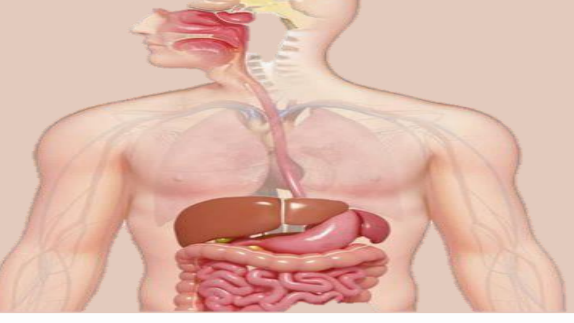


DIGESTION PROCESS

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Intended Learning Outcomes

By the end of this presentation, you will be able to:

- 01 Basic and accessory of digestive system**
- 02 Digestion process**
- 03 Regulatory mechanisms**
- 04 Digestion and absorption**
- 05 Pathologies that affect the digestive organs**

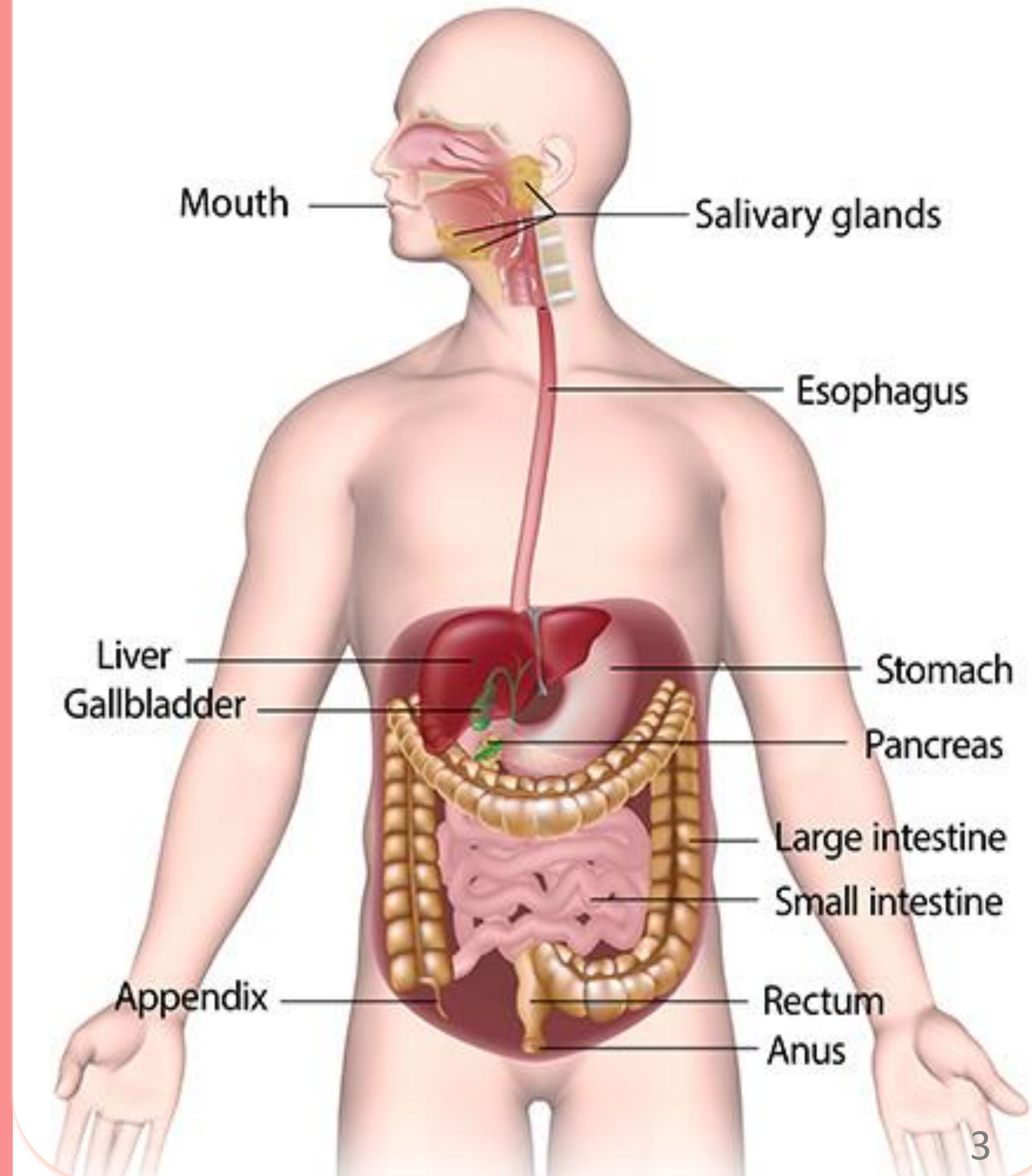
The Basic Digestive system Consists of:

- Mouth, Pharynx
- Esophagus
- Stomach
- Small Intestine
- Large Intestine
- Rectum and Anus

Accessory organs include:

- Tongue and Teeth
- Salivary glands
- Pancreas
- Liver
- Gall bladder and biliary tract

