SOME OBSERVATIONS ON THE REPRODUCTIVE PERFORMANCE OF FRIESIAN CATTLE

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SUMMARY

FIVE-year fertility records of imported Friesian cattle were analysed. The mean monthly distribution of live and still-born calves as well as calf birth-weights showed no significant variations. While the overall mean age at first calving was 28.15 ± 4.57 months, the mean age at first calving of heifers born in February — April, May — July, August — October and November — January were 26.09 ± 3.27, 23.91 ± 1.31, 31.71 ± 4.21 and 28.04 ± 3.67 months respectively. Some of these observed variations differed significantly ($P < 0.01$).

INTRODUCTION

Numerous reports exist in the literature to show seasonality in the reproduction of cattle. In temperate regions, it is generally accepted that there is a strong tendency for cows to calve in the spring (Clegg and Ganong, 1969, Robinson, 1977). Other studies including Wilson (1946), Anderson (1948), Agarwal (1969) and Jochle (1972) all showed some seasonal influence on cattle reproduction. Robinson (1977) pointed out the overriding influence of rainfall and consequent increase in pasture growth and plane of nutrition on the build-up of body condition prior to conception in cattle. Although Adeneye *et al,* (1977) reported seasonal variations in birth-weight of Holstein — Friesian calves in the Western part of the country, information on the reproduction of Friesian cattle under Nigerian environments has been lacking since they were imported about 30 years ago. The work reported herein, is a preliminary observation on the reproduction of the breed in Vom.

MATERIALS AND METHODS

Location:

The geographical location of Vom has been described (Knudsen and Sohael, 1970; Umo, 1978). Temperatures in Vom range between 17° and 28.6°C. Rainfall varies between 1300mm and 1500mm annually and extends from March to October. The rainfall distribution dictates the pattern of pasture growth which spreads through April to October.

Animals:

The study involved 67 cows imported from Britain in 1974 as in-calf heifers or second calvers and 68 heifers born to them in Vom. A total of 283 calvings from the imported dams were used.

The management of the animals has been described (Umo, 1978; Ibeawuchi *et al,* 1978). Animals are reared out-door all the year round. Feeding comprises paddock grazing during the rainy season and hay and silage in the dry season. Supplementary rations are provided all the year round. Milking cows receive per herd, additional production ration of one Scandinavian Feed Unit (S.F.U) for 2.5 kg of fat-corrected milk produced.

Calves are allowed to suckle their dams for 3—4 days after calving. They are then weaned onto whole milk fed at 2.25 liters per head twice daily for the first 3 weeks. Thereafter, the feeding frequency is reduced to once daily at 2.25 liters for 3 weeks more. At this stage, whole milk is replaced with concentrates fed ad libitum. Calves are weaned onto concentrates plus pasture or hay depending on the period of birth.

Five-year fertility records of the cows were analysed. Monthly distribution of live and still-born calves, calf birth-

weights as well as the effect of period of birth on the age at first calving of heifers born in Vom were examined. All data were subjected to one-way analysis of variance.

RESULTS AND DISCUSSION

Mean and range of calving intervals were 396.45 and 287 — 1079 days respectively. The range of calving intervals indicate inadequate reproduction management of the herd. While some cows get pregnant too soon, others remain non-pregnant for too long following calving.

There were no significant monthly variations in the distribution of live and still-born calves (Table 1). However, while still-births showed no trends, two peak (February — April and August — October) were observed with live calves. These peaks probably correspond to peaks of sexual activity during the periods of May — July and November — January. Similar peaks of calving observed on some Fulani herds on the Plateau (Pullan and Synge, 1978) were attributed to pasture growth and Fadama grazing or crop residue availability during the period of May — July and December — January respectively, when sexual activities supposedly peaked. However, the herd in the present study, receive supplements all the year round. Therefore, the August — October peak observed could not be due to silage and hay feeding during the December — January period when the Fulani herds has access to Fadama or crop residues as observed by Pullan and Synge, (1978). This peak (August — October) is therefore suggestive of the effect of some climatic variables such as temperature, humidity and incident light (Wilson, 1946; Anderson, 1948; Wood, 1970; Jochle, 1972). Additionally, the seasonal variation in the fertility of the bull (Clegg and Ganong 1969) could not be ruled out. Further studies are required to confirm these observations.

