Digestion is the process of breaking down large food molecules into smaller ones. This involves the digestive system, which breaks down the nutrients obtained from food into a form that body cells can absorb and that can be used to form ATP and body tissue. Below is a concise overview of the physiology of digestion: from ingestion to the act of swallowing, to the digestive organs that are involved and to the absorption of carbohydrates, fats and proteins.
The Basic Stages of Digestion

The digestive system comprises 2 groups of organs:

- **Gastrointestinal tract (GI tract)**
- **Accessory (supportive) digestive organs**

The GI tract, also known as the alimentary canal, is about 9 m long in a cadaver. It is a continuous tube connecting the mouth to the anus.

The constituent elements of the GI tract are:

- Mouth
- Larger part of the pharynx
- Gullet (esophagus)
- Stomach
- Small intestine
- Colon

The accessory digestive organs include:

- Teeth
In addition to the teeth, which are designed to chew the food, and the tongue, which facilitate the chewing and swallowing processes, no other digestive organ ever comes into direct contact with the food. The other digestive organs generate and store vital secretions released into the GI tract and facilitate the chemical breakdown of food.

The digestive system performs 6 fundamental functions:

**Ingestion:** Ingestion refers to the processing of food and the intake of fluid orally. It includes the physiological events in the oral cavity as the food is chewed and ground by the teeth, the lubrication and chemical effects of saliva released by the salivary glands, and swallowing of the food for further digestion down the digestive tract.

**Secretion:** Seven liters of water, acid, buffers and enzymes are secreted into the lumen of the digestive tract every day.

**Mixing and moving:** The active movement (motility) of the GI tract, facilitated by alternating contraction and relaxation (peristalsis) propels the food combined with additional secretions towards the anus.

**Digestion:** During mechanical digestion, the food is ground before it is swallowed and churned intensely by the smooth muscles of the stomach and the small intestine. The mechanical digestion dissolves food mixed with digestive enzymes. During chemical digestion, carbohydrate, lipid, protein, and nucleic acid molecules are broken down into smaller molecules via hydrolysis, and are absorbed after further enzymatic digestion. Substances, such as vitamins and cholesterol, are absorbed by the body without chemical digestion.

**Resorption/Assimilation:** Resorption (resorber = absorb) is defined as the entry of digested and secreted fluid, ions, and products of digestion into the epithelial cells that fill the lumen of the GI tract. These substances reach the cells within the entire body via the blood and the lymph. Assimilation is the process by which components/chemicals from food are taken into the cells of the body following digestion and absorption.

**Defecation:** Defecation is the process, in which waste products, bacteria, undigested substances, or digested materials, which are not absorbed, are excreted via the anus. Material that has been eliminated in the process is defined as feces (a stool).
The layers and innervation of the GI tract

The wall of the GI tract consists of 4 layers—each having the same basic layout—starting from the lower esophagus to the anus.

Starting from the luminal to the outer surface, the layers of the GI tract include:

- **Mucosa**
- **Submucosa**
- **Muscularis**
- **Serosa**

The mucosa, the innermost layer of the GI tract, is a mucous membrane consisting of an epithelial layer, a layer of connective tissue, and a thin layer of smooth muscles.

The epithelium, the most exposed part of the mucosa, plays a protective role and contributes to secretion and resorption via a single-layered columnar epithelium. Exocrine cells are also located among the epithelial cells. They secrete mucus and fluid into the lumen (lat. = the inside of a cavity) of the GI tract. The epithelium contains the goblet cells, which are responsible for the secretion of mucus. The mucus lubricates the passage of food along and protects the intestinal wall from digestive enzymes.

The connective tissue layer or lamina propria (lat. lamina = thin, flat layer; propria = intrinsically) contains several blood and lymph vessels. The lamina propria ensures that nutrients absorbed into the GI tract reach the other tissues in the body. In addition, this layer also includes the majority of mucosa-associated lymphoid tissue (MALT) cells, which initiate immune responses to antigens on the mucosal surfaces.

