material to aid in identifying environmental factors that affect the food supply. Chapters 8 and 9 in Wildlife Management Science and Technology, 2nd ed. text are recommended. Use TM: C5–2C to aid in discussion on this topic.

Objective 4: Describe ways that humans can supplement the natural food supply.

Anticipated Problem: What can humans do to supplement the natural food supply?

- IV. Many times, humans can help supplement the natural food supply. This help may be needed when the natural food supply is not sufficient to support the wildlife in the system. Some ways humans can help are:
- A. Leaving strips of untilled land around the edges of fields. These strips can provide both food and cover for wildlife.
 - B. Planting food producing trees, shrubs, and other plants.
 - C. When harvesting trees out of a forest, leaving food producing trees.
 - D. Providing corn and other feeds to wildlife.
 - E. Providing fertilizers to ponds to produce aquatic plants for fish to consume.

There are many techniques that can be used to assist students in mastering this material. Students need text material to aid in describing ways that humans can supplement the natural food supply. Chapter 9 in Wildlife Management Science and Technology, 2nd ed. text is recommended. Use TM: C5–2D to aid in discussion on this topic.

Review/Summary. Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Questions at end of chapters in the textbook may also be used in the review/summary.

Application. Several opportunities for application are listed in the “Exploring” section at the end of Chapters 8 and 9 in the *Wildlife Management Science and Technology*, 2nd ed. text and Chapter 8 in the *Natural Resources and Environmental Technology* text.

Evaluation.

Answers to Sample Test:

Part One: Matching

1 = d, 2 = b, 3 = a, 4 = e, 5 = c

Part Two: Completion

1. leaves

2. nuts
3. flowers
4. fruit
5. roots

Part Three: Short Answer

1. weather, pests, and fire.
2. any three of the following five: leaving strips of land untilled, planting food producing plants, leaving food producing trees when harvesting trees from the forest, providing feed such as corn, or fertilizing ponds.

Test

Lesson C5–2: Identifying Foods and Environmental Requirements

Part One: Matching

Instructions. Match the term with the correct response. Write the letter of the term by the definition.

- | | |
|---------------------|-------------|
| a. Energy nutrients | d. Vitamins |
| b. Proteins | e. Water |
| c. Minerals | |

- _____ 1. These nutrients regulate body functions.
- _____ 2. These nutrients are provided by meat, nuts, or young, tender vegetation.
- _____ 3. These nutrients are provided by carbohydrates and fats.
- _____ 4. This nutrient makes up over 40 percent of an animal's body.
- _____ 5. This nutrient is important for bones, teeth, and horns.

Part Two: Completion

Instructions. Provide the word or words to complete the following statements.

1. _____ are the green vegetative portion of a plant utilized by ruminants.
2. _____ are seeds covered by a hard outer shell.
3. _____ are the reproductive part of the plant and contain the nectar.
4. Berries are an example of a _____.
5. Nematodes and rodents can consume the _____ of a plant.

Part Three: Short Answer

Instructions. Provide information to answer the following questions.

1. Identify three environmental factors that can affect the natural food supply.
2. Identify three ways that humans can supplement the natural food supply.

ESSENTIAL ANIMAL NUTRIENTS

Nutrient	Used For	Available From
Energy Nutrients	Maintain life process	Sugars, starches, and plant oils
Protein	Animal growth, reproduction, and maintenance	Meat, seeds, berries, and young tender vegetation
Minerals	Growth and reproduction.	Available in the foods animals consume
Vitamins	Regulate body functions	Available in the foods animals consume
Water	Nearly all body functions	Any clean source

SOURCES OF ANIMAL FOOD FROM PLANTS

- ◆ **Leaves—green, vegetative plant parts**
- ◆ **Flowers—reproductive portion of a plant**
- ◆ **Fruit—contains seed covered by edible flesh**
- ◆ **Nuts—contain seeds covered by a hard outer shell**
- ◆ **Seed—sometimes in a pod, similar to a pea**
- ◆ **Twigs and Bark—eaten by some insects and animals**
- ◆ **Roots—the underground portion of a plant**

ENVIRONMENTAL FACTORS THAT AFFECT THE FOOD SUPPLY FOR WILDLIFE

◆ **Weather:**

◆ **Pests:**

◆ **Fire:**

HOW CAN HUMANS HELP SUPPLEMENT THE NATURAL FOOD SUPPLY?

- ◆ **Leaving strips of untilled land around the edges of fields. These strips can provide both food and cover for wildlife.**
- ◆ **Planting food producing trees, shrubs, and other plants.**
- ◆ **When harvesting trees out of a forest, leaving food producing trees.**
- ◆ **Providing corn and other feeds to wildlife.**
- ◆ **Providing fertilizers to ponds to produce aquatic plants for fish to consume.**