

FORAGE QUALITY OF KLEIN AND ANGLETON GRASSES AS STANDING HAY IN THE DRY TROPIC

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ABSTRACT

This study was conducted at Aldama Experimental Station of INIFAP, in Aldama, Tamps., Mexico, to determine the quality and nutritive value of angleton (*Dichanthium aristatum* Poir.) (A) and klein (*Panicum coloratum* L.) (K) pastures used as standing hay. Pastures were closed to grazing in September to promote herbage accumulation until February when the experiment was initiated. Two 200 kg live weight crossbred steers were set stocked per each replication. Two fistulated steers were used to collect extrusa samples every 16 days during the 83-d experimental period. Average daily gain in K was 1.3 times higher ($P < 0.01$) than in A. Crude protein concentration was similar ($P > 0.01$) in leaves of klein and angleton, while ADF was lower ($P < 0.01$) in klein. CP and ADF concentration in stems did not vary ($P > 0.05$), but the values for complete plant were higher ($P < 0.01$) in K for CP concentration and lower in ADF.

INTRODUCTION

Seasonal distribution of forage production and quality has been recognized as one of the most important factors limiting productivity of cattle operations in the dry tropics of Mexico. In the wet-dry tropics both moisture and temperature may become limiting, with a reduction in dry matter production (Mott, 1981). On the other hand, a high percentage of this production occurs during the wet season, according to Mannetje (1978). Seasonality of production results in low carrying capacities because stocking rate must be chosen based on the period of lowest forage availability. In terms of forage quality, Mott (1981) pointed out that a large proportion of digestible energy intake is used for maintenance instead of production, because of the low quality potential of the herbage. Hence, animal production in the tropics is low due to periods of low forage availability and low forage quality (Moore and Mott, 1973).

One alternative considered to overcome these problems is the use of stored or preserved forages harvested during the rainy season and fed during the dry season. The purpose of this study was to determine animal performance and nutritive value of diets selected by cattle grazing pastures of angleton and klein grasses which were preserved as standing hay since september to be utilized in February.

METHODS

This study was conducted during 1993 and 1994 at Aldama Experimental Station of the National Institute of Forestry, Crops and Livestock (INIFAP), in Aldama, Tamps., Mexico. Heavy clay soils are predominant in the area and annual average rainfall is 800 mm involving 7 months of dry season (November through May) and wet season from June to October. Angleton and klein pastures used in the study were 1.5 ha and were managed similarly with respect to grazing prior to this experiment. Pastures were divided to allocate the two replications per each treatment. Pastures were closed to grazing in September to promote herbage accumulation until February when the experiment was initiated. Herbage availability was measured at the beginning of the study to calculate the number of animals needed to consume 65% of the herbage in an 83 day period. Two 200 kg live weight crossbred steers were set stocked per each replication. Two fistulated steers were used to collect extrusa samples

in 5 3-days sampling periods spaced 16 days during the experiment. Complete plant samples were taken each period and manually separated to obtain stem and leaf percentages. Leaf, stem, and extrusa samples were dried to 60 C to be analyzed for crude protein (CP) and acid detergent fiber (ADF).

RESULTS AND DISCUSSION

Animal performance. Average daily gain in kleingrass was higher ($P < 0.01$) than in Angleton (Table 1) and exceeded those reported for Gonzalez et al. (1992) with pangola transvala (*Digitaria decumbens* Stent.) and angleton (0.123 and 0.107 kg animal⁻¹ dia⁻¹, respectively). The average daily gain obtained with klein was 1.3 times higher than with angleton, this is important, considering that in most of the areas of dry tropic in Mexico cattle can lose up to 50% of the weight gained during the rainy season.

Plant characteristics. Percentage of leaves and stems did not differ ($P > 0.05$) between the grasses evaluated (Table 2). Crude protein concentration was similar ($P > 0.01$) in leaves of klein and angleton, while ADF was lower ($P < 0.01$) in klein. CP and ADF concentration in stems did not vary ($P > 0.05$) between grasses, however the values for complete plant were different ($P < 0.01$); kleingrass had higher concentration of CP and less ADF.

Nutritive value of diet selected by cattle. Crude protein did not differ ($P > 0.05$) between angleton and klein grasses in extrusa samples with values of 96 and 90 g kg⁻¹, respectively, and for ADF concentration was different ($P < 0.01$) with 432 and 495 g kg⁻¹, respectively.

We can conclude that kleingrass can be used as standing hay for feeding cattle during the dry season and it is possible to obtain acceptable ADG which represent an advantage considering that in these regions most of the cattle loss weight during the dry period.

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Table 1

Steer average daily gain and gain ha⁻¹ on angleton and klein pastures.

| | ADG (kg) | Gain ha ⁻¹ |
|----------|----------|-----------------------|
| KLEIN | 0.295 a* | 33 a |
| ANGLETON | 0.128 b | 14 b |

*Values within column with the same letter are not statistically different (P>0.05).

Table 2

Percentage of leaf and stem, crude protein and acid detergent fiber in leaf, stem and complete plant of klein and angleton grasses.

| GRASS | LEAF | | | STEM | | | COM. PL. | |
|----------|-------|--------------------------|---------------------------|------|--------------------------|---------------------------|--------------------------|---------------------------|
| | % | CP g kg ⁻¹ | ADF g kg ⁻¹ | % | CP g kg ⁻¹ | ADF g kg ⁻¹ | CP g kg ⁻¹ | ADF g kg ⁻¹ |
| KLEIN | 26 a* | 90 a | 38 b | 74 a | 41 a | 520 a | 53 a | 470 b |
| ANGLETON | 30 a | 92 a | 47 a | 70 a | 35 a | 520 a | 44 b | 560 a |

*Values within column with the same letter are not statistically different (P > 0.05).