The muscularis mucosae, a thin layer of smooth muscle fibers, increase the surface area for digestion and resorption. It ensures that all resorbing cells are exposed to the contents of the GI tract.

The villi, small folds of mucosa found in the small intestine aid the digestive system by increasing the surface area of the intestine. Additionally, the villi contain a lacteal, a vessel-like tube connected to the lymph system that facilitates the removal of lipids as well as tissue fluids.

The submucosa consists of a network of loose elastic fibers that appear prominent due
to the numerous fenestrations (areolar connective tissue). The submucosa links the mucosa to the muscularis. It consists of numerous blood and lymph vessels, which absorbed the nutrients in the digested food. The submucosa is characterized by the Meissner plexus, an extensive network of neurons. It also contains glands and lymphatic tissue.

The muscularis, which consists of a skeleton and smooth muscle fibers, also belongs to the GI tract. The voluntary swallowing phase is generated by the oral, pharyngeal, and the upper and middle esophageal muscle fibers of the muscularis. Further, the control of defecation is facilitated by the skeletal muscles forming the external anal sphincters. The remainder of the GI tract consists of smooth musculature, characterized by an inner layer of annular fibers and an outer layer of longitudinal fibers. This musculature helps to break down food, mix digestive secretions and propel food through the tract. The second plexus of neurons, the Auerbach’s (myenteric) plexus, is located between the layers of the muscularis.

The serosa (if the tissue is intraperitoneal)/adventitia (if the tissue is retroperitoneal), also called the surface layer, is a serous membrane derived from areolar connective tissue and single-layered squamous epithelium. The surface layer of the esophagus is formed by a single layer of areolar connective tissue (adventitia), which is absent in the serosa.

The GI tract is regulated by internal and external nerves:

- The intrinsic nervous system of the intestinal wall/the enteric nervous system (ENS)
- The autonomic nervous system

The ENS is ‘the gut’s own brain’, with about 100 million neurons, which extend from the esophagus to the anus. The Auerbach’s plexus, or plexus myentericus, and the Meissner plexus, also called the plexus submucosus, constitute the nervous system of the intestinal wall.

The Auerbach’s plexus controls the motility of the GI tract as well as the frequency and strength of muscularis contractions. The motor neurons of the plexi supply the longitudinal and circular muscle layers of the muscularis. The Meissner plexus, however, innervates the secreting cells of the mucosa epithelium via motor neurons, and thereby controls the secretion of the organs in the GI tract.

The nerve cells of the intestinal wall operate independently but are subject to regulation by the neurons of the autonomic nervous system. The secretions from the GI tract as well as its motility are increased by the parasympathetic fibers of the vagus nerve (cranial nerve X) and of the pelvic splanchnic nerves, resulting in enhanced activity of the ENS neurons. The sympathetic fibers, however, have exactly the opposite effect. Originating in the thoracic and upper lumbar regions of the spinal cord, they decrease both GI secretion and motility by inhibiting the neurons of the ENS.

Note: Parasympathetic fibers increase whereas sympathetic fibers inhibit the activity of neurons in the ENS.

Swallowing is a Component of Digestion

During swallowing, the food is moved from the mouth to the stomach after digestion with saliva, which dissolves the food. The processed food is sensed by the taste receptors to restart the chemical reactions involved in the process of digestion.
Saliva consists of about 99.5% water and 0.5% dissolved substances such as sodium, potassium, chloride, or bicarbonate ions in addition to dissolved gases. Various organic substances such as urea, uric acid, mucus, and immunoglobulin, in addition to salivary amylase, a digestive enzyme that cleaves starch, are also found.