The Digestive System

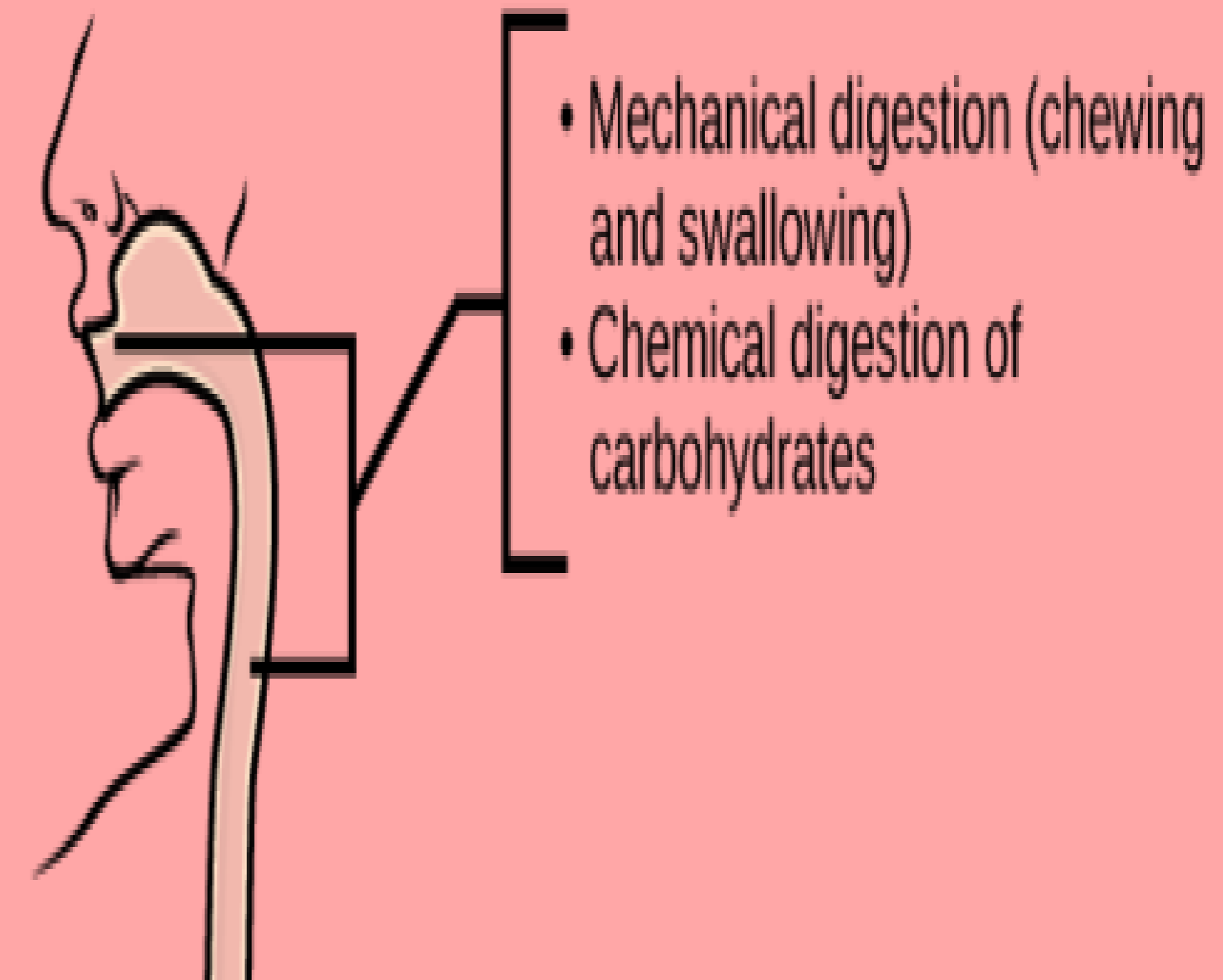




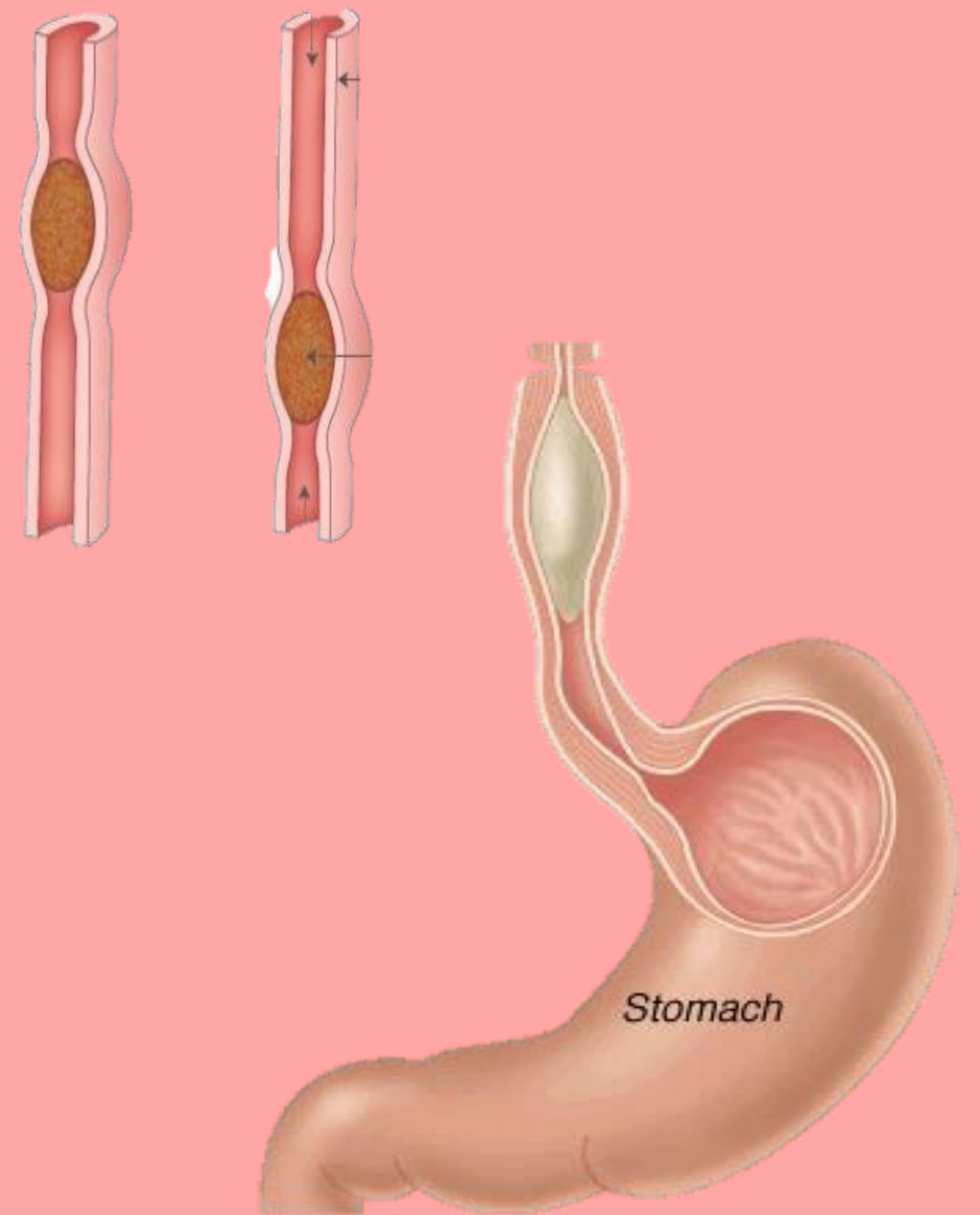
Digestive Processes

The processes of digestion include **six** activities: ingestion, propulsion, mechanical or physical digestion, chemical digestion, absorption, and defecation.

The first of these processes, **ingestion**, refers to the entry of food into the alimentary canal through the mouth. The food is chewed and mixed with saliva.



