

EFFECT OF TEMPERATURE ON THE DEGRADATION OF RAPESEED CAKE PROTEIN

Helgi Kaldmäe, Marko Kass, Olav Kärt, Andres Olt

Institute of Veterinary Medicine and Animal Sciences of Estonian University of Life Sciences, Kreutzwaldi 64, 51014 Tartu, Estonia.

Phone: 372 7 313 473, Fax 372 7 313 477, e-mail: helgi.kaldmae@emu.ee

Summary. Rapeseed cake is frequently used in the diets of high productive cows. Production conditions of rapeseed cake can be variable, affecting the quality of feed.

Objectives of the investigation was to study chemical composition and nutritive value of rapeseed cake produced by short-term heat treatment (HTRC) and cold-pressing (CPRC) of rapeseed. In addition, the effect of treatment temperature of rapeseed on protein degradability and ruminal kinetics was studied. Rapeseed was processed at 100°C for 15-20 minutes. In production of CPRC, temperature reached up to 60°C. Protein degradability of rapeseed cake was studied by the *in sacco* method.

Chemical composition and nutritive value of CPRC were significantly different from these of HTRC. In CPRC, the content of crude protein, crude fat, metabolizable energy, metabolizable protein in dry matter was 336 g/kg; 187 g/kg; 13.99 MJ/kg and 103 g/kg, respectively; ruminal balance was 174 g/kg. As to HTRC, these values were 349 g/kg, 111 g/kg, 12.96 MJ/kg, 161 g/kg and 105 g/kg, respectively. CPRC had significantly higher content of crude fat and metabolizable energy ($P < 0.0001$); in HTRC, the content of metabolizable protein was significantly higher ($P < 0.0001$). Ruminal degradability of HTRC protein was slow. Heat treatment of rapeseed decreased effective protein degradability by 35.8%. The content of metabolizable protein in rapeseed cake increased by 1.5 times (58g per kg dry matter).

The effective degradability of protein of CPRC was 89.5% and of HTRC was 53.7%.

Chemical composition of rapeseed cake was affected by production conditions and temperature. Heat treatment of rapeseed improved the protein quality of rapeseed cake.

Key words: rapeseed cake, heat treatment, cold-pressed, protein, degradability.