Salivary secretion is controlled by the autonomic nervous system in the mouth, the throat, and the esophagus. The amount of saliva secreted everyday ranged from 1,000 to 1,500 mL, which facilitates the swallowing process. Swallowing occurs in 3 stages:

1. **Voluntary phase**
2. **Pharyngeal phase**
3. **Esophageal phase**

The **voluntary phase** of swallowing begins when the bolus is moved up and down by the tongue and is forced against the palate in the posterior oral cavity and in the oropharynx.

The **involuntary phase** starts with the entry of the bolus into the oropharynx. The receptors of the oropharynx, stimulated by the bolus, transmit impulses to the swallowing center in the medulla oblongata and the lower pons of the brain stem. The returning impulses induce the upward movement of the soft palate and the uvula, and to close the nasopharynx, which prevents the swallowed food and fluid from getting into the nasal cavity. Additionally, the epiglottis closes the laryngeal opening in a reflex reaction, thereby preventing the bolus from entering the trachea. Once the **esophageal sphincter** is relaxed, the bolus enters the esophagus.

The **esophageal phase** of swallowing begins when the bolus enters the esophagus. The esophageal peristalsis propels the bolus in the gastric direction via controlled contraction and relaxation of the circular and longitudinal muscles. The contraction moves in waves and pushes the food into the stomach when the lower esophageal sphincter relaxes. The mucus helps in case of slippage and reduces the friction.

This article provides a detailed overview of the oral cavity, the beginning of the digestive tract.
Food Processing in the Stomach

The stomach connects the esophagus with the duodenum. Once the food reaches the stomach, wavy movements, also called mixing waves, occur every 15–25 seconds. The food is macerated (soaked and softened) by these movements and converted to chyme by gastric gland secretions.

The mixing waves increase in strength when the chyme reaches the pylorus, the end of the stomach, followed by emptying of the food into the duodenum. The process is known as ‘gastric emptying’ at the point when the food reaches the pylorus. Each mixing wave periodically pushes a small portion of the chyme through the pyloric sphincter. The remaining amount is pushed back into the corpus of the stomach. Constant forward and backward movements ensure adequate mixing within the stomach.

Due to the strong movements, the chyme is mixed with the acidic gastric juice. The salivary amylase is inactivated and the tongue lipase is activated, which then degrades the triglycerides into fatty acids and diglycerides.

A number of microbes taken in with food are killed by the highly acidic gastric fluid. Proteins in the food are partially denatured by hydrochloric acid (HCl). The HCl stimulates the secretion of hormones, which promote the flow of bile and pancreatic juice.

Pepsin is a digestive gastric enzyme that is secreted by the main cells of the stomach. Pepsin is most effective in a very acidic environment (pH 2). As a peptidase, it is responsible for the breakdown of ingested proteins. To prevent the digestion of internal proteins of the stomach cells along with the food, pepsin is secreted in an inactive form, as pepsinogen. When pepsinogen comes into contact with hydrochloric acid, secreted by the parietal cells, pepsin is activated.

Parietal cells are also necessary for the absorption of vitamin B12, which is used for red blood cell formation.

Another important gastric enzyme produced by the main cells is gastric lipase, which cleaves triglycerides into fatty acids and monoglycerides. It works best at a pH ranging between 5 and 6.

Of greater significance than the tongue and gastric lipase is pancreatic lipase, an enzyme released into the small intestine by the pancreas.

Only a small amount of food – such as water, certain medications (aspirin), and alcohol – is absorbed in the stomach, since the epithelial cells are impermeable to most substances.

Within a few hours of food intake, the stomach will have emptied its contents into the duodenum. Carbohydrates spend the least time in the stomach. By contrast, food with high protein content, such as meat, remains in the stomach a little longer. The slowest gastric emptying occurs in the case of fatty foods.

Note: Pepsin is required for protein absorption in the stomach.

Food Processing in the Duodenum, Plus Pancreatic
Secretion and Bile

The chyme travels from the stomach into the small intestine, starting from the duodenum, passing through the jejunum, and ending in the ileum.

