

Dietary lecithin improves the compression properties of pork from the *longissimus thoracis* muscle

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D'Souza *et al.* (2005) showed that dietary lecithin could improve the eating quality of pork from the *Semitendinosus* muscle by reducing chewiness and hardness. It has been hypothesised that the phospholipid, polyenylphosphatidylcholine (PPC), present in lecithin extracted from soy beans may decrease the cross-linking of collagen fibrils (Lieber *et al.*, 1990) and reduce the chewiness and hardness of pork. However muscles vary in collagen content and in the extent of collagen cross-linking. The aim of this experiment was to investigate the effect of lecithin supplementation at varying doses on the pork quality in the *Longissimus thoracis* and *Semitendinosus* muscles.

Forty crossbred (Large White x Landrace x Duroc) female pigs were used. Pigs were fed either: 1) a commercial grower and finisher phase diet (Control); 2) control diet supplemented with 3 g lecithin/kg of feed during the grower and finisher growth phase (soybean lecithin, ADM Australia Pty Ltd); 3) control diet supplemented with 15 g lecithin/kg feed during the grower and finisher growth phase or; 4) control diet supplemented with 75 g lecithin/kg of feed during the grower and finisher growth phase. The pigs were housed individually and had *ad libitum* access to feed and water via nipple drinkers. The pigs were slaughtered at 23 weeks of age (100 kg \pm 1 kg) according to standard commercial procedures. Twenty-four hours after slaughter, the *Longissimus thoracis* muscle was removed for objective assessment of pork quality (muscle pH, colour, surface exudate, shear force and compression tests (Channon *et al.*, 2002). All data were analysed by ANOVA. Supplementing lecithin at 15 g/kg or 75 g/kg feed reduced the hardness and chewiness of pork significantly compared to the control treatment (Table 1). There was no effect of lecithin supplementation ($P > 0.05$) on muscle cohesiveness, pH, colour, surface exudate, cook loss percentage or shear force.

Table 1: The effect of lecithin supplementation on the objective pork quality of the *Longissimus thoracis* muscle twenty four hours after slaughter.

	Control	Lecithin 3g/kg	Lecithin 15g/kg	Lecithin 75g/kg	Isd.	P - value
pH (24 hr)	5.45	5.47	5.50	5.46	0.099	0.806
L*	50.4	50.3	49.5	51.9	3.50	0.549
a*	6.70	6.84	5.50	6.46	1.23	0.139
b*	3.85	4.03	3.06	4.20	1.15	0.223
Surface exudate (mg)	68.4	59.4	54.0	68.7	23.5	0.523
Cook loss (%)	30.6	30.7	30.5	31.0	2.24	0.965
Shear force (kg)	5.80	6.06	5.76	6.01	1.24	0.947
Hardness (kg)	4.93	4.65	4.32	4.28	0.337	<0.001
Cohesiveness	0.404	0.404	0.398	0.402	0.016	0.819
Chewiness	1.99	1.88	1.73	1.72	0.158	0.002

A dose of 15 g lecithin/kg feed was considered to be the most cost-effective commercial level required to improve the compression characteristics of pork. The impacts of reduced chewiness and hardness on the sensory properties (juiciness, tenderness, flavour and overall acceptability) of pork due to lecithin supplementation need to be quantified. The results from this experiment and D'Souza *et al.* (2005) indicated that varying amounts of lecithin were required to improve the pork compression characteristics of different muscles and that this was most likely dependant on the collagen levels and extent of cross-linking. The lack of effect of lecithin supplementation on cohesiveness of pork requires further investigation.

References

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