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**PHARMACOLOGY**

**18/MHS07/006**

**BCH 204**

**QUESTION**

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

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

* **Biological value** (**BV**) is a measure of the proportion of absorbed [protein](https://en.m.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.m.wikipedia.org/wiki/Protein_biosynthesis) in the [cells](https://en.m.wikipedia.org/wiki/Cell_(biology)) of the organism. Proteins are the major source of [nitrogen](https://en.m.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.m.wikipedia.org/wiki/Ratio) of nitrogen incorporated into the body over nitrogen absorbed gives a measure of protein "usability" – the BV.

Unlike some measures of protein usability, biological value does not take into account how readily the protein can be [digested](https://en.m.wikipedia.org/wiki/Digestion) and absorbed (largely by the [small intestine](https://en.m.wikipedia.org/wiki/Small_intestine)). This is reflected in the experimental methods used to determine BV.

BV uses two similar scales:

1. The true percentage utilization (usually shown with a percent symbol).
2. The percentage utilization relative to a readily utilizable protein source, often [egg](https://en.m.wikipedia.org/wiki/Egg_(food)) (usually shown as unitless).

These two values will be similar but not identical.

The BV of a food varies greatly, and depends on a wide variety of factors. In particular the BV value of a food varies depending on its preparation and the recent diet of the organism. This makes reliable determination of BV difficult and of limited use — fasting prior to testing is universally required in order to ascertain reliable figures.

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

## Advantages and disadvantages

BV provides a good measure of the usability of proteins in a diet and also plays a valuable role in detection of some metabolic diseases. BV is, however, a scientific variable determined under very strict and unnatural conditions. It is not a test designed to evaluate the usability of proteins whilst an organism is in everyday life — indeed the BV of a diet will vary greatly depending on age, weight, health, sex, recent diet, current metabolism, etc. of the organism. In addition BV of the same food varies significantly species to species. Given these limitations BV is still relevant to everyday diet to some extent. No matter the individual or their conditions a protein source with high BV, such as egg, will always be more easily used than a protein source with low BV.

### In comparison to other methods known

There are many other major methods of determining how readily used a protein is, including:

* [Net protein Utilization](https://en.m.wikipedia.org/wiki/Net_protein_utilization) (NPU)
* [Protein Efficiency Ratio](https://en.m.wikipedia.org/wiki/Protein_efficiency_ratio) (PER)
* [Nitrogen Balance](https://en.m.wikipedia.org/wiki/Nitrogen_balance) (NB)
* [Protein digestibility](https://en.m.wikipedia.org/wiki/Protein_digestibility) (PD)
* [Protein Digestibility Corrected Amino Acid Score](https://en.m.wikipedia.org/wiki/Protein_Digestibility_Corrected_Amino_Acid_Score) (PDCAAS)

These all hold specific advantages and disadvantages over BV,[[7]](https://en.m.wikipedia.org/wiki/Biological_value#cite_note-Proteins-7) although in the past BV has been held in high regard.

* 1. It is clear that protein plays a role in promoting optimal health. Many avenues are emerging for exploring protein's potential and elucidating the mechanisms at play in lean body mass retention, weight control, reduced inflammation, insulin sensitivity, and bone and cardiovascular health. The evidence available to date suggests that quality is important not only at the Recommended Daily Allowance but also at higher intakes. It is also evident that quality at higher compared with lower intakes is important for different reasons. Examination of the increasingly complex roles emerging for protein reveals these differences. The roles for IAAs in lean body mass retention, cell signaling, bone health, glucose homeostasis, and satiety induction are particularly intriguing and worthy of further study. Noting that currently accepted methods for protein quality evaluation do not capture the importance of IAAs beyond the first limiting amino acid, and given the long-standing debate regarding assessment of bioavailability, research assessing protein's role in optimal health at higher intakes should also explore implications for protein quality assessment.