

EFFECT OF PARITY ON LIVE BODY WEIGHT, DAILY MILK YIELD AND LACTATION LENGTH OF SUDANESE KENANA CATTLE

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ABSTRACT: Effect of parity (PA) on live body weight, daily milk yield and lactation length of Sudanese Kenana cattle breed were investigated using a surveyed random sample comprised of (200) animals on different numbers of parities, animals were reared on natural pastures. All parameters were determined by standard statistical analysis models with multivariate ANOVA when daily milk yield (DMY), Live body weight (LBwt) and lactation length (LL) as response and parity numbers (PA₁, PA₂, PA₃ and PA₄) as independent ($P \leq 0.05$). The results revealed that parities had a significant effect on all quantitative parameters that investigated. These differences between observed means were separated using Duncan multiple range tests with equal variances assumed. This suggests that parities could be used as independent factor for estimation of quantitative parameters with relatively high accuracy in Sudanese Kenana cattle breed.

Key words: Parity, Live body weight, Daily Milk Yield, Lactation length, Kenana Cattle, Sudan

INTRODUCTION

On a worldwide basis cattle population in Sudan comprise one of the most important livestock species and play a major role in the livelihood of large amount of protein of small farmers and nomadic, the population was estimated to be 38.3 million (FAO, 2002), they well adapted to local environment conditions. Among the Sudanese cattle population Kenana is promising indigenous milk breed. Significances of parity and parameters of economic importance in dairy cattle have been studied by a number of researchers. Oravacová et al. (2006) reported a significant effect of parity on daily milk yield. The aim of the present research was to investigate the effect of parity on daily milk yield, live body weight and lactation length in Sudanese Kenana cattle breeds.

MATERIALS AND METHODS

Research Site

The animals included in this present research were located at Sennar and Blue Nile States on the east and west banks of the Blue Nile. These areas are inhabited by different tribes who raise this local breed.

Research Animals

Animals used in this research were divided into four groups according to parities (1-4). Data for all parameters investigated were collected and taken from (N=200) cows from different householders in one visit surveillance.

Management of Animals

All the animals were managed under a traditional system, the animals were led out to graze freely on the natural pastures during the day and return to pens from local materials in the evening where their feeding was supplemented with whole grained and dry grass forage. Fresh water was given *ad libitum*.

Parameters Measured

The parameters investigated include Daily milk yield (DMY, kg), Live body weight (LBwt, kg) estimated by weighing tape and lactation length (LL, days).

ORIGINAL ARTICLE



Statistical Analysis

Data collected in this research with respect to parity and some quantitative parameters were subjected to various Statistical analysis tools in General linear Model (GLM) procedures, Univariate analysis of variance when the quantitative parameters were response and parity (1, 2, 3 and 4) as independent systematic effects was used and coefficients of variation (CV) were obtained using Statistical Packages for Social Sciences (SPSS) release 15.0 (2006) software to evaluate the effect of parity number on all parameters studied. The model used for all variables was $Y = \mu + \text{cow (parity)}_i + \text{error}$, where: Y is quantitative traits studied, cow (parity)_i is effect of ith parities (for i = 1, 2, 3, and 4) and the random error term (All factors considered systematic except for the random error term). For all quantitative parameters, model effects were declared significant at ($P \leq 0.05$) unless otherwise stated.

RESULTS AND DISCUSSION

Milk yield is defined as the amount of milk that is obtained over certain period which may be a day, a week, a month or a lactation period; it is the most important economical trait in dairy cattle (Musa, 2006). Least square means and standard errors of daily milk yield according to parity number is presented in Table 1, the overall mean daily milk yield was 4.97 kg/day for the 1st through the 4th parity. The mean of daily milk yield increased gradually from the first 4.35 kg/day, up to third 5.76 kg/day, which was reached the peak then persisted and decreased. Similar observations have been made by Likewise Licitra et al. (1990) reported that the milk yield of Modicana and Holstein cows increased with parity. The results of this research also confirms the earlier findings of Malau-Aduli et al. (1996) who analyzed on the dairy performance of animals of the same herds.

Live body weight of Animals is an important factor associated with several management practices including selection for slaughter and breeding, determining feeding levels and also it is a good indicators of animal condition (Ulutas et al., 2001). Body weight is a frequently recorded variable in animal research; it is the measurements most used to evaluate growth (Otte et al., 1992). The results demonstrated that the overall mean for live body weight (kg), was 304.33. Parity had effect on live body weight, but not as constant rate. Thus reduction was seen in the second parity due to advances in both parity and age, so demand for maintenance and milk production increases. Thus reduction may be found in live body weight after calving in order to resume cycle, the cow must "overcome" the negative effect of suckling and for low nutrients intake, the results in this present research similar to that reported by John Hall, (2004) for cattle. The increase of live body weight through parities 3rd and 4th may be found due to high nutrients intake.

