Assessment of haraz *(Acacia albida)* pods as a potential supplement for cattle

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Abstract

Haraz *(Acacia albida)* pods were collected in South Kordofan during the dry season. About 150 pods were selected at random, dried and weighed. Seeds were removed from the selected pods and counted and seeds and seed hulls (empty pods) were weighed.

Eight free-ranging cows were penned at 1700 h and group-fed haraz pods. At the same time a 100 g faecal sample was taken from each cow. These samples were dried in the sun and crushed, and seeds were removed, counted and weighed.

The mean seed number per pod was 19.95 ± 0.04 and the weight of the pod was 3.02 ± 0.08 g. Seeds constituted 46.2% of the pod weight. Seeds ingested with pods passed through the digestive tract intact.

Introduction

Leguminous trees produce nutritious pods that are an important source of supplementary feed for domestic livestock and wildlife in savanna vegetation during the dry season (McKay 1968; Gwynne 1969; Lamprey *et al.* 1974; National Research Council 1979; Owen-Smith and Cooper 1983; Hashim 1990a, 1990b). Haraz *(Acacia albida)* is an important fodder tree in South Kordofan, occurring in riparian zones and yielding about 125–135 kg of pods per tree annually (National Research Council 1979).

Leguminous seeds ingested with pods often pass through the ruminant digestive system intact (Lamprey 1967; Lamprey *et al.* 1974; ILCA 1987; Hashim 1992). ILCA (1987) suggested a scarification or other treatment that may increase the utilisation of fruits and seeds.

Objectives of the present study were to determine: (1) physical and chemical characteristics of haraz pods; and (2) pod intake and percentage of seed escaping digestion.

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Materials and methods

Haraz pods were collected during the dry season in South Kordofan, which has been described by Hashim and Fadlalla (1989). About 1200 kg of the pods were collected from the ground after they had matured and fallen from the trees in December 1988. They were kept in sacks under shade until the beginning of the experiment.

Dry matter was determined according to AOAC (1984) and N by the standard Kjeldahl N procedure. Determination of NDF (neutral-detergent fibre) followed the procedure of Goering and Van Soest (1970). Dry matter digestibility was determined according to Tilley and Terry (1963).

About 1 kg of pods were taken at random, dried in the sun, and 150 pods selected at random and weighed. The selected pods were separated into seeds and seed hulls (empty pods), the seeds were counted and seeds and empty pods weighed.

The feeding experiment was conducted at Kadugli Research Station farm, which was fenced and encompassed 760.6 ha. The farm was stocked with cattle at the rate of 9 ha/head, sheep 10 ha/head and goats 10 ha/head. Cattle, sheep and goats were herded separately and foraged on natural rangeland.

Herding of animals from the camp in the research farm to grazing sites usually starts at 800 h, and after grazing for 4 h or so the animals are herded back for watering and shading, herded again in the evening and corraled at the camp at 1700 h.

Eight cows were selected at random from the herd of cattle, separated from the herd at 1700 h and group-fed supplements of haraz pods daily from 20 March–19 May, 1990. The feeding comprised 4 periods each of 15 days duration. During

the first period (20 March–4 April), each cow was supplemented initially with 2 kg of haraz pods and this amount was increased by 1 kg each succeeding day until *ad libitum* intake (6.04 ± 0.29 kg/hd/d) was reached. Subsequently, cows were supplemented at this level during period 2 (4 April–19 April) and period 3 (19 April–4 May). During the last period (4 May–19 May) cows were fed a sole diet of haraz pods *ad libitum*, which was 7 kg/hd/day. A 100 g faecal sample was taken from each cow. These samples were dried in the sun and crushed. Seeds were removed from the crushed faeces, counted and weighed. Data were subjected to linear correlations between the intake and the faecal seed concentration (Draper and Smith 1966).

Results and discussion

Each pod weighed 3.02 ± 0.08 g and contained 19.95 ± 0.04 seeds whose weight constituted 46.2% of the pod weight. A single seed weighed ca. 70 mg. The empty pod had 16.5% crude protein, 43.9% *in vitro* dry matter digestibility and 59.2% NDF. Dry matter was 94.9%.

The average intake *ad libitum* from days 7–14 and 15–22 was 6.11 ± 0.33 and 5.97 ± 0.25 kg/hd/d, respectively. *Ad libitum* intake of pods when fed alone declined from 7 kg/hd/day to 6.38 kg/hd/day from day 1 to day 4 and thereafter remained relatively constant. Since each kg of offered seed pods comprised 6605 indigestible seeds weighing approximately 462 g, the intake of these seeds was 3.24 kg/hd/d and the mean faecal seed concentration was 4.40 ± 0.22 seeds/g faeces. The decline in seed pod intake was a function of faecal seed concentration, which was inversely related ($r = -0.88$, $P < 0.005$) to the intake of pods. The intake of the pods could be predicted from the faecal seed concentration by the following regression equation:

$$\hat{y} = 7.49 - 0.26X,$$

where $\hat{y}$ is the predicted kg of seed pod intake and X is the number of seeds/g faecal sample.

Cows showed diarrhoea during the fourth period when they were fed the pods solely to appetite, but this did not occur in other periods. Cows appeared in better condition in the second and the third periods compared to those in the fourth period. Further research is needed to study the effect of feeding haraz pods to cattle solely to appetite for an extended period.

These findings that hard-coated seeds of haraz passed through the digestive tract of cattle intact are similar to previous reports for other plant species with hard-coated seeds (Lamprey 1967; Lamprey *et al.* 1974; ILCA 1987; Hashim 1992).

In conclusion, my study has shown that haraz pods are useful supplements for cattle during the dry season in association with low quality roughage diets. However, the quantity of pods fed should be limited as feeding a sole diet of haraz pods to appetite may lead to digestive upsets.

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