PERFORMANCE OF AYRSHIRES AND AYRSHIRE X ZEBU CROSSES IN IRINGA REGION.

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SUMMARY

Performance results of Ayrshires, 3/4 Ayrshire 1/4 TSZ (Tanzania Shorthorn Zebu) and 1/2 Ayrshire 1/2 TSZ reared at Livestock Experimental Station, Sao Hill are presented. Mean age at first calving was 51 months for Ayrshires and 48 months for Ayrshire X TSZ crosses. Mean calving intervals were 489,381, and 467 days for Ayrshires, 3/4 Ayrshire 1/4 TSZ, and 1/2 Ayrshire 1/2 TSZ, respectively. As for milk production, all genotypes produced less than 1,550 kg per lactation.

INTRODUCTION

For quite some time in the past, *Bos taurus* dairy cattle were considered unproductive in tropical countries because of inadequate disease control measures, climatic stress, and a sub-standard plane of nutrition (Prob, 1953; French, 1955; Rollinson, 1962; Phipps, 1974). French (1941) and Daubney (1942) report that European cattle can perform extremely well inside the tropics if they live at an altitude at which the climate simulates that of temperate zones. In East Africa, work on performance of *Bos taurus* dairy cattle was reported by French, 1941; Daubney, 1942; French 1955; Larkin, 1964; Mahadevan and Hutchison, 1964; Marples and Trail 1967; Kiwuwa, 1968; 1973 and 1974; Phipps, 1974; Kimenye and Russell, 1975; and Bruhn and Mgheni 1977. In view of Sao Hills "temperate microclimate" it was decided to investigate the performance of Ayrshire and Ayrshire X TSZ crosses that have been reared at Livestock Experimental Station, Sao Hill, for about a decade. The results obtained in the study may be of value to planners of dairy development and to progressive farmers contemplating to introduce Ayrshires, or *Bos taurus* dairy cattle.

MATERIAL AND METHODS

Site: The study was undertaken at Livestock Experimental Station, Sao Hill, located in Iringa Region of Tanzania at an altitude of about 1523 metres above sea level. The farm has an area of about 5,200 hectares including some 1,200 hectares of liverfluke *(Fasciola gigantica)* infested marshy areas. It receives a monomodal rainfall of around 800 mm annually from late November to early May. Mean minimum and maximum ambient temperatures are around 8°C in July and 24°C in October, respectively. The vegetation of the area is composed basically of open grassland type with some scattered trees. The natural pasture sward is dominated by grasses mainly *Hyparrhenia rufa, Themeda triandra, Bhynchelytrum* spp, *Sporobolus* spp, *Cynodon* spp, and a small proportion of local legumes, namely *Rhynchosia* spp, *Glycine* spp, *Indigofera* spp. Forage dry matter Production reaches its peak in March and by June frost — bite ensues leaving bleached standing hay of low nutritive value.

Data: Performance records pertaining to the Sao Hill dairy herd from 1969 to 1979 were used in this study. Individuals within the herd belonged to three genotypes: 1/2 Ayrshire 1/2 TSZ, 3/4 Ayrshire 1/4 TSZ, and Ayrshires. Only those individuals with complete records, namely, Central Registry Number, date of birth, sex, dates, of calving, lactation yield and length were used in the study. Besides, lactation records consisted of the normal twice-a-day milk yields over at least an 84-day lactation period.

All individuals whose data was used in the study were exposed to the same management and disease control. As calves, they were bucketfed for 16 weeks in calf houses before being weaned on to pasture. In addition to forage, hay, and silage, some maize bran was fed to lactating individuals at milking. Foot and Mouth Disease, Anthrax and Blackquarter vaccinations and drenching against endemic fascioliasis were attempted.

RESULTS AND DISCUSSION

Age at first calving. Table 1 shows ages at first calving for the three genotypes. Whereas the 1/2 Ayrshire 1/2 TSZ and 3/4 Ayrshire 1/4 TSZ calved at the age of about 48 months, the pure Ayrshires calved three months later.

Age at first calving of 48 months for the Ayrshire grades and 51 months for the pure Ayrshires are higher than those reported by previous research workers in East Africa. In Kenya, Kimenye and Russell (1975) reported an adjusted mean age at first calving of about 36 months for pure Ayrshires and Ayrshire X Sahiwal grades.

