EFFECT OF AMINO ACID IMBALANCE ON NITROGEN RETENTION.

Ricardo Bressani.

Institute of Nutrition of Central America and Panama (INCAP), Guatemala, C.A.

Growing dogs were fed 4-5 g of protein/kg/body wt./day of a complete basal diet supplying N from gelatin 15%, casein 8%, DL-methionine 0.3% and DL-tryptophan 0.2%. N retention was strongly positive. Elimination of either amino acid decreased N balance more than the omission of both, but the retention with tryptophan alone was less than with methionine alone. With both omitted, N balance was only slightly below the level found with the basal diet. N retention was highest when the tryptophan to methionine ratio varied between 1/2.3 and 1/3.8; other rations result in decreased N retentions. All diets were tested for three 4-day balance periods. Supplementation with amino acid mixtures lacking the first limiting amino acid, methionine, was also studied. A 25% casein diet supplemented with tryptophan alone did not decrease N retention. Addition of tryptophan and threonine or of a mixture of tryptophan, threonine, phenylalanine, isoleucine, leucine, histidine and valine, without methionine resulted in a decreased N balance; with the mixture of all amino acids giving the lowest retention. Retention was consistently increased by adding the first limiting amino acid, methionine. Even with an imbalance, in one of the three 4-day periods, usually the second, a higher retention was observed than with the basal diet apparently a transient compensatory reaction.

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