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ASSIGNMENT.

1. WHAT DO YOU UNDERSTAND BY THE TERM ''BIOLOGICAL VALUE OF PROTEINS”

2. LIST AND EXPLAIN THE VARIOUS METHODS OF ASSESSMENT OF PROTEIN QUALITY.

ANSWER.

1.Biological value (BV) is a measure of the proportion of absorbed [protein](https://en.wikipedia.org/wiki/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](https://en.wikipedia.org/wiki/Protein_biosynthesis) in the [cells](https://en.wikipedia.org/wiki/Cell_%28biology%29) of the organism. Proteins are the major source of [nitrogen](https://en.wikipedia.org/wiki/Nitrogen) in food. BV 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. A [ratio](https://en.wikipedia.org/wiki/Ratio) of nitrogen incorporated into the body over nitrogen absorbed gives a measure of protein usability of the BV.

Unlike some measures of protein usability, biological value does not take into account how readily the protein can be [digested](https://en.wikipedia.org/wiki/Digestion) and absorbed (largely by the [small intestine](https://en.wikipedia.org/wiki/Small_intestine)).

BV is commonly used in nutrition science in many [mammalian organisms](https://en.wikipedia.org/wiki/Mammals), and is a relevant measure in humans. It is a popular guideline in [bodybuilding](https://en.wikipedia.org/wiki/Bodybuilding) in protein choice.

2. **Biological Value (BV)**

Biological value has long been considered the method of choice for estimating the nutritive value of proteins. It has been defined as the "percentage of absorbed nitrogen retained in the body" and a

complete evaluation of the dietary protein includes measurement of the Biological Value and the Digestibility. These values are obtained by measuring the fecal and urinary nitrogen when the test protein is fed and correcting for the amounts excreted when a nitrogen-free diet is fed.

**Net Protein Utilization (NPU)**

Like Biological Value, NPU estimates nitrogen retention but in this case by determining the difference between the body nitrogen content of animals fed no protein and those fed a test protein. This value divided by the amount of protein consumed is the NPU which is defined as the "percentage of the dietary protein

retained". Since both NPU and BV are based upon estimates of "retained nitrogen", they should measure the same thing except that in the calculation of NPU the denominator is the total protein eaten whereas in the calculation of BV it is the amount absorbed. BV would be expected to be higher than NPU by the amount of nitrogen lost owing to lack of digestibility (lack of absorption). In weanling rats, it is possible that total carcass analysis is a more accurate measure of "retained nitrogen" that can be obtained from nitrogen balance measurements although this has not been proven. It is certainly less tedious. Nitrogen balance measurements must be used in large animals and in studies on man.

**Amino Acid Score**

If the composition of an "ideal protein" was known, that is a protein which contained every essential amino acid in sufficient amounts to meet requirements without any excess, then it should be possible to compute the nutritive value of a protein by calculating the deficit of each essential amino acid in the test protein from the amount in the "ideal protein". The "most limiting amino acid", the one in greatest deficit, would presumably determine the nutritive value.

**Plasma Amino Acids**

Changes in plasma amino acid levels after the feeding of various proteins can under certain conditions yield estimates of the nutritional quality. It may be noted, however, that the range of each

of the amino acids in the plasma in normal animals is relatively large. This variability imposes serious limitations upon the quantitative interpretation of any changes in

the levels observed. Thus, while it may be possible to identify the limiting amino acid in certain proteins by this technique, the likelihood that good quantitative assays for nutritional quality can be developed using plasma amino acid levels is not promising.