Kiwuwa (1968) also reported a mean age at first calving of 30 months for *Bos taurus* dairy cattle with an upper limit of around 44 months. In Tanzania, Mahadevan and Hutchison (1964) reported a mean age at first calving of about 37.4 months for *Taurindicus* cattle. Age at first calving is, within a breed, a function of the growth rate of the heifer to breeding maturity plus her reproductive efficiency during the time she is first served (Kiwuwa, 1968).

Calving Interval: Calving intervals for the three genotypes are shown in Table 2. From the table, it is evident that the pure Ayrshires had rather longer intervals than the other two genotypes. The mean calving intervals obtained in this study were certainly longer than those reported elsewhere. In Kenya, Kimenye and Russell (1975) obtained calving intervals of, 421, to 436 days for the pure Ayrshires and Ayrshire X Sahiwal grades. Kiwuwa (1968). likewise reported mean calving intervals of 425 and 439 days for pure bred Ayrshires and Ayrshire grades, respectively. In Tanzania, Mahadevan and Hutchison (1964) also reported a mean calving interval of 432 days for *Taurindicus* cattle. Calving interval seems to a large extent to depend on management and, in order to reduce it, correct observation of heat periods, serving at the optimum time and treating animals for reproductive failures are necessary (Kimenye and Russell, 1975).

Milk Production: As regards milk production, all the genotypes on average produced less than 1,550 kg per lactation as shown in Table 3. In Kenya, Kimenye and Russell (1975), reported lactation yields of above 2,400 kg in 3 & 5 days for Ayrshires. Kiwuwa (1968) however, reported slightly higher milk yields of about 3,000 and 2,500 kg for pure bred Ayrshires and Ayrshire grades, respectively. In Tanzania, however, Bruhn and Mgheni (1977) reported lactation yields of 1627 kg in 277 days for Ayrshire while Shokimweri (1982) recorded first lactation yields of 1488.7 kg in 248 days for Ayrshire X Zebu crosses. The low milk yield at Sao Hill was probably due to a substandard plane of nutrition, lack of culling of unproductive individuals, and the high fascioliasis challenge.

Using the quoted Kenye figures as a general guide, it is evident that hte Ayrshires and Ayrshire X TSZ crosses at Sao Hill will have to be managed well if they are tc reach an acceptable level of performance. However, the variability observed in the traits studied offers possibilities for improvement in performance through selection.

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Table 1. Age at First Calving of Ayrshires and Ayrshire X Zebu Crosses.

Genotypes	Number of Observations	Age at First Calving in Days		
		Mean	S.D.	C.V.%
Ayrshire	32	1544.7	231.6	15.0
3/4 Ayrshire × 1/4 TSZ	6	1445.3	265.1	18.3
1/2 Ayrshire × 1/2 TSZ	12	1443.9	267.2	18.5

NB: TSZ = Tanzania Shorthorn Zebu
S.D = Standard Deviation
C.V = Coefficient of Variation

Table 2. Calving Intervals of Ayrshires and Ayrshire X Zebu Crosses.

Genotypes	Number of Observations	Calving Interval in Days		
		Mean[1)]	S.D.	C.V.%
Ayrshire	138	489.2a	149.6	30.6
3/4 Ayrshire × 1/4 TSZ	6	381.3b	53.5	14.0
1/2 Ayrshire × 1/2 TSZ	6	467.0a	196.5	42.1

N.B. TSZ = Tanzania Shorthorn Zebu
S.D = Standard Deviation
C.V. = Coefficient for Variation

a, b represent significantly different means (PLO.05)

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Table 3. Milk Production of Ayrshires and Ayrshire X Zebu Cross

Genotypes	Number of Observations	Lectation Yield in kg			Lactation Length in Days			Milk Yield per day in kg		
		Mean	S.D.	C.V%	Mean	S.D.	C.V.%	Mean	S.D.	C.V.%
Ayrshire	153	1366.9a	344.8	25.2	277.9	38.8	14.0	5.1	1.2	23.5
3/4 Ayrshire × 1/4 TSZ	10	1197.2b	231.9	19.4	278.5	46.9	16.8NS	4.7	1.1	23.4
1/2 Ayrshire × 1/2 TSZ TSZ	8	1504.4a	384.6	25.6	268.2	37.0	13.8NS	5.2	1.3	25.0

N.B. TSZ = Tanzania, Shorthorn Zebu
S.D. — Standard Deviation
C.V. = Coefficient of Variation

1) a, b represent significantly differenct means (PLO.05)