Forage

*Lesson Plan for Grade 1, Science*

*Prepared by NAITC*

*Modified by Mississippi State University, School of Human Science*

*for Mississippi Farm Bureau Federation - AITC*

# OVERVIEW & PURPOSE

Students will explain the importance of the beef cattle industry, including the products cattle produce, the production process from farm to plate, and how cattle can utilize and obtain energy from grass and other forage.

# EDUCATIONAL STANDARDS

**Mississippi College-and-Career Readiness Standards:**

L.1.1.4 Create a model which explains the function of each plant structure (roots, stem, leaves, petals, flowers, seeds.

Math-1.OA.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

**NALOs:**

T2.K-2 f Identify the types of plants and animals found on farms and compare with plants an animals found in wild landscapes.

# OBJECTIVES

* Students will identify carbohydrates, proteins, fats, vitamins and minerals in the forms of forages

# MATERIALS NEEDED

* Veggie straws (1 bag)
* Raisins (1 large bag)
* Beef Jerky ( cut into smaller pieces) (4-5 bags)
* M&Ms (1 large bag)
* Cheerios (1 large box)
* Plastic Sandwich bags (1 per student)
* Gloves (1 set for yourself)
* Large Bowl (1)
* Small bottles of water (1 per student)
* [Field Trip: Beef 101 YouTube video](https://www.youtube.com/watch?time_continue=2&v=m-03aT4SavE&feature=emb_logo)

# Lesson Set Up:

1. Pull up the Field Trip: Beef 101 YouTube video
2. Set out the Cow Chow activity supplies.

# VOCABULARY

**bull:** male cattle that are or will become fathers

**by-product:** something that is made in addition to or that is leftover from the production of the desired good; can still be very useful in different ways

**calf:** the offspring of a cow

**cellulose:** the main component of green plants like grass and shrubs; not digestible by humans but very nutritious to ruminant animals

**cow:** female cattle that have had a calf

**digestion:** the process by which food is changed to a simpler form after it is eaten

**edible:** suitable or safe to eat

**heifer:** female cattle that have never had a calf

**inedible:** not possible or safe to eat; not edible

**rangeland:** open land that domesticated animals use for grazing and roaming

**ruminant:** an animal that uses a series of stomach compartments and chew its cud in order to digest plant cellulose

# Ag Facts:

* Forages are the foundation of livestock production in Mississippi’s agriculture.
* In gross value, hay is considered the state’s fifth largest crop. This acreage represents 6.8% of the open farmland in the state.
* Over 80% and 70% of marketed beef and dairy products respectively are derived directly from forages.
* It is estimated that 1.4 million acres of pasture and 620,000 acres of hay and silage are harvested annually in Mississippi.
* Some of the most common forages utilized in Mississippi include bermudagrass, bahiagrass, tall fescue, annual ryegrass, oats, wheat, white clover and annual clovers (arrowleaf, ball, berseem, crimson).

# Background information for teachers:

The average American consumes 55 pounds of beef each year. As a country, we devour nearly 50 billion hamburgers annually.2 Not only is beef an important part of the American diet, but it also plays a significant role in our economy. Beef cattle are raised in every state across the nation. Texas, Oklahoma, and Missouri rank as the states with the highest inventory of beef cattle.3

Why such a high demand for beef? In addition to being prized for its delicious taste, beef provides many nutrients essential to the human diet. Humans need complete proteins with balanced amino acids in order to build muscle, nerves, and organ tissue. Animal proteins are one way to fill this nutritional need. Beef is a good source of ZIP: zinc (a mineral that ensures proper functioning of the immune system), iron (a mineral that helps red blood cells carry oxygen to body cells and tissues), and protein (a nutrient that builds, maintains, and repairs body tissues); as well as B12 (a vitamin that promotes healthy skin, nerves, and red blood cells).

Cattle are **ruminant** animals. Their four-compartment stomach allows them to graze pastures and **rangelands**, eating grass and plants (that humans are unable to digest) in areas where it would be difficult or impossible to grow other food crops. These grazing animals convert plant **cellulose** into high-quality food for humans. Because of this ability, as well as their generally calm and manageable demeanor, people have relied on cattle as a food source for thousands of years.

In the United States, cattle were introduced in the early 1500s, coming from Mexico through Texas and California. The English later brought large numbers of cattle when they founded the Jamestown Colony.

