

Apparent lack of toxicity of jute (*Corchorus olitorius*) seed for poultry

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Following outbreaks of jute seed poisoning in pigs in northern Queensland (Johnson and Toleman 1982) it was discovered that quantities of the contaminated sorghum grain involved had been used for the preparation of poultry rations. As there was circumstantial evidence of poisoning of young chickens from one large poultry unit in the area, experiments were undertaken to assess the effect of different concentrations of jute seed in diets on the mortality and growth rate of young chickens.

The jute seeds used in the 3 experiments were obtained from contaminated sorghum grain by screening and were finely ground and incorporated into a commercial chicken starter mash by thorough mixing. Seeds from these same screenings proved highly toxic when fed to pigs (Johnson and Toleman 1982).

The first chicken experiment was done immediately the seed was obtained and before being fed to pigs. A period of 10 months elapsed between the first and second experiments and 4 weeks between the second and third experiments. During these periods, the intact jute seed was stored in the dark, in sealed containers at a temperature of 5°C.

The identity of the seeds was confirmed by the Botany Branch, Department of Primary Industries, Brisbane. Day-old layer strain chickens were obtained from a commercial hatchery and penned on deep litter at the laboratory. Water was supplied *ad libitum* and artificial heating was provided for the duration of the trials.

All chickens were weighed and randomly allocated to equal groups. In the first 2 experiments, 5 groups of 15 chickens and 5 groups of 20 chickens, respectively, were allocated randomly to 5 treatments, namely 0% (control), 0.05%, 0.1%, 0.5% and 1.0% by weight of jute seed in the diet. In the third experiment, 3 groups of 20 chickens were fed 0%, 3.0% and 5.0% by weight of jute seed in the diet. The mean initial weights in grammes of the chickens in the three experiments were 29.9 ± 0.16 (\pm S.E.), 30.4 ± 0.27 , and 31.0 ± 0.31 , respectively. In all experiments the chickens were maintained on the diets for 3 weeks.

Data were analysed by analysis of variance for a completely randomised design and differences between treatment means were tested using the least significant difference procedure.

No mortalities occurred in any of the groups fed jute seed. In the first experiment the mean weight of the group fed 0.5% jute seed was significantly greater than that of either the control or 0.05% groups after the first week, but no differences were evident after 3 weeks (Table 1). The second experiment was conducted to check this anomalous finding,

and the results (Table 1) revealed no differences between any of the groups.

As no toxicity was detected in the first 2 trials, the third experiment was conducted to assess the effects of greater contamination. No adverse effects were evident even when the seed was fed at 5.0% by weight of the diet (Table 1).

At the completion of each experiment the birds were autopsied and tissues were processed for histopathology and examined for evidence of toxic change. No abnormalities were detected in any of the birds.

Jute seed contains saponins (Watt and Breyer-Brandwijk 1962) and poisoning in mammals is usually manifest by vomiting and diarrhoea, both of which probably result from the irritant action of saponins on the mucous membranes of the gastrointestinal tract (Clarke and Clarke 1975).

TABLE 1

The effect of jute seed contamination in diets on the bodyweight of chickens

Level of contamination (%)	Average bodyweight (g) after 21 days		
	Experiment 1	Experiment 2	Experiment 3
Control	116.4	150.0	148.3
0.05	110.7	161.1	—
0.1	116.1	146.5	—
0.5	122.7	150.7	—
1.0	109.2	149.4	—
3.0	—	—	152.7
5.0	—	—	141.8
LSD (P = 0.05)	12.8	15.9	13.7

There are few reports in the literature of toxicity to poultry by saponin containing plants. The seeds of corn cockle (*Agrostemma githago*) contain saponins and have been incriminated as a cause of losses in poultry (Hofstad *et al*, 1972), although Bierer and Rhodes (1960) were unable to poison chickens with diets containing 5.0% by weight of these seeds.

The failure to produce adverse effects in young chickens, with levels of jute seeds up to 5.0% of the diet indicates that this seed has a low toxicity for this class of poultry.

References

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