EVALUATION OF THE REPRODUCTIVE PROBLEMS OF FRIESIANS, BUNAJI AND CROSSED COWS IN A SUBTROPICAL ENVIRONMENT

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ABSTRACT

Herd health fertility records of 248 cows comprising 103 Friesians, 84 Bunaji and 61 Crossbreeds in Vom from 1992-1999 were utilized to study the incidence of reproductive problems. The overall incidence of various reproductive problems was 54.4% and this was more frequent (P<0.001) in crossbred cows (72.6%) than in Friesians, (59.9%) and in Bunaji (32.7%). Second Calvers (67.1%) were more susceptible (P<0.01) to reproductive problems than heifers (56.0%) and mature cows (45.3%). The incidence of still birth (8.10%) and relative infertility (8.2%), were influenced by genotype (P<0.05); similarly genotypic differences (P<0.001) were observed in the incidence of retained placenta (7.4%). Abortion (5.6%), dystocia (12.2%) and repeat breeding (12.5%) were uniformly distributed among genotypes. Parity of dams had marked influence (P<0.001) on dystocia, still birth and retained placenta. Significant differences (P<0.01) were also observed on the incidence of relative infertility, but the rate of dystocia (P<0.01), abortion and repeat breeding (P<0.001) varied with the years. The results emphasize the need for greater management intervention to reduce the incidence of reproductive problems in sub tropical cattle herds.

Keywords: Cattle, Reproductive problems, Subtropic

INTRODUCTION

Bos indicus (zebu) cattle are the main source of both meat and milk production in Nigeria. The poor dairy potential of this genotype however, had led to importation of *Bos Taurus* cattle and adoption of crossbreeding with superior exotic dairy breeds as a means of improving milk production (Mbap and Ngere, 1995).

Exotic dairy breeds, in particular Friesians, were first imported into Nigeria in the early 1950s. They were mainly needed to upgrade indigenous breeds of cattle and to a lesser extent kept as pure breeds on government farms and research Stations (Armour and Sainsbury, 1956; Knudsen and Soheal, 1970; Mbap and Ngere, 1989; 1995).

When introducing genes for milk production from temperate breeds, consideration has to be given to physiological adaptation of the genotypes and their crosses to tropical conditions. Most previous studies on Friesians, White Fulani and their crosses had largely been limited primarily to the assessment of dairy potential (Mbap and Ngere, 1989; 1995). Emphasis on increasing dairy potential without maximizing reproductive efficiency is not good enough. The present study therefore considered some reproductive problems limiting the genetic attainment of optimum reproductive performance of local, exotic and hybrid cattle in Vom, Nigeria.

MATERIALS AND METHODS

Location and Climate

Vom has an altitude of 128m above the sea level and lies on longitude 8°45′ East and latitude 9°43′ North (Knudsen and Soheal, 1970). The average annual precipitation ranges between 1250-1650mm. The rainy season extends from April to October with peak rainfall in August; there is little or no rainfall

in the dry season. The seasons are thus (July-September) Early dry (October-December) and late dry (January-March). Relative humidity ranges from 49-85% while evaporation ranges from 14 to 298mm, with minimum and maximum evaporations recorded in August and March, respectively. The mean air temperatures varied little from 19.5-23.5°C while the daily minimum and maximum air temperatures ranged from 12.0-17.0°C and 24-31°C, respectively. The climate shows a characteristic cold spell common to high altitudes and subtropical regions. The climate has therefore been described as subtropical with montane vegetation (Mbap and Ngere, 1989).

Animal Management

Cattle were semi-intensively maintained on fenced and electrified paddocks. The paddocks consisted of improved and rain fed pastures made up mainly of Rhode grass (*Chloris gayana*). Other grasses include; *Cynodon dactylon, Digitaria smuttsi, Hyparrhenia rufa, Pennisetum* spp. *Andropogon gayanus and Branchiaria brizantha*. The pastures were fertilized to ensure good growth and regrowth. During the rainy season, (April-September) the cows were rotationally grazed. All cows, dry and milking were supplemented daily with maize silage and concentrate at 5.5-8kg DM and 6-14kg DM/cow/day respectively. The concentrate was formulated based on "Intestine digestible protein". During the dry season (October-March) they were partly grazed on the paddock and also fed with hay, maize silage (10-12kg DM/day) and concentrate (6.14kg DM/day). The lactating animals in addition to grazing received a small amount of fresh spent brewers grain in the waiting yard next to the milking parlour during milking. Water and mineral salt lick were provided *ad libitum* to all animals during all seasons. Calves were allowed to take colostrums from their dams for the first 3-4 days after calving, and thereafter bucket fed whole milk at the rate of 10% of their body weights but reduced to 5% after 4 weeks. classified into Early rain (April-June), Rainy Concentrate feeding was introduced during the second week at the rate of 0.5kg/day/calf and gradually increased to 2.0kg at the eight week. Hay and silage were introduced (*ad libitum*) as from the third and fourth weeks, respectively.