Rangelands cover approximately 26 percent (about 587 million acres) of land across America. This land is generally too arid and mountainous to be suitable for cultivation but can sustain grazing of domesticated animals when well managed. The pasture or range is one of the most important resources to a beef producer because it provides the food and water that animals need at little cost and effort. Producers are allowed to use public lands for grazing and work with the U.S. Forest Service or the Bureau of Land Management (BLM) to ensure that the land remains healthy.

Typically, cattle are turned out to graze on their allotted land late in the spring. Mothers will raise their calves on the open range throughout the summer. The producers will keep a close eye on their cattle, monitoring their growth and health during this time period. Sometime in the fall, the cattle will be rounded up. At this point, the cattle that will be saved for breeding stock are separated from the cattle that will go into beef production. The breeding stock includes pregnant mothers who will give birth in the spring and then be returned to the range to complete the cycle all over again.

Some of the animals designated for beef production will be sold to stockers (also called backgrounder). Stockers are cattlemen who raise weaned steers and/or heifers until they are ready to be sent to market or to a feedlot. Most beef cattle will spend four to six months at a feedlot where they are fed a grain-based diet that helps them gain weight quickly. During this “finishing phase,” the cattle’s health is monitored on a daily basis. When market weight is reached, the animals are sent to a processing facility. The average beef animal weighs 1,200 pounds (544 kg) and yields approximately 520 pounds (236 kg) of meat. While beef cattle are primarily raised for meat, they also provide valuable **by-products** such as medicine, paint, adhesives, soap, cosmetics, detergents, and hundreds of other products. Including by-products, as much as 99% of the animal is used.

# LEARNING PROCEDURES

Interest Approach:

1. Tell your students that there are two primary products that cattle produce. Ask if they can tell you what they are. If they need a hint, tell them that both products fall in the category of "food." (Cattle produce milk and meat)
2. Tell the students:

**“It takes a lot of energy for cattle to produce milk and to gain weight to produce meat. They get this energy through their food just like we as humans do”**

**“Today we are going to go over what cattle eat. Cattle eat something called forage. bulky food such as grass or hay for horses and cattle."**

Activity 1: Cow Chow

1. Explain the following directions to students while you are making the cow chow in front of them.

**“First, cattle need a lot of water. That's why we have these small bottles of water for each of us to drink.**

**Now in our bowl, we are to put some veggie straws in our bowl. These represent vitamins that cattle need. Next, we are going to put some raisins in our mixture, these are going to represent minerals that cattle need.**

**Next, we are going to add in the beef jerky. This represents protein. We and cattle need protein for energy.**

**We and cattle also need fat in our diets. We are going to put M&Ms in our mixture to represent fat.**

**Lastly, cattle need carbohydrates for energy as well. We are going to put cheerios in our mixture to represent carbs.”**

**Concept Elaboration and Evaluation**

* The teacher should then scoop some of the cow chow into plastic bags or cups, pass out the water bottles and bags to the students to eat and play the [Field Trip: Beef 101 YouTube video](https://www.youtube.com/watch?time_continue=2&v=m-03aT4SavE&feature=emb_logo) for the students to watch while they eat their cattle mixture.

# Additional Learning Procedures

To help students review and elaborate more about forage and beef cattle, complete a [write about](https://drive.google.com/file/d/1zWlPXKoCjW1GVILIjY_bEC246zZW4m7G/view?usp=drive_link) with key terms that can be pulled from the lesson or youtube video. Such as rangeland, beef, rangeland, and calf.

Reading from additional resources like the book [“In the Tall, Tall Grass” by Denise Fleming](https://www.lakeshorelearning.com/products/ca/p/BK994/?utm_source=google&utm_medium=ppc&utm_campaign=performancemax&gclid=Cj0KCQjw3JanBhCPARIsAJpXTx6NKYCEMNRCDPeT2vEEhWBcRipb2HLAzT96rRIi45N8IkGQGPAwx1EaAkQBEALw_wcB) can encourage students to make further connections outside the lesson.

Additional Texts to Include:

[From Grass to Milk](https://www.agfoundation.org/recommended-pubs/from-grass-to-milk)

[Sun in My Tummy](https://www.agfoundation.org/recommended-pubs/sun-in-my-tummy)

[What if There Were No Bees?](https://www.agfoundation.org/recommended-pubs/what-if-there-were-no-bees)



Source: <https://www.agclassroom.org/teacher/matrix/>

*For more information and additional lessons visit*

*https://msfb.org/ag-in-the-classroom/lesson-plans/.*