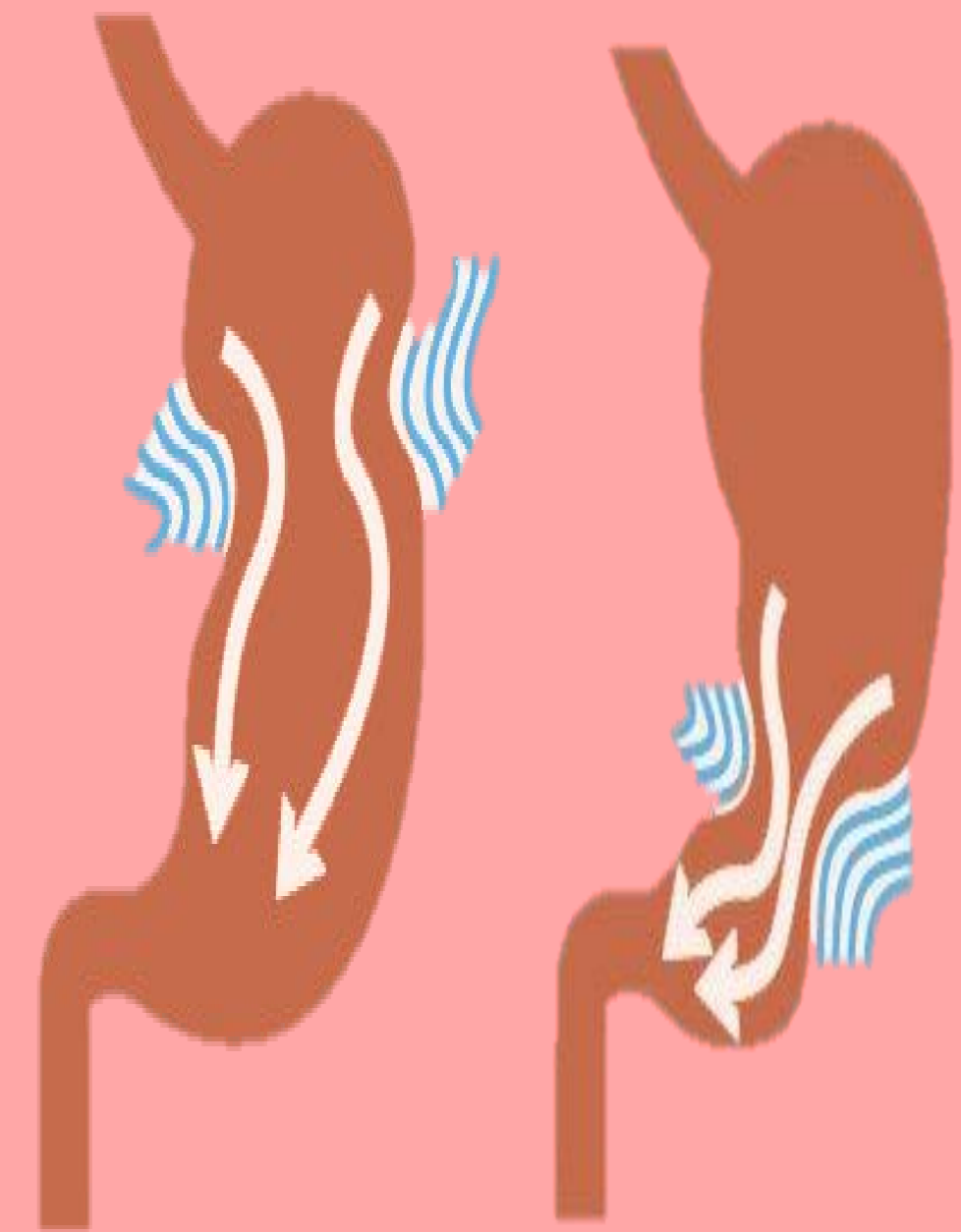
Propulsion, which refers to the movement of food through the digestive tract. It includes both the voluntary process of swallowing and the involuntary process of peristalsis. Peristalsis consists of sequential, alternating waves of contraction and relaxation of alimentary wall smooth muscles, which act to propel food along.



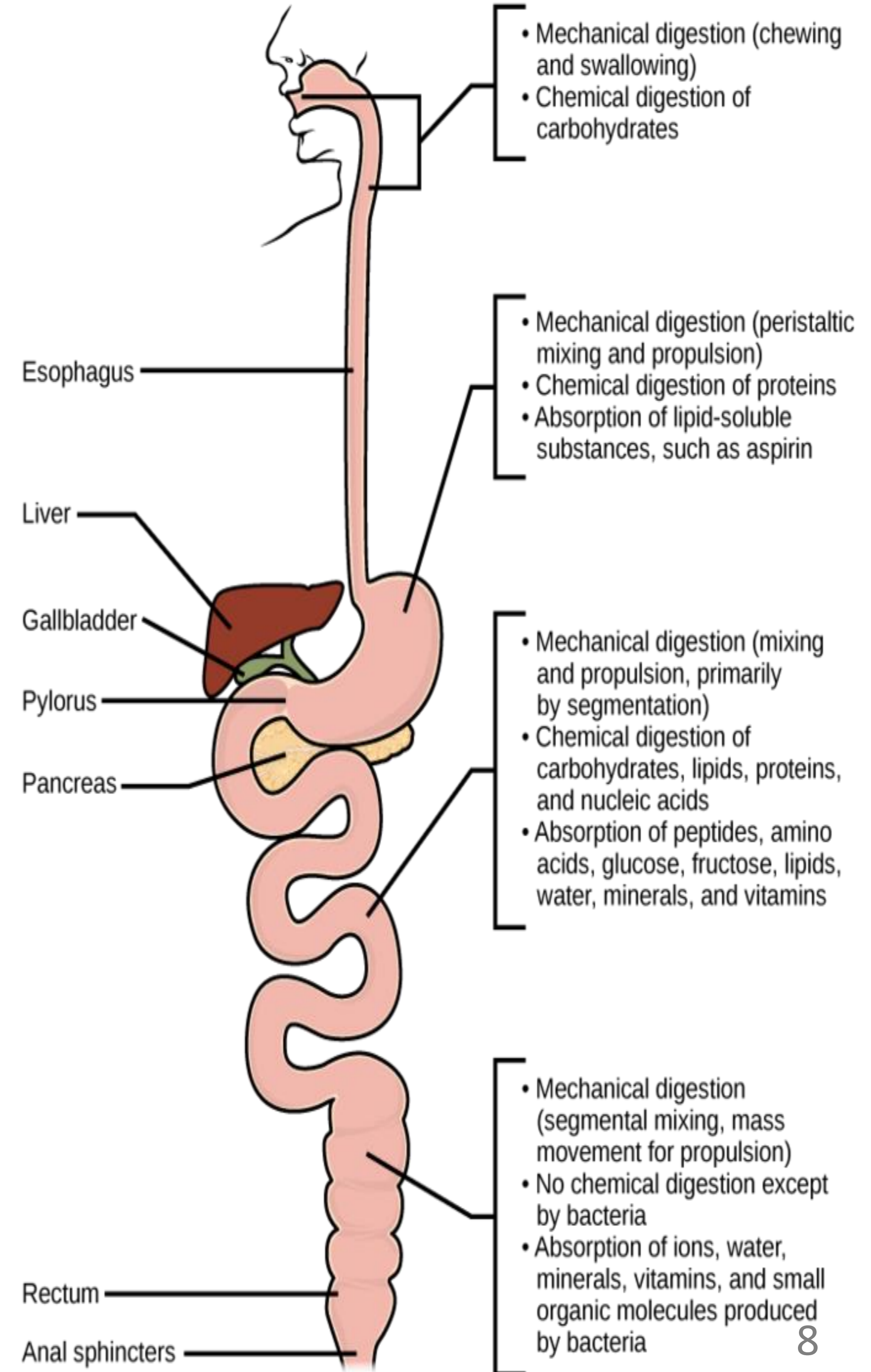
Mechanical digestion is makes the food smaller to increase both surface area and mobility.

It includes chewing in the **mouth** , as well as tongue movements that help break food into smaller bits and mix food with saliva.

In the **stomach** serves to further break it apart and expose more of its surface area to digestive juices.



