56th Annual Meeting of the European Association for Animal Production (EAAP)
Uppsala - Sweden, June 5th – 8th 2005
Commission: Animal Nutrition
Session 15: Poster new coding 15.20_Homolka.pdf, (old coding N4.9_Homolka.pdf)
Email address: Homolka.Petr@vuzv.cz

INTESTINAL DIGESTIBILITY OF RUMEN UNDEGRADED PROTEIN DETERMINED BY MOBILE BAG METHOD IN RAPESEED, RAPESEED MEAL AND EXTRACTED RAPESEED MEAL

P. Homolka*, V. Koukolová
Research Institute of Animal Production, Uhříněves, 104 00 Prague, Czech Republic
****Corresponding author: Homolka.Petr@vuzv.cz***

Abstract: In this study, nutritive value of rapeseed, rapeseed meal and extracted rapeseed meal were compared. The experiments were performed usin the mobile bag technique with three dry cows (Black Pied), fitted with a large ruminal cannula and a T-piece cannula in the proximal duodenum. The procedure involves three steps:
1. Incubation of feed samples for 16 hours in the rumen of cattle to obtain the undegraded residues.
2. Incubation of the residues for 2.5 hours in an artificial stomach (abomasum).
3. Estimation of protein digestibilities of residues in the intestine using mobile bags.

The cows were fed twice a day (at 6 a.m. and 4 p.m.) and their daily rations consisted of 4 kg alfalfa hay, 10 kg maize silage and 1 kg barley meal with a vitamin and mineral supplement. Intestinal digestibility of rumen undegraded protein was 30 % for rapeseed, 15 % for rapeseed meal and 65 % for extracted rapeseed meal. There were statistically significant difference among the feeds ($P<0.05$). This work was supported by the Ministry of Agriculture of the Czech Republic (MZE 0002701403).

OBJECTIVES

To determine intestinal digestibility of rumen undegraded protein by mobile bag method in rapeseed, rapeseed meal and extracted rapeseed meal.

INTRODUCTION

The precise feed quality evaluation is one of the main assumptions for the increase of milk production in dairy cows and for the efficient utilisation of feeds. Protein supplements are the essential part of diets for high-production dairy cows. Based on current knowledge of ruminant physiology of nutrition, new systems of protein evaluation in feeds for ruminants have been introduced and accepted in most European countries and in the USA. These systems determine how adequately are the requirements of organism for the amino acids

intake met according to the quantity of protein actually entering the small intestine. All these systems are based on the same principles:
1) Separate evaluation of protein used by a host animal and by micro-organisms in the rumen.
2) The use of protein degradability (the most important criterion) and intestinal digestibility of rumen undegraded protein.
In the Czech Republic, the PDI system is used which has been taken over from French PDI system - Proteines vraies réclement Digestibles dans´l Intestin (Verité et al., 1988). To determine PDI units, it is necessary to know nitrogen content, digestibility of the organic matter, degradability of protein in the rumen and intestinal digestibility of protein undegradable in the rumen.

MATERIAL AND METHODS

Feeds

Tab. Nutrients and energy contents of tested feeds in absolute dry matter

Feed	Dry matter	Crude protein	Ether extract	Crude fibre	Nitrogen free extract	Organic matter	Gross energy
	g/kg						MJ/kg
Rapesead (1418)	927	214	466	203	75	958	29.320
Rapesead meal (1419)	902	322	182	113	318	935	23.253
Extracted rapesead meal (1420)	879	390	25	114	396	925	20.539

Mobile bag method

The procedure involves three steps:
1. Incubation of feed samples for 16 hours in the rumen of cattle to obtain the undegraded residues.
2. Incubation of the residues for 2.5 hours in an artificial stomach (abomasum).
3. Estimation of protein digestibilities of residues in the intestine using mobile bags.

Animals

The mobile bag method was performed with three dry cows (Black Pied), fitted with a large ruminal cannula and a T-piece cannula in the proximal duodenum. The cows were fed twice a day and their daily rations consisted of 4 kg alfalfa hay, 10 kg maize silage and 1 kg barley meal with a vitamin and mineral supplement.

RESULTS

Intestinal digestibility of rumen undegraded protein was 30 % for rapeseed, 15 % for rapeseed meal and 65 % for extracted rapeseed meal. There were statistically significant difference among the feeds ($P<0.05$).

REFERENCES

Vérité E. R., Michalet-Doreau B., Chapoutot P., Peyrand J. L., Poncet C., (1987): Revision du systéme des protéines digestibles dans l´intestin (PDI). Bull. Tech. C.R.Z.V. Theix, I.N.R.A., 70: 19 - 34.

Acknowledgement
This work was supported by the Ministry of Agriculture of the Czech Republic (MZE 0002701403).