

THE USE OF HOMOARGININE TO CORRECT ILEAL DIGESTIBILITY VALUES
FOR ENDOGENOUS AMINO ACIDS

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Measurements of the true digestibility of dietary protein by the analysis of ileal digesta require estimates of the contribution of endogenous amino acids. Hagemester and Erbersdobler (1985) have proposed the use of homoarginine to distinguish between exogenous and endogenous amino acids. This is achieved by transforming lysine side-chains in dietary protein into homoarginine (Mauron and Bujard 1963) and monitoring the homoarginine content of digesta. Homoarginine is not used for protein synthesis and therefore is not present in endogenous protein. The present studies were designed to evaluate the suitability of homoarginine as a marker of exogenous or dietary amino acids in the gut.

Nine protein sources, casein, isolated soybean, cottonseed meal, soyabean meal, sunflower meal, meat meal, maize, sorghum and wheat, were guanidinated by incubation in a buffered solution (pH 10.5) of O-methylisourea at 4°C for 24 hr. The average conversion of lysine to homoarginine was 60%. Aerobic and anaerobic in vitro incubation of free homoarginine with gut contents of chickens fed a conventional diet were carried out at 41°C for 3 hr. There was complete recovery of homoarginine after aerobic incubation but only 88% recovery following anaerobic incubation. Six-week-old, male broilers were fasted for 12 hr and then precision fed a semi-purified diet containing guanidinated casein as the sole source of protein. Contents of the small intestine were collected 3 hr later and it was shown that 90% of amino acids appearing in the ileum were of endogenous origin.

The use of homoarginine appears to offer considerable advantages over other methods of correcting ileal digestibility values for endogenous amino acids.

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