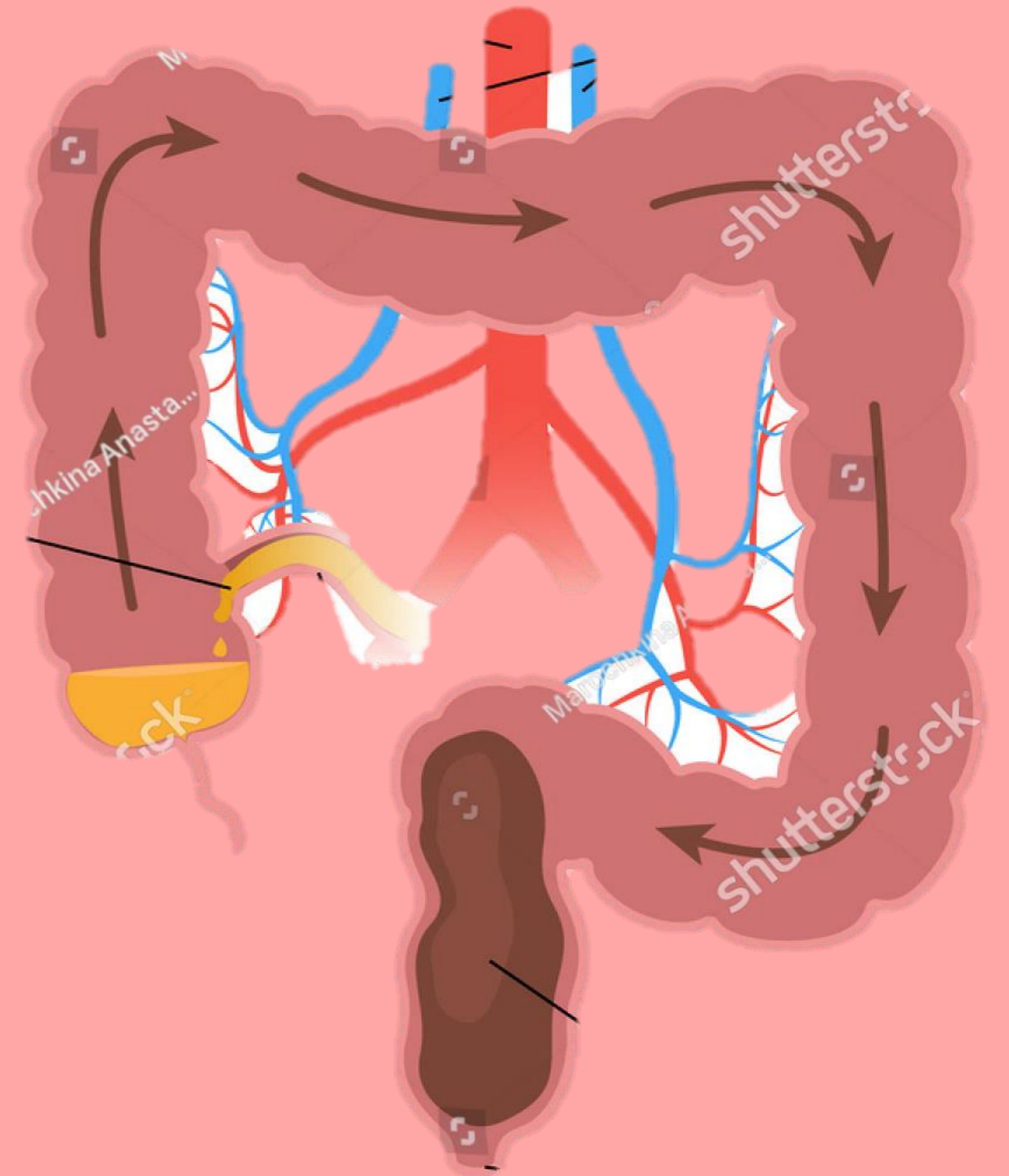
In **chemical digestion**, starting in the **mouth**, digestive secretions break down complex food molecules into their chemical building blocks (for example, proteins into separate amino acids). The process is completed in the **small intestine**.



Food that has been broken down is of no value to the body unless it enters the bloodstream and its nutrients are put to work. This occurs through the process of **absorption**, which takes place primarily within the **small intestine**.

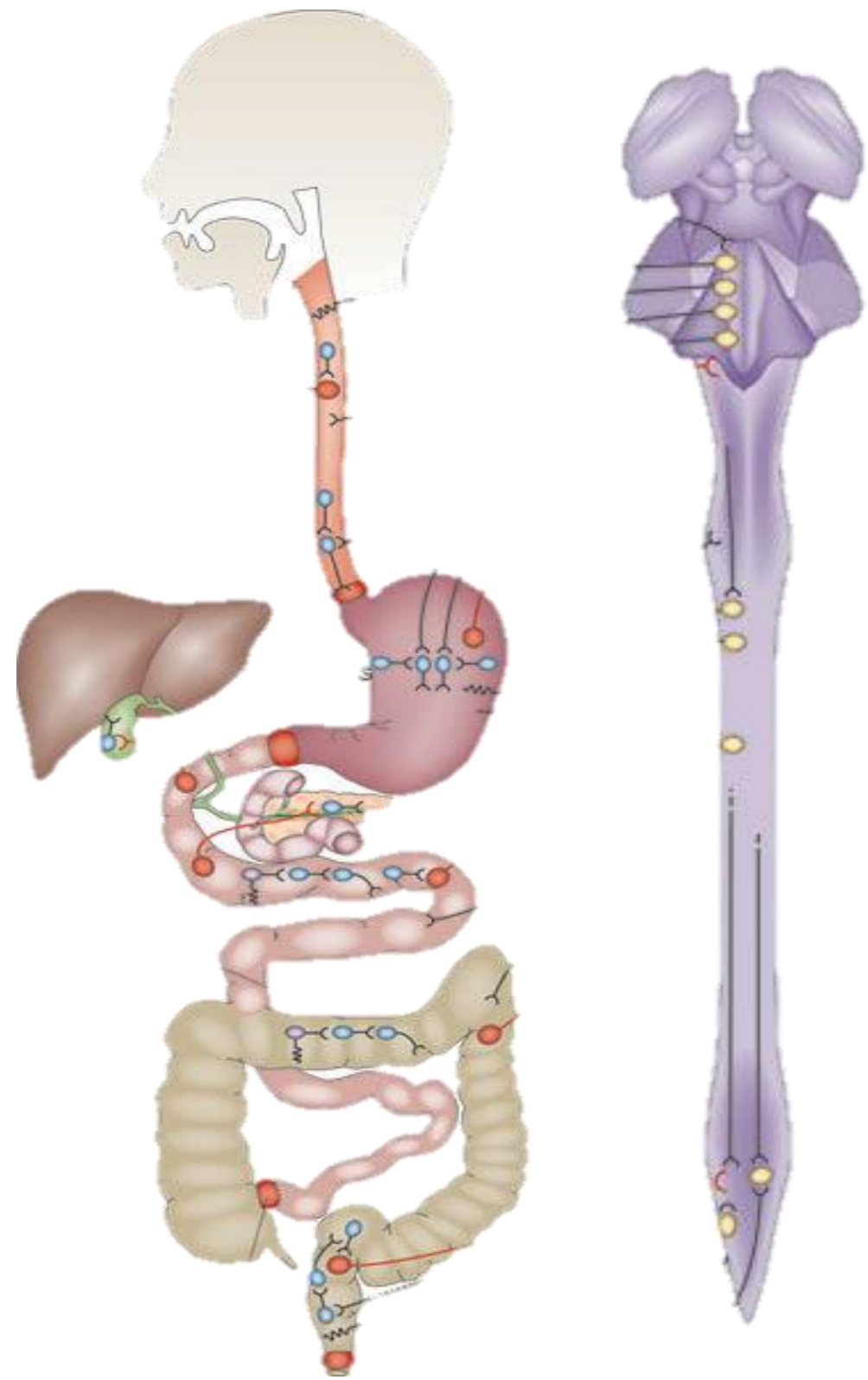


In **defecation**, the final step in digestion, undigested materials are removed from the body as feces.