Calf birth-weights (Table 2) showed no significant monthly variations. However, February — April calves were 8.3, 11.6 and 8.4 percent lighter than May — July, August — October and November — January calves respectively.

TABLE 1
Monthly Distribution of Births

	Jan.	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*
Mean Live Calves	6.40 ±5.00	8.60 ±4.72	15.40 ±6.05	11.20 ±5.19	7.40 ±4.92	5.40 ±2.58	7.20 ±1.14	9.20 ±2.56
Mean Still-Births	0.20 ±0.40	0.20 ±0.40	1.00 ±1.73	0.80 ±0.84	0.40 ±0.89	0.60 ±0.8	0.40 ±0.55	0.00 ±0.00

	Sept.	*Oct.*	*Nov.*	*Dec.*
Mean Live Calves	9.60 ±1.96	9.60 ±4.96	7.20 ±1.94	9:40 ±3.72
Mean Still-Births	1.20 ±1.30	1.20 ±1.10	0.80 ±0.84	0.40 ±0.55

TABLE 2
Mean Monthly Birth — Weights of Calves (kg)

	Jan.	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*
Mean Birth-Weights	37.55 ±2.10	35.06 ±1.68	31.67 ±2.26	35.40 ±2.39	34.67 ±3.28	37.28 ±4.60	38.60 ±3.12	37.54 ±4.26

Sept.	*Oct.*	*Nov.*	*Dec.*
37.70 ±4.54	38.74 ±3.35	37.16 ±2.50	36.02 ±2.68

The overall mean and range of age at first calving were 28.15 ± 4.57 and 19.43 - 40.07 months respectively. The range indicated that improvement could be made by introducing reproductive management methods.

The period of birth significantly influenced mean age at first calving (Table 3). Heifers born in August — October had their first calves later than those born at any other period. This difference was significant for heifers born in February — April and May — July ($P < 0.01$). The differences between heifers born in February — April and May — July and between November — January and February — April were not significant. However, heifers born in May — July calved earlier than those born in November — January ($P < 0.01$).

These findings are not easily explained. However, Lamond, 1969, 1970) has shown that nutritional setbacks typical of dry and winter seasons lead to delayed puberty in heifers. This could explain the delayed sexual maturity in heifers born in August — October and November — January periods as observed in this study. These heifers were weaned onto dry season as opposed to their counterparts born in February — April and May — July periods which were weaned onto luxuriant pasture and thus became exposed to dry season at a later age and higher body weight. The difference between the heifers born in August — October and November — January ($P < 0.01$) could be attributed to exposure to a longer dry season (4 — 5 months) for the former (August — October) group while the latter (November — January) group were exposed to less than three months of dry season. Further studies are underway to explain fully, these observations.

This study indicates; (1) given adequate production management, the Friesian cattle would have good reproductive performance under Vom conditions, (2) apart from pasture availability or otherwise, climatic variables could be exerting

TABLE 3
Effect of Period of Birth on age at First Calving

Period of Birth	*No. of Heifer Calves*	*Mean Age at First Calving (Months)*
Feb. — Apr.	21	26.09 ± 3.27^{a}
May — July	10	23.91 ± 1.31^{ab}
Aug. — Oct.	25	31.71 ± 4.21^{c}
Nov. — Jan.	12	28.04 ± 3.67^{ac}

a, b, c Means differ ($P < 0.01$)

some influence on the reproduction of this breed in Vom, (3) the age at first calving could be improved through planned breeding to take advantage of the pasture season.

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