

1.3. Metabolism of proteins

Protein is a large, complex molecule that must undergo a series of processes inside the body. During digestion and absorption, protein passes through many organs. Once protein is digested, the body can utilize its nutrients to build and repair many of the cells in the body. The body also uses the calories from protein, which are released during the digestion process for energy when carbohydrates and fats are not available. When there is too much protein in the body, the excess is converted into fat for storage (Erickson, 1990).

Locations of intensive protein or peptide metabolism are gastrointestinal tissue, kidneys, liver, but also blood and other body tissues. Molecular weight determines that major metabolism site as well as the predominant degradation process (Kayser & Warzecha, 2012).

Once protein is chewed and swallowed, hydrochloric acid and pepsin begin protein metabolism in the stomach. HCl causes denaturation of proteins and converts proteins to metaproteins, which are easily digested. It also makes the stomach very acidic with a pH of 1.5. This acidic environment is necessary for HCl to react with pepsinogen to form pepsin so that it can break the central peptide bond in proteins. Rennin is a milk-clotting enzyme that is present in infants to help break down milk protein (Sherman, 1952).

Major factors limiting systemic bioavailability of orally administered protein drugs include acidic degradation and protein metabolism in the GIT (Gavhane & Yadav, 2012).