Lactation length is defined as the period between two consecutive calving during which cows are capable of producing milk or lactating (Musa, 2006). There was a great deal of variation in lactation length of different breeds of cattle in the tropics.

Table 1 - Least square(means \pm SE) of quantitative parameters in Sudanese Kenana cattle breed by parities

Parities	Quantitative Parameters			
	N	Daily milk yield(kg)	Live body weight(kg)	Lactation length(days)
PA ₁	40	4.35 \pm 0.40 ^b	311.40 \pm 7.25 ^a	233.50 \pm 6.78 ^b
PA ₂	65	5.06 \pm 0.39 ^{ab}	289.39 \pm 7.16 ^b	248.56 \pm 6.70 ^{ab}
PA ₃	41	5.76 \pm 0.35 ^a	305.85 \pm 6.23 ^{ab}	258.59 \pm 5.84 ^a
PA ₄	54	4.64 \pm 0.32 ^b	309.98 \pm 5.68 ^a	250.08 \pm 5.32 ^{ab}
Overall	200	4.95 \pm 0.18	304.33 \pm 3.31	247.68 \pm 3.09

The differences between means of quantitative parameters are marked by various letters in the same columns are significant ($P \leq 0.05$).

In tropical cattle, restricting the lactation records to 305-days would have less effect, as few cows produce milk for more than 305-days (Musa, 2006). A shorter interval would be more effective, but would penalize high persistency (Syrsted, 1993). Least square means and standard errors were presented according to parities Table-2, the overall mean lactation length was 247.68 days which was lower than that reported by Abdalla et al. (1990) 283.00 days for the same breed at Um-Benen Livestock Research Station.

Coefficients of variation for quantitative parameters according to parities were tabulated in Table-3. These coefficients evaluate and rank the quantitative parameters among their overall rank of CV.

Table 2- Coefficient of variation(CV%) of quantitative parameters in Sudanese Kenana cattle breed by parities

Parities	Quantitative Parameters			
	N	Daily milk yield(kg)	Live body weight(kg)	Lactation length(days)
PA ₁	40	44.36	17.58	16.27
PA ₂	65	63.04	15.59	21.47
PA ₃	41	46.18	12.43	15.82
PA ₄	54	50.22	14.89	15.93
Overall	200	112.46	15.15	17.53



CONCLUSION

Kenana cattle daily milk yield, live body weight and lactation length were relatively changed by parity, further researches on this topic are required using larger number of animals. Nevertheless, our findings indicate that all parameters investigated have linked to parity number may also depend on different factors such as physiological and metabolic status in cattle of varying parities. At least, this present research was necessary step in validity the use of parity as independent factors assist dairy producers and breeders especially in Sudan.

REFERENCES

- Abdalla EA, M. Khalafalla AM and Shafei SA (1990). The influence of age on lactation length and milk yield in Kenana and Butana cows. *Sudan Journal of Animal*, 3: 93-100
- FAO (Food and Agriculture Organization) (2002). FAO data base 2002.
- John Hall (2004). The cow calf Manager Livestock Update, February Extension Animal Scientists, Beef, VA Tech. 20 proceeding 2004 Florida Dairy Reproduction Road Show.
- Licitra G, Oltenacu PA, Blake RW, Lanza A and D'Urso G (1990). Season of calving and parity effects on milk yield and reproduction of Modicana and Holstein cows in Sicily. *Journal of Dairy Science*, 73: 224.
- Malau-Auli AEO, Abubakar BY, Ehoche OW and Dim NI (1996). Studies on milk production and growth of Friesina × Bunaji crosses. 1 Dairy performance. *Asian-Aus. Journal of Animal Science*, 9: 503-508.
- Musa, AM (2006). Linear body measurements as an indicator of Kenana cattle weight and milk production. M.A.Sc. Thesis, University of Gezira, Sudan.
- Orvacová M, Margetin M, Peškovičová D, Daňo J, Milerski M, Hetényi L, Polák P (2006). Factors effecting milk yield and ewe's lactation curves estimated with Test-day model. *Gezch journal of Animal Science*, 51: 483-490.
- Otte MJ, Woods AJ and Abuabara Y (1992). Live weight estimation of cattle by scale and tape- A method comparison study. *Tropic. Anim. Health Prod*, 24: 109-114.
- SPSS (2006). Statistical Packages for Social Sciences Inc. (2006), SPSS user's guide.
- Ultuas Z, Saactci M, Ozluturk A (2001). Prediction of body weights from body measurements in East Anatolian Red calves. *J Agri Collage of Ataturk University*, 32: 61-5.

