

Evaluation of Two different Methods of processing Jackbean meal as a Feed ingredient for pigs.

Abstract

The aim of this Research was to determine the response of young growing pigs to diets containing cracked and cooked jackbean (CACJ) and jackbean soaked in water for 72 hours and cooked (SACJ). Cracked and cooked jackbean meal was prepared by breaking the seeds into pieces for an hour. The soaked whole jackbean seeds were also cooked for an hour. The cooked material were dried in the sun and milled. Seven diets were formulated such that diet 1 (control) contained no jackbean. Diets 2, 3, and 4 contained CACJ at 15, 20, and 25% respectively, while diets 5, 6, and 7 contained 15, 20, and 25% SACJ respectively. Forty Seven young growing pigs were divided into seven groups of seven pigs each, and each group randomly assigned to one of the seven experimental diets and fed for twelve weeks. The results of this studies showed that Cracked and Cooked jackbean significantly ($P < 0.05$) depressed feed intake, growth rate, of the pigs even at 15% dietary level. Soaked and Cooked jackbean also Significantly ($P < 0.05$) depressed feed intake and growth rate of the pigs at three tested levels. CACJ and SACJ improved the feed gain ratio of the pigs. The feed cost was also reduced. The results of this trials tended to confirm the information in literature that pigs are very sensitive to diets containing jackbean.

Based on this findings it is recommended that jackbean should not be used as a feed ingredient up to 15% dietary level for pigs.

Key words: pigs, crack, cooked, Soaked, Feed, jackbean.

1.0 Introduction

The need to increase pig production for increased protein supply to the growing population of the country^[SPCA1], calls for the use of alternative source of livestock feed which do not attract competition with man. Jackbean (Canavalia ensiformis) has been identified as an indigenous legume which has shown promise as energy and protein source for livestock production^[SPCA2]. However, the potentials of the jackbean is limited due to growth inhibiting proteins that must be denatured before the beans are edible (D'Mello *et al* 1985, Udedibie and Maduik 1988, Udedibie and Nwaiwu 1988, Wyss and Biucel, 1988^[SPCA3]). Many methods have been tried as means of improving nutritive value of jackbean so as to render its valuable as a protein and energy supplement for monogastric animals^[SPCA4]. It has been reported that heat treatment alone could not significantly destroy the anti-nutritional factors in it (Monilla *et al*, 1981, Udedibie and Nkwocha 1990, Udedibie *et al*, 1994^[SPCA5]). Recent studies by Uka (1998), Emenalom *et al* 2002^[SPCA6]) have shown that cracked and cooked legumes

could be tolerated by broilers up to 25% in the diet. Information on pigs performance on diets containing jackbean is very sketchy. The aim of this research was to evaluate the response of young growing pigs to diets containing cracked and cooked jackbean (CACJ) and jackbean soaked in water for 72 hours and cooked (SACJ).

2.0 Materials and methods

The jackbean seeds were processed using the two processing techniques developed by Udedibie and Carlini and (1997). Firstly, cracked and cooked: the seeds were broken into smaller pieces using grinding machine, the broken seeds were then cooked for 1 hour. The cooked material was sun dried to about 90% dry matter. It was then milled to produce cracked and cooked jackbean meal (CACJM). The second method, soaked in water and cooked: The whole beans were soaked in water for 72 hours, the soaking water was changed after 48 hours and replaced with fresh one to complete the remaining 24 hours. After, the seeds were washed and raised with fresh water and cooked for 1 hour. It is then sun dried and milled to produce soaked and cooked jackbean meal (SACJM). The meal was incorporated in the diets of growing pigs at 15, 20, and 25% levels respectively. (Table: 1).

Forty seven (47) weaned pigs of large white breed at week 6 of age and weighing 5.5kg were procured from university farm. The pigs were divided into seven groups of seven (7) each according to weight and sex and randomly assigned to the seven experimental diets. They were individually weighed at the beginning of the experiment and weekly thereafter. Feed consumption was recorded daily and water offered ad libitum.

Data collected were subjected to a one way analysis of variance (Snedecor and Cochran 1967) where the analysis of variance indicated significant treatment effects, means were compared using Fishers Least Significant Differences (LSD) test (Snedecor and Cochran, 1967).

3.0 Results

The data on the performance of the experimental Pigs are shown in Table 4.

Table 4: Performance of the experimental Pigs

Feed intake significantly ($P < 0.05$) dropped among the pigs fed on jackbean diets. The drop in feed intake was so drastic that the pigs were consuming only about 33% of the quantity of feed being consumed by the control group. There was no significant ($P > 0.05$) difference in feed intake among the groups on jackbean diets.

Weight gain: the control group recorded significantly ($p < 0.05$) higher growth, reflecting the significantly ($P < 0.05$) higher feed intake. Jackbeans significantly ($P < 0.05$) depressed growth of the pigs. The depression in growth rate was most severe among the pigs on CACJ diets. Interestingly growth rate of the pigs on SACJ diets increased with increase in dietary level of SACJ. However the

84 increase was not significant ($P>0.05$). All the jackbean based diets promoted
85 similar growth rate ($P>0.05$). This observation could not immediately be
86 explained. The feed conversion ratio of the pigs on the control diet was
87 significantly ($p<0.05$) inferior when compared with those of the groups on
88 Jackbean diets. The feed conversion ratios of groups on jackbean were
89 statistically similar ($P>0.05$). The groups fed the SACJ diets gave the best feed
90 conversion ratios, ranging from 1.37-1.4gm of feed per gram of the body
91 weight.

92 **3.1 Discussion**

93 The results of this study tended to show that the two processing methods (CAC
94 and SAC) could not completely eliminate the factors in the jackbean responsible
95 for depressed feed intake of the experimental animals. The only anti-nutritional
96 factor in the jackbean that could be blamed for sharp drop in feed intake of the
97 pigs is conavanine. Enneking *et al* (1993), Michelangeli and Vargas (1994) have
98 demonstrated that canavanine induces reduced feed intake in pigs. If the two
99 processing methods used in this study were able to eliminate Con A, the factor
100 that remains which could affect feed intake of the pigs is Canavanine^[SPCA10]. The
sharp

101 drop in feed intake of the pigs at 15% dietary level of both CACJ and SACJ
102 showed that pigs are more sensitive to anti-nutritional factors in the jackbean
than broilers. This is in confirmation of the recent study 103 by Ukah (1988)^[SPCA11]
104 reported that CAC jackbean significantly depressed feed intake of broilers at
105 30% dietary level. This research was also in line with the studies by Wyss and
106 Bickel (1988) reported that pigs are very sensitive to diets containing jackbean.
107 They also observed that more than 5% dietary inclusion of jackbean severely
108 depressed feed intake and growth rate of growing pigs.

109 **4.0 Conclusion**

110 The results of this study have shown that CACJ and SACJ are too strong for
111 young growing pigs at dietary level as low as 15%. There is need therefore for
112 further studies to determine the exact factors in the seeds that are responsible for
113 the sharp drop in feed intake of the pigs and then find ways of eliminating them.
114 Until this is done, it is difficult to recommend jackbean as feed ingredients for
115 pigs