

# The nutritive value of yellow lupins (*L. luteus*) seed for growing pigs: retention of cadmium

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Recent selections of Yellow Lupins (YL) have been found to have a higher crude protein content than that of Australian Sweet Lupins (ASL) (*L. angustifolius*) (380 vs 310 g/kg, respectively) and to yield better than ASL varieties on low-fertile acid soils (700 vs 470 kg/ha, respectively) (Cowling, unpublished). Mullan *et al.* (1997) concluded that YL have the potential to be a high quality feedstuff for growing pigs based on the results of a study where pigs were fed diets containing up to 260 g/kg of the seed to pigs between 20 and 55 kg liveweight (LW). However, as part of the testing of seed from the Agriculture WA breeding program it was found that cadmium (Cd) levels in YL were higher than in ASL (Peterson, unpublished). Although still below the international standard for Cd in stockfeed, there was some concern that this might limit its potential market as a stockfeed. The aims of this experiment were to: (i) measure the retention of Cd in body tissues of pigs that had been fed a diet containing high levels of YL over an extended period of time, and (ii) to measure the performance of pigs fed diets that contain varying proportions of YL as a replacement for soybean meal.

Female pigs (n = 5) were allocated to one of four treatments at weaning (19 days of age) and fed *ad libitum* in individual pens until reaching the target LW. Diets were formulated to contain similar concentrations

of DE and amino acids for pigs at 5, 20 and 50 kg LW, representing the three common growth phases for pigs. The inclusion rate of YL in the 'Low' diets was 50, 100 and 150 g/kg, the 'Medium' was 80, 160 and 230 g/kg, and the 'High' was 150, 220 and 270 g/kg for the three growth phases, respectively. At slaughter, samples of liver, kidney and muscle were collected from each pig and analysed for Cd.

The level of Cd in kidney samples was almost 10 times below the maximum permissible concentration, and Cd could not be detected in samples of muscle or liver. There was no significant effect of inclusion level of YL on performance of pigs, although the number of animals per treatment was relatively small (n = 5) due to the limited quantity of seed available. These results support those of Mullan *et al.* (1997) that YL are a suitable replacement for soybean meal in grower diets. The concentration of Cd in YL seed is below that which would be of concern to the stockfeed industry.

Mullan, B.P., van Barneveld, R.J. and Cowling, W.A. (1997). Yellow lupins (*Lupinus luteus*): A new feed grain for the pig industry. In: *Manipulating Pig Production VI*, p. 237 (ed. P.D. Cranwell). Australasian Pig Science Association, Werribee Vic 3030.

**Table 1** Performance of growing pigs fed diets with increasing concentrations of yellow lupins (YL).

	YL inclusion level				P =	I.s.d.
	Nil	Low	Medium	High		
Liveweight (kg) – start	5.87	6.38	6.28	6.30	0.802	1.22
Liveweight (kg) – end	92.20	95.50	96.00	92.10	0.819	12.54
ADG (g)	684.00	729.00	733.00	693.00	0.672	112.90
VFI (kg/d)	2.32	2.47	2.52	2.44	0.883	0.599
FCR	2.89	2.97	2.98	3.04	0.910	0.481
P2 (mm)	16.80	15.60	18.80	17.30	0.525	5.09