

Lupin based diets increase digesta retention in growing pigs

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The high protein and energy contents of the grain legumes *Lupinus angustifolius* (narrow-leaf lupins) and *L. albus* (white lupins) suggest that they should be an excellent stockfeed. However, when lupins are included in pig diets, performance is poorer than expected, particularly with *L. albus*. The poorer performance of pigs consuming diets containing lupins may be due in part to a reduction in feed intake which is associated with the high fibre content of lupins (1). The aims of the present study were to quantify the reduction in performance of pigs consuming lupin containing diets and identify if the factors responsible are in the whole seed or the seed coat.

Six wheat based diets, with peas or lupins included at 35%, were formulated to similar digestible energy and lysine contents. The six diets were wheat (Wheat), wheat + whole *L. angustifolius* seeds (*L. angus.*), wheat + *L. angustifolius* kernels (*L. angus - K*), wheat + whole *L. albus* (*L. albus*), wheat + *L. albus* kernels (*L. albus - K*) and wheat + peas (Peas). Thirty-six, male pigs (78.5 ± 2.55 kg body weight) were individually penned and allocated to one of the six diets and allowed ad libitum access to the diets. After four weeks the pigs were slaughtered and the gastro-intestinal tract (GIT) removed and sectioned into stomach, small intestine (SI), caecum and large intestine (LI). The contents of each section were removed and weighed.

	Wheat	L.angus	L.angus-K	L.albus	L.abius-K	Peas	SED	P
Average feed intake (kg/d)	3.00a	2.83a	3.07a	2.19b	2.34b	2.79a	0.143	<0.001
Average gain (kg/d)	1.13a	1.01a	0.98a	0.75b	0.78b	0.98a	0.073	<0.001
Feed:gain	2.68	2.81	3.16	2.93	3.11	2.85	0.223	0.269
Stomach contents (g)	242a	512ab	324a	837bc	1093c	307a	203.8	0.001
SI contents (g)	642a	996ab	660ab	1161bc	1572c	708ab	247.1	0.004
Caecum contents (g)	258	446	290	370	301	293	83.1	0.259
LI contents (g)	1002a	1767b	990a	1335ab	1216ab	1081a	276.0	0.076
Total GIT contents (g)	2143a	3721b	2264a	3702b	4182b	2389a	560.3	0.002

abc= Values within a row with the same superscript are not significantly (P<0.05) different

In general, pigs offered diets containing lupins consumed less feed and grew slower than the pigs offered the Wheat or Peas diets, however there were no differences in feed efficiency. Pigs consuming lupin diets, particularly *L. albus*, had more digesta in the GIT tract than the pigs consuming diets without lupins. We postulate that the increased retention of digesta in the GIT, particularly the stomach, may have a negative effect on feed intake by triggering satiety signals. Feeding lupin kernels rather than whole seeds did not consistently improve pig performance suggesting that the factor(s) responsible are not solely in the seed coat.

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1. van Barneveld RJ, King RH, Mullan BP, Dunshea FR. Maximising the efficiency of lupin use in pig diets. Recent Advances in Animal Nutrition in Australia 1995:37-42.