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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.

**ASSIGNMENT**

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 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 (usually shown as

BIOLOGICAL VALUE OF FOOD PROTEINS:

The biological value (BV) of a protein is an expression of a number of the nutritional characteristics of the food. These include (1) the digestibility,

(2) the availability of the digested products, and

(3) the presence and amounts of the various essential amino acids. The biological value can be calculated by determining the nitrogen of the food intake minus the urinary and fecal nitrogen excretions by the formula:

V= Dietary N-( urinary N+ fecal N)

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Dietary N- fecal N

The biological value of a protein extends beyond its amino-acid composition and digestibility, and can be influenced by additional factors in a tissue-specific manner. In healthy individuals, the slow appearance of dietary amino acids in the portal vein and subsequently in the systemic circulation in response to bolus protein ingestion improves nitrogen retention and decreases urea production. This is promoted by slow absorption when only protein is ingested (e.g. casein). When a full meal is ingested, whey achieves slightly better nitrogen retention than soy or casein, which is very likely achieved by its high content of essential amino acids (especially leucine).

2. METHODS OF ESTIMATING PROTEIN QUALITY

Current protein quality methods assess animal growth (protein efficiency ratio) or, in humans, nitrogen balance, where both digestibility and the suitability of the amino acid pattern of absorbed amino acids (biological value) determines net protein utilization.

The method include:

* Biological value (BV)
* Net protein utilization (NPU)
* Amino acid score
* **BIOLOGICAL VALUE (BV)**

Biological value has long been

considered the method of choice for estimating the nutritive value of proteins. It can be 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. True digestibility is defined as the percentage of food nitrogen absorbed from the gut.

* **NET PROTEIN UTILIZATION (NPU)**

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".

* **AMINO ACID SCORE**

Amino Acid Scores have been

been calculated as the "percentage of adequacy". Amino Acid Scores be calculated from an amino acid pattern that was based upon estimates of amino acid requirements in man. All amino acids must be present at the site of protein synthesis in adequate amounts if protein synthesis is

to proceed, a comparable deficit of any amino acid would limit protein synthesis to

the same degree. Thus if the composition of an "ideal protein" was known, i.e., 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.