



What is the digestive system?

The digestive system is made up of the gastrointestinal tract—also called the GI tract or digestive tract—and the liver, pancreas, and gallbladder. The GI tract is a series of hollow organs joined in a long, twisting tube from the mouth to the anus. The hollow organs that make up the GI tract are the mouth, esophagus, stomach, small intestine, large intestine, and anus. The liver, pancreas, and gallbladder are the solid organs of the digestive system.

The small intestine has three parts. The first part is called the duodenum. The jejunum is in the middle and the ileum is at the end. The large intestine includes the appendix, cecum, colon, and rectum. The appendix is a finger-shaped pouch attached to the cecum. The cecum is the first part of the large intestine. The colon is next. The rectum is the end of the large intestine.

Bacteria in your GI tract, also called gut flora or microbiome, help with digestion. Parts of your nervous and circulatory NIH external link systems also help. Working together, nerves, hormones, bacteria, blood, and the organs of your digestive system digest the foods and liquids you eat or drink each day.

Why is digestion important?

Digestion is important because your body needs nutrients from food and drink to work properly and stay healthy. Proteins, fats, carbohydrates, vitamins, minerals, and water are nutrients. Your digestive system breaks nutrients into parts small enough for your body to absorb and use for energy, growth, and cell repair.

- Proteins break into amino acids
- Fats break into fatty acids and glycerol
- Carbohydrates break into simple sugars

MyPlate offers ideas and tips to help you meet your individual health needs.

How does my digestive system work?

Each part of your digestive system helps to move food and liquid through your GI tract, break food and liquid into smaller parts, or both. Once foods are broken into small enough parts, your body can absorb and move the nutrients to where they are needed. Your large intestine absorbs water, and the waste products of digestion become stool. Nerves and hormones help control the digestive process.

How does food move through my GI tract?

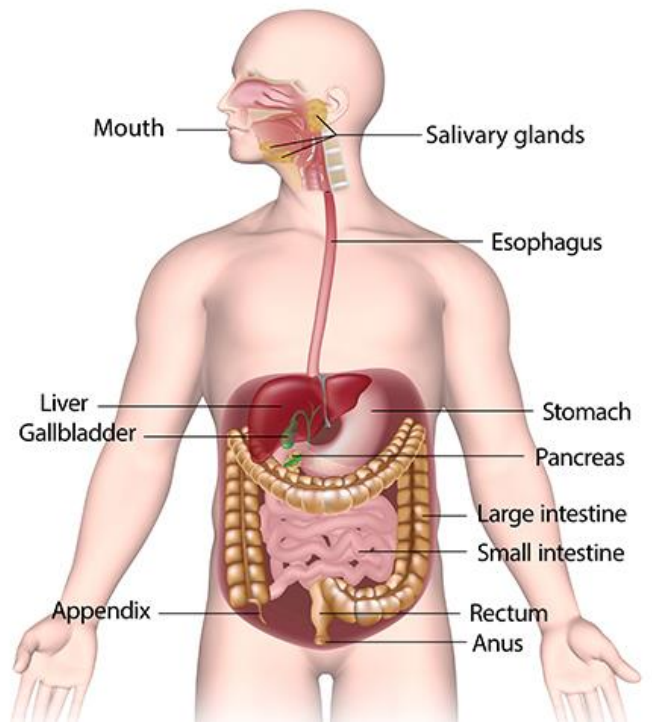
Food moves through your GI tract by a process called peristalsis. The large, hollow organs of your GI tract contain a layer of muscle that enables their walls to move. The movement pushes food and liquid through your GI tract and mixes the contents within each organ. The muscle behind the food contracts and squeezes the food forward, while the muscle in front of the food relaxes to allow the food to move.

Mouth. Food starts to move through your GI tract when you eat. When you swallow, your tongue pushes the food into your throat. A small flap of tissue, called the epiglottis, folds over your windpipe to prevent choking and the food passes into your esophagus.

Esophagus. Once you begin swallowing, the process becomes automatic. Your brain signals the muscles of the esophagus and peristalsis begins.

Lower esophageal sphincter. When food reaches the end of your esophagus, a ring like muscle—called the lower esophageal

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sphincter —relaxes and lets food pass into your stomach. This sphincter usually stays closed to keep what's in your stomach from flowing back into your esophagus.

Stomach. After food enters your stomach, the stomach muscles mix the food and liquid with digestive juices. The stomach slowly empties its contents, called chyme, into your small intestine.

Small intestine. The muscles of the small intestine mix food with digestive juices from the pancreas, liver, and intestine, and push the mixture forward for further digestion. The walls of the small intestine absorb water and the digested nutrients into your bloodstream. As peristalsis continues, the waste products of the digestive process move into the large intestine.

