THE REPRODUCTIVE PERFORMANCE OF *SANTA GERTRUDIS* BEEF CATTLE IMPORTED INTO NIGERIA

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ABSTRACT

An analysis of some reproductive performance traits was carried out for the period 1983 to 1985, in a herd of 168 *Santa Gertrudis* beef cattle imported from Oklahoma, U.S.A. in 1981 into Ikyogen cattle ranch in Nigeria. Three calf crops were obtained during the period. Mean pregnancy rate and calving percentage were 63.24 and 55.72% respectively; with pregnancy rate increasing from 54.23 to 70.41% while calving percentage increased from 48.42 to 61.11% during the period. Mean calf mortality rate of 40.83% was high and increased from 36.34 to 45.15%. Mean adult mortality rate was 5.68% of which 16.99% was recorded in the first year of introduction but this declined sharply to 0.02% in the next two years. Mean weaning rate was 50.08% and this declined from 55.71 to 44.32% during the period under study. Mean birth weight, weaning weight and calving interval were 27.8 ± 0.29 kg, 174 ± 4.6kg and 451 days respectively.

It was concluded that with the exception of weaning weight, the reproductive traits of the imported *Santa Gertrudis* cattle reported in this study were not superior to those of the predominant indigenous cattle breeds of Nigeria. The implications of these results in the beef cattle industry of Nigeria are discussed.

INTRODUCTION

The reproductive performance of a beef herd is frequently the most important factor affecting the success of a beef production enterprise. A low performance not only reduces the profit per cow or per unit area of land, but it may limit attempts to improve the herd genetically (Toops, 1977). When the calving percentage is low, all or nearly all the female calves must be kept for the breeding herd to maintain the herd number and therefore little or no selection can be practiced. For this reason, the common occurrence of low or mediocre levels of reproduction is a matter of considerable concern throughout the world.

The main objective in earlier attempts in the importation of cattle from Europe to Nigeria was to crossbreed with the local breeds in an attempt to improve the genetic potentials of the indigenous cattle. Reports are available on the reproductive performance of some breeds of cattle in Northern Nigeria kept on Government farms (Foster 1960; Sada 1968; Wheat and Broadhurst 1968; 1972; Wheat 1972; Johnson and Bell 1978; Oyedipe, Buvanendran and Eduvie 1982) and in nomadic herds (Nuru and Dennis 1976; Pullan 1979; 1980; Pullan and Grindle 1980). It is with these performance records that the reproductive performance traits of the imported *Santa Gertrudis* cattle are compared in order to guide prospective cattle producers on the desirability or otherwise, of importing similar cattle into

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the country.

Information on the reproductive performance of cattle imported into Nigeria is scanty. The data in this study serve to unvail for the first time the reproductive performance of *Santa Gertrudis* beef cattle in Nigeria.

MATERIALS AND METHODS

The study was made on a commercial cattle ranch in Ikyogen situated in the southern guinea savannah of Benue State, Nigeria from 1983 — 1985. The ranch is situated on a hilly, undulating area and lies between latitude 6.7°N and 9.5°E and about 720 m above sea level. Average annual rainfall is about 1800 mm, most of which falls between March and October, the [illegible] maximum temperatures are 25°C and 28°C respectively.

160 heifers and 8 bulls ranging in age from 2½ to 3 years were introduced into the ranch in 1981. The animals were reared extensively on pasture. During the 8 months of the rainy season, they depend entirely on grazing. In the dry season (November — February), the animals graze improved pasture and are supplemented with brewers' dried grains and molasses. Mineral salt licks are provided free choice.

