

## **Productive performance of dairy cows under the Gezira prevailing conditions**

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### **SUMMARY**

**Ninety nine cows of Kenana, Butana, cross-bred (Friesian crosses to Kenana or Butana, of different grades), and the mixture type (crossing between Kenana and types, or other Sudanese indigenous cattle), were studied in Barakat area of the Gezira Scheme to examine the potentiality of dairy cow and the correlation between the different production traits. Milk production had been studied according to the type of milking cows. The cow breed showed a very high significant effect ( $P < 0.001$ ) on milk production and lactation period. The results showed an average milk yield for Kenana, Butana, cross-bred and the mixed type of 661.7 kg in 190.7 days; 688.4 kg in 232.4 days; 1365.2 kg in 249.4 days and 729.3 kg in 187.4 days, respectively. The cross-bred cows proved to be superior and significantly ( $P < 0.001$ ) outyielded the Kenana, Butana and the mixed types, with longer duration of milking. On the other hand milk composition showed no significant differences between type of cows . The respective**

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values for the average daily milk yield for Kenana, Butana, crossbred and the mixed type were 3.2 kg, 3.5 kg, 6.1 kg and 3.7 kg. Milk yield had a very high positive correlation ( $r = 0.98$ ) with butter-fat, protein and solids-not-fat yields. Lactation period had a high positive correlation ( $r = 0.70$ ) with butter-fat, protein and solids-not-fat yields. Milk yield was negatively correlated with butter-fat, protein and solids-not-fat percent.

## INTRODUCTION

On a world wide basis, cattle are the most important source of both milk and meat for consumption; cattle contribute 94% of world milk production and 41% of total meat production (FAO, 1979). Sudan is among countries where the present supply for milk and dairy products does not cover the need of the population. In the Sudan as well as in many other countries there is a considerable interest towards improvement of cattle breeds either for milk production, or for beef production or for both. A strategy which was followed in many countries, is to cross the local types to breeds of superior traits. European breeds such as Friesian and Jersey had proved to be more productive in favourable environments. El Ghurashi Dair), Farm is one of the old farms on which the crossing of European and Sudanese indigenous cattle had been undertaken on a relatively large scale and for long time. (Osman and Russell, 1974). Management of dairy cows in the Gezira was described by Badi (1988). The objective of this study was to investigate the productive performance of dairy cows in the Gezira

## MATERIALS AND METHODS

Ninety nine cows of different types of Kenana (54), Butana (8) , Friesian cross-bred of different grades (24) and the mixture type (the crossing between Kenana and Butana or other Sudanese indigenous cattle (13) , were studied in Barakat area, latitude 14° 20' N and longitude 33 20 E, during the periodslated August 1986-August 1987).

The survey involved ten cattle herds distributed in six villages, including the National Dairy Research Centre (N.. D. R. C.) at Shukaba as a control herd. Farmers in the Gezira do not keep records, however, visits were made to cattle herds on a regular basis and the herd milk sampling was taken regularly every 2-weeks to the end- of the survey. An individual herd record card was established for separate visits. Cows were milked only in the morning, although some were milked in the evening. The morning milk samples were analysed for butter-fat , protein and solids-notfat percent, using standard methods of Gerber, Formol titration and lactometer, respectively. One man milked on the average five cows. The milking time ranged between 3-17 minutes with an average of ten minutes per cow. Cows are usually milked with their calves present. No sanitation to milking equipments was practiced. The International Method II (ICRPMA, 1978) was used to calculate the yields of milk. This method can be described as follows: for each interval between two successive testings a separate calculation is made for the quantity of milk produced by adding the results of the weighings of the two test days, then divided by two. The quotient is then multiplied by the number of

days between the two testings. The total yield of milk produced is obtained by summing the milk yield calculated for all intervals. The quantity of fat, protein and solids-not-fat contained in the milk is obtained in the same way. The average percentage of fat, protein and solids-not-fat contained in the milk is obtained by multiplying the total quantity of fat, protein and solids-not-fat in (kg) by 100 and dividing these totals by total quantity of milk in (kg) .

