FEED A COW!

In this activity, you’ll learn how to prep and parcel a pretend meal for your animals.
Feed a Cow!

In this activity, you’ll learn how to prep and parcel a pretend meal for your animals.

About the Activity

Water, vitamins, minerals, protein. Sound familiar? Similar to humans and pets, it’s important for beef cattle to ingest all the nutrients that provide a balanced diet. From corn to cottonseed, there are many different feeds and forages from which to choose.

In this activity, you’ll learn how different grains – also referred to as feeds and forages – can support a healthy cattle diet, and how to measure out a proper meal for our cattle.

Supplies

These simple supplies are all you’ll need for this activity. You may have most of them in your kitchen cabinets:

• 1 cup peanuts (substitute with popcorn or pretzels if allergies are a concern)
• ½ cup chocolate chips
• 1 tbsp. (or small bag) raisins
• 1½ cup + 1 tbsp. sunflower seeds
• 3 sandwich-size plastic bags
• Sharpie
• Measuring cups
  – ½ cup
  – 1 cup
• Measuring spoons
  – 1 tablespoon

Grades: 3-8

Topic: Animal Science, Math
Time: 30 minutes
Activity Steps

Most beef cattle will feed on forages for a majority of their nutrition needs throughout their lives. However, cattle also have other nutritional needs, such as energy-based foods, protein, vitamins, and minerals. Before you begin to measure out feed mixtures for cattle, let’s explore the various types of nutritional elements you will add into each mixture.

- **Energy**: Energy is used by cattle for growth, respiration, and maintaining body temperature. Beef cattle primarily create energy through the intake of carbohydrates and fats.

- **Protein**: Protein aids in digestion, growth promotion, and immune response. While specific feeds can help aid this, a cow’s digestion process also helps with this on its own. Through a special form of digestion, cattle can also produce a type of protein -- called microbial protein -- from living organisms that already exist in their stomachs. You may have learned about this process in a prior activity.

- **Fiber**: Fiber is the roughage or bulk part of the diet that passes through the body largely undigested by the animal. This roughage/fiber is needed by cattle to ensure proper function in the rumen, which is a part of the cow’s stomach that uses a special process to convert fiber into energy.

- **Vitamins**: Vitamins are organic substances that are essential for body tissues, but are needed in very small amounts. A cow’s digestion process will help to produce these.

- **Minerals**: Minerals are inorganic substances that are essential for many body processes. Most cattle are provided a mineral mixture with various types of minerals at different stages of production.

**DID YOU KNOW?** Grain-based feeds like corn are primarily used in feedlots. When selecting these feeds and forages, consider:

- How well the animal will eat the feed
- How available the nutrients are in that feed
- Are there any toxicity concerns that can affect the final feed mixture?

Now that you’ve learned about how different types of nutrients contribute to a cow’s health and digestion, you can start mixing your own feed mixtures.

**MAKE RATION 1: TYPICAL FEEDLOT FEED MIXTURE**

- Take one of the plastic sandwich bags and write “feedlot” on the bag with your Sharpie.

- Follow the measurements in the chart on the next page. Using your measuring cups and measuring spoons, portion out the appropriate amount of each food item into the bag.
### MAKE RATION 2: TYPICAL WEANED CALF FEED MIXTURE

- Take one of the plastic sandwich bags and write “weaned calf” on the bag with your Sharpie.
- Follow the measurements in the chart below. Using your measuring cups and measuring spoons, portion out the appropriate amount of each food item into the bag.