The bulls are allowed to run with the breeding herd during the breeding season (July — September), and are removed thereafter. This ensures that the cows calve in the rainy season to guarantee adequate nutrition from pasture for the lactating cows and their calves. Pregnancy diagnosis is carried out through rectal palpation 60 days after withdrawal of bulls. Calves are born in the range and allowed to run with the dams. Calves are grouped together and creep fed supplementary rations of brewers' dried grains and molasses. Calves are weaned and weighed at 6 months of age. All animals are routinely vaccinated against Rinderpest, Contagious Bovine Pleuropneumonia (CEPP) and Anthrax once every year. All animals are dewormed with thabendazole once before the rainy season, twice during the rainy season and once at the end of the rainy season every year. All the animals are also sprayed against ticks every 2 — 4 weeks with triatix.

Extensive clearing of the ranch was carried out in 1982 especially along the river, streams and watering points to reduce tsetse population. During this time, all animals received berenil treatment. Two weeks after treatment with berenil, samorin was administered to all anim[illegible] weeks for prophylaxis.

Trypanosomiasis from tsetse infestation was recorded in 1982 and 1983 while streptothricosis outbreak occured in 1983 and persisted to 1985.

RESULTS AND DISCUSSION

The reproductive performance traits of the *Santa Gertrudis* herd are presented in tables 1 and 2 and fig. 1.

It would appear that the animals' adaptability to the environment improved with time as was demonstrated in the yearly increase in the pregnancy rate of 54% (1983) to 70% (1985) and calving percentage of 48.4% (1983) to 62.1% (1985). The pregnancy rate reported here for *Santa Gertrudis* appears generally higher than what had earlier been recorded for the Nigerian Zebu Cattle (Nuru and Dennis 1976 and Voh *et al.*, 1984). Nuru and Dennis (1976) reported pregnancy rate of 24—59% for Bunaji Cattle, while Voh, Oyedipe and Buvanendran (1984) reported 33-59% pregnancy rate for Sokoto Gudali Cattle. The differences in the pre-

TABLE 1

Reproductive performance traits of *Santa Gertrudis* Cows.

	1983	1984	1985	Mean
Pregnancy rate (%)[a]	54.23	65.07	70.41	63.24
Calving percentage[b]	48.42	56.64	62.11	55.72
Calf Mortality rate (%)[c]	36.34	41.02	45.12	40.83
Adult Mortality rate (%)	16.99	0.025	0.017	5.68
Weaning rate (%)[d]	55.71	50.21	44.32	50.08
Calving Interval (days)	452	450		451

[a]Pregnancy rate = $\frac{\text{Number of pregnant females x 100}}{\text{Number of females of breeding age examined.}}$

[b]Calving percentage = $\frac{\text{Number of calves born x 100}}{\text{Total Number of cows in the herd.}}$

[c]Calf Mortality rate = $\frac{\text{Number of calves died before weaning x 100}}{\text{Total Number of calves born in the herd.}}$

[d]Weaning rate = $\frac{\text{Number of calves weaned x 100}}{\text{Total number of cows in the herd.}}$

Table 2

Means and standard errors of birth weights (kg) and weaning weights (kg) in *Santa Certrudis* calves.

	1983		1984		1985	
	Maie	*Female*	*Male*	*Femal*	*Male*	*Female*
n	30	40	28	36	30	27
Birth Mean (kg)	28.1	26.9	28.7	27.2	28.6	27.1
SE	0.29	0.25	0.32	0.27	0.33	0.26
n	19	20	14	18	12	16
Weaning Mean (kg)	177.6	169.1	179.2	171.0	179.0	170.3
SE (6 months)	3.7	5.2	4.4	3.9	5.6	4.9

gnancy rate between the exotic and the local breeds could possibly be due to breed differences and secondly, due to differences in the breeding techniques and methods of pregnancy diagnosis used. While pregnancy rate recorded by Nuru and Dennis (1976) were based on questionnaires in extensively managed local breeds of cattle, those of Voh *et al.*, (1984) were based on Artificial Insemination scheme with pregnancy diagnosis through