## **RESULTS**

The overall average milk yield in this study was 880.5 kg in 207.8 days. Least-squares analysis of variance for the effect of cow breed on milk production showed that breed of cow had a very high ( $P < 0.001$ ) significant difference on milk production. The average milk production (Table 1) showed that the cross-bred cows had significantly ( $P < 0.001$ ) higher milk production, and duration of milking compared to all types of milking cows. Milk composition showed no significant differences between types of milking cows.

The study revealed an average daily milk yield of 4.1 kg, the cross-bred cows had the highest average of 6.1 kg, while 3.2 , 3.5 and 3.7 kg were daily averages for Kenana, Butana and the mixed type.

There was a very high positive correlation ( $r = 0.98$ ) of milk yield with butter-fat, protein and solids-not-fat yield. A similar correlation was found between butter-fat yield and protein yield; protein yield and solids-not-fat yield. Lactation period had a high positive correlation ( $r = 0.70$ ) with milk, butter-fat, protein and

solids-not-fat yields. Milk yield was negatively correlated with butter-fat, protein and solids-not-fat percentage.

**Table 1. The average milk yield, milk composition of Kenana, Butana, cross-bred and the mixed types of cows.**

Triat / lactation	Kenana	Butana	Cross-bred cliff. grades	mixed type	S.E. signif.
No. of cows	45	8	24	13	
Milk yield (kg)	661.7 <sup>b</sup>	668.4 <sup>b</sup>	14652 <sup>a</sup>	7293 <sup>a</sup>	145.5***
Butterfat yield (kg)	29.1 <sup>b</sup>	27.4 <sup>b</sup>	54.2 <sup>a</sup>	33.5 <sup>a</sup>	5.7***
Protein yield (kg)	21.8 <sup>b</sup>	22.1 <sup>b</sup>	48.4 <sup>a</sup>	24.1 <sup>b</sup>	4.6 ***
Solidsnotfat yield (kg)	55.6 <sup>a</sup>	56.1 <sup>b</sup>	123.1 <sup>a</sup>	62.0 <sup>b</sup>	12.2***
Butter-fat percent	4.4	4.1	3.7	4.6	0.2
protein percent	3.3	3.3	3.3	3.3	0.1
Solids-not-fat percent	8.4	8.4	8.4	8.5	0.1
Lactation period (days)	190.7 <sup>b</sup>	193.4 <sup>ab</sup>	249.4 <sup>a</sup>	187.4 <sup>b</sup>	51.8***

N. B. means within the same line followed by different letters are significantly different ( $P < 0.001$ ).

## DISCUSSION

Danasoury and Bayoumi (1963) reported an average milk yield for Sudanese indigenous cattle of 442 gallons, which was

higher than the average reported in this study . This may be due to management i. e. cows in the Gezira were traditionally maintained on crop residues, and the milking cows were not fed on proper production basis, in addition to the traditional means of milking which resulted in lowering of both milk and lactation period. Osman (1981) reported an average milk yield for Kenana cattle of 1860 kg in 222 days, while McLaughlin (1955) reported 1721 kg in 242 days for the same breed; both results were lower than the Kenana type under this study, this may also be due to the absence of shade and free access to drinking water that affects feed intake which reduces milk production of cows. Similarly the Butana type in this study showed lower milk yield and lactation period than 1419 kg in 253 days reported by Alim (1962). the cross-bred cows tended to have longer lactation period and this was in line with that reported by Kiwuwa *et al.* (1983).

The average daily milk yield reflects the genetic potential of the herd and is greatly affected by climatic conditions, feeding and management Osman (1970) reported an average daily milk yield of Northern Sudan cattle of 5.9 kg, which was higher than the results obtained by Osman (1972) and, for the local herd under this study. However, the cross-bred cows had the highest average daily milk yield and this agreed with Latif (1984).

The phenotypic correlation between milk and milk composition had been investigated by many research workers; their results were either similar, higher or lower than the results obtained in this study. Poutus (1964) reported positive correlation ( $r = 0.95$ ) of milk yield with butter-fat yield, milk yield and protein yield which was slightly lower than in the herd under this study.

On the other hand Bayoumi (1960) reported correlations between milk yield and solids-not-fat yield were closer than between butterfat and solids-not-fat yield, which agreed with the results obtained in this study . Generally there was a negative correlation between milk yield and its corresponding butter-fat percentage which agreed with the finding of Buldakova 1973).

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