

PEER Life Science Organ Systems Digestion Notes Outline

Why It Matters

- The main purpose of the digestive system is to provide the body with [nutrients](#), including
 - [water](#)
 - [proteins](#)
 - [carbohydrates](#)
 - [lipids](#)
 - [vitamins](#)
 - [minerals](#)
- The two main ways that the stomach breaks down proteins into amino acids are [acidic stomach juice](#) and [enzymes](#)
- [Bile](#) is secreted by the liver and helps separate fats so they can be broken down by enzymes and absorbed.
- Insulin is secreted by the [pancreas](#) and is involved in a disease called [diabetes](#).

What We Know

- Food first enters the body through the [mouth](#) where [saliva](#) begins to break down carbohydrates.
- The [esophagus](#) pushes food down into the stomach with muscular contractions.
- Bile is produced by the [liver](#) and is stored in the [gall bladder](#).

- The [pancreas](#) helps digest carbohydrates, proteins, and fats as well as regulates blood sugar.
- The [small](#) intestine breaks down and absorbs proteins, carbohydrates, and fats. The [large](#) intestine absorbs moisture from what is left of the food.
- The final storage space before waste is removed is the [rectum](#).
- Food stays in the [stomach](#) for 4-6 hours, the [small intestine](#) for 2-4 hours, and the [large intestine](#) for 24-48 hours
- The [pharynx](#) has openings that go into the lungs and to the esophagus/stomach.
- The [epiglottis](#) is the structure that covers the opening of the trachea and prevents food from entering the lungs.
- The body has a normal pH of [7.2](#). The stomach has a pH of [2.5 or 2](#).
- The stomach secretes [mucous](#) to protect the lining of the stomach and prevent ulcers.
- The pH of the small intestine is [higher](#) than the stomach.
- In addition to making bile, the liver:
 - Processes [carbohydrates](#), [fats](#), and [proteins](#) absorbed by the small intestine.
 - Breaks down hormones, [drugs](#), and [toxins](#)
 - Makes the proteins in blood responsible for [clotting](#)
- The pancreas releases [insulin](#) when blood sugar is high and [glucagon](#) when blood sugar is low.

- The large intestine removes [fluid](#) and [salt](#) from solid waste and stores [feces](#).
- The large intestine has many beneficial [bacteria](#) that aid in fermentation and produce vitamin K.

How We Know

- A cow's stomach has [four \(4\)](#) compartments.
- [Enzymes](#) in your saliva break down carbohydrates.
- Dr. Beaumont noted that [proteins](#) were especially degraded by acids in the stomach.
- The liver is a nutrient [storage](#) organ that releases stores as needed.
- The gall bladder [is not](#) necessary for life
- The pancreas secretes two hormones into blood
 - [Insulin](#) - triggers cells to absorb sugar from blood
 - [Glucagon](#) - triggers cells to release sugar into blood
- There are two ducts that connect the pancreas and the [small intestine](#).
- The [portal vein](#) collects all of the blood leaving the small intestine and has high amounts of carbohydrates and amino acids.
- Fats from the small intestine are absorbed through [lymphatic](#) vessels.
- Blood leaving the large intestine has more [water](#) and [salt](#) than the blood entering the large intestine.

- [Bacteria](#) can break down certain foods that humans cannot.
- Vitamin K is needed for normal blood [clotting](#).

Common Hazards

- Ulcers
 - A lesion in the mucus lining of the stomach or duodenum is called a peptic [ulcer](#).
 - Causes of ulcers include
 - a [bacteria](#) called *Helicobacter pylori*
 - long term use of [NSAIDs](#)
 - a disease called Zollinger-Ellison syndrome that causes tumors that release hormones that causes large amounts of [acid](#) to be produced.
- Food Poisoning
 - Symptoms of food poisoning are
 - [nausea](#)
 - [vomiting](#)
 - [abdominal cramps](#)
 - [fever](#)
 - [diarrhea](#)
 -

- Food poisoning can be avoided by
 - [Washing](#) your hands
 - [Cleaning](#) kitchen tools
 - [Washing](#) fruits and vegetables
 - [Cooking](#) food thoroughly
 - Refrigerating leftovers within [2](#) hours

Fill in the blanks labeling the digestive system. (Source: NIH NIDDK)

The Digestive System