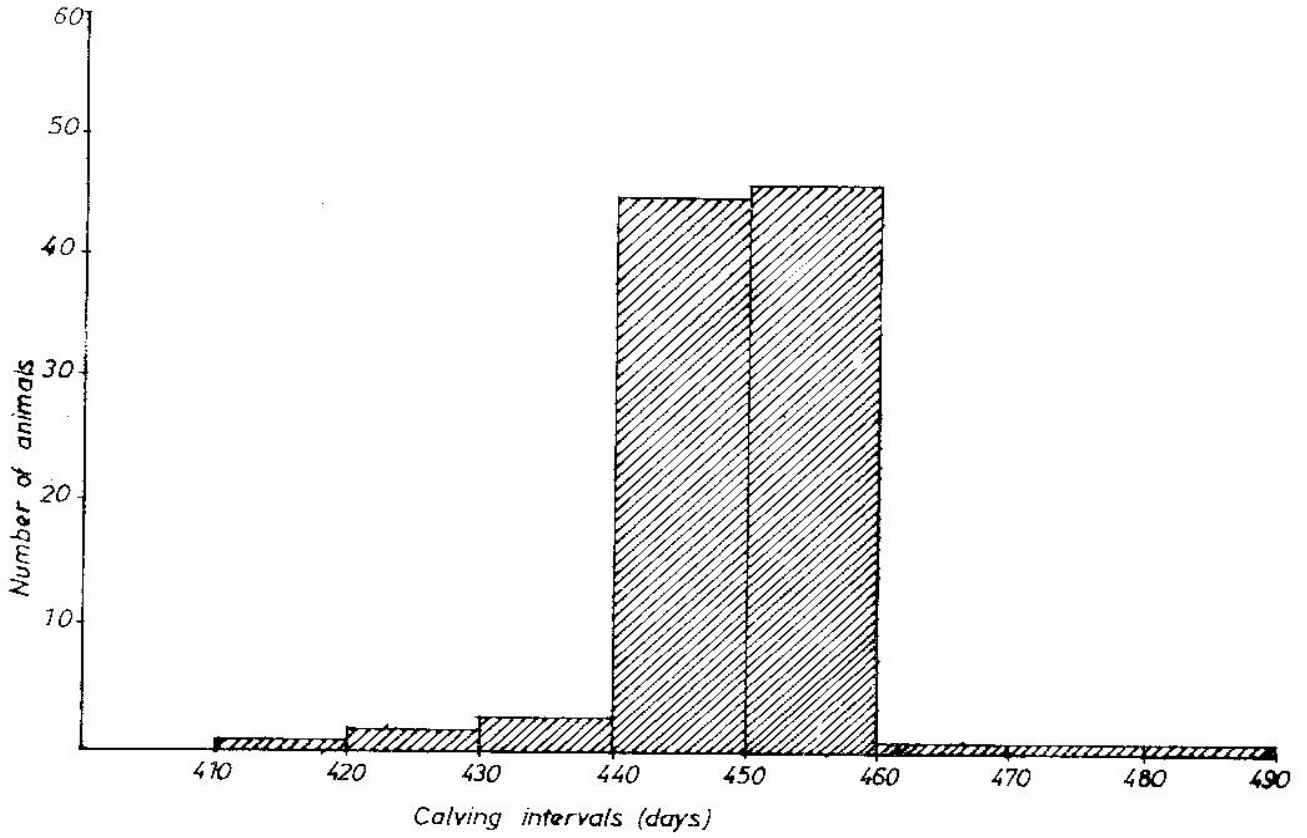

Fig. 1. Distribution of animals classified according to calving intervals

rectal palpation. In this study, recorded pregnancy rate were based on pasture mating with pregnancy diagnosis through rectal palpation.

The calving percentage obtained in this study compares favourably with those of Meade *et al.*, (1959), Cobb, Burns and Koger (1964), Warnick, Kirst, Burns and Koger (1967) who reported calving percentage of 57, 65 and 68 respectively with *Santa Gertruais* in the U.S.A. while Willis and Preston (1969) recorded 64% calving rate for the same breed in Cuba. However, higher calving percentage of 67, 36 — 72 and 89 respectively have been reported in indigenous cattle of Nigeria by Nuru and Dennis (1976) and Pullan (1979).

