Dietary lecithin improves the compression properties of pork from the *semitendinousus* muscle

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Consumers rate tenderness and texture as important eating quality attributes of pork. Pork tenderness and texture are affected by the collagen and myofibril protein components of pork. For example, cross-linking and temporal pattern of thickening of collagen fibrils and the subsequent decline in heat solubility can result in tough and chewy pork (Fang *et al.*, 1999). In this experiment we hypothesised that the phospholipid, polyenylphosphatidylcho line (PPC), present in lecithin extracted from soy beans would decrease the cross-linking of collagen fibrils (Lieber *et al.,*1990) and that this would improve the tenderness and texture of pork. The aim was to determine the effect of dietary lecithin supplementation during the grower and finisher growth phases on the compression properties (measure of texture) of pork.

Twenty crossbred (Large White x Landrace x Duroc) female pigs were used with the main nutritional treatments being: 1) control (pigs fed commercial grower and finisher phase diet) and; 2) lecithin (3g/kg) supplementation during the grower and finisher growth phase (soy bean lecithin, ADM Australia Pty Ltd). The pigs were housed individually and had *ad libitum* access to feed and water via nipple drinkers. The pigs were weighed weekly and total feed intake recorded. At about 23 weeks (105 kg ± 2 kg) the pigs were transported to a commercial abattoir and slaughtered according to standard commercial procedures. Twenty-four hours after slaughter the *semintendinosus muscle* was removed for muscle compression tests (hardness – peak force required to achieve initial penetration, cohesiveness – increase in proportion of work required for a second penetration compared to that required for the first penetration and chewiness – the product of hardness and cohesiveness) (Channon *et al.*, 2001). All data were analysed by ANOVA.

Table 1. The effect of dietary lecithin supplementation on the growth performance, carcass quality and *semitendinosus* compression properties of female pigs housed individually.

	Control	Lecithin (3g/kg)	lsd	P-values
Start live weight – Day 68 (kg)	25.5	25.9	2.60	0.786
End live weight – Day 166 (kg)	106.7	104.9	11.1	0.738
ADG (kg) day 68-166	0.828	0.811	0.108	0.734
VFI (kg/d) day 68-166	2.42	2.41	0.242	0.931
FCR day 68-166	2.93	3.03	0.306	0.534
Carcass weight (kg)	72.1	72.9	9.46	0.866
Back fat depth - P2 (mm)	14.9	14.4	3.64	0.795
% Cook loss	31.4	28.7	3.16	0.090
Compression test: Hardness (kg)	3.22	2.80	0.321	0.011
Cohesiveness	0.385	0.381	0.015	0.569
Chewiness	1.26	1.07	0.155	0.021

There was no significant difference in live weight, average daily gain, feed intake, feed conversion ratio, carcass weight and back fat depth in pigs fed the control or lecithin supplemented diet ($P>0.05$). Although not significant ($P = 0.09$), pigs fed the lecithin-supplemented diet tended to have lower percentage of cook loss than pigs fed the control diet. The compression tests indicated that pigs fed the lecithin-supplemented diet had significantly lower ($P<0.05$) hardness and chewiness values for the *semitendinosus* muscle than pigs fed the control diet. Dietary lecithin supplementation did not have a detrimental effect on growth performance or carcass quality and significantly reduced the chewiness and hardness of pork. Lecithin also had the potential to improve the tenderness of pork. The lack of effect of lecithin supplementation on cohesiveness of pork requires further investigation.

References

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