

Response of Growing Pigs to Flaxseed



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Summary

A growth experiment was carried out in young pigs (25-30 kg) in order to evaluate the response to flax in their diet and to determine if the feeding of relatively high levels of flaxseed causes changes in performance not predicted by the nutrient profile. Five levels of flaxseed in the diet were tested: 0, 5, 10, 15 and 20%. Four other diets were formulated in order to contain the same amounts of fat as those of the flaxseed-based diets but in the form of canola oil (1.7, 3.3, 5.0 and 6.7% oil). A slight decline in growth occurred when flaxseed was added to the diet (-2.7 g ADG/% flaxseed, compared to -1 g ADG/% canola oil), no statistically significant differences between treatments was observed for ADG or average daily feed ($P > 0.05$).

Introduction

The pork industry is continually seeking alternative ingredients for use in pig diets, either as a means of diversifying rations and thus reducing cost, or to achieve a final pork product that meets certain specifications, eg. omega-3 fatty acid enrichment. Thus, there is growing interest in the expanded use of flaxseed and related products by the pork industry. Flaxseed possesses properties that make it unique as a feed ingredient, not the least of which

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is a highly desirable fatty acid profile in the lipid fraction. Flax acreage is expected to increase substantially, thus expanding the quantity and consistency of supply. The pork industry has traditionally shunned, or heavily discounted, ingredients with an uncertain supply.

However, whether or not flaxseed and related products will be viewed favourably by the pork industry will depend on a number of factors, the most important of which is a well-defined nutrient profile. There is also a need to determine how the pig will respond to increasing levels of flaxseed in its diet. By formulating diets based on the above-mentioned nutrients, nutritionists expect predictable performance. Because palatability and the impact of so-called anti-nutritional factors will not be determined in nutrient profiling, the only way to ensure that pigs perform as expected on diets containing flaxseed is to feed graded levels to the pig and evaluate performance compared to a known control. With a complete nutrient profile of flax in hand, and with objective information on the acceptability of flaxseed by the pig.

Table 1. Amount of Basal Diets and Blending Regimes for Intermediate Diets

Percent	% Diet	20% Flaxseed Diet	8% Canola Oil Diet
Flaxseed Diets			
0	600	0	0
5	450	150	0
10	300	300	0
15	150	450	0
20	0	600	0
Canola Oil Diets			
1.7	450	0	150
3.3	300	0	300
5.0	150	0	450
6.7	0	0	600
Required Amount	2,400	1,500	1,500

Table 3. Total fat, fibre, and protein composition of experimental diets.

Trt #	Treatment Description	Average feed intake (g/d)	Average daily gain (g/d)	Feed efficiency
#1	basal diet	2,314 (211)a	1,038 (081)	0.450 (0.036)
#2	5 % flaxseed	2,384 (248)a	1,088 (106)	0.464 (0.029)
#3	10 % flaxseed	2,173 (196)ab	1,034 (103)	0.477 (0.031)
#4	15 % flaxseed	2,226 (339)ab	1,029 (110)	0.466 (0.035)
#5	20 % flaxseed	2,302 (377)a	1,001 (076)	0.441 (0.047)
#6	1.7 % canola oil	2,304 (331)a	1,069 (129)	0.467 (0.045)
#7	3.3 % canola oil	2,177 (236)ab	1,067 (153)	0.489 (0.030)
#8	5.0 % canola oil	2,324 (227)a	1,110 (023)	0.481 (0.042)
#9	6.7 % canola oil	2,035 (302)b	1,012 (118)	0.509 (0.030)

a, b for average feed intake: means with different superscripts differ significantly ($P = 0.032$)

No difference was observed for average daily gain ($P = 0.081$) and feed efficiency ($P = 0.07$)

Experimental Procedures

Pigs were weighed at experiment initiation (day 0) and weekly thereafter (d7, 14, 21, 28). All feed was weighed into the feeders and feeder weigh backs done on weigh days, for the calculation of weekly feed intake. Feed samples were obtained at the time of mixing and weekly thereafter. Samples were composite by treatment. Faecal grab samples were collected during week 2 from 3 randomly selected male and 3 randomly selected female pens per treatment. Samples were composite by gender and treatment. All data were entered into the computer on the day of collection and stored on the main server to ensure regular back-ups were performed.

Results and Discussion

Analysis of the ground flax seed indicated it contained (as fed basis) 33.3 % crude fat, 19.6 % crude protein and 8.6 % moisture. Analysis of the diets is described in Table 3. With the exception of treatment # 9, which contained more total fat than formulated, the basal diet and all the flaxseed diets contained more total fat than formulated and all the canola oil diets contained less total fat than formulated. The % difference between formulated and actual was greater in the canola oil diets than the corresponding flaxseed diets.

Pigs came off test September 14, 2005. Overall performance was excellent, and no pigs were removed from test during the 28-d experiment. Average initial weight was 27.5 and 27.4 kg for male and female pigs, respectively. The average initial weight and SD of blocks ranged from 24 ± 1.2 kg to 31.8 ± 2.3 kg. Average final weight was 63.01 and 63.12 for male and female pigs, respectively.

Implications

Balanced diets containing up to 15% flaxseed will not adversely affect average daily gain, feed intake, feed efficiency of growing pigs (30-55kgs). Growing pigs can adapt to high levels, approximately

7%, of fat in the form of flaxseed better than equivalent levels of canola oil.

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