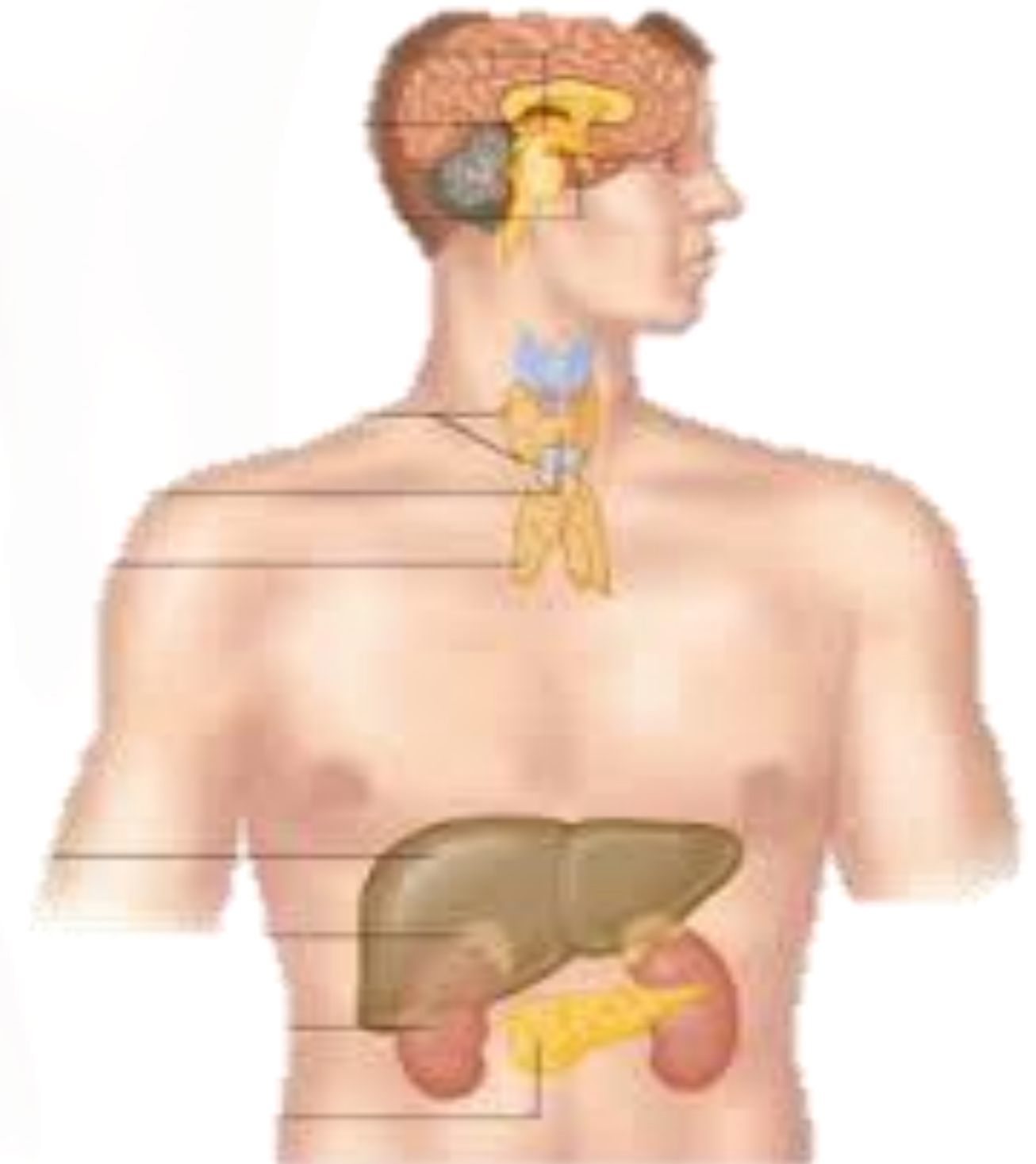


Regulatory Mechanisms

- **Neural Controls**



- **Hormonal Controls
(endocrine)**





Neural Controls

Salivation: Seeing a plate of food triggers the secretion of saliva in the **mouth** and the production of hydrochloric acid in the **stomach**.

There are three overlapping phases of gastric control:

- ❖ the cephalic phase
- ❖ the gastric phase
- ❖ the intestinal phase

Hormonal Controls (endocrine)

Hormones, play important roles in digestive processes. These hormones are released from endocrine tissue to generate specific controls in the digestion of chyme.

The endocrine system's effects are slow to initiate, but prolonged in their response, lasting from a few **hours** up to **weeks**.

Liver

Insulin-like growth factor (somatomedin)
Angiotensinogen
angiotensin
Thrombopoietin

Duodenum

Secretin
Cholecystokinin

Kidney

Renin
Erythropoietin
Calcitriol
Thrombopoietin

Stomach

Gastrin
Ghrelin
Neuropeptide Y
Somatostatin
Histamine
Endothelin

Pancreas

Insulin
Glucagon
Somatostatin
Pancreatic polypeptide

Adrenal glands

Glucocorticoids
Mineralocorticoids
Androgens

Adrenal medulla

Adrenaline
Noradrenaline
Dopamine
Enkephalin

Digestion and Absorption

Digestive enzymes are diverse and are found in the saliva , in the stomach , in the pancreatic juice secreted by pancreatic exocrine cells, and in the intestinal (small and large) secretions.

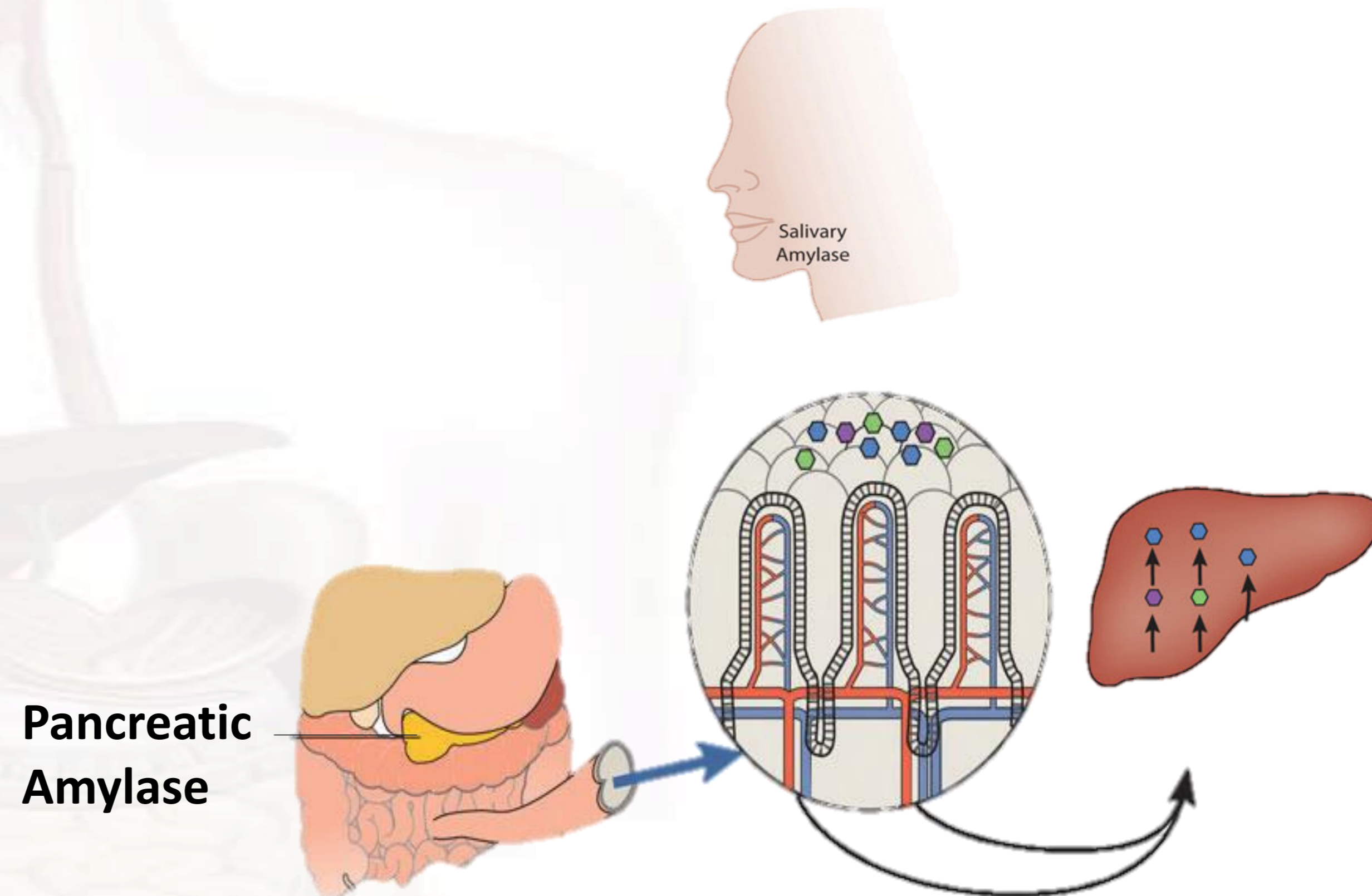
Intestinal bacteria also play a role in synthesizing vitamin B and vitamin K.



Carbohydrates

The digestion of carbohydrates begins in the **mouth** (maltose), **duodenum**. The **chyme** from the stomach enters the duodenum and mixes with the digestive secretions (**maltases**, **sucrases**, and **lactases**).

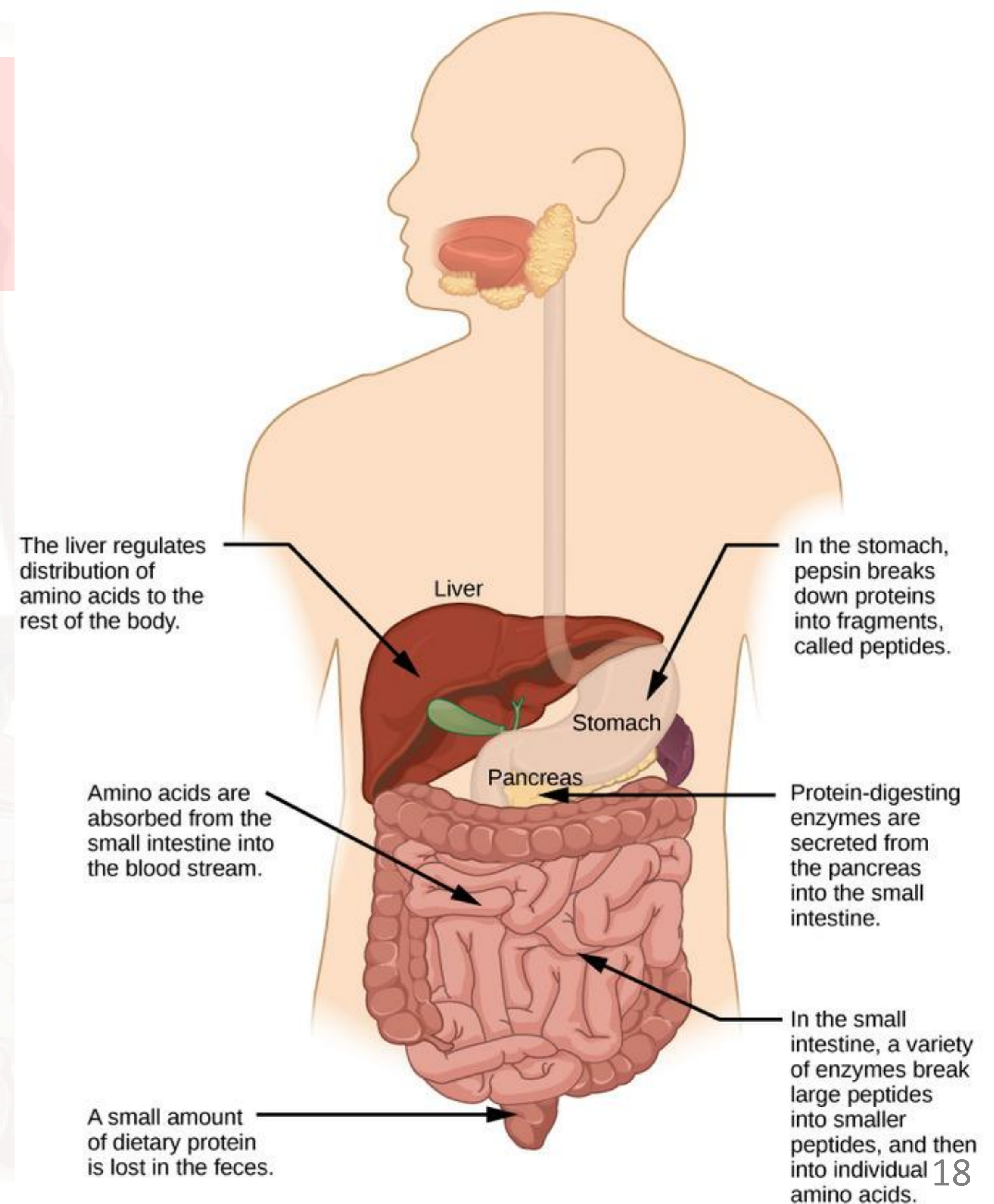
They are **absorbed** across the intestinal epithelium into the bloodstream to be transported to the different cells in the body.



Protein

Protein digestion is a multistep process that begins in the **stomach** and continues through the **intestines**.

Proteins are absorbed into the **blood stream** by the small intestine.

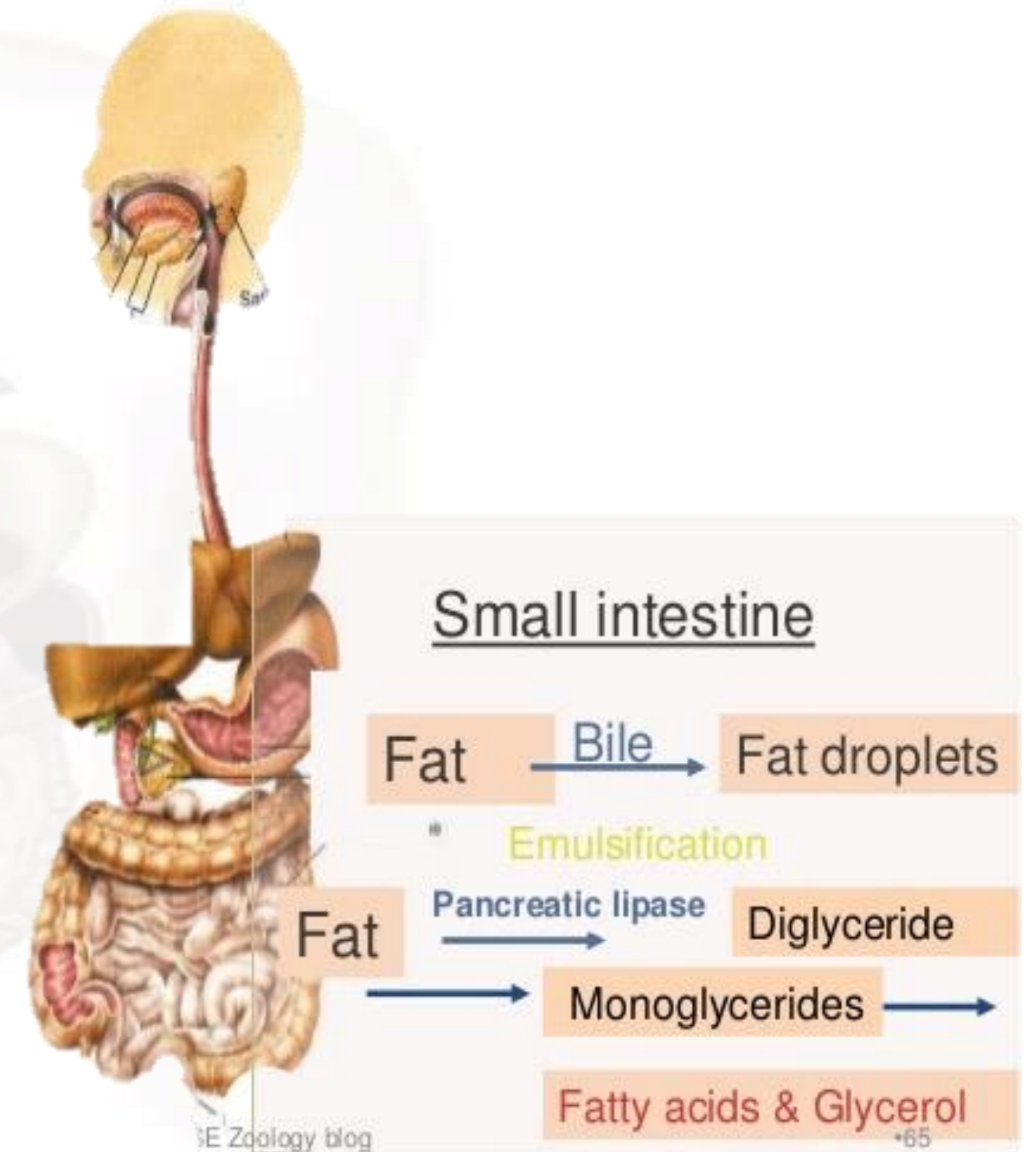


Lipid

Lipid (fat) digestion begins in the **stomach** with the aid of lingual lipase and gastric lipase.

the bulk of lipid digestion occurs in the **small intestine** due to pancreatic lipase.

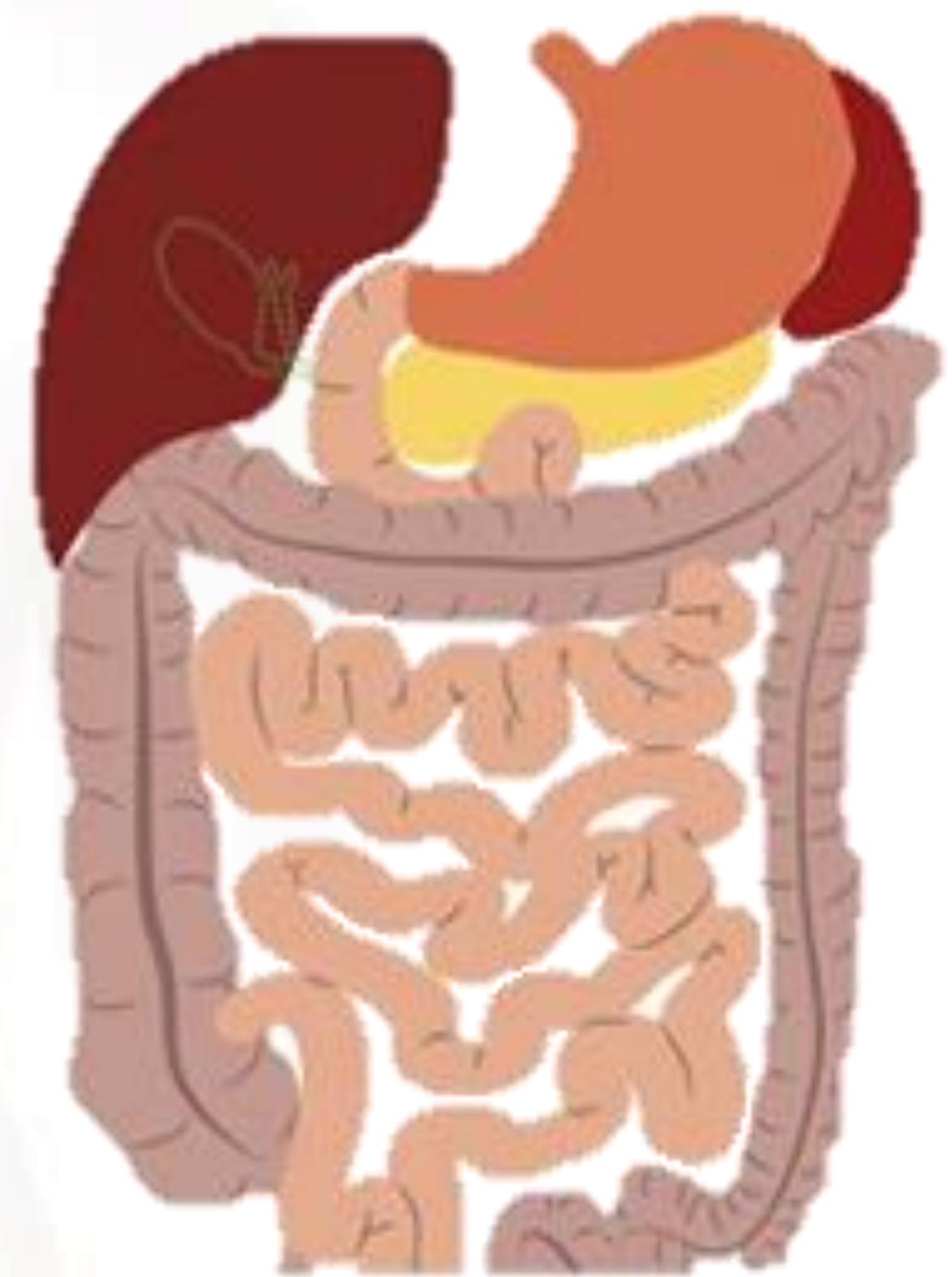
Emulsification is a process in which large lipid globules are broken down into several small lipid globules.



