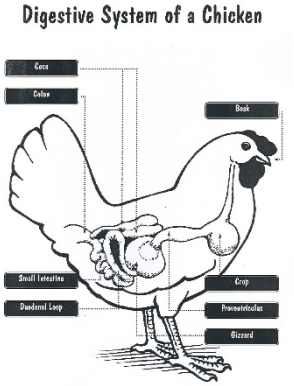
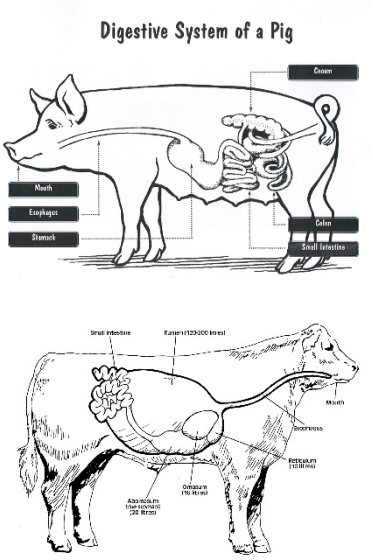
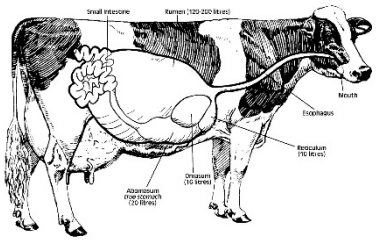
BC Agriculture in the Classroom Foundation

Farm Animal Digestive System Diagrams







Students will learn about the digestive systems of dairy cattle, beef cattle, chickens, and pigs through diagrams.

Subject Levels/ Suggested Grade

Science K, 1, 3, 4, 5, 6

Science

Grade	Big Ideas	Curricular Competencies	Content Connections
Kindergarten	Plants and animals have observable features.	Demonstrate curiosity and a sense of wonder about the world	Basic needs of plants and animals Adaptations of local plants and animals
Grade 1	Living things have features and behaviours that help them survive in their environment.		Structural features of living things in the local environment
