18/mhs07/018

Bch 204 Assignment

May 30, 2020

1) What do you understand by the term” biological value of proteins”

Biological value (BV) is a measure of the proportion of absorbed [protein](/wiki/Protein%22%20%5Co%20%22Protein) 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](/wiki/Protein_biosynthesis%22%20%5Co%20%22Protein%20biosynthesis) in the [cells](/wiki/Cell_%28biology%29%22%20%5Co%20%22Cell%20%28biology%29) of the organism. Proteins are the major source of [nitrogen](/wiki/Nitrogen%22%20%5Co%20%22Nitrogen) 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](/wiki/Ratio%22%20%5Co%20%22Ratio)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](/wiki/Digestion%22%20%5Co%20%22Digestion) and absorbed (largely by the [small intestine](/wiki/Small_intestine%22%20%5Co%20%22Small%20intestine)). 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](/wiki/Egg_%28food%29%22%20%5Co%20%22Egg%20%28food%29)(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](/wiki/Mammals%22%20%5Co%20%22Mammals), and is a relevant measure in humans. It is a popular guideline in [bodybuilding](/wiki/Bodybuilding%22%20%5Co%20%22Bodybuilding) in protein choice.

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

Protein quality is the [digestibility](/wiki/Digestion%22%20%5Cl%20%22Protein_digestion%22%20%5Co%20%22Digestion) and quantity of [essential amino acids](/wiki/Essential_amino_acid%22%20%5Co%20%22Essential%20amino%20acid) for providing the proteins in correct ratios for human consumption. There are various methods that rank the quality of different types of [protein](/wiki/Protein%22%20%5Co%20%22Protein), some of which are outdated and no longer in use, or not considered as useful as they once were thought to be. The [Protein Digestibility Corrected Amino Acid Score](/wiki/Protein_Digestibility_Corrected_Amino_Acid_Score%22%20%5Co%20%22Protein%20Digestibility%20Corrected%20Amino%20Acid%20Score) (PDCAAS), which was recommended by the [Food and Agriculture Organization of the United Nations](/wiki/Food_and_Agriculture_Organization_of_the_United_Nations%22%20%5Co%20%22Food%20and%20Agriculture%20Organization%20of%20the%20United%20Nations) (FAO), became the industry standard in 1993. FAO has recently recommended the newer [Digestible Indispensable Amino Acid Score](/wiki/Digestible_Indispensable_Amino_Acid_Score%22%20%5Co%20%22Digestible%20Indispensable%20Amino%20Acid%20Score)(DIAAS) to supersede PDCAAS. The dairy industry is in favor of this[*[citation needed](/wiki/Wikipedia%3ACitation_needed%22%20%5Co%20%22Wikipedia%3ACitation%20needed)*], because while PDCAAS truncates all protein types that exceed the [essential amino acid](/wiki/Essential_amino_acid%22%20%5Co%20%22Essential%20amino%20acid)(EAA) requirements to 1.0, DIAAS allows a higher than 1.0 ranking: while for example both soy protein isolate and whey isolate are ranked 1.0 according to PDCAAS, in the DIAAS system, whey has a higher score than soy.