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Class: Deg.III(Hons.)
Paper: VI (Biochemistry)
Topic: Protein (contd.)
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Protein: Structure, Classification and Properties (continued):

Properties of Proteins:

1. Denaturation:

Partial or complete unfolding of the native (natural) conformation of the polypeptide chain is known as denaturation. This is caused by heat, acids, alkalies, alcohol, acetone, urea, beta- mercaptoethanol.

2. Coagulation:

When proteins are denatured by heat, they form insoluble aggregates known as coagulum. All the proteins are not heat coagulable, only a few like the albumins, globulins are heat coagulable.

3. Isoelectric pH (pH^1):

The pH at which a protein has equal number of positive and negative charges is known as isoelectric pH. When subjected to an electric field the proteins do not move either towards anode or cathode, hence this property is used to isolate proteins. The proteins become least soluble at pH^I and get precipitated. The pH^I of casein is 4.5 and at this pH the casein in milk curdles producing the curd.

4. Molecular Weights of Proteins:

The average molecular weight of an amino acid is taken to be 110. The total number of amino acids in a protein multiplied by 110 gives the approximate molecular weight of that protein. Different proteins have different amino acid composition and hence their molecular weights differ. The molecular weights of proteins range from 5000 to 10^9 Daltons. Experimentally the molecular weight can be determined by methods like gel filtration, PAGE, ultra centrifugation or viscosity measurements.

Functions of Proteins:

The main functions of proteins in human body are:

. They serve as body building units, e.g., muscle proteins.

2. They provide support and protection to various tissues, e.g., collagen and keratin.

3. All chemical reactions in the body are catalysed by proteinaceous enzymes, e.g., trypsin.

4. They transport various molecules and ions from one organ to the other, e.g., hemoglobin, serum albumin.

5. They store and provide nutrients, e.g., milk casein, ovalbumin.

6. They defend the body from harmful foreign organisms, e.g., immunoglobulin's, fibrinogen.

7. They help to regulate cellular or physiological activity, e.g., hormones, viz., insulin, GH.