Grade 3	Living things are diverse, can be grouped and interact in their ecosystems		
Grade 4	All living things sense and respond to their environment	Demonstrate curiosity about the natural world.	Sensing and responding: other animals
Grade 5			Basic structures and functions of body systems: digestive
Grade 6			Basic structures and functions of body systems

Teacher Background

Farm animals have digestive systems that are different than ours. Use the following diagrams and information to teach students about how these living things digest their food.

Included Materials:

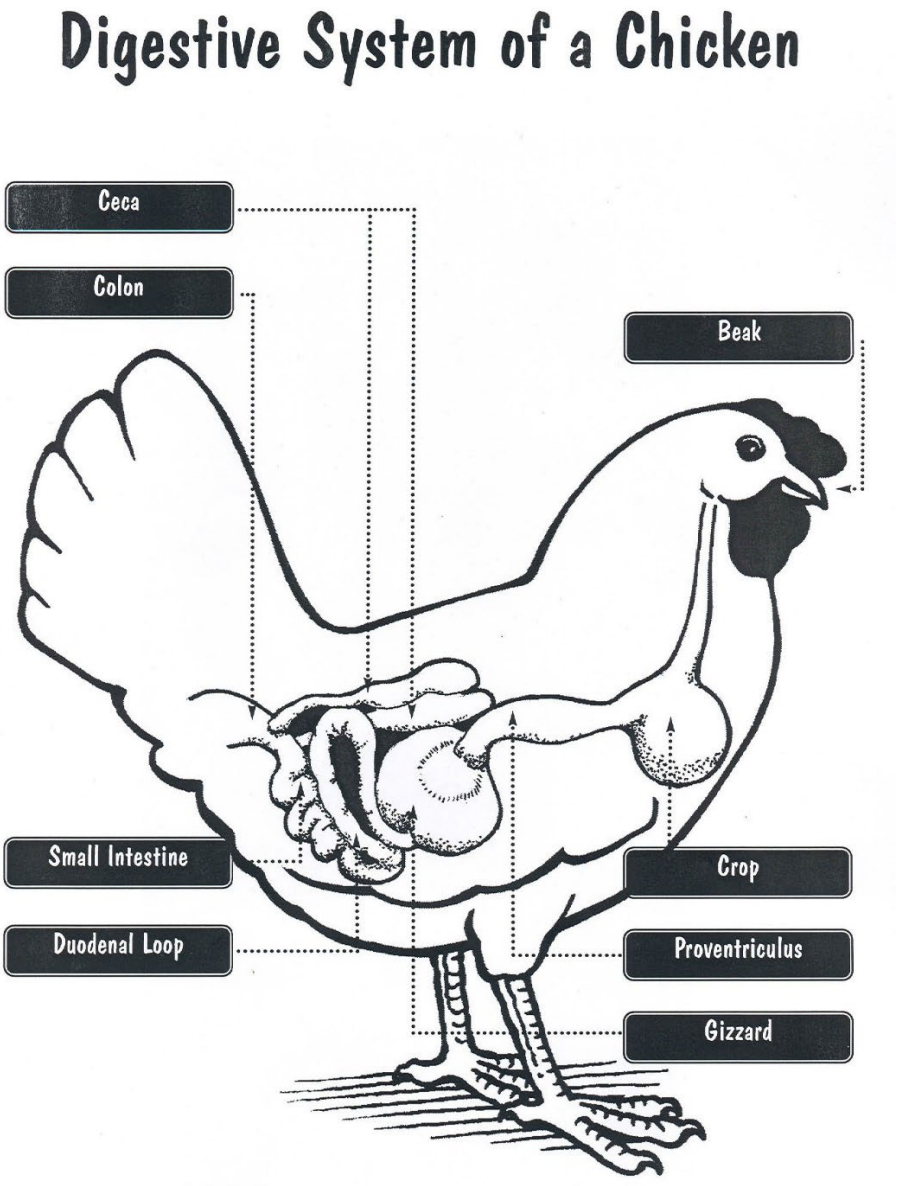
- **Chicken Digestive System**
- **Pig Digestive System**
- **What is a Ruminant?**

