EFFECT OF CASSAVA ROOT MEAL AND UREA LEVEL ON THE PERFORMANCE OF STEERS GRAZED ON POOR QUALITY PASTURE WITH FREE ACCESS TO MOLASSES

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Forty-eight Zebu steers of initially about 335 kg were divided into four groups of 12 animals and kept in four paddocks (2.5 ha/group) of unfertilized pasture. The groups were allocated to one of four treatments according to a 4 x 4 factorial design. The treatments were two levels of urea (2.5 and 5 .0% by weight) in molasses which was given ad libitum, and supplemented with 0 75 or 1 25 kg/d of cassava root meal. In addition, all animals received 250 g/d blood meal and minerals. The experiment lasted 97 d. The main treatment effects were: liveweight gain 782, 707, 715 and 772 ± 140 g/d; molasses/urea intake 4,62, 4 77, 4.68 and 4.70 kg/d for the 2 5 and 5.1% urea and 0.75 and 1.25 kg cassava treatments respectively- the response to the cassava root meal was thus small, and the absence of an effect of urea concentration different to that when cattle are intensively housed.

Key Words: Cattle, fattening, molasses/urea, urea level, cassava root

It is generally accepted that in order to fatten cattle on high levels of molasses/urea, it is necessary to provide limited quantities of a protein supplement, if acceptable rates of animal performance are to be achieved (Preston 1972), The use of rice polishings and coconut meal in this feeding system has resulted in liveweight gains of cattle at this station of about 800 g/d for supplementation levels of about 1 kg daily (Losada and Rivera 1976). More recently, it was reported that a supplement providing appreciable quantities of starch (rice polishings) mixes with blood meal gave better results than the protein supplement given alone (Losada and Alderete 1976).

Factors that must be taken into account when selecting a suitable supplement for these feeding systems relate to its availability in the area, which has a direct effect on the price, which in turn is an important determinant of the economics of using a particular supplement. In this respect, the cassava plant presents a considerable potential because, apart from being a crop totally adapted to the tropics, it is also capable of producing up to 40 tons/ha of fresh root, equivalent to a dry matter (DM) yield of 12 ton/ha (Moore 1976).

Molasses has risen in price in Mexico to the point where there is interest in reducing the level consumed by the animals, and for this purpose high levels of urea have been found to be a useful mechanism for achieving this affect (Wilson et al 1975; Silvestre et al 1977a; Ferreiro and Preston 1976).

The objective of this experiment was to study the effect of two levels of urea in molasses given on a free choice basis to steers grazing poor quality pasture. Two levels of cassava root meal were also compared.

Materials and Methods

Treatments, Design and Animals: A 2 x 2 factorial design was applied to a total of 48 commercial Zebu steers (groups of 12) of average initial weight of 335 kg. The treatments were two levels of urea (2.5 or 5% by weight) in the molasses, and two levels of cassava root meal (.75 or 1.25 kg/d). In the factorial analysis, the variance between animals within treatment groups was used as the error term.

Procedure: The experiment was carried out at the Centre's experimental farm, the climatic and soil characteristics of which have been described by Perez et al (1976). The area used in this study comprised of a total of 10 ha divided into 4 paddocks, each of 2.5 ha. The stocking rate was thus equivalent to 4.8 animals/ha. The pasture was not fertilised. Within each pasture area, small dry lots were fenced off in which the different supplements were made available to the animals. The mixtures of molasses/urea were prepared by diluting the urea with an equal weight of water and then adding the molasses. m e cassava root meal was prepared by dehydrating the root and grinding this into small particles. The animals on all experimental treatments received 250 g/d of bloodmeal which was mixed with the cassava meal and sprinkled on the molasses. The animals had free access to water and to a mineral mix (48% common salt, 48% rock phosphate and 4% trace mineral mixture).

The animals were allowed to adapt to the experimental conditions for a period of 15 d, at the end of which the liveweight of the animals was considered to be the initial weight of the experiment. The set stocking rate 3 was maintained throughout the experiment, with the animals having free access to the dry lot and to the grazing area. The experiment lasted 97 d and was carried out between March and June,

Table 1:
Mean values for animal performance and intake of supplements for Zebu steers fed molasses with 2.5 or 55 urea and 0.75 or 1.25 kg/d of dried cassava root meal(12 animals/treatment comparison; factorial analysis for main treatment effects)

	Level of urea, %		Cassava meal, kg/d		
	2.5	5.0	.75	1.25	SEx
Initial weight kg	336	335	336	336	±22
Final weight, kg	411	403	403	411	±28
Daily gain, g	782[a]	707[b]	715	772	±140
Intake of supplements, kg DM/d					
Molasses/urea	4.62	4.77	4.68	4.70	
Blood meal	.22	.22	.22	.22	
Cassava meal	.87	.87	.65	1.09	
Total	5.71	5.86	5.55	6.01	

[ab] Different at P<.10

Results and Discussion

Mean values for animal performance and intake of the supplements according to the main treatment effects are set out in Table 1. There was a tendency ($P < .10$) for the animals receiving the lower concentration of urea to gain faster than those receiving the 5% concentration. There was also some indication of slightly better liveweight gain for the higher level of cassava meal supplementation. There were no interactions between the levels of urea and cassava meal on liveweight gain. In contrast with the findings of Silvestre et al (1977) and Ferreiro and Preston (1976), raising the urea level in the molasses did not reduce voluntary intake of the mixture. Molasses intake was also unaffected by the level of cassava root meal.

It is difficult to explain why there was no inhibiting effect of urea on voluntary intake of molasses, since urea level in molasses was negatively related to consumption of the mixture in the experiments reported by Silvestre et al (1977a) and Ferreiro and Preston (1976). The latter trials were carried out under feedlot conditions and it may be that the free grazing system. used in the present experiment we. in some way responsible for the lack of effect.

Cassava root is very rapidly fermented in the rumen (Ravelo et al 1978a; Ravelo et al 1978b) and this may explain the poor response to its inclusion in the supplement. In an experiment reported by Silvestre et al (1977b), the addition of 1 kg/d cassava root meal to cattle fed a molasses based ration led to a depression in growth performance. It may be that in order for a starch supplement to be effective in a molasses diet, then it should have by-pass characteristics in order to have a beneficial effect on animal performance. In this respect, maize meal, which is known to by-pass partially the rumen fermentation, has given consistent improvements in animal performance in diets based on molasses/urea (Redfern and Creek 1973; Preston and Willis 1974).

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