The papilla of Vater is found in the middle of the duodenum is the point where the dilated junction of the bile and pancreatic ducts (ampulla of Vater) enter the duodenum.

Further digestive enzymes are released from the pancreas and the gall bladder to process the acidic chyme. These enzymes are released into the duodenum, and the acidic chyme is simultaneously neutralized via alkaline secretions.

The whole process is triggered when the acidic chyme contacts the intestinal mucosa. The mucosa then produces 2 hormones, secretin, and cholecystokinin-pancreozymin (CCK).

CCK triggers the release of pancreatic enzymes into the bloodstream, which ensures a rhythmic contraction of the gall bladder and stimulation of bile secretion within the liver. The bile is increasingly released into the duodenum via the bile duct.

Composition of the pancreatic juice

Every day, the pancreas produces about 1200–1500 mL of pancreatic juice, characterized by clear, colorless fluid.

It mainly consists of water, a little salt, sodium carbonate, and a few enzymes.

Sodium carbonate in the pancreatic juice increases the alkaline pH value slightly, which activates the digestive enzymes in the small intestine.
- Pancreatic amylase—a starch-digesting enzyme
- Trypsin, chymotrypsin, carboxypeptidase, and elastase—protein-digesting enzymes
- Pancreatic lipase—the most important triglyceride-digesting enzyme
- Ribonuclease and desoxyribonuclease—nucleic acid-digesting enzymes.

As already mentioned, the excretory gall duct also drains into the duodenum.

**The composition of bile**

Hepatocytes (liver cells) secrete about 1 L of bile daily, which is associated with an alkaline pH of 7.5–8.6.

The yellow, brownish, or olive liquid is composed of:

- Water
- Bile salts
- Cholesterol
- Lecithin—phospholipid
- Bile pigments
- Ions

**Bilirubin** is the main pigment in bile, which is secreted in the gall bladder and degraded in the intestine. **Stercobilin** is a degradation product of bilirubin, which gives the stool its normal brown color.

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Image: Liver showing canalicular accumulation of bilirubin pigment. By Department of Pathology, Calicut Medical College, License: CC BY-SA 4.0

Bile is not only an **excretory product** but also a digestive secretion.
Bile plays a key role in the emulsification, i.e., the degradation of large fat globules into a suspension (lat. suspendere = suspend) of smaller fat globules. The larger surface area offered by the smaller fat globules enables the rapid digestion of triglycerides by the pancreatic lipase.

Following the digestion of fat, the bile salts facilitate fat absorption.

**Digestion of Food in the Small Intestine**

By the time it gets into the small intestine, the chyme contains partly digested carbohydrates, along with proteins and lipids. Salivary amylase converts starch to maltose, maltotriose, and α-dextrins in the mouth. Further, pepsin converts proteins into peptides (small protein fragments), whereas lingual and gastric lipases convert a few triglycerides into fatty acids.

The combined activity of pancreatic juice, bile, and intestinal juice in the small intestine—which contains water and mucus and is slightly alkaline—completes the digestion of carbohydrates, proteins, and lipids.

**Digestion of carbohydrates**

As mentioned earlier, the digestion of carbohydrates begins in the mouth. However, the acidic gastric pH in the stomach eliminates the effect of salivary amylase, which becomes inactive once the food reaches the stomach.

The remaining starch is cleaved into maltose, maltotriose, and α-dextrins by pancreatic amylase, an enzyme in pancreatic juice that is activated in the small intestine. A brush border enzyme, α-dextrinase, acts on the resulting α-dextrins by splitting off a glucose unit each time starch is separated into small fragments.

Carbohydrate digestion ends with the production of monosaccharides, which are subsequently absorbed by the body.

Three disaccharide molecules are supplied by food: sucrose (beet sugar), lactose (the sugar found in milk), and maltose (malt sugar).