Extension Activities

- Learn how a dairy cow digests its food and makes butter- Marvelous Milk
- Learn more about beef cattle through this primary thematic unit-All About Beef
- Watch a farm tour of a Broiler Chicken Farm-Spotlight on Chickens Farm Tour Video
- Complete the Palatable Pig Crossword Puzzle

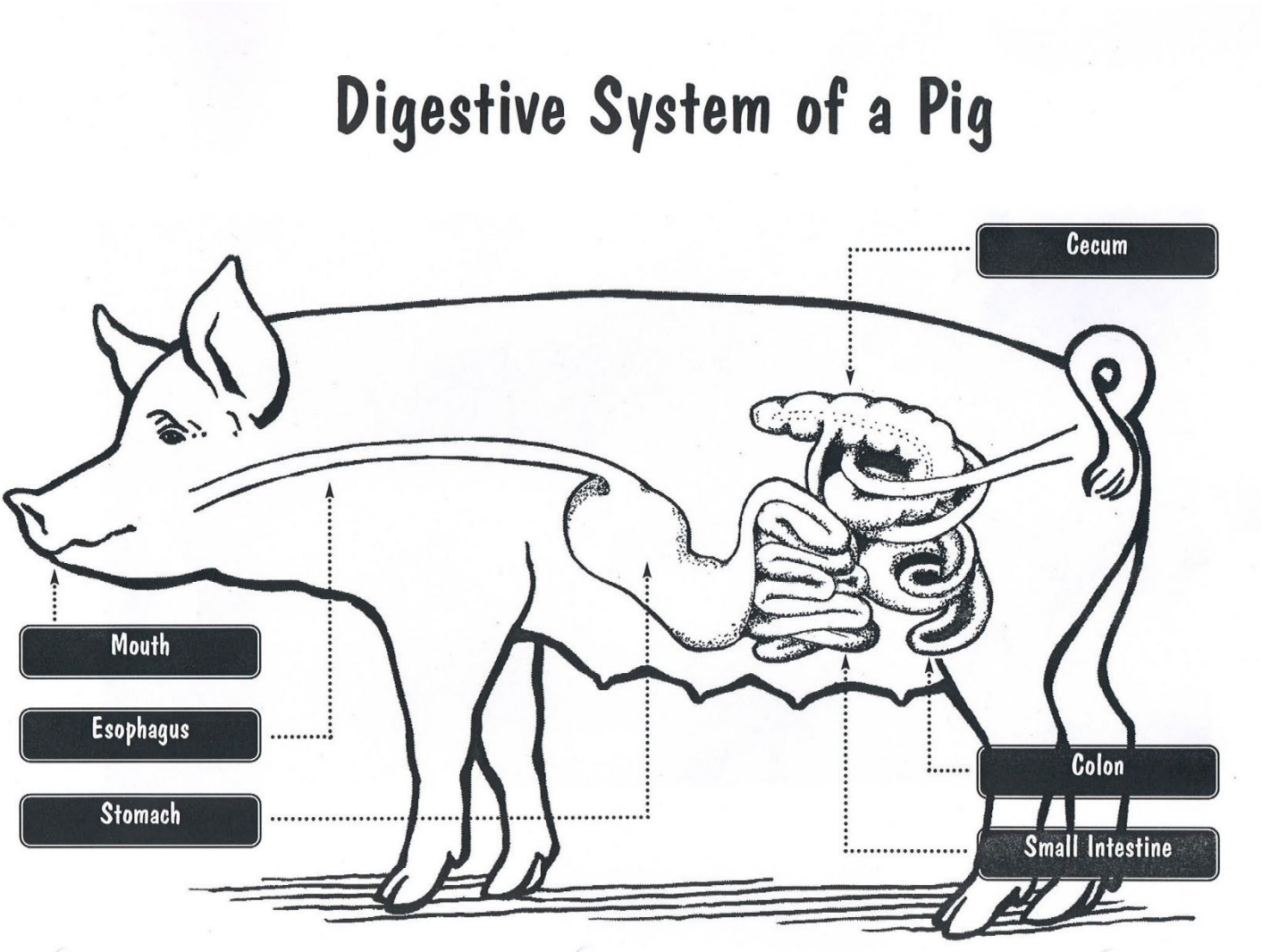
Chicken Digestion

The digestion of food begins in the **beak** of the chicken. In the beak, saliva is mixed with the food so that it can be easily swallowed. The swallowed food then moves to a storage organ called the **crop** and then through to the true stomach of the bird called the **proventriculus**. Here, the food is further mixed with more enzymes to assist with the breakdown of the food. The food then moves to a grinding organ called the **gizzard**. Grit and gravel that has been picked up by the bird helps to grind or crush the food particles in this organ. The food then passes through the **duodenal loop** and into the **small intestine**, where absorption of food particles primarily occurs. Undigested particles then pass through two pouches called **ceca**, where the water is absorbed from the food. The remaining undigested food particles then pass through the colon and rectum to the cloaca, where they are excreted.



Pig Digestion

Food digestion begins in the **mouth** of the pig. Food is chewed into smaller pieces and mixed with saliva so that it is easier to swallow. As food is swallowed, food moves down the **esophagus** and into the **stomach**. Once in the stomach, the food is mixed with more enzymes to help break down the food. The partially digested food, now called chyme, moves to the **small intestine** where most of the broken down food is absorbed. The food particles then enter the large intestine. The large intestine is composed of two sections, the **cecum** and the **colon**. Food travels very slowly through the cecum into the lower part of the colon, where the remaining nutrients and water are absorbed into the body. The colon is where feces are formed and are later expelled through the anus.



What is a Ruminant Animal?

Many different species of ruminant animals are found around the world. Ruminants include cattle, sheep, goats, buffalo, deer, elk, giraffes and camels. These animals all have a digestive system that is uniquely different from our own.

Instead of one compartment to the stomach they have four. Of the four compartments the rumen is the largest section and the main digestive centre. The rumen is filled with billions of tiny microorganisms that are able to break down grass and other coarse vegetation that animals with one stomach (including humans, chickens and pigs) cannot digest.

