
PERFORMANCE OF DAIRY CATTLE AS AFFECTED BY PARITY, UNDER SEMI-INTENSIVE SYSTEM OF MANAGEMENT IN NORTHERN PART OF NIGERIA

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ABSTRACT

Milk yield increases with age and parity until about sixth lactation. Multiparous cow produced 66-84% more milk than first calf heifer during early and late lactation. Thus, the study was conducted to access LL and yield of Friesian x Bunaji (F_2) and Bunaji cows. The lactation records utilized consisted of 150 records on lactation length (LL) and total lactation yield (TLY) of Friesian x Bunaji (F_2) that milked for about five years in National Animal Production Research Institute Shika-Zaria. The lactation records were separated into <100 days, 101-200 days of lactation length and lactation yield respectively. 29 records on lactation length (LL) and total lactation yield (TLY) of Bunaji for the first parity. The mean lactation length (MLL) obtained from this study for Friesian x Bunaji were very high compared to that of pure Bunaji, except for <100 days. The maximum LL for Friesian x Bunaji obtained in the 1st parity down to the 3rd parity, were very high compared to that of pure Bunaji at 70 days. The mean total yield (MTY) for Friesian x Bunaji cows 204.36±40.3kg down to 910±163.65kg were high compared to pure Bunaji 63±5kg per year. The maximum total milk yield obtained for Bunaji was 39kg and lower compared to Friesian x Bunaji 583kg down to 647kg. MDY for Friesian x Bunaji cows across the parities were very large compared to that of pure Bunaji. Cross breeding of Friesian and pure Bunaji cattle in Shika was beneficial to high milk yield than our indigenous breeds. For dairy production our indigenous breeds e.g. Bunaji that has genetic traits of low milk yield should be cross with exotic breeds like Friesian, Jersey, and Guernsey etc for high milk yield. Lactation length should be extend in order to have more milk yield.

Keywords: Friesian x Bunaji, Bunaji, Milk yield, Lactation length, Shika.

INTRODUCTION

In Nigeria, cattle (cow) provide more than 90% of the total animal milk output while goats and sheep provide less than 10% and are kept for production of meat, hides and skin (Walshe *et al.*, 1991). The main limiting factors of these tropical breeds as it relates to milk yield include late sexual maturity, long interval between calving and short lactation length (Alphonsus, 2008). One of the most common ways of increasing dairy production in the tropics and subtropics is through importation of breeds with superior genetic potential from other countries either for use in purebred breeding or in crossbreeding with local breeds (McDowell *et.al.*, 1985). The White fulani (Bunaji) is the most numerous and wide spread of all the Nigerian cattle breeds accounting for about 37% of the National cattle population (Oni *et al.*, 2001). Of all the local breeds of cattle in Nigeria, Bunaji is the most wide spread and extensively studied. It was first introduced to National Animal Production Research Institute (NAPRI) Shika in 1928 and for many years it constituted the entire milking herd until 1964 when cross-breeding with Friesian sires commenced (Malau-Aduli and Abubakar, 1992). The introduction of Friesian sire in Nigeria has produced a stabilized crossbred Friesian x Bunaji cows whose dairy performance has been adjudged to be higher than the pure Bunaji. First generation cross bred generally have been reported by Richard, (1993) to yield twice that of the indigenous pure breeds. Thus, the objective of this study was to determine the performance of dairy cattle as affected by parity under semi intensive system of management in Northern part of Nigeria.

MATERIALS AND METHODS

The study was carried out in the Dairy Research Programme Farm of the National Animal Production Research Institute, Ahmadu Bello University, Shika-Zaria. Shika is located in the Northern Guinea Savannah on latitude 11°N, longitude 12°E, altitude 610m. Mean annual rainfall is 1100mm lasting from May to October with peak rainfall between July and September with relative average humidity of about 72% at this period, The mean temperature is about 24.4°C (14.5-39.3°C) with the lowest temperature occurring during early dry season (November to January). Higher temperatures are experienced during the late dry season (February –April) with mean relative humidity between 20-37% (Google map, 2013).

Experimental cows and their management

The cows were raised during the rainy season on paddock-sown pastures, while hay or silage supplemented with concentrate mixture of cottonseed cake, maize or guinea corn were offered during the dry season at 3.5kg/day when the cows were housed in open sheds. They had access to water and salt-lick at all times. Regular spraying against ticks was observed, while vaccination was carried out against contagious diseases namely anthrax and contagious bovine pleuropneumonia (CBPP). Calves were separated from their dams three days after birth and bucket-fed until three months of age when they were weaned. The cows were hand-milked in the morning and evening daily.

Data analysis

The data utilized was generated in 2017, consisted of 150 and 29 records on lactation length (LL) and total lactation yield (TLY) of Friesian x Bunaji (75% crossed) and Bunaji cows respectively that milked for about five years. The data were analyzed using descriptive statistics.

