



In sacco degradability of protein and amino acids in rapeseed meal and extruded rapeseed meal

DESIGN OF STUDY

AIM

The aim of this study was to compare the nutritive value of rapeseed meal and extruded rapeseed meal.

MATERIAL AND METHODS

- The degradability experiments were performed using in sacco method in three dry cows (Black Pied) with a large ruminal cannula.
- The cows were fed twice a day and their daily feed rations consisted of:
 - alfalfa hay (4 kg),
 - maize silage (10 kg),
 - barley meal (1 kg),
 - vitamins and mineral supplements.
- The nylon bags (pore size 42 μm - Uhelon 130 T, Silk & Progress Moravska Chrástova) containing feed samples were attached to a cylindrical carrier.
- The samples were incubated in the rumen for 2, 4, 8, 16, 24 and 48 hours.

RESULTS

The effective degradability of amino acids (rumen outflow rate 0.06 h^{-1}) was determined as follows in order of rapeseed meal and extruded rapeseed meal, respectively:

- ⇒ arginine (Arg) 82.5, 86.0 %;
- ⇒ histidine (His) 84.5, 91.3 %;
- ⇒ isoleucine (Ileu) 89.6, 86.5 %;
- ⇒ leucine (Leu) 90.6, 87.4 %;
- ⇒ lysine (Lys) 82.4, 87.8 %;
- ⇒ methionine (Met) 97.6, 91.5 %;
- ⇒ phenylalanine (Phe) 93.9, 87.1 %;
- ⇒ threonine (Thr) 86.7, 85.5 %;
- ⇒ valine (Val) 89.6, 86.6 %;
- ⇒ alanine (Ala) 93.3, 87.7 %;
- ⇒ cysteine (Cys) 76.2, 90.1 %;
- ⇒ glycine (Gly) 89.1, 87.9 %;
- ⇒ proline (Pro) 81.2, 87.2 %;
- ⇒ serine (Ser) 87.2, 85.9 %;
- ⇒ tyrosine (Tyr) 87.2, 89.8 %.

CONCLUSIONS

The statistical differences were determined for all amino acids ($P < 0.05$), except of Thr, Gly, Ser, and Tyr.

These findings should provide the improved nutritional information necessary for determining the effects of the processing method on crude protein and amino acids digestibility in ruminants.

Tab. 1. Chemical compositions (in 100 % dry matter) and gross energy (KJ.g^{-1}) values of rapeseed meal and extruded rapeseed meal.

	Rapeseed meal	Extruded rapeseed meal
Original dry matter (%)	93.4	93.8
Crude protein (%)	31.3	31.9
Ether extract (%)	14.1	13.3
Crude fibre (%)	16.9	14.3
Nitrogen free extract (%)	31.1	33.9
Ash (%)	6.6	6.5
Organic matter (%)	93.5	93.5
Acid-detergent fibre (%)	28.1	27.3
Neutral-detergent fibre (%)	29.5	27.7
Gross energy (KJ.g^{-1})	21.9	21.6

Tab. 2. The effective degradability parameters of protein ($k = 0.06 \text{ h}^{-1}$).

	Rapeseed meal	Extruded rapeseed meal
Effective degradability (%)	85.8	82.7
Soluble fraction a (%)	46.5	35.9
Potentially degradable fraction b (%)	47.6	57.6
Rate of degradation c (h^{-1})	0.184	0.225
Lag time (h)	0	0

Fig 1. The effective degradability (%) of individual essential amino acids.

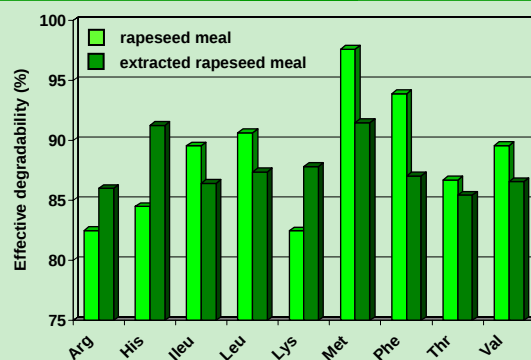


Fig 2. The effective degradability (%) of individual non-essential amino acids.

