**SHREE H N SHUKLA NURSING INSTITUTE- RAJKOT**

**NUTRITION**

**UNIT- 4(PROTEIN)**

It is most important component of the body. It ammount for about 16% of body weight. The term has a greek origin derived from the word ‘proteios’ means primary or first place

Proteins contain carbon, hydrogen, oxygen and nitrogen. The basic unit of protein are amino acid linked through peptide bond. Each amino acid contains an acidic group and amino groups.

**Types of amino acid**

There are three type of aminoacid

1. **Esssential amino acid:** The 10 essential amino acid that can not synthesized in the body but have to be supplied in the diet are essential amino acids.

Eg: histinine, isoleucine,leucine, lysine, methionine, phenylalanine, theronine, trypotophan, valine, serine.

1. **Non esseential amino acid:** the amino acids that can be synthesized by body are called as nonessential aminoacids.

Eg: alanine, arginine, aspartic acid, cystine, glutamic acid, glutamine, glycine,prolines and tyrosine.

1. **Semi essential aminoacids:** ariginine and histidine are called semiessential amino acids as they are required in the diet of children, pregnancy and lactating mother.

Classification of protein:

* Based on their chemical composition

1. Simple protein: these protein are made up of amino acids. Eg:plasma albumin,collagen
2. Conjugated protein: these protein contains non protein in their structure. Eg: hemoglobin and lipoprotein.
3. Derived protein: these are produced by the action of acids, alkaline and heat and enzymes

* On the basic of sources of protein:

1. Animal protein: these are the protein derived from animal sources such as milk, egg, meat and fish.
2. Plant protein: these are called lower quality protein since they have alow content of one or more of essential aminoacids.

Caloric value:

One grams protein contains 4 kcals.

RDA:

* MAN : 60 GM/DAY
* FEMALE: 55 GM/DAY

PREGNANCY65GM/DAY

LACATATING MOTHER: 0-6 M- 75GM/DAY

6/12 M- 68 GM/DAY

DIETARY SOURCES:

* Animal sources: meat,egg, milk, cheese, fish.
* Vegetable souces: pulses, beans, cereals,nuts and oil seeds.

Function:

* Repair and development: protein are called as building blocks of the body. It is important in the maintanence of normal tissue including development and repair. Hair, eyes, muscles,skin and organs are made up of protein.
* Hormones: protein is involved in thew creation of some hormones. Eg insulin
* Energy: protein is a major source of energy. Each gm of protein provides 4 kcal.
* Enzymes: enzymes are the protein that increase the rate of chemical reaction of chemical reaction.it facilitate the digestion, absorption, catabolism and anabolism.
* Antibodies: protein from antibodies which help to prevent infection,illness and disease. It indentify and distroye the antigen virus and bacteria.
* Transport and storage: it help in transporation eg hemoglobin help in the transportation of oxygen. Protein also sometime used in the storage of some certain moleculess. Eg, ferritin that combines with iron for storage in the liver.
* Growth of fetus: protein provides amino acids for the growt h of fetus in pregnancy and for the production of milk during lactation period.

Digestion of protein:

In mouth

* Mechanical breakdown occur in the mouth.

In stomach

* Protelytic enzyme in stomach is pepsin. First produced inactive form pepsinogen and get actived by strong acid hcl secretion.
* Large polypeptide is brokedown in small peptide by pepsin.
* Renin is secreted infant and children act on milk protein casein and produce curd. (coagulate curd)

In small intestine

* In the small intestine the protelytic enzyme is secreted by pancreas and intestine itself.

Pancreatic juices:

It contains trypsin,chymotrypsin and carboxyl peptidase.

Trypsinogen -------------🡪 trypsin

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Inactive enzyme** | **activator** | **Active enzyme** |
| intestine | trypsinogen | entrokinease | trypsin |
|  | chymotripsinogen | trypsin | Chymotripsin  Aminopeptidase  dipeptidase |
|  |  |  |  |