

The effect of three different systems on the performance of young growing heifers in the Gezira.

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SUMMARY

Eighteen cross-bred heifers (with an average body weight 63.2 kg) were used in an experiment to study the effects of feeding pioneer 988 alone or supplemented with either legume forage or a concentrate ration, on the feed intake and growth rate of heifers. Treatments were; A, pioneer 988 only (basal diet); B, pioneer 988 + *Clitoria ternata* and; C, pioneer 099 + concentrate ration. The average liveweight gains of the heifers were 0.18, 0.30 and 0.61 kg/head/day (SE±1.5) for treatment A, B and C respectively. The corresponding feed dry matter were 2.89, 3.20 and 3.52 kg/head/day (SE ± 0.27) . Heifer liveweight gains were significantly ($P < 0.01$) affected by the supplementation offered to the basal diet. Within the supplement treatments heifers fed concentrates have grown significantly ($P < 0.01$) more than heifers fed forage and legume supplement.

INTRODUCTION

Inadequate nutrition in the tropics is one of the main causes of low growth in growing cattle (Preston, 1989). Poor growth rates in heifers delay sexual maturity and result in poor reproductive performance (Topps, 1977).

For the five years 1980 to 1984, the average daily gain of Kenana calves (males and females) fed on natural grazing only was 0.11 kg/head (Saeed, *et al* 1987). Babiker *et al.*, (1988) found that when feeding *ad libitum* concentrate and forage sorghum (Abu 70) to Friesian x Kenana calves (males and females), the average liveweight gains were between 0.52 to 0.58 kg/head/day . In the Gezira area most of the tenants depend mainly on agricultural residues especially, sorghum straw to feed their animals (Badi, 1988). The five course rotation adopted recently in the Gezira Scheme will allow extra green forage, mainly pioneer Forage Sorghum - Sudangrass Hybrid (cv pioneer 988) to be grown for animal feeding. The present experiment was carried out to investigate the feeding value of pioneer 988 alone or supplemented with either *Clitoria ternata* (legume forage) or concentrate ration. Supplementation is reported to improve liveweight gains (Labe, *et al.*, 1982 and El Tayeb, *et al.*, 1989) which means early sexual maturity of heifers and better reproductive performance.

MATERIALS AND METHODS

Eighteen cross-bred heifers (Friesian x Kenana and Friesian x Butana) with an average body weight 63.2 kg, were allocated to three treatment groups of comparable average initial weight and

breed. The heifers in each treatment (six heifers/treatment) were group fed as follows:

Treatment A : Pioneer 988 *ad libitum* only (basal diet).

Treatment B : Pioneer 988 + *Clitoria ternata* on a 60:40 ratio *ad libitum*.

Treatment C: Pioneer 988 *ad libitum* + concentrate fed at 1.5 kg/head/day.

The groups of heifers were housed separately in three adjacent pens constructed from wood poles with an overhead shade.

The concentrate ration used contained the following ingredients (g/kg) on fresh basis: Groundnut cake 200, Wheat bran, 400 and Molasses 400. No special mineral or vitamin mixtures were added. Fresh water was available at all time. The daily record of total feed intake of each group was taken. Heifers were weekly weighed during the feeding trial of 126 days. Representative samples of the feeds were analysed for dry matter (DM), crude protein (CP), crude fibre (CF), Ether extract (FE), and ash according to standard methods (AOAC, 1980). The chemical analysis of the feeds is presented in Table 1. The Pioneer 988 and *Clitoria ternata* were fed at mature stemmy stage of growth.

The data were analysed using a one way analysis of variance for a completely randomised design (Steel and Torrie, 1980).

Table 1. The Chemical Composition of the experimental feeds.

	Pioneer 988	<i>Clitoria ternata</i>	Concentrate ration
DM (g/kg of feed)	361	423	866
CP (g/kg DM)	34.2	45.4	162.0
CF (g/kg DM)	308.3	207.4	70.2
EE (g/kg DM)	17.1	-	27.3
Ash (g/kg DM)	7.73	3.2	6.12

RESULTS AND DISCUSSION

Table 2 show that liveweight gain of heifers was significantly ($P<0.01$) affected by the supplementation of the basal diet. There was a 12.0 and 51.67 kg increase in final liveweight for heifers in treatments B and C respectively, compared with heifers in treatment A. Within the supplementation treatments, heifers in treatment C have grown significantly ($P<0.01$) more than heifers in treatment B. The average daily DM intake tended to be higher, but not significant in treatments B and C compared to treatment A. The supplementation offered improved the feed conversion ratio, particularly when concentrates were fed (Treatment C).

The better growth in the supplement groups could be attributed mainly to higher CP intake . However the daily CP intake in treatment A and B were low compared to 236 g daily CP required for maintenance + 0.5 kg gain per day adapted from Roy (1980) for calves of the same weight.

Table 2. performance data of heifers in the experiment.

	Treatment			SE	Level of significance
	A				
Number of animals	6	6	6		
Initial liveweight (kg)	64.33	62.50	62.83	16.40	NS
Final liveweight (kg)	87.40a	99.50b	139.17c	30.47	
Liveweight gain (kg/day)	0.18a	0.30	0.61c	1.49	**
DM intake (kg/day)	2.89	3.20	3.52	0.27	NS
CP intake (g/day)	98.8	116.76	263.99	-	
CP as % of DMI	3.4	3.6	7.5		-
Feed conversion ratio	15.75	10.81	5.80		

Means in the same row with different superscripts differ significantly at the level shown.

NS: Not significant.

* $P < 0.05$, ** $P < 0.01$.

The heifers growth rate was improved by supplementing the basal diet with concentrates and this agrees with previous works (El Khidir, *et al.*, 1979 and El Tayeb, *et al.*, 1989). Intake and growth rate of heifers reported in the present trial were low compared to those reported in the study of El Tayeb, *et al.*, (1989). One possible explanation could be mainly due to the fact that pioneer 988 in the present experiment was fed at mature stemmy stage of growth. Indeed the feeding value and digestibility of forages decrease as the plants mature (McDonald 1981). Moreover the better performance of bull calves recorded by El Khidir *et al.*, (1988)

compared to the present trial may be attributed to the fact that they were supplementing their hay with high levels of concentrate or cotton seed meal. The latter bull calves had higher DM and CP intake which could account for the increased gain. The results of the present trial suggest considerable scope for forage supplementation, in improving the growth performance of heifers in the Gezira from the low growth rate achieved traditionally on farms in the area. However, more research is required to quantify the most suitable and economic feed regime for heifers from post weaning to first calving.

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