- **Brush border enzymes** digest disaccharides to monosaccharides
- **Sucrase** cleaves sucrose into glucose and fructose
- **Lactase** digests lactose into glucose and galactose
- **Maltase** digests maltose and maltotriose into two to three glucose molecules

**The digestion of protein**

As we already know, protein digestion starts with the action of pepsin, which degrades proteins into peptides in the stomach.

Digestion of protein into peptides continues via enzymes in the pancreatic juice—trypsin, chymotrypsin, carboxypeptidase, and elastase. All the enzymes act slightly differently because each enzyme cleaves the peptide bonds between different amino acids. While trypsin, chymotrypsin and elastase cleave peptide bonds between a specific amino acid and its neighbor, the carboxypeptidase separates amino acids at a carboxyl terminus.

Protein digestion is completed by 2 peptidases in the brush border:
- **Aminopeptidase**
- **Dipeptidase**

Aminopeptidase cleaves amino acids at the amino terminus of a peptide.

Dipeptidase cleaves a peptide bond into individual amino acids.

### The digestion of fat

The fats that are most commonly absorbed from food include triglycerides, which consist of a single glycerol molecule linked to 3 fatty acid molecules.

Fat enzymes, the so-called lipases, cleave triglycerides. The fat enzymes include:

- **Lingual lipase**
- **Gastric lipase**
- **Pancreatic lipase**

Due to the effect of pancreatic lipase, fat digestion mainly occurs in the small intestine, although it is actually initiated by both lingual and gastric lipases in the stomach. Pancreatic lipase breaks down triglycerides into fatty acids and monoglycerides to facilitate absorption and assimilation mainly via the intestinal villi.

Fatty acids include short and long chains. Emulsification is the only way to cleave large fat globules that contain triglycerols into small fat globules for digestion in the small intestine. The resulting small fat globules provide a large surface area, which contributes to the effectiveness of pancreatic lipase.

### Phases of Digestion

Digestion can be divided into 3 overlapping phases:

- **Cephalic phase**
- **Gastric phase**
- **Intestinal phase**

Nerve centers in the cerebral cortex, the hypothalamus, and the brain stem are activated by smell, visual stimulation, or thoughts of food. In order to prepare the mouth and the stomach for food, the salivary glands secrete saliva, and the gastric glands secrete gastric juice during the **cephalic phase** of digestion.

When the food reaches the stomach, the **gastric phase** begins. Neural and hormonal mechanisms during the gastric phase stimulate gastric secretion and motility.

Nerve impulses generated by **stretch receptors** (measuring the filling volume) and **chemoreceptors** (monitoring the pH of the gastric chyme) reach the Meissner plexus and activate the **parasympathetic nervous system** and intestinal neurons. The resulting nerve impulses trigger **peristaltic waves** and stimulate gastric secretion.

Once the waves gain strength, a small amount of the chyme is released into the duodenum. The pH of the chyme becomes acidic. Simultaneously, the stretching of the stomach wall is reduced because the chyme reaches the duodenum and thus inhibits the secretion of gastric juice.

During the gastric phase, the gastric secretion is also regulated by the hormone **gastrin**, which stimulates the gastric glands to secrete large amounts of gastric juice. Additionally,
it enhances the contraction of the lower esophageal sphincter in order to prevent the reflux of acidic chyme into the esophagus. Gastrin, furthermore, increases gastric motility and simultaneously contributes to the relaxation of the pyloric sphincter, which promotes gastric emptying.

The **intestinal phase** is triggered by the food reaching the small intestine. During this phase, gastric motility and gastric secretion decrease, in order to slow down the discharge of chyme from the stomach, so that the small intestine is not loaded with more chyme than it is able to process. The intestinal phase is regulated by 2 important hormones that are secreted by the small intestine.

