

The Digestive Tract of the Pig¹

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The pig has a digestive system which is classified as **monogastric**, or nonruminant. Humans also have this type of digestive system. They have one stomach (mono = one, gastric = stomach). The monogastric differs from that of a **polygastric**, or ruminant, digestive system found in cattle and sheep. These animals have one stomach broken into four compartments. Due to the differences in the digestive systems, cattle can utilize different types of feeds than pigs. Cattle and sheep can live on hay and pasture, while pigs must eat grains that can be digested more easily.

Digestion is the break-down of food occurring along the digestive tract. The digestive tract may be thought of as a long tube through which food passes. As food passes through the digestive tract, it is broken down into smaller and smaller units. These small units of food are absorbed as nutrients or pass out of the body as urine and feces.

The digestive tract of the pig has five main parts: the mouth, esophagus, stomach, and small and large intestines (Figure 1). The following discussion explains how each part digests nutrients.

The mouth is where food enters the digestive tract and where mechanical breakdown of food begins (Figure 2). The teeth chew and grind food into smaller pieces. **Saliva**, produced in the mouth, acts to soften and moisten the small food particles. Saliva also contains an **enzyme** which starts the digestion of starch. The tongue helps by pushing the food toward the **esophagus**.

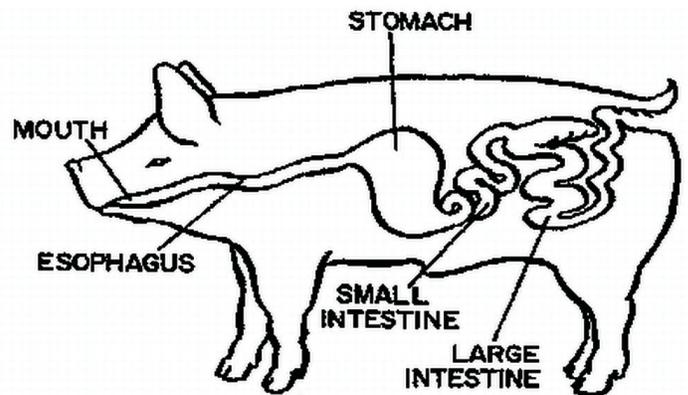


Figure 1.

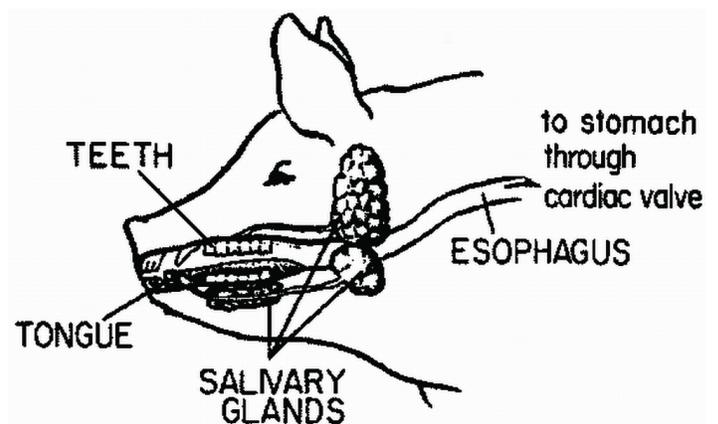


Figure 2.

The esophagus is a tube which carries the food from the mouth to the stomach. A series of muscle contractions push the food toward the stomach. Swallowing is the first of these contractions. At the end of the esophagus is the

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cardiac valve, which prevents food from passing from the stomach back into the esophagus.

The stomach is the next part of the digestive tract (Figure 3). It is a reaction chamber where chemicals are added to the food. Certain cells along the stomach wall secrete hydrochloric acid and enzymes. These chemicals help break down food into small particles of **carbohydrates**, **protein**, and **fats**. Some particles are absorbed from the stomach into the bloodstream. Other particles that the stomach cannot absorb pass on to the small intestine through the **pyloric valve**.