The high calf mortality and low weaning rate were due to losses from Trypanosomiasis and *Streptothricosis* outbreaks. This appears to be a common occurence in tropical Africa. In Uganda for instance, Stebbs (1966) reported 74% calf mortality in Boran Cattle imported from Kenya due largely to East Coast Fever compared with only 23% for indigenous Zebu.
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High adult cattle mortality of 16.99% recorded in 1983 was due to Trypanosomiasis outbreak. This situation however improved after tsetse control measures were instituted.

The mean calving interval of 451 days recorded in this study is about the same as that of 433 days and 440 days respectively reported for the same breed of cattle in the U.S.A. (Warren, Thrift and Carmen 1965) and in Cuba (Willis and Preston 1969). The two calving intervals observed in this study were the same and contrast with the

findings in Friesians in Egypt by El-Sheikh and El – Fouly (1962) and in Bunaji Cattle in Nigeria by Oyedipe *et al.* (1982) and Johnson, Buvanendran and Oyejola (1984) who observed the first calving interval to be longer than subsequent calving intervals. The observations recorded in this study, however, were too few.

The distribution of the number of animals with different calving intervals is shown in figure 1. More than 90% of the animals have calving intervals of 440 to 460 days. Only approximately 3% of the animals have calving intervals greater than 460 days. This probably represents that percentage of the population with reproductive disorders of nutritional genetic, infectious or environmental origin. Many of these disorders occur during the post-partum period. Morrow *et al.*, (1966) observed varying incidences of post-partum diseases which were significantly correlated with conception rate. Shorter calving intervals ranging from 365 days to 435 days have been reported for Nigeria's indigenous Bunaji and Sokoto Gudali Cattle (Wheat and Broadhurst 1968; 1972; Wheat, de Leeuw and Koch 1972; Johnson *et al.*, 1984). Pullan (1979) however, reported long calving intervals averaging about 810 days in Bunaji herds owned by few private farmers in Plateau State of Nigeria, and this was attributed to poor manage-

Fairly consistent birth and weaning weights were recorded throughout the period under study; the bull calves were heavier than heifer calves both at birth and at weaning (table 2). The mean birth weights of calves recorded in this study are similar to those earlier reported for the same breed of cattle by Cobb *et al.*, (1964), Plasse and Koger (1967), Munoz and Martin (1968) and Willis and Preston (1968). Similar birth weights (26–27kg) were recorded for the indigenous Bunaji Cattle in Nigeria (Johnson and Bell 1978). Recently, however, Gotti, Benyshek and Kiser (1985) recorded as high as 37.3 kg mean birth weight in Santa Gertrudis calves in Georgia – U.S.A.

Weaning weights recorded in this study were similar to those earlier reported for the same breed by Cobb *et al.*, (1964), Plasse and Koger (1967), Willis and Preston (1968) and suggests the remarkable adaptation to the Nigerian environment. However, the weaning weights recorded in this study (169–175 kg), were much more superior to those reported by Johnson and Bell (1978) for the indigenous Bunaji breed that weaned at 128 – 133 kg at 6 months. The superior weaning weight of the *Santa Gertrudis* compared to that of the Bunaji suggests a more rapid growth rate of the *Santa Gertrudis* which may be a genetic factor as well as its better feed utilization.

Data on some important reproductive traits of *Santa Gertrudis* cattle imported into Nigeria have revealed that the reproductive performance of these cattle may not be superior to that of the indigenous breeds of cattle in Nigeria. These findings strengthen earlier calls for selection and proper management of the indigenous stock rather than importation as a long term measure in boosting beef cattle production in Nigeria.

The similarity in the reproductive traits of the *Santa Gertrudis* in this study with those in the U.S.A. from [illegible] suggests an inherent capacity for the breed to adapt fast to a new environment.

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