

Full-fat canola seed meal as a protein source for weaner and grower–finisher pig

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Abstract

Summary. Full-fat canola seed (*Brassica napus* cv. Oscar) (260 g/kg crude protein and 410 g/kg ether extract) was evaluated as an alternative protein source in diets fed to weaner and grower–finisher pigs. Four diets for weaner pigs were formulated on an iso-nutrient (about 198.9 g/kg crude protein, 15.2 g/kg lysine, 8.3 g/kg methionine and cystine and 2.4 g/kg tryptophan on a dry matter basis) and iso-energy basis (16.2 MJ/kg dry matter digestible energy) to substitute full-fat soybean with increasing levels of full-fat canola seed meal (0, 8, 16 and 24%). Similarly, 4 diets for grower–finisher pigs were formulated on an iso-energy and iso-nutrient basis (about 14.9 MJ/kg dry matter digestible energy, 178 g/kg crude protein, 10 g/kg lysine, 6.8 g/kg methionine and cystine and 2.2 g/kg tryptophan on a dry matter basis), where soybean oilcake meal was similarly substituted. Weaner pigs ($n = 80$) were fed *ad libitum* from 9.6 to 26.7 kg liveweight. Piglets were kept in groups of 4 (2 gilts and 2 castrated boars combined at random) in cages (1.5 by 1 m) with solid floors, fitted with a self-feeder and equipped with an automatic water nipple. Grower–finisher pigs ($n = 52$), individually housed in flat deck-type cages (1.6 by 1.0 m), fitted with a self-feeder and equipped with an automatic water nipple, were fed *ad libitum* from 22.9 to 91.1 kg, whereafter pigs were slaughtered, carcass characteristics determined and back-fat samples taken. Energy and nitrogen metabolism data were evaluated in a digestion and metabolism trial for the 4 grower–finisher diets. No significant difference in the intake, growth rate or feed conversion of weaner pigs was observed. The dry matter digestibility of the grower–finisher diet differed significantly ($P < 0.05$) between diets and decreased linearly by 4.5% ($P < 0.01$; SEb = 0.36) for each incremental increase in the canola inclusion level. The digestible energy content of the diets was not affected. Regression analysis revealed a linear decrease [2 g N/day ($P < 0.01$; SEb = 0.18)] in nitrogen retention rate for each increment increase in canola inclusion. The inclusion of up to 24% canola had no significant effect on feed intake, liveweight gain or feed conversion ratio of grower–finisher pigs, although regression analysis revealed a linear decrease of 21.7 (SEb = 5.9) g/day in growth rate with increasing canola levels. Inclusion levels of 16% in diets for grower–finisher pigs were recommended for maximum efficiency. The back-fat of pigs consuming diets with 16 and 24% full-fat canola in their diets had 13% ($P < 0.05$) higher iodine numbers than pigs that received 0 and 8% full-fat canola in their diets. Generally, all saturated fatty acids decreased while monounsaturated and polyunsaturated fatty acids increased, with increasing levels of canola in the diets.

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