

The influence of Calving season on the productive performance of Kenana cows in the Gezira Scheme, Sudan.

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Summary

198 multiparous Kenana cows' records were used to study the effect of calving season on some production traits. Cows were similar in live weight: (300kg), and age between 3-5th parity, belonged randomly to herds in four villages in the Gezira scheme. The traits chosen were total lactation yield, daily yield, lactation length, dry period and calving interval. Results obtained, respectively were: 852.9 ± 91.8 Kg, 3.9 ± 0.59 Kg, 249.9 ± 10.23 days, 216.9 ± 16.8 days, and 461.1 ± 11.77 days. The study revealed no seasonal variations among the traits investigated ($p > 0.05$). Instead, cows calved in wet summer were proven to an overall better performance, in terms of high lactation and daily yield in a longest milking duration, with a correspondingly shortest days dry and calving interval, in contrast to the other seasons.

Introduction

Indigenous (*Bos indicus*) cattle have a low response capability to incremental inputs for increased milk production, and that milk production in tropical cattle often ceases several months before the subsequent calving, and before the depressant effect of gestation on milk production is noticeable, (Wilson 1987). Therefore, length of lactation is not so much influenced by calving interval. Contemporary, the lactation length of temperate breeds is completely determined by the length of calving interval, (Bastos 1989). Season of calving had been recognized as an important factor affecting milk production in dairy cows. Certain seasons appear to sustain good lactation, due to favourable climatic conditions, (El Amin, 1969).

The objectives of this study were to assess the effect of season of calving on the production performance of Kenana cows in the Gezira scheme.

Materials and Methods

Animals

The study was undertaken in the Gezira scheme during (1990/91), and involved 198 milking multiparous Kenana cows with a similar liveweight ± 300 Kg, and average age between 3-5th parity were derived randomly from eight cattle herds, located in four villages; at longitude $33^{\circ} 20'$ E, and latitude $14^{\circ} 20'$ N.

Housing

Cows were kept in traditionally earth-bedded yards, bounded with no-shaded thorny *acacia* shrubs.

Management

Feeding system in the Gezira depends mainly on the grazing resources provided by the natural grasses during the rainy season, and the crops residues after harvesting the Sorghum grain (October-November); Groundnut, Wheat and Cotton during March-May. Some crop residues are preserved, and fed during feed scarcity. A limited green fodder and concentrate meal composed of some crushed sorghum grain, Wheat bran and Groundnut or Cottonseed cake feeding, was practiced by some farmers; and are offered before or during milking time. Cows were milked once per day, traditionally with the means of their calf's presence. Cessation of lactation coincides with the calf weaning.

Data collection and manipulation

Calving and dry dates were registered regularly. Daily milk yield was recorded by using one-kilogramme, and a half-kilogramme measuring cups. From these data, total and daily yields, lactation length, dry period and calving interval were computed. The seasons of the year have been classified into: wet summer (July-October), winter (November-February), and dry summer (March-June).

Statistical analysis

The data were analyzed according to Freese (1980), using Least-square means and standard errors. Analysis of variance was performed in accordance the following model: $Y = \mu + \alpha$; where; Y = Studied trait: (Total yield , daily yield, lactation length, dry period and calving interval, μ = Mean effect, and α = Error effect.

Results

Table 1 shows an overall lactation yield and daily yield of 852.9 ± 91.8 and 3.9 ± 0.59 Kg in 249.9 ± 10.23 days. The table also depicts an overall dry period and calving interval of 216.9 ± 16.8 , and 461.1 ± 11.77 days, respectively; regardless the insignificant ($P > 0.05$) effect of calving season upon the traits investigated. **Table 1**, again indicated the superiority of the wet summer calving cows, by gaining the maximum contribution on total lactation yield of 952 ± 95.60 Kg, and on daily yield of 4.4 ± 0.64 Kg, that was associated with the longest milking duration of 270.7 ± 11.0 days, but with correspondingly shortest days dry of 198.3 ± 19.7 , and calving interval of 459.2 ± 10.2 days. The least values of total and daily yield of, 796.4 ± 89.0 , and 3.4 ± 0.53 Kg, were recorded by the dry summer calving cows that sustained the shortest milking duration, of 233.8 ± 0.89 days, and the longest respective days dry and calving interval, of 240.3 ± 13.8 , and 464.5 ± 12.7 days. The winter calving cows were shown, to maintain the intermediate values of total and daily yields of, 809.8 ± 90.8 , and 4.0 ± 0.59 Kg, in 245.3 ± 10.8 days, together with 212.1 ± 16.9 days dry, and calving interval of 459.6 days.

Discussion

El Habeeb (1991) demonstrated a lactation yield and daily yield in a Kenana herd of 1599.73 ± 50.2 and 6.1 ± 1.7 Kg in 262.13 ± 5.5 days. Variable results of 852.20 ± 91.8 and 3.9 ± 0.5 Kg in 249.9 ± 10.2 days, were displayed by the Kenana in the current study, (**Table 1**). It was suggested that the Zebu cattle, like the Kenana, are characterized by too short lactations (ElAmin, 1969).

