

Cows



Activity 1: Filling 4 Stomachs

Did you know that cows have 4 compartments to their stomachs? Each one helps digest food and absorb the nutrients they need. If you thought cows spent a lot of time eating, then you are right, and this is why...

Participate in this experiment to replicate the digestion process of a cow. Make sure you have adult help and prepare to get a little bit messy!

Equipment:

- Measuring jug
- Water
- 1 slice of bread
- Orange juice
- Plastic food bag (that can be tied or zip locked)
- Colander (with large holes)
- Large bowl
- Sieve (with small holes)
- Spatula
- Second plastic food bag or bowl

Instructions:

1) The first and largest stomach is called the 'Rumen.' This can hold 50 gallons of food. Take a measuring jug and fill it to 1 litre. Look carefully at the amount of water you have there and imagine how full your tummy would feel if you drank it all. 50 gallons is the same as 228 litres! When a cow eats, it doesn't thoroughly chew its food, so the

rumen is full of partially chewed food. Then, enzymes and digestive juices start to break the food down.

EXPERIMENT: To replicate this, take a slice of bread and tear it into small pieces. Put these pieces into a plastic food bag. Then take some orange juice and pour a small amount into the bag. Seal it up securely and then gently squash the contents of the bag from the outside.

2) Once the food is broken down, it moves into the second and smallest compartment called the 'Reticulum.' This part of the stomach traps anything the cow shouldn't have eaten in the grass, like small stones.

EXPERIMENT: To replicate this, put a colander (with large holes) over the top of a large bowl and carefully pour the contents of the plastic bag into it. The liquid and smaller mashed up pieces of bread will pass through the holes and any large bits, will not.



The food then mixes with saliva to produce small bits of food called 'cud.' Cows regurgitate this back into their mouths and then chew them completely.

EXPERIMENT: To replicate this, pour a small amount of water into the bowl with the mixture that was passed through the colander. Then carefully pour it all back into the bag.

3) After chewing the cud, the food is passed back into the rumen, broken down even more and then sent into the third compartment called the 'Omasum.' In this section of the stomach, all the water is absorbed out of the food.

EXPERIMENT: To replicate this, put a sieve (with small holes) over the top of a large bowl and carefully pour the contents of the plastic bag into it. Use a spatula to gently press the mixture, to ensure all water is removed.

4) Finally, the food reaches the fourth and final compartment called the 'Abomasum.' This is where nutrients are extracted and sent into the bloodstream and the rest is sent into the intestines.

EXPERIMENT: To replicate this, use the spatula to scrape the contents of the sieve out into a clean bag or bowl.

Make sure you help to tidy up afterwards!

Activity 2: Milking Madness!

Try playing this milking maths game to see how much money each player makes from their herd of cows! You will need a dice and a piece of paper and a pencil to record your scores.

1) Roll the dice to see how many cows you have in your herd. Write down the number you get.

2) Roll the dice to see how many litres of milk each of your cows has produced. Write this down.

3) Now calculate how many litres your cows have produced overall. To do this, multiply the number of litres by the number of cows. Write this number down.

4) Let the other players have a turn and record your scores.

5) A litre of milk sells in the corner shop for 70p. Work out how much money you would earn from selling the milk you have produced. To do this, multiply 70p by the number of litres your herd of cows produced.

6) Finally, roll the dice again to see how many friends you need to share your earnings with. To do this, divide the amount of money you earned by the number shown on the dice. The number you are left with is the amount you will keep, and you need to give the same amount to each of your friends. Who has the highest final score and has made the most money?