RESULTS AND DISCUSSION

Lactation length (LL): These are days through which the animals give milk. It varies between the species of cattle especially exotic breeds, indigenous breeds and their crosses. The lactation length is normally 305 days while 60 days is a dry period. It was reported by McDowell *et.al.*, (1995), the dry period is required for renewal of udder glandular tissue. Dry period longer than 60 days in length does not result in significant milk production, rather it decreased the annual average milk production by extending calving interval beyond the normal (13-14 month) and cause decrease in lifetime production of dairy cow. The mean lactation length (MLL) obtained from this study for Friesian × Bunaji in (Table 2) was very high compared to that of pure Bunaji 98 days. The maximum LL for Friesian × Bunaji obtained in this study for the 1st parity down to the 3rd parity days were very high compared to that of pure Bunaji which was 70 days. This indicate that cross breeding Friesian with Bunaji had beneficial effect on LL since on average longer LL means more milk yield. The MLL 250 ±4.8days reported by Malau Aduli *et.al.*, (1996) was higher than all the MLL in Table 1 and 2 for Friesian × Bunaji cows. 246.4 days reported by Akpa *et.al.*, (2006) was also higher than mean Lactation lengths from this findings. Variation in LL across the parities were due to management, climate or season and other genetic factors that may affect the dam LL.

Mean total yeild (MTY): MTY is the total milk yield obtained from dam over a period of time per parity or year. The total lactation yield (TLY) obtained from this study for Friesian×Bunaji cows, 204.36±40.3kg down to 910±163.65kg were very high compared to that of pure Bunaji 63±1.3kg per year. The maximum total milk yield obtained from this study for Bunaji was 39kg was lower compared to that of Friesian×Bunaji cows 583kg, 218kg in (Table 1) down to (Table 2), 647kg. It was reported by Barje P.P *et.al.*, (2006) at Shika the MLY for Friesian×Bunaji cows were 1740kg which was higher than 204.36±40.31kg, 566.52±41 for 1st and 2nd parity that their LL terminate at <100days and slightly closer to 1592.57±610.47Kg in (Table 2). The variation MTY across the (Table 1) to (Table 2) for Friesian× Bunaji cows were due to the LL, the longer the LL the more the milk yield. The total milk yield is affected by both genetics and non-genetics factors. During the wet season there is abundant forages and pasture for grazing therefore, the milk yield will be high.

Daily milk yield (DMY): The local fulani cows yield on average 0.7 liters of milk per day during lactation (World Bank 1993). This value was slightly higher than mean daily yield (MDY) presented in (Table 3), 0.68 litres for pure Bunaji and the value was low compared to what was obtained in other places. In Bangladesh average yield was 1.19 litres, Saha and Haque, (2001) while in Cameroon it was 2.46 litres on average as reported by Njire *et al.*, (2001) and in Tanzania it was 2.68 litres on the

average Kurwijila, (2001). It was lower than 2.74l reported by Shitu, A. *et al.*, (2023) for grazing Bunaji supplemented with concentrate under semi-intensive system. It was reported by Fatima D. *et al.*, (2019), average yield from the traditional system of rearing White fulani was 0.7-1.5litres of fluid milk per day. During the dry season, this figure drops to about 0.5 litres, with supplementation using cotton seed cake, milk yield could be increased to 1.5-2.0 litres. Mean daily milk yield for Friesian × Bunaji cows presented in Table 1 and 2 across the parities was very large compared to that of pure Bunaji. The average milk yields/day from this findings were above the range 3.43-5.81 litres as reported by Finangwai, (2014) except 2.83l on feeding concentrate diets containing graded levels of groundnut haulms on the performance of Friesian x Bunaji cattle.

TABLE 1: Milk yield performances and lactation length (LL) of Friesian × Bunaji cows for <100 days

Parameters	PARITY		
	1	2	3
Mean LL (days)	72.5±5	36.5±9.88	
Minimum	30	20	
Maximum	98	75	
Mean total yield (kg)	204.36±40.31	566.52±41.0	
Minimum	21	54.8	
Maximum	583	2181	
MDY (kg)	2.83	15.52	

MDY=Mean daily yield

TABLE 2: Milk yield performances and lactation length (LL) of Friesian × Bunaji cows for 101-200 days

Parameters	PARITY		
	1	2	3
Mean LL (days)	149.1±7.04	153.25±9.84	153.75±6.22
Minimum	101	121	144
Maximum	199	184	170
Mean total yield(kg)	1592.57±610.47	983.96	910±163.65
Minimum	384.5	234	741.65
Maximum	13435.5	1538.5	647
MDY (kg)	10.68	6.42	5.92

MDY=Mean daily yield

TABLE 3: Milk yield performances and lactation length (LL) of Bunaji cows for first parity

Parameters	1 st parity
Mean LL (days)	90.77±6
Minimum	20
Maximum	70
Mean total yield (kg)	63±5
Minimum	13
Maximum	39
MDY (kg)	0.68

MDY=Mean daily yield

CONCLUSIONS AND RECOMMENDATIONS

Cross breeding of Friesian and pure Bunaji cattle in Shika was beneficial to high milk yield than our indigenous breeds. More than 4 times milk yield for Friesian × Bunaji (F₂) than the pure Bunaji. The greater the LL the more the milk yield, 101-200days yield more than <100days. For dairy production our indigenous breeds e.g. Bunaji that has genetic traits of low milk yield should be cross with exotic breeds like Friesian, Jersey, and Guernsey etc. for high milk yield. Lactation length should be extend in order to have more milk yield.

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