

Ileal and fecal digestibilities of various dietary components in raw or toasted Jack beans (*Canavalia ensiformis*) for growing pigs

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Previous work (Leon et al. 1993) indicates that the seeds of Jack bean (JB) may be suitable for swine feeding. However, preliminary observations (unpublished) have shown that when growing pigs are offered diets containing raw JB, even at levels as low as 5%, feed intake is almost nil. Toasting of JB seeds, seems to be a promising approach to counteract the negative effects of raw JB on pig performance (Melción et al. 1994). The nutritional value of toasted JB, though, has not been assayed. Hence, this study was conducted to evaluate the ileal and fecal digestibility of various dietary components of toasted JB (TJB) in pigs.

Twelve castrated male pigs (20 kg body weight) were surgically modified to create an ileo rectal anastomosis for use in an ileal digestibility trial (Exp. 1). In addition, 12 intact pigs averaging 29.5 kg body weight were used in a fecal digestibility study (Exp. 2). In both experiments, apparent digestibility coefficients of dry matter, nitrogen, neutral detergent fibre (NDF), acid detergent fibre (ADF), ether extract (EE), energy and N balance were estimated. Jack bean seeds (*Canavalia ensiformis*) were toasted at 196°C for 18 minutes using a coffee toaster. Canavanine, an antinutritional factor present in Jack beans, content was determined. In addition, analysis of total lectins was carried out on raw and toasted Jack bean samples using the haemagglutination method. A 15% CP diet based on corn and soybean meal was formulated. Two levels of toasted Jack beans (10 or 20%) were mixed thoroughly with the basal diet. The pigs were fed twice daily (0800 and 1800). Faeces were collected for 5 days after a 5 d

adaptation period. Ileal digesta were collected for 24 h. In general, toasting did not affect the chemical composition of jack beans except for an increase in ADF and NDF fractions. No haemagglutination activity was detected in toasted jack beans. The original canavanine content in raw jack beans was reduced by 90% following toasting. Adding 20% of toasted jack beans resulted in significant ($p < 0.05$) reduction in fecal and ileal digestibilities of dry matter, nitrogen and ADF (Table 1). At this level, ileal energy digestibility was not affected. At 10% level, toasted jack beans had no effect on the digestibility of the dietary components tested. These results confirm the potential of the toasting procedure as a means to improve the nutritive value of jack bean seeds for pigs.

References

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- Melción, J.P., Michelangeli, C. and Picard, M. (1994). Evaluation of the effect of extrusion cooking of jack bean (*Canavalia ensiformis* L.) seed on short-term feed intake in chicks. *Animal Feed Science Technology* 46, 197-213.

Table 1 Apparent ileal and fecal digestibility coefficients (%).

Dietary Component	Digestibility (%)*			
	Ileal		Fecal	
	C	C+ 20 % TJB	C	C+ 20 % TJB
Dry matter	72.2 ^a	66.9 ^b	88.6 ^a	85.7 ^b
Nitrogen	76.9 ^a	67.7 ^b	88.3 ^a	79.0 ^b
ADF	20.2 ^a	17.5 ^b	64.5 ^b	47.6 ^b
Digestible energy	70.0 ^a	65.0 ^a	87.0 ^a	83.4 ^b

^{a,b} Means in a row within a given collection methodology with no common superscripts differ significantly ($P < 0.05$). TJB: Toasted jack beans.