The animals were routinely dewormed and regularly vaccinated against ectoparasites twice weekly during rainy season and forthnightly in the dry season. Vaccinations against diseases such as Contagious Bovine Plueropneumonia (CPP), Brucellosis, Haemorhagic septicaemia, Rinderpest and Black quarter were also done periodically.

All animals were artificially inseminated, using deep frozen semen from Dutch progeny tested Friesian bulls known to possess below average calving problems. Calvings were done in individual stalls. Stalls were disinfected before a cow was admitted for calving.

Data Collection and Analysis

Data were collected from herd health fertility charts. The nature of reproductive problems was recorded according to the following criteria:

Abortion was scored if pregnancy was terminated through the expulsion of the foetus of recognizable size prior to period of viability.

Still birth was recorded as death of a calf shortly before, during or up-to 24 hours after parturition at term (Bendixen *et al.*, 1986).

Dystocia was recorded as calving in which assistance was necessary to save the life of the calf or to prevent the cow from suffering.

Retained placenta was recorded if after calving the foetal membrane was not spontaneously released.

Relative infertility was recorded as cases of functional abnormalities of the reproductive

tract occurring in relations to calving, (Kodagali, 1974).

Repeat breeding was secured as number of cows requiring 3 or more services to conceive.

Differences between categories were tested using Chi square analysis (Little and Hills, 1978).

RESULTS AND DISCUSSION

Table 1 shows the incidence of some reproductive problems. The overall incidence was 54.4% and was significantly influenced by breed ($P<0.001$) and parity ($P<0.01$). The incidence of abortion was 5.6% and was not influenced by breed and parity. Year, however, had a significant influence ($P<0.001$) on the incidence of abortion. Mbap and Ngere (1989) reported lower percentage (3.3%) of gestations terminated by abortion/still birth. The higher incidence of abortion in 1994/95 coincided with a period when there was an outbreak of anaplasmosis, besides, there were suspected cases of ephemoral fever on the farms. These might have accounted for the rise in incidence of abortion.

The frequency of difficult calvings (dystocia) was 12.2% and this is comparable to the value of 10.1% reported by Berglund and Phillipson (1987). Parity had profound ($P<0.001$) effect on the incidence of dystocia. Heifers had the highest incidence, 19.0%, compared with 13.9% for second calvers and 6.5% for mature cows. The significant influence of parity on dystocia is in accord with several earlier findings (Phillipson, 1976; Meijering, 1984; Berglund and Phillipson, 1987; Na'azie *et al.*, 1989). There were no significant breed differences in incidences of dystocia, thus suggesting that Bunaji cows can be successfully bred to Friesian bulls without any increase in calving problems.

Breed ($P<0.05$) and Parity ($P<0.01$) significantly influenced the incidence of stillbirth. The incidence of stillbirth (8.12%) obtained in this study compares favourably with the 8.8% reported by Laster and Gregory (1973). The low incidence of stillbirth in the Bunaji might reflect their adaptability to their native environment. Heifers are small and therefore more prone to dystocia and hence more stillbirths.

Approximately seven percent of all pregnant cows had retained placenta after calving which is in accord with earlier reports of Joosteen *et al.* (1987, 1991); Stevenson and Call (1988). The significant breed ($P<0.01$) and Parity ($P<0.001$) differences in the incidence of

TABLE 1: INCIDENCE OF SOME REPRODUCTIVE PROBLEMS AMONG FRIESIANS, BUNAJI AND CROSSBRED CATTLE

	Total Calving	Abortion	Dystocia	Stillbirth	Retained Placenta	Relative Infertility	Repeat Breeding	Cumulative Incidence
Overall	788	44(5.6)	96(12.2)	64(8.1)	58(7.4)	65(8.2)	102(12.9)	429(54.4)
Breed	X^2(df=2)	4.48^{NS}	5.37^{NS}	8.64^{*}	12.13^{**}	5.93^{*}	2.32^{NS}	36.98^{***}
Friesian	319	23(7.2)	42(13.2)	31(9.7)	23(7.2)	52(10.0)	40(12.5)	191(59.9)
Bunaji	257	8(3.1)	20(7.8)	10(3.9)	9(3.5)	12(4.7)	25(9.7)	84(32.7)
Friesian x Bunaji	212	13(6.1)	31(14.6)	23(10.8)	26(12.3)	21(9.9)	25(11.8)	154(72.6)
Parity	X^2 (df=2)	3.89^{NS}	18.3^{***}	15.52^{***}	19.76^{*}	9.32^{**}	9.86^{**}	11.72^{**}
1	232	68(3.4)	44(19.0)	33(14.2)	11(4.7)	8(3.4)	26(11.2)	130(56.0)
2	216	11(5.1)	30(13.9)	10(4.6)	31(14.4)	21(9.7)	42(19.4)	145(69.5)
3	430	25(7.4)	22(6.5)	21(6.2)	16(4.7)	36(10.6)	34(10.0)	154(45.5)

