

True metabolizable energy of starches isolated from raw or toasted *canavalia ensiformis* seeds

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Jack beans (JB) have a high nutritive value (Michelangeli and Vargas, 1994), but their use in poultry diets is restricted due to deleterious effects on growth performance (Vargas et al. 1996). Toasting has been proposed as an effective means of minimizing the toxic effects of the antinutritional factors known to be present in JB (Picard et al. 1992). However, there is no information on regarding the TME, content of JB starch (native or toasted) in relation to the TME, content of raw or toasted JB seeds.

An experiment was conducted to determine the True Metabolizable Energy values, corrected to zero nitrogen balance (TME_n), of starches isolated from raw or toasted jack beans (*Canavalia ensiformis*). The seeds were toasted at 196°C for 18 min. The TME_n values of raw and toasted jack beans were also measured. Corn starch was used as a control for the overall experimental procedure. Eight adult Rhode Island Red cockerels were assigned to each ingredient. Birds were fasted for 24 h prior to the experiment and then precision-fed, by intubation, with 30g of test material. Excreta were collected for 48 or 72 h after feeding.

Table 1 shows that the TME_n value of raw jack bean starch was significantly ($P<0.05$) lower than that measured for toasted starch. No difference was observed between TME, values for starch samples estimated after collecting the excreta for either 48 or 72 h. Dry matter excretion of birds fed the raw jack bean meal at 48 h was significantly ($P<0.01$) lower than that of cockerels intubated with toasted jack beans (data

not shown). This resulted in an overestimation of the TME, value of raw jack beans. TME, values of starch isolated from raw and toasted jack beans at 72 h were 5.9 and 10.0 mJ/kg, respectively. TME_n of corn starch was 15 mJ/kg. The TME, value of toasted jack beans (10.8 mJ/kg) was similar to that of raw seeds (10.8 mJ/kg), suggesting that toasting selectively improved the digestibility of the starch fraction of jack beans. The results also indicated that when measuring TME, content of jack beans, the excreta collection period should be extended to 72 h.

References

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Table 1 TME, of Jack beans (raw or toasted) starch, corn starch, and raw or toasted JB seeds.

Sample	$TME_n \pm SE$ (MJ/kg dry matter)		p*
	0 - 48 h	0 - 72 h	
RJB Starch	6.51 ± 0.55 ^c	5.90 ± 0.51 ^c	0.44
TJB Starch	10.0 ± 0.28 ^b	10.0 ± 0.40 ^b	0.93
Corn Starch	14.2 ± 0.20 ^a	15.0 ± 0.25 ^a	0.04
RJB Seeds	13.6 ± 0.23 ^a	10.9 ± 0.27 ^b	0.01
TJD Seeds	9.4 ± 0.26 ^b	10.8 ± 0.15 ^b	0.01

^{a,b,c} Means within a given column with no common superscripts differ significantly ($P<0.05$).

*P value comparing means within a row.