Mandelup lupins (*Lupinus angustifolius L.*) and enzyme supplementation do not affect carcass composition and meat quality of pigs

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Feeding albus lupin seed to pigs is known to decrease dressing percentage due to gut fill and intestinal cell proliferation. In addition, feeding lupins to pigs has been shown to decrease backfat thickness, without influencing carcass leanness and lean meat percentage in the ham. Enzyme supplementation can alter protein digestibility and this may have an effect on carcass composition. The impacts of including high levels of recently released cultivars of Australian sweet lupins (ASL) (*Lupinus angustifolius*) and the interaction of lupins with supplemental enzymes on carcass composition and indices of meat quality have not been examined. The purposes of this experiment were to examine 1) whether increasing use of the current variety of ASL seed (cv. Mandelup) and addition of multi-enzyme influences carcass characteristics of pigs and 2) whether high inclusion levels of ASL influences meat quality traits.

Two hundred and twenty-four (Large White x Landrace, 27.2±0.22 kg) male pigs were allocated to a 4x2 factorial design with the respective factors being lupin inclusion level (200, 250, 300 and 350 g/kg) and multi-enzyme supplementation (± added enzyme; Allzyme® SSF, Alltech Biotechnology Pty Ltd). All diets were formulated to contain equal amounts of ileal digestible amino acids and the same ileal digestible lysine to digestible energy ratio by progressively substituting lupins for soybean meal. Pigs were fed grower, finisher and pre-sale diets to 50 kg, 75 kg and 107 kg, respectively and then slaughtered at 107 kg. At 24 hours post-slaughter, longissimus thoracis muscle from the left side of each carcass were collected between the 10th and 15th ribs and indices of meat quality were measured in pigs at the two extremes (i.e. 200 and 350 g/kg). The GLM procedure of SPSS (SPSS Inc) was used (using pig as the experimental unit) for statistical evaluation.

Carcass composition and P2 fat depth were not significantly influenced by lupin concentration or enzyme supplementation (Table 1). Enzyme supplementation did not alter the growth of pigs or carcass characteristics. Including either 350 g/kg or 200 g/kg lupin seeds in the diets did not alter meat quality (Table 2). Under the conditions of this experiment, feeding up to 350 g/kg cv. Mandelup showed no negative effects on carcass composition or meat quality.

Table 1. Effects of lupin concentration and enzyme addition on carcass compositions

	Lupin (g/kg)				Enzyme			Main effect		
	200	250	300	350	-	+	SEM	Lupin	Enzyme	LxE
HCW[1]	69.9	70.0	69.7	69.5	69.7	69.9	0.18	0.824	0.710	0.793
Dressing %	65.0	64.9	64.8	64.5	64.8	64.8	0.18	0.771	0.876	0.984
P2 Backfat	13.6	13.5	14.0	14.0	13.7	13.9	0.23	0.821	0.719	0.532

[1]Hot carcass weight: AUSMEAT trim 13- head off, flare off, fore trotters off, hind trotters on.

Table 2. Effects of lupin concentration on meat quality

Lupin inclusion rate	200 g/kg	350 g/kg	SEM	Significance
Relative lightness (L*)	49.2	50.1	0.53	0.403
Relative redness (a*)	6.84	6.46	0.214	0.377
Relative yellowness (b*)	3.41	3.44	0.157	0.942
Ultimate pH	5.23	5.23	0.017	0.862
48-hour drip loss (%)	3.40	3.13	0.186	0.486
Cook loss (%)	36.5	35.9	0.32	0.348
WB shear-force (kg)	6.91	5.96	0.290	0.102

This work was funded by the WA Agricultural Produce Commission: Pork Producers' Committee.