

FEEDING RACEHORSES AND STUDENTS

Objectives

- Students will understand the need to supplement natural food sources when the environment may not fully meet the needs of an organism.
- Students will be introduced to carrying capacity.
- Students will develop an understanding of the basic needs of horses.
- Students will develop an understanding of the basic nutritional elements needed by most organisms and how these nutrients can benefit the organism and their offspring.

Supplies/Resources

- Small plastic snack bags (you may instruct students to use a marker to write FEED on the bag)
- Provide various food items to represent possible combinations for FEED. The following are suggestions, and food items may not be true representations of their labels. Make sure each are labeled for the students. Check your students' food allergies before gathering food items or use colored papers with nutrient labels. Templates can be found on the website

Carbs & Fiber	Protein	Vitamins	Minerals	Fats
Popcorn	Oats	Dried Cranberries	Dried Apples	Sunflower Seeds
Wheat Bran Flakes	Chia Seeds	Raisins	Dried Bananas	Coconut Flakes

- Bowls for food items
- Spoons or "shovels"
- Nutrition labels of favorite cereals (see the website)
- Computer access for each group to conduct research
- Student information and lab worksheets

Teacher Suggestions

- Discuss the nutritional value of the foods we eat and the importance for horses and people. You may point out that not all cereal carries the same nutritional value by mixing the types (not so healthy, sugary cereal combined with a grain cereal).
- Provide ample time for research, discussion, and presentation.
- Follow-up with FEED bags.
- Students should provide an explanation for choosing the amount of FEED items in their bags. Enrichment: Have students show percentages of each item to represent parts of a whole or ask them to show simple number comparisons.

Kentucky Academic Science Standards

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.

3-LS4-2. Use evidence to construct an explanation for how variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.



Horse Forages & Feeds



Horses can eat many grasses and plants in pastures. Since some plants are toxic to horses, the fields must be checked often. Never give horses grass clippings from mowed lawns, and never feed horses that you do not own without permission.



Hays are cut grasses that have been dried for storage. This provides a forage source when pasture is scarce or when horses are stabled.



Grain-based feeds provide horses more nutrients. Oats (above) can be found in many horse feeds. A mixed feed (below) can contain several grains, vitamins, and minerals in the correct amounts.



Horses naturally eat grasses and small plants, but those alone do not provide enough energy for a Thoroughbred racehorse to train and run very fast without getting tired. In addition to the horses' regular grazing, horse managers may provide a balanced diet of hay, oats, and other grains along with vitamins and minerals. Farmers call this food "feed," and it could be compared to a box of cereal you buy at the store.

Just like students, a horse also needs to eat a balanced and healthy diet so they can grow strong and healthy. A nutritionist, someone who is an expert in the use of food for promoting healthy bodies, looks at the needs of a horse or human to decide what nutritional elements are needed. They make sure they are eating enough fiber for digestion, carbohydrates and fat for energy, and protein for growth and rebuilding of tissues. Vitamins and minerals help the body function. A feed recipe can be created that meets all nutritional needs.

Horses are grazers, which means they are herbivores designed to eat nearly 24 hours a day. A 1,000-pound horse could easily eat 20 to 30 pounds of grass in one day. That's a lot of chewing! If a horse is racing or being used for another sport, they may need more energy than what the grasses and hays can provide. Grain feeds can give horses more energy, protein, vitamins, and minerals.

In some cases, a horse may not be able to graze in a pasture all day. Horses that don't get much exercise don't need all of the calories grazing all day provides. Some farms may not have enough pasture space to let horses graze outside all day. Feeding hay and grain can give the horse the calories he needs while protecting pasture land from becoming overgrazed.

Having too many animals on one area of land may use up the pasture's resources. It's important to pay attention to the land's "carrying capacity." Carrying capacity is the number of animals a piece of land can support without harming the environment or causing the animals to starve if no additional feed is provided. For example, if a forest has enough trees to sustain 10,000 birds and 15,000 birds fly in to live in that forest, either 5,000 will have to leave or 5,000 may perish from a lack of food.

One horse that lives outside full-time in Kentucky will need about 2 acres* of well-managed land to provide enough food. Hay and feed may also need to be given in the winter months or when there is a shortage of rain. Too much rain can also affect how much grass grows. In areas of the country where grass is more scarce, one horse may need 20 acres to supply enough food to meet their needs.

*One acre is 43,560 square feet. This is slightly smaller than a football field.

Be a Nutritional Researcher!

1. Work with a group to research the following terms. We hear these words used in commercials and everyday conversations, but we are not always sure what they really mean. Be a researcher. Educate yourself and others. Define the words and give some examples. Be sure to use words and examples that make sense to you.

Researchers: _____

Nutritional Term	What is it?	What does it do?	Examples of food it can be found in:
Carbohydrates			
Fiber			
Protein			
Vitamins			
Minerals			
Fats			

2. Your teacher will give your group a box of cereal or pictures of cereal nutrition labels. Read the ingredients list.
3. What evidence suggests that the cereal meets your nutritional needs? Be ready to share your evidence with your teacher and classmates.

- 4. Now it's your turn to create a nutritional FEED for your horse.
 - A. Based on the horse profile you receive, your group will decide what kinds of nutrients and how much of each nutrient will go into your horse's feed.
 - B. Be ready to explain why you chose the amount of each item. For example, if you choose to include more fiber than protein, use your research to explain why.

Use this area to list your evidence:

Use this area to write your FEED recipe: