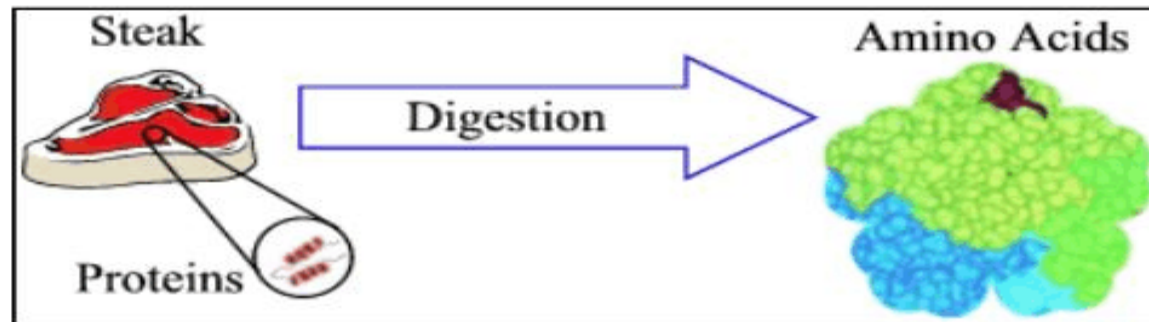


Digestion Of Protein

Protein--like meat, fish, eggs, milk products, some vegetables, nuts, etc,--are long chains of amino acids.

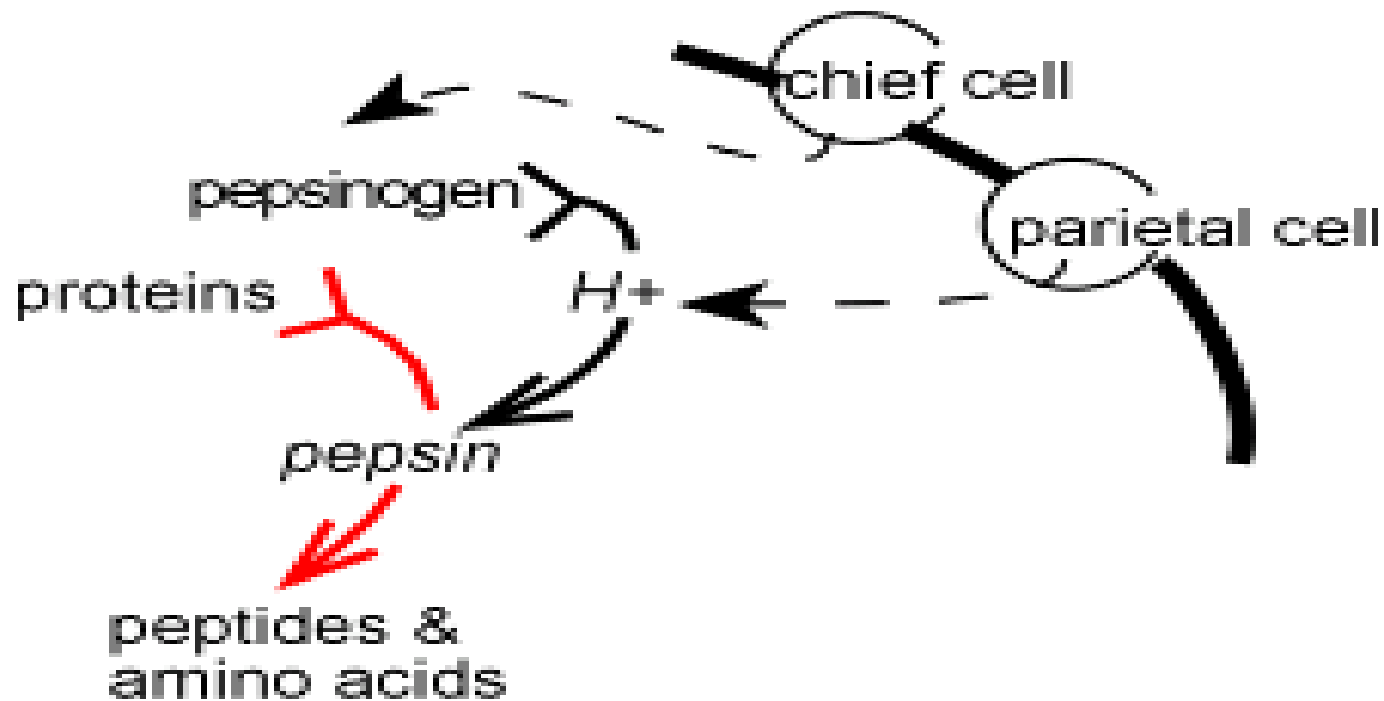


There are no enzymes in the mouth acting on [protein](#).

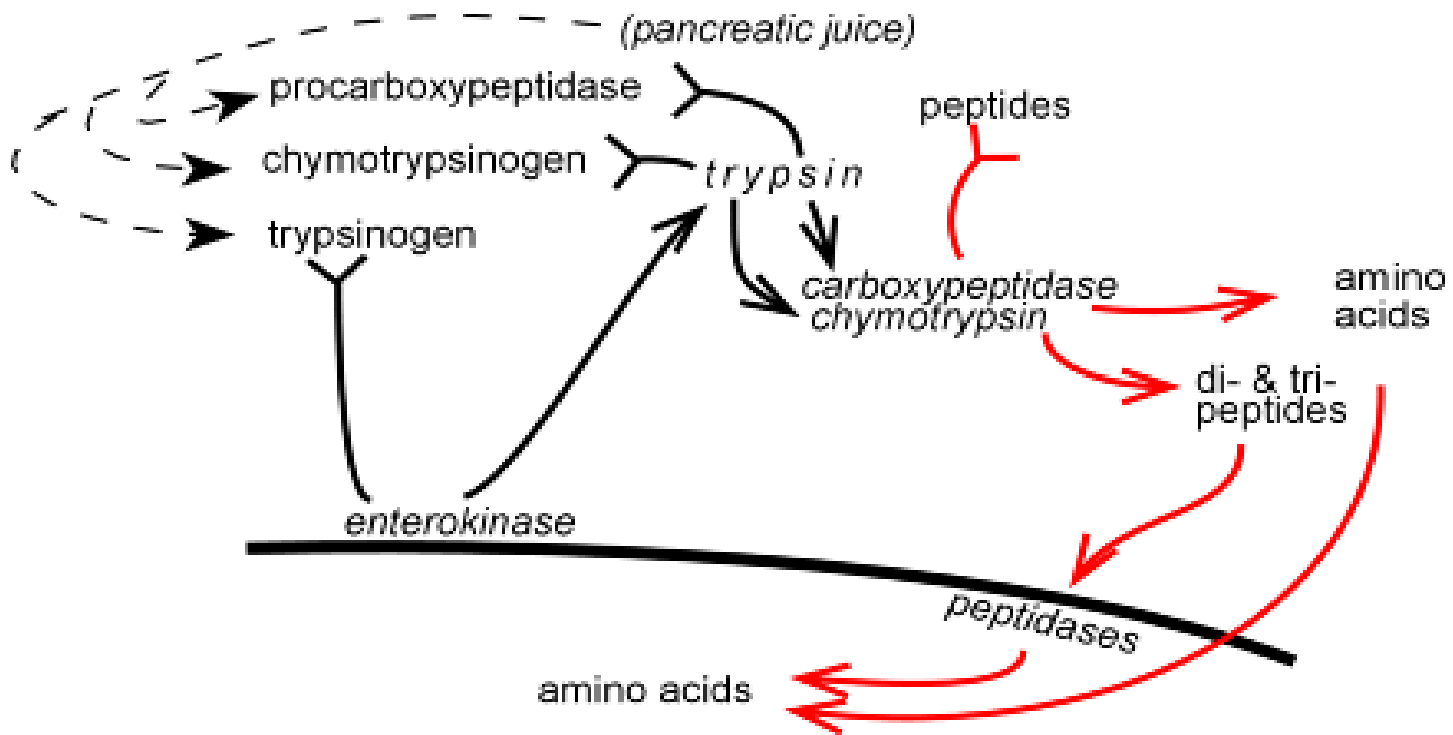
In the stomach, the hydrochloric acid helps to make it soften and swell, and then pepsin begins its digestion. Protein

- pepsin, is most active at a pH of about 2 and totally inactive at a pH above approximately 5. So, for pepsin to affect any digestive action on protein, the stomach juices must be acidic. Hydrochloric acid provides the acid environment.

- Even collagen, present, for example, in connective tissue of meat, can be digested by pepsin even though other digestive enzymes cannot affect it.



- After leaving the lower stomach, protein has been broken down from long protein molecules into shorter strings of amino acids (the building blocks of protein). As soon as these partially broken-down products enter the small intestine, they are "attacked" by pancreatic enzymes like *trypsin*, *chymotrypsin* and *carboxypolypeptidase*.



Protein Metabolism

- **Protein metabolism** or **proteolysis** denotes the various biochemical processes responsible for the synthesis of proteins and amino acids ,and the breakdown of proteins (and other large molecules, too) by catabolism

Urea cycle

- The **urea cycle** is a cycle of biochemical reactions occurring in many animals that produces urea) (NH₂)2CO from ammonia (NH₃). In mammals, the urea cycle takes place only in the liver.

Determination of Total Serum Protein

- A total serum protein test measures the total amount of protein in the blood.
- It also measures the amounts of two major groups of proteins in the blood: albumin and globulin

- **Albumin** is made mainly in the liver. It helps keep the blood from leaking out of blood vessels. Albumin also helps carry some medicines and other substances through the blood and is important for tissue growth and healing.

- **Globulin** is made up of different proteins called alpha, beta, and gamma types. Some globulins are made by the liver, while others are made by the immune system.
- Certain globulins bind with hemoglobin. Other globulins transport metals, such as iron, in the blood and help fight infection.

- A test for total serum protein reports separate values for total protein, albumin, and globulin. The amounts of albumin and globulin also are compared (albumin/globulin ratio).

- **Why It Is Done**

Albumin is tested to:

- Check how well the liver and kidney are working.
- Find out if your diet contains enough protein.

Globulin is tested to:

- Determine your chances of developing an infection.
- See if you have a rare blood disease, such as multiple myeloma or macroglobulinemia

- **Normal values**
- **Total serum protein= 5.5- 9 (g/dL)**
- **Albumin=3.5- 5.5 g/dL**
- **Globulin=2- 3.5 g/dL**
- **Albumin/globulin ratio:Greater than 1.0**

Hyperproteinemia

- **High values**

High albumin levels may be caused by:

- 1- severe dehydration .

High globulin levels may be caused by:

- 1- Diseases of the blood, such as multiple myeloma ,leukemia ,or hemolytic anemia .

- 2- An autoimmune disease ,Kidney disease .

- 3- Liver disease .

- **Hypoproteinemia**
- **Low values**

Low albumin levels may be caused by:

- 1- A poor diet (malnutrition)
- 2- Severe burns .
- 3- Kidney disease .
- 4- Liver disease .
- 5- Hyperthyroidism