Because proteins are complex molecules, the body takes longer to break them down. As a result, they are a much slower and longer-lasting source of energy than carbohydrates.

If the body is getting enough calories, it does not use protein for energy. If more protein is consumed than is needed, the body breaks the protein down and stores its components as fat.
Glycine

Alanine

Aspartic acid

Phenylalanine
Protein Structure

- Primary Structure
  - sequence of amino acids

- Secondary Structure
  - helical coil
Protein Functions

- Enzymes & related proteins
  - Catalysts
  - Membrane transporters
  - Cell receptors

Two separate compounds, A and B, are attracted to the enzyme’s active site, making a reaction likely.

The enzyme forms a complex with A and B.

The enzyme is unchanged, but A and B have formed a new compound, AB.
Vegetarian Diets

Is there a protein problem?

Plant proteins are “Incomplete proteins”

Complementary Proteins

Example: Mexican Food
- Tortilla: low lysine, hi methionine
- Beans: low in methionine, hi lysine
Peanut butter (legume) sandwich (wheat)
Protein Deficiency

Marasmus
- Both Protein and Calories low
  - inadequate food intake

Symptoms
- wasting of lean and fat tissue
- weak, anemic, low metabolism
- death due to secondary infections