

SUGAR CANE, MOLASSES UREA AND RESTRICTED GRASS/LEGUME GRAZING OR UNSUPPLEMENTED GRAZING FOR MILK AND WEANED CALF PRODUCTION IN A DUAL PURPOSE HERD DURING THE WET SEASON

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14 crossbred cows (approximate genetic makeup was 60% Zebu the remaining contribution being mainly Brown Swiss and some Holstein) were used in a single changeover design with two treatments. These were (A) restricted grazing of a 70/30 grass/legume sward (mainly Santo Domingo Star grass and *Setaria Kazangula* with *Leucaena leucocephala* as the legume) for 3 hr daily, the remainder of the time having free access to chopped whole sugar cane, molasses containing 10% urea, minerals and with 750 g/d of rice polishings per head, and (B) unsupplemented grazing throughout 24 hr on the same grass/legume sward. The experimental periods were 42 days with 7 for adaptation and 35 for recording of data. The calves received the same treatments as the dams. They were suckled a few seconds before milking to stimulate let down and allowed to be with the cows for 3 hr following milking (on grazing) after which they were separated according to the experimental treatments (i.e. in dry lot receiving sugar cane, molasses/urea and 300 g/d of rice polishings and minerals or unsupplemented grazing on Bermuda grass plus minerals. milking was once daily by machine. For sugar cane/restricted grazing and grazing only saleable milk yield was 3.3 and 3.4 kg/d and did not differ between treatments; persistency (in relation to milk yield before the experiment) was .92 and .93. Milk consumed by the calves was 2.1 and 2.4 kg/d to give total milk production of 5.4 and 5.7 for the two treatments respectively. None of these differences was significant. There was a tendency ($P < .08$) for calf growth to be better on the sugar cane/restricted grazing treatment; however, the cows on this treatment lost weight at a more rapid rate than those on unsupplemented grazing ($P < .06$). It is concluded that, in general, the nutritive value of rations based on sugar cane, molasses/urea and restricted grazing with low levels of supplementation is comparable to that of unrestricted grazing during wet season conditions.

Key words: Cattle, sugar cane, milk production, *Leucaena leucocephala*, dual purpose, calf rearing

The use of sugar cane/urea, with restricted grazing of the legume *Leucaena leucocephala* as a basis for dual purpose milk and weaned calf production under dry season conditions, was described by Alvarez and Preston (1976). The objective of the trial described here was to examine the response of cows and calves on the same system to sugar cane and restricted grazing during the wet season and to compare this with results for unsupplemented unrestricted grazing of a mixed grass/legume sward, the latter being the preferred feeding system during the wet season when pasture is abundant.

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Materials and Methods

Treatments and Design: The treatments consisted of (A) restricted grazing for 3 hr daily on a mixed grass/legume sward (approximately 70:30) of Santo Domingo Star Grass and *Setaria Kazangula* and *Leucaena leucocephala*; the remainder of the day the animals were confined in shaded pens where they had free access to chopped whole sugar cane, molasses/urea (800 g molasses, 100 g water and 100 g urea) in separate feeders; rice polishings was given at the rate of 750 g/d per animal; and (B) unsupplemented unrestricted grazing on the same pasture. Cows on both treatments has free access to a mineral mixture (50% salt 47% rock phosphate and 3% trace minerals). The calves received the same dietary treatments as their dams except that the rice polishings was only 300 g/d per head. There were 7 cows with their respective calves on each treatment and the design was a single changeover with 7 dads adaptation and 35 days for collecting experimental data. The total length of the trial was 84 days.

Animals: The cows were of mixed genetic origin with Zebu genes predominating (about 60%) the other components being mainly Brown Swiss with some Holstein. The cows were allocated to each treatment according to their previous production, stage of lactation and genetic makeup. Almost all the cows were at least two months advanced in lactation before starting the experiment.

Procedure: Milking was once daily by machine, the calves being used to stimulate letdown by suckling for a few seconds before milking, then staying with their dam_ for 3 hr after milking. for the sugar cane treatment, this period coincided with the time the cows were on grazing After this the calves on this treatment were returned to a separate pen where they had free access to sugar cane, the molasses/urea mixture and 300 g/d or rice polishings. For the unsupplemented grazing treatment the calves after separation from their dams, were allowed to graze on a Bermuda grass pasture where they also had access to minerals.

The mixed legume/grass pasture was divided into four sub-divisions of 2.5 ha and was managed on a rotational basis. Milk production was recorded daily while, once weekly, milk consumed by the calf was determined by weighing before and after suckling. Feed intake in the drylot treatment was recorded daily while during restricted grazing an attempt was made to estimate the forage consumed by weighing the cows before and after the grazing period. Brix and dry matter content of the sugar cane was determined twice weekly. The cows were weighed every 14 days and the calves every 7 days.

Table 1:
Feed intake (kg/day fresh material) of cows and calves on the sugar cane and restricted grazing treatment

<i>Cows:</i>	
Whole sugar cane ¹	20.4
Molasses/urea ²	3.39
Pasture ³	10.9
Rice polishings	.75
Minerals ⁴	.078
<i>Calves</i>	
Whole sugar cane ¹	4.05
Molasses/urea ²	.491
Pasture ⁵	-
Rice polishings	.30
Minerals ³	.019

¹ Average composition was 11°Brix and 21.1% DM

² Contained 10% (W/W) of urea

³ Difference in live weight before and after grazing

⁴ 50% salt, 45% rock phosphate 5% trace elements

⁵ Not estimated

Results and Discussion

Mean values for feed intake of the animals on the sugar cane/restricted grazing treatment are given in table 1 while performance data for both treatments are summarised in table 2. There were no significant differences between treatments in milk production or persistency or in milk consumed by the calves. There was a strong indication ($P < .08$) that the calves on the sugar cane/restricted grazing system gained more weight (534 g/d) than those on grazing only (457 g/d). However the opposite effect was noted in the cows where live weight loss was significantly greater ($P < .06$) for the sugar cane/restricted grazing system (- 300 g/d) compared with grazing only (-64 g/d).

These results support the proposal (Preston 1977) that the feeding of sugar cane and/or molasses with restricted legume grazing and small amounts of supplement will support the same level of performance for dual purpose milk/weaned calf production as the use of unsupplemented unrestricted grazing.

Table 2:
Milk production and changes in live weight of cows and calves

	Restricted grazing and sugar cane	Grazing only	SE _x	Level of significance
Saleable milk, kg/d				
Pre-experimental	3.57	3.63		
Experimental	3.28	3.38	±.12	NS
Persistence ¹	.92	.93		
Milk consumed				
by calf, kg/d	2.08	2.35	±.18	NS
Total milk production, kg/d	5.36	5.73	±.20	NS
Gain in live weight, kg/d				
Calves	.534	.457	±.04	.08
Cows	-.300	-.064	±.12	.06

¹ Persistence = Experimental/pre-experimental

It is obvious that under conditions of the rainy season, the economic advantages will almost always favour unsupplemented grazing. The role of sugar cane and molasses/urea in the dry season when pasture growth is normally inadequate to maintain the stocking rates possible during the rainy season.

References

- Alvarez F J & Preston T R 1976 *Leucaena leucocephala* as protein supplement for dual purpose milk and weaned calf production on sugar cane based rations *Trop Anim Prod* 1:112-119
- Preston T R 1977 A strategy for cattle production in the tropics *Wild Anim Rev* 21:11

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