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Estimation of rumen degradability of feed proteins and comparison of intestinal digestibility by *in vitro*, *in vivo* and mobile bag methods

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The extent of protein degradation in the rumen and the intestinal digestibility of the undegraded residues are an important characteristic of feed's quality in the new protein evaluation systems. A few methods are available to assess the intestinal digestibility of UDP but none of them is fully accepted.

The aim of this study was to estimate rumen degradability and intestinal digestibility of nitrogen (N) of some selected feeds and to compare the mobile bag method (MBM) and the *in vitro* enzymatic methods to *in vivo* method.

Feeds used were rape cake, rape extracted meal, sunflower meal, soya meal, wheat meal and wheat bran. Feed N degradability was determined by the *in sacco* method. Intestinal digestibility of rumen undegraded feed residues (after 16 h incubation) was estimated by an *in vitro* multienzymatic (pepsin, trypsin, chymotrypsin) method, by the MBM (difference between duodenum and faeces) and by an *in vivo* method based on N digestibility (5 days total faecal collection) in rats fed diets (10 %

CP, 10 g DM/d/rat) where the only N source was from feed N residues. A close relation was observed between ruminal N degradability and N solubility in solution 0.15 M NaCl with tested feeds. N degradability after 16 h rumen incubation was the lowest for soyabean meal (55.7 %) and the highest in rape seed meal (89.9 %). The intestinal digestibility of undegraded residues estimated with various methods increased as ruminal degradation decreased. The results of CP intestinal digestibility are presented in the table. The enzymatic method gave the highest values. The lowest difference among methods was observed for rape extracted meal (about 2 %) and the highest for sunflower meal (about 10 %). For all six feeds the *in vitro* results were closely related to the *in vivo* and MBM results, similarly the *in vivo* to MBM. It is demonstrated by the high correlation coefficients 0.955, 0.946 resp 0.937 ($P < 0.001$). This study documents that all methods are considered as equivalent to estimate intestinal digestibility of feeds tested in our experiment. In spite of the fact it is necessary to test a wider range of feeds.

| Feeds | <i>in vitro</i> % | Methods | |
|---------------------|-------------------|---------------|------------------|
| | | mobile bags % | <i>in vivo</i> % |
| Rape cakes | 48.5 | 46.5 | 42.2 |
| Rape extracted meal | 64.2 | 65.9 | 63.8 |
| Sunflower meal | 68.6 | 58.5 | 64.9 |
| Soya meal | 89.0 | 86.7 | 85.0 |
| Wheat meal | 81.3 | 77.1 | 73.0 |
| Wheat bran | 64.6 | 58.6 | 64.4 |