Large intestine. Waste products from the digestive process include undigested parts of food, fluid, and older cells from the lining of your GI tract. The large intestine absorbs water and changes the waste from liquid into stool. Peristalsis helps move the stool into your rectum.

Rectum. The lower end of your large intestine, the rectum, stores stool until it pushes stool out of your anus during a bowel movement.

The digestive process

Organ	Movement	Digestive Juices Added	Food Particles Broken Down
Mouth	Chewing	Saliva	Starches, a type of carbohydrate
Esophagus	Peristalsis	None	None
Stomach	Upper muscle in stomach relaxes to let food enter, and lower muscle mixes food with digestive juice	Stomach acid and digestive enzymes	Proteins
Small intestine	Peristalsis	Small intestine digestive juice	Starches, proteins, and carbohydrates
Pancreas	None	Pancreatic juice	Carbohydrates, fats, and proteins
Liver	None	Bile	Fats
Large intestine	Peristalsis	None	Bacteria in the large intestine can also break down food.

How does my digestive system break food into small parts my body can use?

As food moves through your GI tract, your digestive organs break the food into smaller parts using:

- motion, such as chewing, squeezing, and mixing
- digestive juices, such as stomach acid, bile, and enzymes

Mouth. The digestive process starts in your mouth when you chew. Your salivary glands make saliva, a digestive juice, which moistens food so it moves more easily through your esophagus into your stomach. Saliva also has an enzyme that begins to break down starches in your food.

Esophagus. After you swallow, peristalsis pushes the food down your esophagus into your stomach.

Stomach. Glands in your stomach lining make stomach acid and enzymes that break down food. Muscles of your stomach mix the food with these digestive juices.

Pancreas. Your pancreas makes a digestive juice that has enzymes that break down carbohydrates, fats, and proteins. The pancreas delivers the digestive juice to the small intestine through small tubes called ducts.

Liver. Your liver makes a digestive juice called bile that helps digest fats and some vitamins. Bile ducts carry bile from your liver to your gallbladder for storage, or to the small intestine for use.

Gallbladder. Your gallbladder stores bile between meals. When you eat, your gallbladder squeezes bile through the bile ducts into your small intestine.

Small intestine. Your small intestine makes digestive juice, which mixes with bile and pancreatic juice to complete the breakdown of proteins, carbohydrates, and fats. Bacteria in your small intestine make some of the enzymes you need to digest carbohydrates. Your small intestine moves water from your bloodstream into your GI tract to help break down food. Your small intestine also absorbs water with other nutrients.

Large intestine. In your large intestine, more water moves from your GI tract into your bloodstream. Bacteria in your large

intestine help break down remaining nutrients and make vitamin K [NIH external link](#). Waste products of digestion, including parts of food that are still too large, become stool.

What happens to the digested food?

The small intestine absorbs most of the nutrients in your food, and your circulatory system passes them on to other parts of your body to store or use. Special cells help absorbed nutrients cross the intestinal lining into your bloodstream. Your blood carries simple sugars, amino acids, glycerol, and some vitamins and salts to the liver. Your liver stores, processes, and delivers nutrients to the rest of your body when needed.

The lymph system, a network of vessels that carry white blood cells and a fluid called lymph throughout your body to fight infection, absorbs fatty acids and vitamins.

Your body uses sugars, amino acids, fatty acids, and glycerol to build substances you need for energy, growth, and cell repair.

How does my body control the digestive process?

Your hormones and nerves work together to help control the digestive process. Signals flow within your GI tract and back and forth from your GI tract to your brain.

Hormones

Cells lining your stomach and small intestine make and release hormones that control how your digestive system works. These hormones tell your body when to make digestive juices and send signals to your brain that you are hungry or full. Your pancreas also makes hormones that are important to digestion.

Nerves

You have nerves that connect your central nervous system—your brain and spinal cord—to your digestive system and control some digestive functions. For example, when you see or smell food, your brain sends a signal that causes your salivary glands to "make your mouth water" to prepare you to eat.

You also have an enteric nervous system (ENS)—nerves within the walls of your GI tract. When food stretches the walls of your GI tract, the nerves of your ENS release many different substances

that speed up or delay the movement of food and the production of digestive juices. The nerves send signals to control the actions of your gut muscles to contract and relax to push food through your intestines.

Clinical Trials

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and other components of the National Institutes of Health (NIH) conduct and support research into many diseases and conditions.

What clinical trials are open?

Clinical trials that are currently open and are recruiting can be viewed at www.ClinicalTrials.gov.

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The International Foundation for Gastrointestinal Disorders (IFFGD) is a 501(c)(3) nonprofit education and research organization. We work to promote awareness, scientific advancement, and improved care for people affected by chronic digestive conditions. Our mission is to inform, assist, and support people affected by gastrointestinal disorders. Founded in 1991, we rely on donors to carry out our mission. Visit our website at: www.iffgd.org or www.aboutIBS.org.

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