REPLACEMENT VALUE OF CANE MOLASSES FOR MAIZE IN DRY SEASON RATIONS BASED ON BREWERS' DRIED GRAINS FOR BEEF CATTLE

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Twenty-four Ndama yearlings averaging 121 kg body weight were allotted, in groups of six, to four dietary treatments. The control group received a basal ration containing neither brewers' dried grains (BDG) nor molasses; the second group, Group BDG 1 received an 802 BDG ration containing 10% maize but no molasses; the third group, BDG 3 received an 80% BDG ration with 5% maize and 5% cane molasses and the fourth group, BDG 3, received an 80% BDG ration in which all the maize component was replaced with molasses (10%) Mean values for live weight gains on the four diets were .457 , .162 , .173 and 292b kg/d, respectively (SEx ± .025). There was a significant depression of live weight gain when maize was replaced by brewers' grains, however, this was offset by inclusion of 10% molasses. Feed intake on the diet of brewers grains without molasses was significantly less than on the other diets (mean values 2.03, 1.55, 2.09 and 2.09. SEx ± 0.12) . Feed costs per kg gain were lowest for the ration containing brewers' grains and 10% molasses. It is concluded that when brewers' grains are used at high levels in fattening diets, there should be a minimum of 10% molasses in the diet in order to maintain adequate levels of voluntary intake and animal performance.

Key words: Beef cattle, maize, brewers' grains, molasses

Recent studies (Ademosun 1973; Babatunde et al 1975; Omole and Ajayi 1976)have shown that brewers' dried grains (BDG) have a useful place in livestock feeds. Adeyanju and Ilori (1976) also found rations containing up to 80% BDG suitable for feeding beef cattle. Even at this high level of BDG in the beef cattle ration some maize was still in the ration. Any material that can be substituted for maize in beef cattle rations should be exploited fully, especially because the maize supply is not adequate for human needs, and is therefore being competed for by the human and the livestock population. Cane molasses, a by-product of the sugar industry, is one such material which has been used with varying degrees of success as a substitute for maize in livestock feeds, mainly as a source of readily available energy.

The present study was designed to replace the maize component of an 80% BDG ration with graded levels of cane molasses and to determine the effect on the performance of beef cattle during the dry season.

Materials and Methods

Animals: Twenty-four Ndama yearlings comprising 12 bulls and 12 heifers of an average initial body weight of 121 kg were used.

Treatment and Design: The Ndama yearlings were allotted in groups of six, equalized as to sex, to four dietary treatments (Table 1). The control group received a basal maize ration (A) which contained neither BDG nor molasses; (B) contained 80% BDG and 10% maize but no molasses; (c) had 80% BDG, 5% maize and 5% molasses; (D) 10% molasses and 80% BDG and no maize.

Table 1:
Percent composition of experimental rations (air dry basis)

Ingredients	Rations			
	Control	BDG1	BDG 2	BDG 3
Maize	62.5	10.0	5.0	0.0
Molasses	0.0	0.0	5.0	10.0
Brewers' dried grains	0.0	80.0	80.0	80.0
Groundnut cake	31.5	4.0	4.0	4.0
Dicalcium phosphate	3.0	3.0	3.0	3.0
Bone Meal	2.0	2.0	2.0	2.0
Agricare[1]	0.5	0.5	0.5	0.5
Salt	0.5	0.5	0.5	0.5

[1] A trace mineral-vitamin supplement manufactured by Pfizer Livestock Feeds Company, Lagos.

Procedure: The animals were fed the experimental rations ad libitum in a feedlot between December, 1976 and March, 1977 (105 days) during which they had free access to water and opportunity to exercise themselves in the exercise pens. Feeds refused daily by each group were weighed back and records of feed intake and individual body weight changes were kept on weekly and biweekly basis, respectively. Operating market prices of the various feed ingredients used in compounding the experimental rations and feed intake data were employed in computing feed costs for the experimental animals.

Statistical Analysis: The data were analysed statistically by analysis of variance and the differences between treatment means tested by Duncan's Multiple Range Test as outlined by Steel and Torrie (1960).

Results and Discussion

Animal performance data (Table 2) indicate that there were significant differences in live weight gain, feed intake and feed conversion attributable to the dietary treatments. The best performance was on the diet based on maize grain; the worst when maize was substituted by dried brewers' grains in the absence of molasses or with only a low level of molasses (5%). The diet of brewers' grains and 10% molasses gave results intermediate between the others. The data thus indicate that including 10% molasses in the diet, in some way, helped to correct the growth depression caused by replacing maize grain by dried brewers' grains.

The depression in animal performance caused by replacing maize with dried brewers' grains appeared to be due to effects on voluntary feed intake. This depression was apparently corrected by giving molasses at the level of 10% of the ration. The remaining difference in animal performance between the brewers' grains/molasses ration and the maize ration can be related to the differences in nutritive value between maize and brewers' grains due to the higher fibre content of the latter. Under practical feeding conditions, in which cattle were fattened mainly on fresh brewers' grains, it was also observed that there was a depression in feed intake

and in growth whenever molasses was not included in the diet (Preston T R 1976; unpublished data).

Table 2: Mean values for animal performance on diets with brewers dried grains and molasses replacing maize

Dietary treatments:					
Maize	62	10	5	0	
Brewers grains	0	80	80	80	
Molasses	0	0	5	10	SEx
Live weight, (kg)					
Initial	122.8	117.5	122.8	120.5	6.3
Final	169.8b	134.5a	141.0a	151.2	6.7
Daily gain (g)	457a	162c	173c	292b	+ 25
Feed intake, (kg/d)	2.03a	1.55b	2.09a	2.09.	+ 0.12
Feed conversion[1]	4.48	9.5b	12.1b	7.2ab	2.2
Feed cost/kg gain, *	1.358	1.15ab	.98b	.49c	0.23

[1] Feed intake/gain in live weight
Values with different superscripts differ- (P 0.05)

The rations in the present study were all supplemented with a complete range of minerals and vitamins and therefore it seems unlikely that the superiority of the molasses was related to any of these components. Molasses is poorer than maize both in the utilization of its metabolizable energy and in the value of its nitrogen fraction (see Preston 1972). Therefore these fractions also can be discounted as possible causative factors in the superiority of the molasses over the maize in this study. More research is needed to clarify these differences.

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