

NUTRITIVE VALUE FOR PIGS OF WHITE LUPINS (*L. albus* cv. Hamburg)

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Narrow-leaved lupins (*L. angustifolius*) are used extensively as pig feed in Australia. White lupins (*L. albus*) contain more protein and energy than narrow-leaved lupins and there has been some interest in developing the use of the white lupin variety Hamburg as pig feed. However, King (1981) found that dietary levels of Hamburg lupin greater than 10% depressed the growth performance of pigs. This effect appeared unrelated to alkaloid levels ($< 0.02\%$) or high manganese levels (> 2000 ppm) in the seed but King (1981) suggested that amino acid availability may be low.

The work reported in this paper further investigates amino acid availability in Hamburg lupins using both a growth trial and a digestibility trial. Sixty-four pigs were grown from 20 to 50 kg live weight on two feeding scales (ad libitum or 3.1 M) and individually fed one of four diets. The diets contained either 0, 8.3, 16.5 or 25% Hamburg lupin in place of soyabean meal and all diets had similar levels of total lysine (0.95%) and digestible energy (14.6 MJ/kg).

As shown in Table 1, there was a decrease in either growth rate or food utilization with each increment of dietary lupin but lupin had no significant effect on food intake.

TABLE 1 Main effects of lupin and feeding levels on pig performance between 20 - 50 kg live weight

	Hamburg lupin (%)				Feeding System		Coefficient of Variation (%)
	0	8.3	16.5	25	Restricted	Ad lib	
Daily gain (g)	743 ^a	691 ^b	663 ^b	614 ^c	586 ^a	770 ^b	8.2
Feed conversion	2.5 ^a	2.5 ^a	2.8 ^b	3.0 ^c	2.6 ^a	2.8 ^b	9.7
Daily feed intake (kg)	1.8	1.7	1.8	1.9	1.5 ^a	2.1 ^b	8.9

a,b,c For each main effect and for each row, means followed by a different superscript are significantly different ($P < 0.05$)

Amino acid digestibility was determined using four pigs prepared with simple ileal cannulas and fed a basal wheat diet and diets in which wheat was supplemented with Hamburg lupin or soyabean meal. The average true digestibility of amino acids in the soyabean meal diet was greater ($P < 0.05$) than that in both the lupin and wheat diets. It was calculated that the true digestibilities of lysine in soyabean meal and Hamburg lupin were 89 and 82%. Less than half of the dry matter of the lupin was digested in the gut proximal to the ileal cannula but 36% was digested in the hind gut.

Although the pigs absorbed less of the lysine from Hamburg lupin than from soyabean meal, this difference alone is unlikely to account for the depressed performance of pigs fed high levels of Hamburg lupin. However, in addition to this it seems likely that the utilization of the energy of lupins by the pig will be low because of the large proportion of the Hamburg lupin digested in the hind gut (Just, 1981). These two effects together reduce the nutritive value of Hamburg lupins relative to soyabean meal.

JUST, A. (1981). *Pig News and Information* 2 : 401.

KING, R.H. (1981). *Anim. Feed Sci. Technol.* 6 : 285.

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