

Evaluation of cottonseed meal for grower pigs between 20 and 50 kg liveweight

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Cottonseed meal (CSM) offers great potential for use in Australia's intensive livestock industry as an economical protein-rich source. Unfortunately, CSM is often limited to low dietary inclusion levels in pig diets (4–10%) because of the suspected adverse effects of anti-nutritive factors such as gossypol. Gossypol may bind with lysine during heat processing thereby reducing digestibility and availability (1,2). This experiment examined the inclusion level of solvent-extracted CSM in diets of pigs growing from 20 to 50 kg liveweight. The experiment was arranged as a randomised block layout of 36 individually penned Large White cross pigs, with six dietary treatments (0, 50, 100, 150, 150 with Fe and 200 g/kg CSM X two sexes (males and females) replicated three times. Pigs weighing ~20 kg were randomly allocated within sex and initial weight class to blocks of pens with pen blocks corresponding to initial weight classes. Diets were formulated to contain 14MJ/kg Digestible Energy (DE) and 0.63 g available lysine per MJ DE. Diets and water were offered *ad libitum*. CSM was sourced from Brisbane and contained 453 g protein/kg, 16.6 g lysine/kg, 18 g fat/kg and 0.06 g free-gossypol/kg.

Diet CSM g/kg	0	50	100	150	150 (Fe) ¹	200	LSD _(0.05)
ADG ² (kg/d)	0.826 ^b	0.747 ^c	0.893 ^{ab}	0.905 ^a	0.899 ^a	0.899 ^a	0.067
FCR ³ (kg/kg)	3.001	2.984	2.835	2.780	2.806	2.823	0.238
DFI ⁴ (kg/d)	1.843 ^b	1.883 ^b	2.120 ^a	2.086 ^a	2.079 ^a	2.134 ^a	0.189

Row means not followed by a common superscript differ significantly. ¹150g/kg CSM + iron sulphate. ²Average Daily Gain, ³Feed Conversion Ratio, ⁴Daily Feed Intake.

The performance of pigs fed > 100 g/kg CSM was significantly greater than those on control diet ($P < 0.05$). This suggests that the DE value of CSM was underestimated in the formulation of the diets. Diet containing 50 g/kg of CSM yielded the lowest ADG (0.747 kg/d), although the DFI at this inclusion level was not significantly different to the control diet. Addition of iron salt did not have any effect on growth performance. This suggests that inclusion of solvent extracted CSM in diets of growing pigs does not require the addition of iron salts to neutralise the effects of gossypol that is present in CSM. The FCR was not significantly different as the level of CSM increased. The data confirms that up to 200 g/kg of CSM can be fed to pigs growing from 20 to 50 kg without any deleterious effect on performance. Further investigation on energy digestibility and amino acid digestibility and availability is warranted if CSM is included at high levels in pig diets. *Supported in part by Pig Research and Development Corporation.*

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2. Fernandez SR, Zhang Y, Parsons CM. Dietary formulation with cottonseed meal on a total amino acid versus a digestible amino acid basis. *Poultry Sc* 1995; 1168–1179.