df = degrees of freedom; NS = Not Significant; *P<0.05; **P<0.001, values in parentheses are percentages.

retained placenta observed in this study could be due to its close association with other reproductive problems such as abortion, stillbirth and dystocia.

The economic consequence of retained placenta in terms of poor appetite, reduced milk and meat yields especially if metritis sets in and generally reduced fertility should not be over looked. The incidence of relative infertility as defined previously (in the materials and methods) ranges from 4.7% to 10.0% amongs the genotype as evaluated. There were significant breed (P<0.05) and parity (P<0.01) effects on the incidence of this breed category of reproductive problems. The 8.2% reported for relative infertility in this study is lower than the rate (17.4%) reported by Curtis *et al.* (1985). The low incidence observed in this study is not unlikely to be connected with improvement in management and sanitation at calving in Vom. Non specific bacterial infections may cause infertility in cows. Eduvie *et al.* (1984) isolated pathogenic and saprophytic bacterial organisms from the vagina, cervix and uterus of cattle that had conditions such as retained placenta, endometritis as well as from genitalia of normal cows. Some of these saprophytic organisms became pathogenic when the animals were stressed.

Repeat breeding constitutes a serious cause of economic loss to dairy farmers, Voh *et al.* (1994) using delayed return rate method in artificially inseminated Bunaji cows reported an incidence rate of 15.3%. The occurrence of repeat breeder cows in this study were 12.94% lower than the findings of Nuru and Dennis (1976) who reported a range of 16.6 to 58.8% in Bunaji herds in six northern states of Nigeria. It is probable to accept that the high level of management in the farm was responsible for the lower rate observed.

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There is paucity of experimental data relating to the possible morphological mechanisms and other factors that account for fertilization failure in tropical cattle, there is therefore a need, to ascertain the actual factors that account for fertilization failure and embroyonic mortality. The reproductive performance in the present study is unsatisfactory. Management intervention should be employed so as to reduce the high incidence of reproductive problems observed. In addition a further study using data from large population herds should be carried out to ascertain the incidence of reproductive problems.

REFERENCES

ARMOUR J. and SAINSBURY, R.W. (1956): Artificial Insemination in Nigeria using air transported bull semen, Veterinary Record, 68:140-143.

BERGLUND, B. and PHILLIPSON, J. (1987): The influence of relative birth weight and certain other factors on calving performance in Swedish dairy cattle breeds. Animal Reproduction Science, 15:81-105.

BENDIXEN, P.H. VILSON, B., EKESBO, I. And ASTRAND, D.B. (1986): Disease frequency in Swedish dairy cows. 1. Dystocia. Preventive Veterinary Medicine 4(4):307-316.

CURTIS, C.R., ERB H.N. SNIFFEN, C.J., SMITH, R.D. and KRONFFELD D.S. (1985): Pathonalysis of dry period nutrition, postpartum metabolic and reproductive disorders and mastitis in Holstein cows. Journal of Dairy Science, 68:2347-2358.

EDUVIE, L.O. OSORI, D.I.K., ABDU, P.D. and NJOKU, C.O. (1984) Bacteriological investigation of the postpartum uterus. Relationship to involution and histopathological findings.

NURU, S. and DENNIS, S.M. (1976): Abortion and reproductive performance of cattle in northern Nigeria. Tropical Animal Health and Production 8:213-219.

PHILLIPSON, J. (1976): Studies on calving difficulty, stillbirth and associated factors in Swedish cattle breeds II. Effect of non genetic factors. Acta Agriculture Scandinavica, 26:166-174.

STEVENSON, J.S. and CALL, E.P. (1988): Reproductive disorder in the periparturient dairy cow. Journal of Dairy Science, 71:2572-2584.

VOH JR. A.A., OGWU, D. and OYEDIPE, E.O. (1994): Incidence of late embryonic mortality and repeat breeder syndrome in artificially inseminated Bunaji cows following eserus synchronization. Paper presented at the National Animal Production Research Institute (NAPRI) seminar, Ahmadu Bello University, Shika Zaria, Nigeria on 12th April (un-published). 9pp.