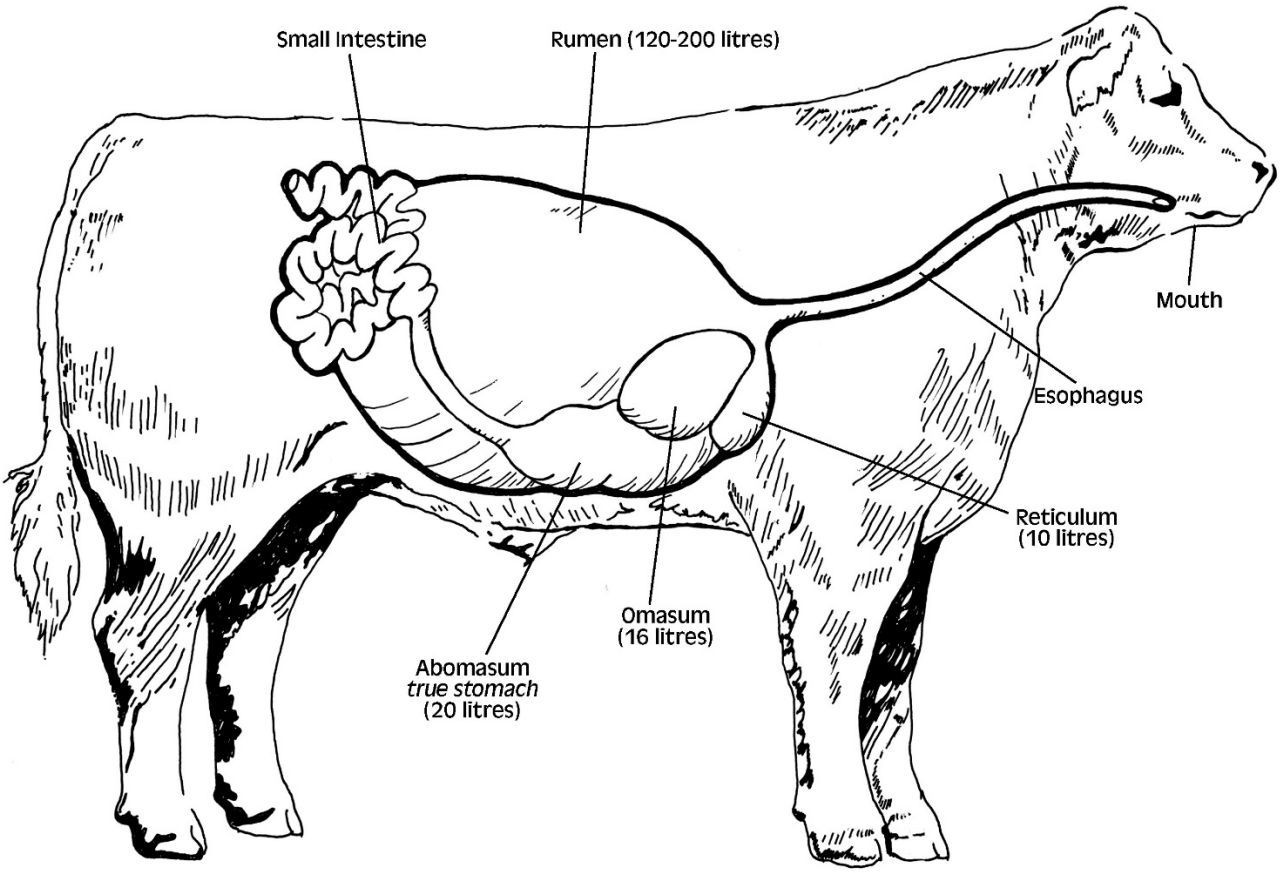
Ruminant animals do not completely chew the grass or vegetation they eat. The partially chewed grass goes into the large rumen where it is stored and broken down into balls of “cud”. When the animal has eaten its fill it will rest and “chew its cud”. The cud is then swallowed once again where it will pass into the next three compartments—the reticulum, the omasum and the true stomach, the abomasum.

Dairy calves have a four-part stomach when they are born. However, they function primarily as a monogastric (simple-stomached) animal during the first part of their lives.

At birth the first three compartments of a calf’s stomach—rumen, reticulum, and omasum—are inactive and undeveloped. As the calf grows and begins to eat a variety of feeds, its stomach compartments also begin to grow and change. The abomasum constitutes nearly 60 percent of the young calf’s stomach, decreasing to about 8 percent in the mature cow. The rumen comprises about 25 percent of the young calf’s stomach, increasing to 80 percent in the mature cow.

Many of the plants that grow on earth cannot be used directly by humans as food. Over 50 percent of the energy in cereal crops that are grown for food is inedible to humans. Ruminants have the ability to convert these plants and residues into high quality protein in the form of meat and milk. In addition they feed on the rejects and cutting from fruit and vegetable farming and the by-products from food processing plants.

The Ruminant Digestive System in Beef Cattle



The Ruminant Digestive System in Dairy Cattle