Table 1. Means \pm standard error of milk production traits by calving seasons of Kenana cows in Gezira scheme

Season / Parameter	Wet summer	Winter	Dry summer	Overall mean
Total milk yield (kg)	952.5 ± 95.5	809.8 ± 90.8	796 ± 89.0	852.9 ± 91.8
Daily milk yield (kg)	4.4 ± 0.64	4.0 ± 0.59	3.4 ± 0.53	3.9 ± 0.50
Lactation length (days)	270.7 ± 11.0	245.3 ± 10.8	233.8 ± 0.89	249.9 ± 10.3
Dry period (days)	198.3 ± 19.7	212.1 ± 16.9	240.3 ± 13.8	216.9 ± 16.8
Calving interval (days)	459.2 ± 10.6	459.6 ± 12.0	464.5 ± 12.7	461.1 ± 11.77

Relevant results were shown by Mohamed (1991), for the same breed in the Gezira. This lower productivity might be associated with the long term nutritional stress during the dry summer months, as well as the milking practices adopted in the area which would ultimately impair the expression of the milking potential of the Kenana in the Gezira. Many reports proposed an essential role of calving season on milk production traits, of these: Ageeb and Hillers (1991) showed that the Sudanese wet summer calving cows gave better yield and had the longest milking period. Amasaib *et al.*, (2008) also, confirmed such results. On the contrary, the present investigation results revealed no seasonal variations ($P > 0.05$), among the traits studied, (**Table 1**). Despite of this, the wet summer calving cows showed an overall better performance, due to that calving took place concomitantly with the fresh sprouting grasses that led to the marked increases in milk production and lactation length. FadelMoula (1994) obtained contrasting results, who denoted, that dry summer calving cows were more superior in milk production. Osman (1972) stated several possible reasons for the lack of the pronounced seasonal effects; (i).The low inherent productivity of the indigenous cattle makes them unable to produce more milk even under improved feeding. (ii).Cows eats more or grazes selectively to compensate for the poor quality of the grass during the dry season. (iii).Cows can yield this lower quantity of milk at the expense of their body reserves.

Research work evaluating the dry period, in dairy cows suggests an optimal of 2-month period (Yousif 1994). Optimal length may vary depending on parity, calving interval and level of milk production (Grummer and Rastani 2004). Alim (1960), in previous findings

of Kenana cattle at Wad Medani reported a 164 days dry period. Concurrently, the present trait indicated an excessively longer period of 216.9 ± 16.8 days (**table 1**), that was not affected by calving season, ($P > 0.05$). Moreover, the dry summer calving cows were shown to attain the longest duration of days dry of 240.3 ± 14.8 days. These cows were expected to face increasing climatic and nutritional stresses exhibited by the hot weather that brings about a curtailing of their lactations, as supported by Kiwuawa *et al.*, (1983) findings.

The calving interval of dairy cows has been an area of research for the past several years. At Umbanein station, Wilson *et al.*, (1987) reported of the Kenana, a calving interval of 530 days, which is higher than the average value obtained in the present study. Cilek (2009) reported a significant season effect on Holstein Friesian's calving interval. Inconsistent results were shown by the Sudanese cross-bred cows, as demonstrated by Mohsen (2000), that agree with the results of this study, ($P > 0.05$). Moreover, Khalafalla (1977) found no seasonal effects on calving interval in a herd of Kenana cattle. In disagreement, results in the current study showed that cows calving in the dry summer had; though non-significantly ($P > 0.05$), the longest calving interval compared with other seasons. These discrepancies had been attributed by Musa (2001), to the management practices, and or genetic constitutions of the different herds, and sampling effects associated with unadjusted records that could be another cause.

In conclusion, with regards to this study, the current data were statistically similar, and proposed no seasonal variations among the productive traits investigated.

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أثر الموسم علي الخصائص الإنتاجية لأبقار الكنانة في الجزيرة

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الملخص:

شملت هذه الدراسة 198 رأساً من أبقار الكنانة ذات الولادات المتعددة متماثلة في الوزن ± 300 كجم والعمر (3-5 ولادات) تتبع لثمانى قطعان تنحدر عشوائياً لأربع قري بمنطقة مشروع الجزيرة لدراسة أثر فصل الولادة علي بعض الصفات الإنتاجية لأبقار الحليب المتمثلة في الإنتاج الموسمي ، الحليب اليومي ، طول فترة الإدرار ، طول فترة الجفاف وطول الفترة مابين الولادتين. وقد خلصت الدراسة ترتيبياً علي النتائج الآتية:- 91.8 ± 852.9 كيلوجرام ، 0.59 ± 3.9 كيلوجرام ، 10.23 ± 249.9 يوم ، 16.8 ± 216.9 يوم ، 11.77 ± 461.1 يوم . أظهرت الدراسة أثراً غير معنوياً لفصل الولادة علي الصفات المدروسة ($P > 0.05$) وبالرغم من ذلك تميزت الأمهات الوالدة خلال فصل الخريف بالاداء الجيد للصفات المدروسة مقارنة بولادات الفصول الأخرى .