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COURSE TITLE: MEDICAL BIOCHEMISTRY II

ASSIGNMENT ON NUTRITION

Answer

1. What do you understand by the term ‘’Biological Value of Proteins’’

The term ‘’Biological value of proteins’’ is defined is a measure of the proportion of absorbed **protein** from a food which becomes incorporated into the **proteins** of the organism's body. It captures how readily the digested **protein** can be used in **protein** synthesis in the cells of the organism.

It is done by calculating the percentage of absorbed nitrogen retained by the body and is calculated by:

Biological value (BV) = (Nitrogen retained/ Nitrogen absorbed) × 100

The amount of nitrogen in the diet eaten and in excreta of adult animals is measured and the percentage of nitrogen retained by animals from out of nitrogen absorbed from the diet is calculated. The value thus obtained is the “biological value” (BV) of the protein.

It is a test that gives an **estimate of digestibility of the protein.**

2. List and explain the various methods of assessment of protein quality.

There are four methods of assessment of protein quality, they include;

1. Chemical score or amino acid score

2. Net protein utilization (NPU)

3. Protein efficiency ratio (PER)

4. Biological value (BV).

Chemical score or amino acid score: this involves measuring the concentration of each essential amino acid in the test protein which is then compared with reference protein (usually egg protein). It is calculated by formula below:

Amino acid score = (Number of mg of one amino acid per gm of test Protein/ Number of mg of the same amino acid per gm of egg protein) x 100 .

This mode of chemical assessment does not take into account the digestibility of dietary proteins.

Net protein utilization (NPU): It is a product of digestibility coefficient and biological value divided by 100. Biological measures of NPU gives a more complete expression (both absorption and retention) of protein quality than the amino acid score as said above. It is calculated by the formula below:

NPU= (Nitrogen retained by the body/ Nitrogen intake) × 100

This method of assessment involves measuring percentage of nitrogen intake and nitrogen stored after excretion thereby the amount of nitrogen used is known stating the amount of protein utilized. Here, if the NPU is low, the protein requirement is high and vice versa.

Protein efficiency ratio (PER): The overall quality, i.e. nutritive value of a food protein can be determined with laboratory animal like rat as follows. The gain in weight of young animals per gm of protein consumed is measured and the value obtained is used to determine the protein efficiency ratio (PER).

This method simply involves calculating the amount of protein ingested and the result of in body weight gain. It is calculated by the formula below:

PER = (Gain in body weight in gm/Protein ingested in gm)

Biological value: Biological value of protein is defined as the percentage of absorbed nitrogen retained by the body and is calculated by:

Biological value (BV) = (Nitrogen retained/ Nitrogen absorbed) × 100

The amount of nitrogen in the diet eaten and in excreta of adult animals is measured and the percentage of nitrogen retained by animals from out of nitrogen absorbed from the diet is calculated. The value thus obtained is the “biological value” (BV) of the protein. This test also gives an estimate of digestibility of the protein but it doesn’t take into account the nitrogen that might be lost during the digestion process.