The digestive system breaks down and absorbs nutrients the body needs to survive.

The digestive system’s six functions are **ingestion**, **motility**, **secretion**, **digestion**, **absorption**, and **elimination**.
To survive and perform its functions, the body needs specific macromolecules (proteins, carbohydrates, and lipids) as well as water, vitamins, and minerals.

The digestive system breaks the macromolecules down into smaller molecules the body can use. **Carbohydrates** break down from polysaccharides and disaccharides into monosaccharides (like glucose), **lipids** break down from triglycerides into fatty acids and glycerol molecules, and **proteins** break down into amino acids.
The muscular system plays a key role in digestion. Peristalsis is the name for the involuntary muscle movements that keep food moving through your intestines.

Ring-like muscles called sphincters serve as “gates” between different parts of the digestive system.

Factoid!
Muscle movements in the digestive system are controlled by the enteric nervous system (ENS), a part of the autonomic nervous system (ANS).
The gastrointestinal tract (GI Tract), also referred to as the digestive tract or alimentary canal, includes the oral cavity, pharynx, esophagus, stomach, small intestine, large intestine, and anus.

The accessory digestive organs (salivary glands, liver, gallbladder, and pancreas) work in conjunction with the GI tract. The teeth and tongue allow us to mechanically break down and swallow our food.
THE ORAL CAVITY

The mouth is where ingestion happens. Food and drink enter the GI tract through the oral cavity.

The teeth break solids into smaller pieces and the salivary glands secrete enzymes that begin breaking down the food.

The tongue begins the swallowing process by pushing the saliva-covered food (bolus) against the hard palate and towards the oropharynx.
In the pharyngeal phase of swallowing (involuntary), the oropharynx, the soft palate, and uvula close off the nasopharynx, starting the swallowing reflex.

In the esophageal phase (involuntary), muscle contractions in the esophagus take the bolus to the stomach. This takes five to eight seconds.

**Factoid!**
The transition from the pharynx to the esophagus takes only one second.
The stomach is where the bolus is mixed with gastric juice to form chyme.

The stomach’s interior is extremely acidic. It also contains an enzyme called pepsin, which helps with the breakdown (digestion) of proteins.

Ingested nutrients typically spend two to six hours in the stomach.

Factoid!
Acid reflux (aka gastroesophageal reflux or heartburn) occurs when acid from the stomach escapes back up into the esophagus.
The main digestive function of the liver is to produce bile, which aids in the mechanical digestion of lipids in the small intestine, allowing for more efficient chemical digestion of triglycerides.

The gallbladder stores, concentrates, and releases bile that the liver produces.

**Factoid!**
You can live without a gallbladder! Cholecystectomy (gallbladder removal) is a common surgical procedure for patients with painful gallstones.
The pancreas has exocrine and endocrine cells.

The endocrine cells produce and secrete hormones such as insulin, which helps regulate blood glucose levels, and glucagon, which helps the liver convert glycogen to glucose.

The exocrine cells produce digestive enzymes in a pancreatic juice to assist with digestive activities for proteins, carbohydrates, and fats.
Chyme moves from the stomach into the small intestine, where it spends about 12 hours. The small intestine has three sections: the duodenum, the jejunum, and the ileum.

In the small intestine, secretions from the accessory glands further the breakdown of macromolecules. The products of this breakdown are absorbed along with vitamins, minerals, and water. Blood vessels in the walls of the small intestine carry absorbed nutrients to the liver via the hepatic portal vein.
The small intestine empties into the large intestine (colon), where the remainder of absorption of water, electrolytes, and vitamins occurs.

The remaining undigested food is converted into a solid called feces, which moves through the large intestine and the rectum and is ultimately eliminated (leaves the body) through the anus.

“Food” spends about 6 hours in the colon.
Attached to the cecum is a tiny organ called the appendix.

Though its function is largely vestigial, the appendix interacts with the digestive system by serving as a reservoir for gut bacteria. Research has also shown that the appendix plays a role in the immune system in adults and the endocrine system in embryos.

If it becomes infected, the appendix is usually removed. Like the gallbladder and tonsils, many people live without it.
Enter a world of anatomy like you’ve never seen it before—in dazzling, interactive 3D!

Visible Body

Browse our suite of 3D anatomy and physiology apps

3D Teaching Tools for Instructors

3D Study Resources for Students