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**Cholecystokinin (CCK)** stimulates the secretion of pancreatic juice, which is rich in digestive enzymes. Furthermore, CCK triggers the release of bile from the gall bladder and also causes the Oddis sphincter to open; it also induces a feeling of satiety. **Secretin** stimulates the secretion of pancreatic juice and bile, which are rich in bicarbonates. Additionally, secretin inhibits the secretion of gastric juice, promotes the normal growth and preservation of the pancreas and enhances the effects of CCK.

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**Food Absorption in the Small Intestine**

Nutrient uptake from the GI tract into the blood or lymph is called absorption. Ninety percent of absorption occurs in the small intestine via **diffusion, osmosis, and active transport**. The remaining 10% of nutrient absorption occurs in the stomach and the colon.

The goal of all chemical and mechanical digestion is the conversion of food into a form that is appropriate for absorption via epithelium into the blood or lymph vessels.

**Note:** The body absorbs the following nutrients following digestion:

- **Monosaccharides** such as glucose, fructose, and galactose from carbohydrates
- **Amino acids, dipeptides, and tripeptides** from proteins
- **Fatty acids, glycerol, and monoglycerides** from triglycerides
Absorption of monosaccharides

All monosaccharides are transported through the apical membrane via facilitated diffusion or active transport from the lumen. The enormous absorption capacity ensures uptake of all the digested carbohydrates. The feces contain only indigestible cellulose and fibers.

Fructose, found in fruits, is transported via facilitated diffusion. In contrast, glucose and galactose are transported into cells of the villi via secondary active transport, since they require a carrier (Na\(^+\) gradient).

Absorption of amino acids, dipeptides, and tripeptides

Most proteins are absorbed by active transport (approx. 95-98%), mainly in the duodenum and jejunum. Approx. half of all the necessary protein is absorbed from the food, while the remainder is absorbed by the body from digestive juices and dead cells (erythrocytes).

Some amino acids reach the resorption cells of the villi without assistance, while others require a Na\(^+\)-dependent, secondary active transport similar to the glucose carrier. Amino acids then enter the capillaries of the villi and leave the cells via diffusion.

**Dipeptides and tripeptides** need at least a symporter (Na\(^+\)) to enter the cells for subsequent hydrolysis to single amino acids.

**Note:** Following absorption into the small intestine, monosaccharides and amino acids are transported via the portal vein to the liver, which then enters the general circulation.

Absorption of fats

Dietary fats are absorbed by simple diffusion. Adults absorb approx. 95% of all fats present in the small intestine.

Due to their small size, short-chain fatty acids dissolve in the aqueous intestinal pulp, and similar to monosaccharides and amino acids, they are absorbed via blood capillaries in a villus.

Long-chain fatty acids and monoglycerides are large molecules and are not dissolved easily in the aqueous environment of the intestinal pulp. Bile salts facilitate the formation of **micelles** (lat. mica = clots, small bites) with long-chain fatty acids and monoglycerides.

As soon as the micelles are formed, they migrate from the interior of the small intestinal lumen to the **brush border of the absorption cell**. At this point, the long-chain fatty acids and monoglycerides diffuse out of the micelles and into the absorption cells, leaving the micelles in the chyme.

The micelles undergo this procedure, continuously.

The transport of fat-soluble vitamins, such as vitamins A, D, E, and K and also cholesterol, is facilitated by micelles.

After the long-chain fatty acids and monoglycerides reach the resorption cell, they are resynthesized into triglycerides. Along with phospholipids and cholesterol they
accumulate as beads coated with proteins. The resulting large balls are called **chylomicrons**.

Due to their size, chylomicrons only reach the blood via the lymphatic system. Subsequently, the enzyme **lipoprotein lipase** ensures the degradation of triglycerides into chylomicrons, while the other lipoproteins are degraded into fatty acids and glycerol. Therefore, chylomicrons exist in the blood only for 2–3 hours following a meal.

Bile salts participating in the emulsification and resorption of lipids are reabsorbed within the last segment of the ileum and returned to the liver for reuse by the blood, via the hepatic portal system.

