Undegradable Intake Protein

Undegradable Intake Protein (UIP) is defined by the US NRC as the fraction of crude protein (CP) consumed which is not degraded by rumen microbes. UIP is commonly referred to as bypass protein or escape protein. The magnitude of UIP for any particular diet or feed ingredient is dependent upon both the feed itself and the animal to which it is fed. In particular, when feed intake is low (e.g. dry cow), passage of feed through the rumen is slower and UIP may be reduced because time of exposure to microbial degradation is increased. Conversely, high intakes (e.g. peak lactation cow) reflect high rumen turnover rates, resulting in higher UIP values.

UIP is estimated by measuring the disappearance of CP from feed samples incubated in porous nylon bags in the rumen of a fistulated animal. The procedure is labourious and expensive, limiting its use to research facilities. Results obtained with this method have been quite variable both within and between laboratories.

A much simpler benchtop method has been proposed, in which feed samples are incubated with a mixture of protein-degrading enzymes extracted from the rumen. Although several commercial labs offer UIP analysis using this method, lack of standardization of both protocols and enzymes makes it difficult to place confidence in results.

for more information:

Bypass Protein 1. Background, *University of Alberta Dairy Research Highlights*

Bypass Protein 2. Production responses in early and late lactation, *University of Alberta Dairy Research Highlights*

Rumen-Protected Amino Acids 1. Background, *Dairy Research Results from the Lethbridge Research Centre*

Nutrient Requirements of Dairy Cattle, NRC 1989