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Number one

Biological value (BV) 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. Proteins are the major source of 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 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 and absorbed (largely by the small intestine). This is reflected in the experimental methods used to determine BV.

BV uses two similar scales:

The true percentage utilization (usually shown with a percent symbol).

The percentage utilization relative to a readily utilizable protein source, often egg (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.

Number two

Net protein utilization

The net protein utilization, or NPU, is the ratio of amino acid mass converted to proteins to the mass of amino acids supplied. This figure is somewhat affected by the salvage of essential amino acids within the body, but is profoundly affected by the level of limiting amino acids within a foodstuff.

It is used as a measure of "protein quality" for human nutritional purposes.[1]

As a value, NPU can range from 0 to 1 (or 100), with a value of 1 (or 100) indicating 100% utilization of dietary nitrogen as protein and a value of 0 an indication that none of the nitrogen supplied was converted to protein.

Certain foodstuffs, such as eggs or milk, rate as 1 on an NPU chart.

Experimentally, this value can be determined by determining dietary protein intake and then measuring nitrogen excretion. One formula for NPU is:[citation needed]

NPU = ((0.16 × (24 hour protein intake in grams)) - ((24 hour urinary urea nitrogen) + 2) - (0.1 × (ideal body weight in kilograms))) / (0.16 × (24 hour protein intake in grams))

The Protein Digestibility Corrected Amino Acid Score is a more modern rating for determining protein quality. Best assessment of quality of protein is by digestible indispensable aminoacid score which is superior to PDCAAS

Amino acid score

Amino acid score, in combination with protein digestibility, is the method used to determine if a protein is complete. PDCAAS and DIAAS are the two major protein standards which determine the completeness of proteins by their unique composition of essential amino acids.[1]