**Note:** The secretion of bile from hepatocytes into the gall bladder, reabsorption by the ileum, and repeated secretion into the gall bladder is called enterohepatic circulation.

![Enterohepatic circulation of Bile salts](Image: Bile recycling. By Boumphreyfr, License: CC BY-SA 3.0)

Water, vitamins, electrolytes, and alcohol are also absorbed in the small intestine.

**Splanchnic Circulation**

**Organ flow pattern**

- Heart (celiac artery) → delivers blood flow to places like the spleen, the stomach, and the liver
- Superior mesenteric artery → delivers blood flow to the pancreas and parts of the small intestine
- Inferior mesenteric artery → delivers blood flow to the intestines and the colon
Food Processing in the Colon

The colon is the last part of the GI tract.

**The functions of the colon include:**

- Completion of resorption
- Formation of certain vitamins
- Formation of feces
- Excretion of stools from the body

Digestion

The passage of chyme from the ileum into the cecum is regulated by the **ileocecal sphincter**. After a meal, peristalsis is increased in the ileum by the **stomach-ileum reflex**, and the chyme is transported into the cecum. Colon movements are triggered by the food crossing the ileocecal sphincter. Haustral contractions and peristalsis—which increases proximally—facilitate haustral shuttling of chyme until it reaches the rectum.

The last step in digestion is mediated by bacterial activity. No enzymes are secreted since the glands in the colon secrete mucus. Further, bacteria convert the remaining proteins into amino acids and break down the amino acids into simple substances such as hydrogen sulfide or fatty acids.

Several vitamins, including B and K, are among the bacterial products absorbed.

Reabsorption and formation of feces in the colon

The colon is an important organ when it comes to maintaining the body's water balance, even though up to 90% of water absorption occurs in the small intestine. Between 0.5 and 1 L of water reaches the colon, and up to 100–200 mL is reabsorbed via osmosis.

In addition to the reabsorption of water, ions, including sodium and chloride, and some...
vitamins, are also reabsorbed.

Chyme remains in the colon for approx. 3–10 hours before it becomes solid, or semisolid, due to water reabsorption. The resulting stool, or feces, consists of the following components:

- Water
- Inorganic salts
- Stripped epithelial cells from the GI mucosa
- Bacteria
- Products of bacterial metabolism
- Indigestible parts of food

Defecation occurs as soon as the internal and external anal sphincters open, and the feces are expelled via the anus.

Here is a link to an in-depth article on the end of the digestive tract: the rectum and the anal canal.

Diseases of the Gastrointestinal Tract

Irritable colon—irritable bowel syndrome

This disease is also known as inflamed colon or spastic colitis. Approx. 50% of all patients suffering from gastrointestinal complaints manifest irritable bowel syndrome. It is a functional disorder of the large intestine, but not defined as an organic disease. Almost twice as many women as men suffer from the irritable colon, which is classified as a psychosomatic illness.

It is also considered as ‘a widespread disease’ because approx. 10—20% of adults are affected.

The disease is characterized by the following symptoms:

- Alternating obstipation and diarrhea
- Wind (flatulence)
- Vertigo
- Loss of appetite
- Pressure and bloating, with relief occurring after defecation
- Mild pressure or pain in the left lower abdomen, with no muscular defense
- Inconspicuous bowel sounds
- Excessive mucus in the feces

Further diseases of the gastrointestinal tract

- Peritonitis
- Appendicitis or the inflammation of the appendix
- Esophagitis
- Pyloric stenosis and pyloric spasm
- Pancreatitis or the inflammation in the pancreas
- Cholelithiasis
- Lactose intolerance
- Polyps in the colon
- Peptic ulcer
- Diverticulitis
- Malabsorption
- Heartburn, which is usually caused by regurgitation of gastric contents into the esophagus, or by oesophagitis
- Hemorrhoids or swollen veins in the lowest part of the rectum and anus

References


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