# Human Body: Digestion — Pathway and Enzymes

## Fill in the blanks below with the following words. Use each word only once.

| | | | | | |
|---|---|---|---|---|---|
| steroids | glycogen | sucrose | polysaccharides | glycerol | 3 |
| triglycerides | 20 | monosaccharides | digestion | fructose | fatty acid chains |
| carbohydrates | proteins | glucose | lipids | amino acids | disaccharides |

_____ is the process of breaking down food into nutrients that can be absorbed and used by your body. Three major macromolecules that we digest are_____, _____, and_____. All macromolecules must be broken down into their smaller components in order to be absorbed.

The simplest carbohydrates are _____, single sugar molecules. _____ and _____ need to be broken down into monosaccharides before they can be absorbed. For example, _____ (table sugar) is a disaccharide that's broken down into _____ and _____. Starch, _____, and cellulose all are polysaccharides. Carbohydrates are used for energy, energy storage, and in structural components of cells.

Lipids are macromolecules composed of _____ and _____. Fats, typically referred to as _____, are a group of lipids composed of a glycerol molecule attached to _____ fatty acid chains. Other lipids found in the body include phospholipids and _____. Lipids are used in energy storage, cellular membrane construction, and cell signaling.

Proteins are polymers of _____. The same _____ amino acids make up all proteins, but their shapes and functions vary. There are enzymatic proteins that catalyze reactions, structural proteins that provide support, storage proteins, transport proteins, and many more.

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## Fill in the blanks below with the following words. Use each word only once.

| | | | | | |
|---|---|---|---|---|---|
| bolus | protein | liver | polypeptides | enzymes | mastication |
| chemical | stomach | chymotrypsin | pancreatic amylase | large intestine | peristalsis |
| chyme | gall bladder | pepsin | mechanical | pancreas | acids |
| lipase | amylase | small intestine | rectum | hydrochloric | trypsin |

There are 2 major kinds of digestion. _____ digestion involves the physical breakdown of food, and _____ digestion involves the further breakdown of that food into soluble nutrients using _____ and _____. When food enters the mouth, mechanical digestion begins with _____ (chewing). Chemical digestion also begins in the mouth when saliva mixes with food. _____ is a salivary enzyme that breaks down starches.

After being chewed and swallowed, the mass of partially digested food, called the _____, enters the esophagus. By the action of _____, a series of involuntary muscle relaxations and contractions, it travels through the esophagus to the _____. Here, chemical digestion of _____ begins. Gastric juice containing the enzyme _____ and _____ acid breaks down proteins into _____.



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Peristalsis continues along the stomach wall until liquid _____ is formed. As the liquid enters the small intestine, it mixes with enzymes from the _____ and bile produced by the _____. The pancreatic enzymes _____ and _____ further hydrolyze proteins. Starches in the small intestine are broken down by _____, which has the same function as salivary amylase.

Bile that was temporarily stored in the _____ emulsifies lipids. To complete digestion, pancreatic _____ acts on the lipids to produce glycerides and free fatty acids. The majority of nutrients can now be absorbed by the _____. Leftover material is passed through the _____. As water is absorbed, solid stool forms. The stool is emptied into the _____ and then eliminated from the body as waste.

## Related Kit

Delve further into the roles that enzymes play in digestion with Carolina BioKits®: Digestion.



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# Human Body: Digestion — Pathway and Enzymes Key

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| steroids | glycogen | sucrose | polysaccharides | glycerol | 3 |
| triglycerides | 20 | monosaccharides | digestion | fructose | fatty acid chains |
| carbohydrates | proteins | glucose | lipids | amino acids | disaccharides |

Digestion is the process of breaking down food into nutrients that can be absorbed and used by your body. Three major macromolecules that we digest are carbohydrates, proteins, and lipids. All macromolecules must be broken down into their smaller components in order to be absorbed.

The simplest carbohydrates are monosaccharides, single sugar molecules. Polysaccharides and disaccharides need to be broken down into monosaccharides before they can be absorbed. For example, sucrose (table sugar) is a disaccharide that's broken down into glucose and fructose. Starch, glycogen, and cellulose all are polysaccharides. Carbohydrates are used for energy, energy storage, and in structural components of cells.

Lipids are macromolecules composed of glycerol and fatty acid chains. Fats, typically referred to as triglycerides, are a group of lipids composed of a glycerol molecule attached to 3 fatty acid chains. Other lipids found in the body include phospholipids and steroids. Lipids are used in energy storage, cellular membrane construction, and cell signaling.

Proteins are polymers of amino acids. The same 20 amino acids make up all proteins, but their shapes and functions vary. There are enzymatic proteins that catalyze reactions, structural proteins that provide support, storage proteins, transport proteins, and many more.

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| chemical | stomach | chymotrypsin | pancreatic amylase | large intestine | peristalsis |
| chyme | gall bladder | pepsin | mechanical | pancreas | acids |
| lipase | amylase | small intestine | rectum | hydrochloric | trypsin |

There are 2 major kinds of digestion. Mechanical digestion involves the physical breakdown of food, and chemical digestion involves the further breakdown of that food into soluble nutrients using enzymes and acids. When food enters the mouth, mechanical digestion begins with mastication (chewing). Chemical digestion also begins in the mouth when saliva mixes with food. Amylase is a salivary enzyme that breaks down starches.

After being chewed and swallowed, the mass of partially digested food, called the bolus, enters the esophagus. By the action of peristalsis, a series of involuntary muscle relaxations and contractions, it travels through the esophagus to the stomach. Here, chemical digestion of protein begins. Gastric juice containing the enzyme pepsin and hydrochloric acid breaks down proteins into polypeptides.



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# Human Body: Digestion — Pathway and Enzymes Key

Peristalsis continues along the stomach wall until liquid chyme is formed. As the liquid enters the small intestine, it mixes with enzymes from the pancreas and bile produced by the liver. The pancreatic enzymes trypsin and chymotrypsin further hydrolyze proteins. Starches in the small intestine are broken down by pancreatic amylase, which has the same function as salivary amylase.

Bile that was temporarily stored in the gall bladder emulsifies lipids. To complete digestion, pancreatic lipase acts on the lipids to produce glycerides and free fatty acids. The majority of nutrients can now be absorbed by the small intestine. Leftover material is passed through the large intestine. As water is absorbed, solid stool forms. The stool is emptied into the rectum and then eliminated from the body as waste.

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