Vitamins

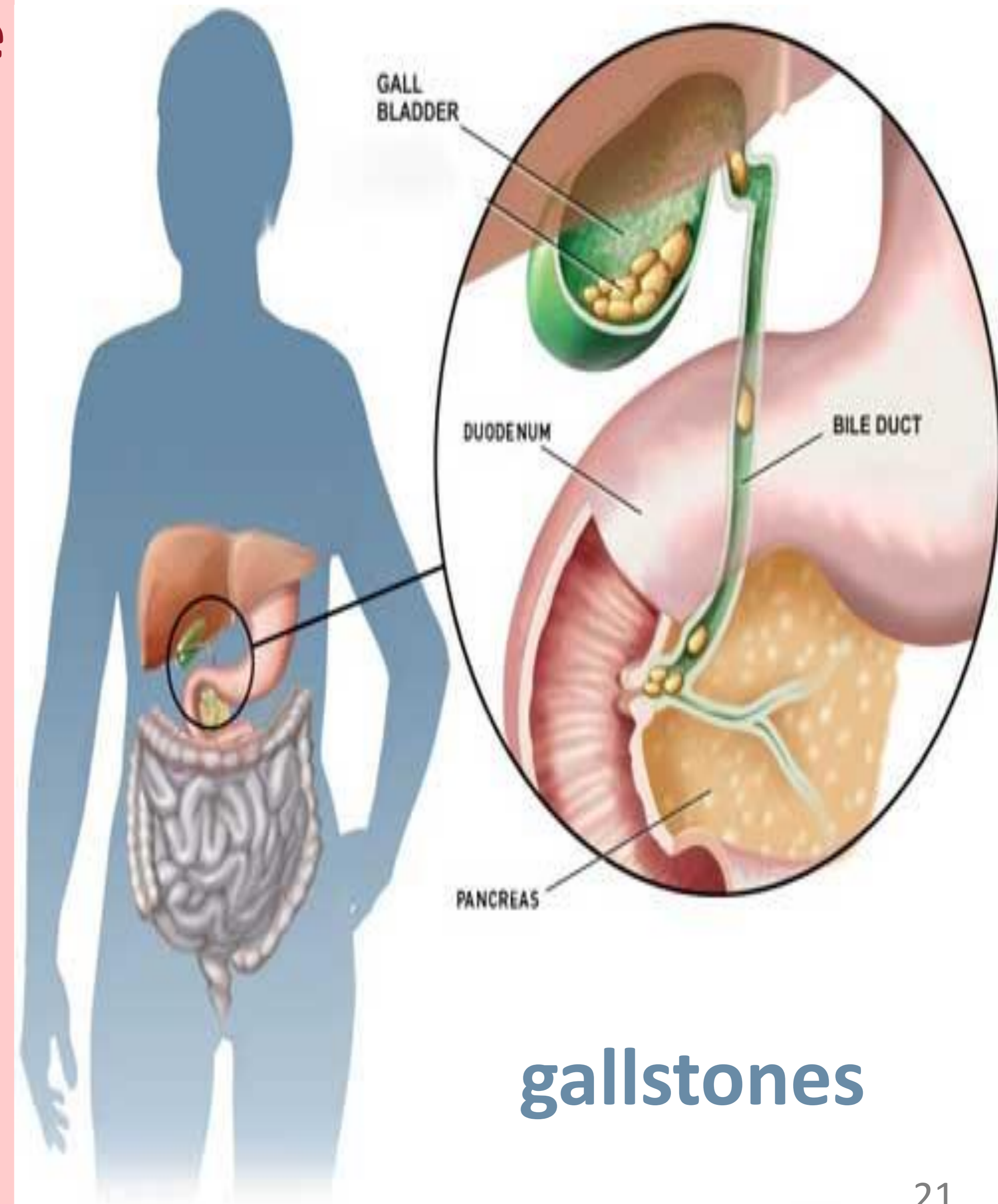
Fat-soluble vitamins are absorbed in the same manner as lipids.

Water-soluble vitamins can be directly absorbed into the bloodstream from the intestine



Pathologies that affect the digestive organs such as

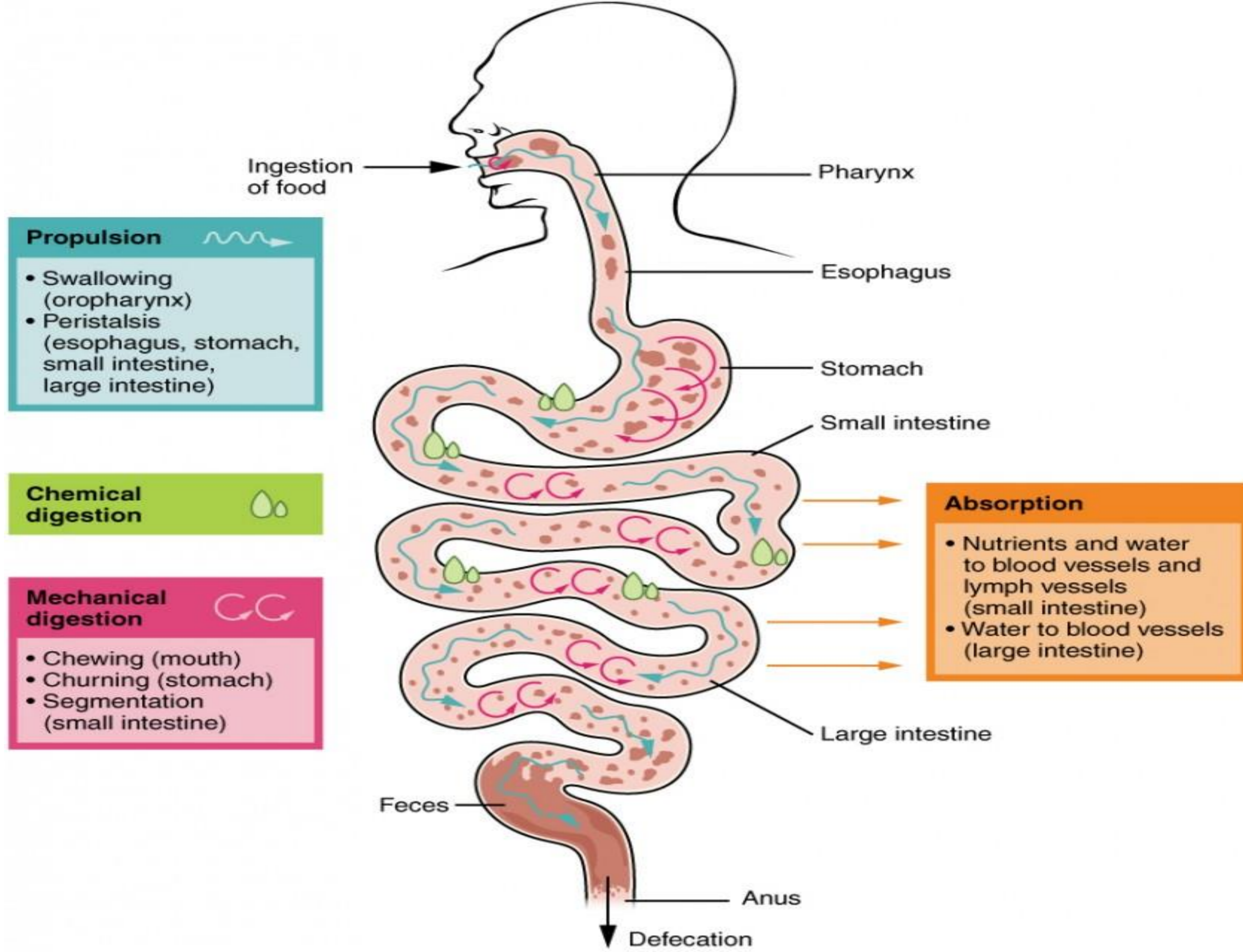
- *Gastritis*
- *peptic ulcer disease*
- *Maldigestion*
- *Malabsorption*
- *Constipation*
- *Acute pancreatitis*
- *Cirrhosis*
- *Gallstones.*





Summary

The digestive system ingests and digests food, absorbs released nutrients, and excretes food components that are indigestible. The six activities involved in this process are ingestion, motility, mechanical digestion, chemical digestion, absorption, and defecation. These processes are regulated by neural and hormonal mechanisms.





THANK YOU...