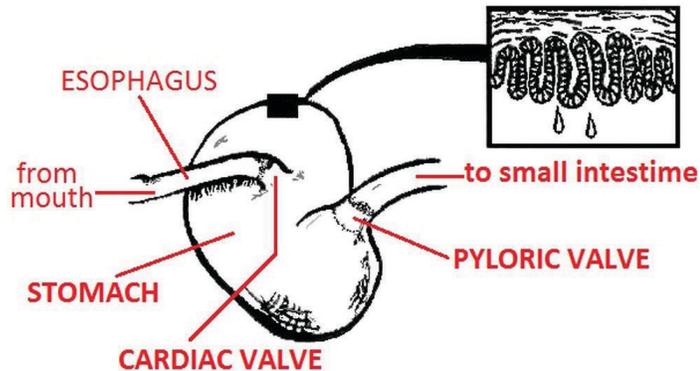


Figure 3.

The small intestine is a complex tube which lies in a spiral, allowing it to fit in a small space (Figure 4). Its wall has many tiny finger-like projections known as **villi**, which increase the absorptive area of the intestine. The cells along the small intestine's wall produce enzymes that aid digestion and absorb digested foods.

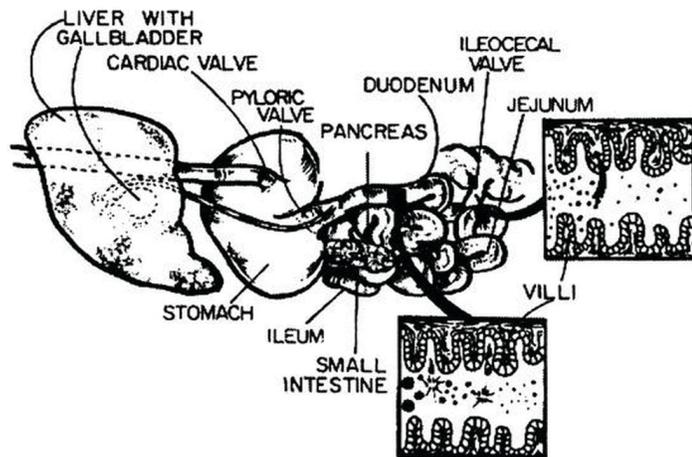


Figure 4.

At the first section of the small intestine (called the **duodenum**), secretions from the liver and pancreas are added. Secretions from the liver are stored in the gall bladder and pass into the intestine through the bile duct. These bile secretions aid in the digestion of fats.

Digestive juices from the pancreas pass through the pancreatic duct into the small intestine. These secretions contain enzymes that are vital to the digestion of fats, carbohydrates, and proteins.

Most food nutrients are absorbed in the second and third parts of the small intestine, called the **jejunum** and the **ileum**. Undigested nutrients and secretions pass on to the large intestine through the **ileocecal valve**.

A “blind gut” or **cecum** is located at the beginning of the large intestine (Figure 5). In most animals, the cecum has little function. However in animals such as the horse and rabbit, the cecum is very important in the digestion of fibrous feeds.

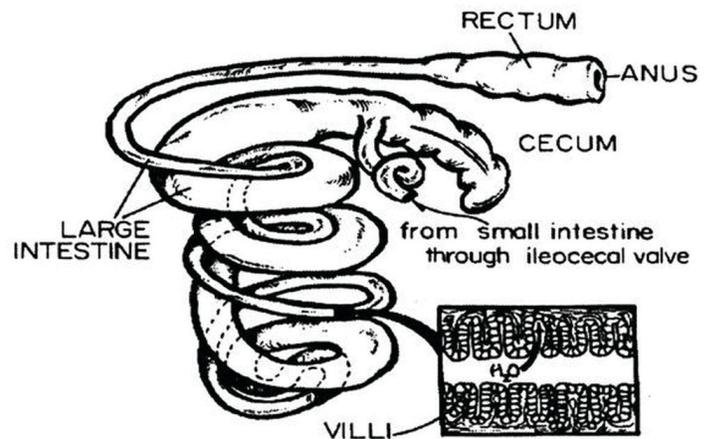


Figure 5.

The last major part of the digestive tract, the large intestine, is shorter, but larger in diameter than the small intestine. Its main function is the absorption of water. The large intestine is a reservoir for waste materials that make up the feces. Some digestion takes place in the large intestine. Mucous is added to the remaining food in the large intestine, which acts as a lubricant to make passage easier. Muscle contractions push food through the intestines. The terminal portion of the large intestine is called the **rectum**.

