NAME:- IBE CHIAMAKA ALMA

MATRIC NO:- 18/mhs01/171

DEPARTMENT:- ANATOMY

COURSE:- BCH 204

ASSIGNMENT

1. What do you understand by the term Biological Value of Protein.
2. List and explain the various methods of assessment of protein quality.

ANSWER

A. Biological value 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. Biological value assumes protein is the only source of nitrogen and measures the proportion of this nitrogen absorbed by the body which is then excreted. The remainder must have been incorporated into the proteins of the organisms body. Unlike some measures of protein usability, biological value does not take into account how readily the protein can be digested and absorbed.

Equation for Biological Value

Biological Value (BV) = $\dfrac{\text{Nitrogen retained} \times 100}{\text{Nitrogen Absorbed}}$

B. Net Protein Utilization (NPU)
   - Amino Acid
   - Protein Efficiency Ratio (PER)
   - Net Protein Ration (NPR)

Net Protein Utilization (NPU)
   is the ratio of amino acid mass converted to proteins to the mass of amino acids supplied. Like biological value, determination of NPU provides an estimate of nitrogen retention, but does so by measuring the difference between the body nitrogen content of animals fed no protein and those fed a test protein. Both NPU and BV are based upon estimates of retained nitrogen. They should measure the same except the calculation of BV is based on the amount of nitrogen absorbed rather than consumed.

Amino Acid

All Amino acids must be present at the site of protein synthesis in adequate amounts if protein synthesis is to proceed, a deficit of any one of them would limit synthesis to the same degree as would a comparable deficit of another. Thus, it was suggested they if the composition of ma ideal protein were known that is a protein that contained every indispensable amino acid in sufficient amounts to meet requirements without any excesses, then it should be possible to compute the nutritive value of protein by calculating the deficit of each indispensable amino acid in the test protein as compared to the amounts in the ideal protein.

Protein Efficiency Ratio (PER)

is the ratio of grams of body weight gain to the grams of protein consumed. Protein Efficiency Ratio (PER) has been the method most widely used because of its simplicity. The PER for any protein incorporated in the test diet. For example, In the use of 10 weanling rats per test group, diet containing 9.09 percent protein, a test period of 4 weeks duration and the inclusion in each experiment of a group receiving standardized casein.

Net Protein Ratio (NPR)

A major criticism of PER has been that it does not take in account the protein required for maintenance, since only gain in weight is used in the calculation. NPR was then calculated as the overall difference in gain (gain in weight of the test group plus loss in weight of the protein free group) divided by the amount of protein eaten. It is apparent that, if body composition is constant, the procedure is identical to net protein utilization (NPU) except that it is expressed in arbitrary units that are less useful than the percentage of protein utilized.