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Percentage</th>
<th>Food item Represents</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>20%</td>
<td>Peanuts/Popcorn/Pretzels Corn/Soybean Hulls</td>
<td>3 tbsp.</td>
</tr>
<tr>
<td>Protein</td>
<td>10%</td>
<td>Chocolate chips Cottonseed meal/Soybean meal/Corn gluten feed</td>
<td>2 tbsp.</td>
</tr>
<tr>
<td>Fiber</td>
<td>68%</td>
<td>Sunflower seeds Forages/Soybean hulls/Cottonseed hulls</td>
<td>½ cup + 3 tbsp.</td>
</tr>
<tr>
<td>Minerals</td>
<td>2%</td>
<td>Raisins Mineral mix</td>
<td>1 tsp.</td>
</tr>
</tbody>
</table>

**DID YOU KNOW?** Total Digestible Nutrients – also called TDN – is the common measure of energy in beef cattle feeds.
MAKE RATION 3: TYPICAL MID-GESTATION COW FEED MIXTURE

- Take one of the plastic, sandwich-size bags and write “mid-gestation” on the bag with your Sharpie.
- Follow the measurements in the chart below. Using your measuring cups and measuring spoons, portion out the appropriate amount of each food item into the bag.

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Percentage</th>
<th>Food item</th>
<th>Represents</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>10%</td>
<td>Peanuts/Pop-corn/Pretzels</td>
<td>Corn/Soybean Hulls</td>
<td>2 tbsp.</td>
</tr>
<tr>
<td>Protein</td>
<td>10%</td>
<td>Chocolate chips</td>
<td>Cottonseed meal/Soybean meal/Corn gluten feed</td>
<td>2 tbsp.</td>
</tr>
<tr>
<td>Fiber</td>
<td>78%</td>
<td>Sunflower seeds</td>
<td>Forages/Soybean hulls/Cottonseed hulls</td>
<td>3/4 cup</td>
</tr>
<tr>
<td>Minerals</td>
<td>2%</td>
<td>Raisins</td>
<td>Mineral mix</td>
<td>1 tsp.</td>
</tr>
</tbody>
</table>

DID YOU KNOW? Though not part of the feed mixtures you’ve created, water is one of the most essential nutrients for cattle. Water plays a major role in digestion, transport of nutrients throughout the body, helps with excretion of waste products, and also helps to regulate body temperature. It is vitally important to ensure that all cattle have free access to clean, fresh water at all times.
Test Your Knowledge

See how much you’ve learned about feeding beef cattle!

**QUESTION 1**
What nutrient is important for cows that you won’t find in a feed mixture:
- a. Fruit
- b. Water
- c. Corn
- d. Soybeans
- e. None of the above

**QUESTION 2**
True or false: Forages are a primary source of nutrition for beef cattle:
- a. True
- b. False

**QUESTION 3**
What types of nutrients are a part of the diet for beef cattle?
- a. Energy
- b. Protein
- c. Fiber
- d. Vitamins and Minerals
- e. All of the above
- f. A, B, and C only.

**QUESTION 4**
True or false: Grain-based feeds are primarily used in feedlots.
- a. True
- b. False

**QUESTION 5**
True or False: Cattle in all stages of life eat the exact same feed.
- a. True
- b. False

Reflection Questions

Bonus questions to inspire wonder:

- What difficulties did you face while making the feed mixes with the different ratios of ingredients?
- What is the purpose of supplying beef cattle with specific types of feeds and forages?
- Discuss the functions of each of the different nutrients. Does this impact how you feed your own beef cattle? If, so why?
- Sometimes, we have to eat foods that we don’t really like to get specific nutrients from them. What are some foods you eat to provide your body with nutrients even though you may not like those foods?
- What careers might be of interest to you relative to feeding beef cattle?
Investigate & Explore
Take your new knowledge to the next level.

Grain-based feeds like corn are primarily used in feedlots, but lately, discussions have risen that promote alternative ways to provide those forages through regenerative farming practices.

Take a visit to a local farm or zoo, and observe what type of feed the cows are grazing on. With permission from your grownup, ask the animal caretaker what types of feed the cattle eats. Find out:

- Are the cattle receiving nutrients from a feedlot diet? A grass-fed diet? Or an alternative diet?
- Are there other potential ways to feed cattle in addition to mixing forages?
- What types of rations or nutrients benefit each animal?

Brought to you by:

No endorsement of these supporters’ products or services is granted or implied by 4-H. This work is supported by the USDA National Institute of Food and Agriculture, AFRI - Education and Workforce Development project 2021-67037-33376.