The **anus** is an opening through which undigested food passes out of the body. Food that enters the mouth and is not digested or absorbed as it passes down the digestive tract is excreted through the anus as feces.

This was a general discussion of the digestive tract of the pig. The tract acts to digest and absorb nutrients necessary for maintenance of cells and growth. Efficient absorption of nutrients depends on each segment of the digestive system functioning to its maximum capacity.

Figure 6 gives a summary of the digestive system of the pig. You may wish to test your knowledge by identifying the parts in Figure 7.

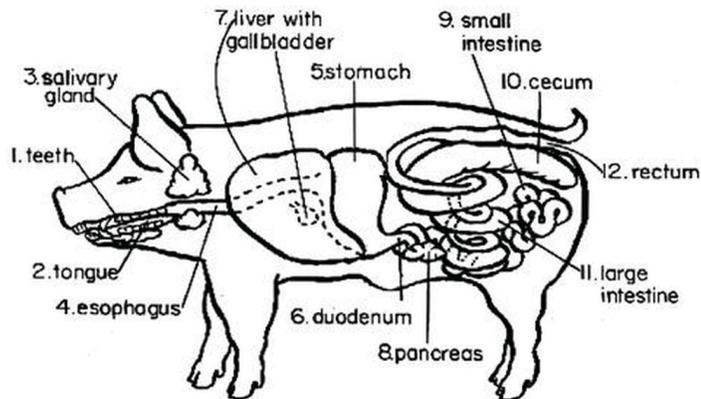


Figure 6.

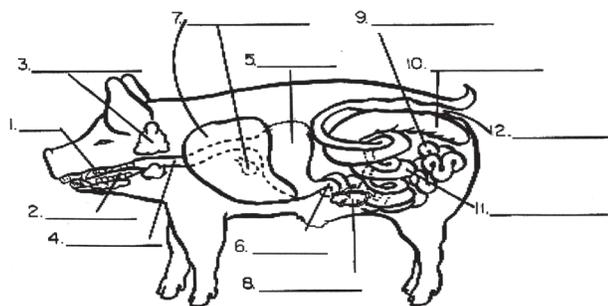


Figure 7. Test your knowledge by identifying the parts.

References are listed at the end of this publication. You can get additional information by referring to a farm animal anatomy book.

References

Advanced Livestock Science Manual, University of Illinois at Urbana, Champaign Cooperative Extension Service.

Swine Technology, Farm Science Services, Extension Bulletin 536, January, 1975 (Rev'd), Cooperative Extension Service, Michigan State University.

Glossary

Anus — the last part of the digestive tract through which undigested food passes out of the body

Bile — a secretion of the liver which aids in the digestion of fats

Bile Duct — a duct which carries bile from the gall bladder to the small intestine

Cardiac Valve — a valve which prevents food from passing from the stomach back up into the esophagus

Carbohydrates — the main nutrient that supplies energy to the body (starch and cellulose)

Cecum — a “blind gut” located between the ileum and the large intestine

Duodenum — the first section of the small intestine

Enzymes — substances that speed up chemical reactions within the body

Esophagus — a tube which carries food from the mouth to the stomach

Fats — energy nutrients which supply 2.25 times as much energy as carbohydrates.

Gall Bladder — a sac-like structure which serves as a storage compartment for bile

Ileocecal Valve — the valve separating the ileum and the cecum

Ileum — the terminal portion of the small intestine

Jejunum — the intermediate or middle portion of the small intestine

Liver — a gland in the body that performs a number of functions including the secretion of bile

Monogastric — having only one stomach (non-ruminant)

Pancreas — a gland which secretes digestive juices necessary for the digestion of fats, carbohydrates, and proteins.

Pancreatic Duct — a duct that carries secretions of the pancreas to the small intestine

Polygastric — having more than one stomach (ruminants)

Pyloric Valve — the valve separating the stomach and the small intestine

Proteins — the nutrients that supply the building materials from which body tissue and many body regulators are made

Rectum — the terminal portion of the large intestine

Saliva — a watery, mucoid secretion of the salivary glands in the mouth that lubricates the food and aids in digestion

Villi — tiny finger-like projections located along the wall of the small intestine that aid in food absorption