W 447

DO THEY REALLY HAVE FOUR STOMACHS?

An Introduction to Basic Anatomy of Cattle

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Do They Really Have Four Stomachs?

An Introduction to Basic Anatomy of Cattle

Skill Level
Beginner

Learner Outcomes
The learner will be able to:

- Identify the four compartments of a cow's stomach.
- Label the four compartments of a cow's stomach.
- Understand the function of each compartment.

Educational Standard(s) Supported
This lesson is designed to be used in a project group and is not aligned to state education standards.

Success Indicator
Learners will be successful if they:

- Correctly label the parts of the stomach.

Time Needed
40 minutes

Materials List
Play Dough
Student Handout (optional)

Introduction to Content

This lesson will focus on the stomach of the cow. The lesson dispels a common misconception that cows have four stomachs, when in reality they have one that is divided into two compartments.

Introduction to Methodology

Before the content is presented, the students will be asked to create, out of play dough, what they think a cow's stomach looks like. After the content is presented, the students will recreate their model of the stomach. Students will also be asked to demonstrate their understanding of the content by discussing what would happen if a part of the stomach was missing.

Author

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Prepared using research based practices in youth development and experiential learning.

Terms and Concepts Introduction

- Rumen — The fermentation chamber. This is where plant fiber is broken down by bacteria and other microbes.
- Reticulum — Heavy or dense feed and metal objects that are eaten by the cow drop into this compartment.
- Omasum — This compartment absorbs water and other substances from digestive contents.
- Abomasum — This is known as the "true stomach." It uses hydrochloric acid and digestive enzymes to break down feed.

Tips for Engagement

Encourage the students to talk about their model to the classmates sitting around them. Have them compare and contrast their models. Maybe even ask them if they can name or label the different parts.

Setting the Stage and Opening Questions

Begin the lesson by saying, **"Who knows what the stomach of a cow looks like?"** After students raise their hand ask, **"Who thinks they have one stomach? Ok, who thinks that they have four stomachs? What I would like you to do is take the play dough that was given to you and create what you think their stomach looks like."**

Walk around and talk to the children about their representation of the cow's stomach.

Experience

After allowing students to construct their models, say, **"I've seen a lot of creative artwork and a lot of different representations of what the stomach of the cow looks like. However, the truth is cows only have one stomach; it just has four chambers, just like the human heart."**

For this part of the lesson, as you introduce a new chamber write the name on the board, and ask the students if they know what that specific chamber's function is. Tell them the true function (information listed below), and write a brief statement about the chamber beside the name.

For the remainder of the lesson discuss the different chambers of the stomach and their functions.

- Rumen — This is the largest of the four compartments. It acts as a storage vat, but it is also known as the fermentation chamber. This is where plant fiber is broken down by bacteria and other microbes.
- Reticulum — This chamber is also known as the "honeycomb chamber" because the tissues are arranged in a way that resembles a honeycomb. This is where heavy or dense feed and metal objects that are eaten by the cow end up. Cows will eat anything, and occasionally they will eat metal objects such as nails. These nails and other sharp objects can cause hardware disease (a disease caused by sharp, metallic objects irritating or penetrating the lining of the reticulum).
- Omasum — This is the compartment that absorbs water and other substances from digestive contents.
- Abomasum — This is known as the "true stomach." It uses hydrochloric acid and digestive enzymes to break down feed. This is the chamber that you would compare to the stomach of a nonruminant (animals that digest their feed in a one-compartment stomach).

Share

Ask the students, **"What did you learn today that you didn't know before?"**

"What did you find the most interesting?"

Process

Say to the students, "**Now that you know a little more about the cow's stomach, take a few minutes to redesign what you think the stomach looks like."**

As students complete this, rotate around the room and correct any misconceptions you see.

Generalize

Ask students to share they're redesigned stomachs. Pick three or four quality examples to share with the class.

Group the students and have them discuss whether they think that one compartment of the stomach is more important than the others. Each group can share their opinions with the class.

Apply

Discuss how each chamber is equally important and what could happen if a specific chamber was missing. (If the reticulum was missing, the cow could die because the compartment that collects heavy metals and sharp objects would be missing. If the Rumen was missing, the cow would not be able to start the digestive process. If the Omasum was missing, the cow would not be able to filter the food and squeeze the water out of it. If the Abomasum was missing, the cow would not be able to receive nutrients from its food after it had digested.)

At the end, pass out the worksheet that shows the correct representation of the cow's stomach.

Life Skill(s)

4th Grade

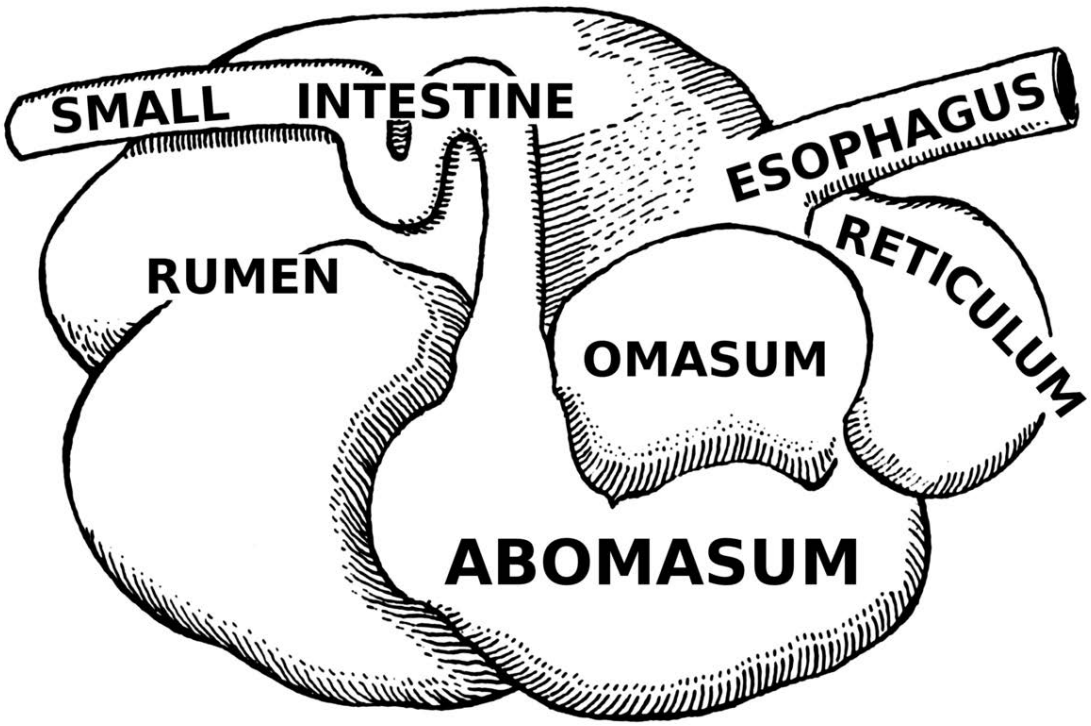
- Participate in 4-H club meetings by saying pledges, completing activities. and being engaged. (Head)
- Identify at least four project areas to consider as a project area for future 4-H work. (Head)

5th Grade

- Participate in 4-H club meetings by saying pledges, completing activities, and being engaged. (Head)
- Select at least one project area in which to focus future 4-H participation. (Head)

Student Handout

Digestive System of a Cow



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Programs in agriculture and natural resources, 4-H youth development, family and consumer sciences, and resource development. University of Tennessee Institute of Agriculture, U.S. Department of Agriculture and county governments cooperating. UT Extension provides equal opportunities in programs and employment.