

Nutritive Value of a Canola-Pea-Navy Bean Mixture for Pigs: Effect of Extrusion or Enzyme Supplementation

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Pulses have high quality proteins whereas oilseeds are rich in energy due to their high oil content. Thus, a mixture of pulses and oilseeds should provide an excellent source of energy and protein for swine. In two separate experiments, the nutritive value of a mixture of canola seed, peas, and navy beans (50:28:22, wt/wt) following extrusion or enzyme supplementation was evaluated using growing pigs (25-35 kg BW). The mixture was extruded in a commercial facility using the following conditions: internal pressure 2933 kilopascals and temperature 138°C for 15 seconds. The enzyme supplement was a multi-carbohydrase containing cellulase, pectinase, mannanase, xylanase, glucanase and galactanase activities. In Exp. 1, 8 barrows were housed in metabolism crates to determine DE and ME by difference method whereas in Exp. 2, 4 barrows were fitted with simple T-cannula and used to determine the apparent (ACPD) and true (TCPD) crude protein digestibilities by index marker method. A low protein diet was included in Exp. 2 to quantify endogenous losses. Both experiments utilized the same batch of raw or extruded canola-pea-navy bean products, except that inclusion rates differed (Exp. 1, 30%; Exp. 2, 35%).

The ME content for the extruded product tended ($P=0.07$) to be higher (6,002 kcal/kg DM) than that for the raw product (5,242 kcal/kg DM) whilst raw + enzyme supplemented product was intermediate (5,808 kcal/kg DM). The ACPD for raw mixture was lower ($P<0.05$) than for the extruded or enzyme supplemented product. When corrected for endogenous crude protein losses, the ACPD of extruded and enzyme supplemented mixtures showed similar ($P>0.10$) TCPD values.

Implications: The present studies provide information on the nutritive value of canola-pea-navy bean mixture for growing pigs. Enzyme technology or extrusion may be used to increase the energy value of pulse-oilseed mixtures for swine.