THE INFLUENCE OF DAM AGE ON WEIGHT FOR AGE OF STEERS AT WEANING, AND AFTER WEANING

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SUMMARY

Age-corrected weights of 580 *Bos indicus* cross *Bos taurus* steers were analysed to estimate age of dam effects at 6mo, (weaning), 12 mo, 17 mo, 23 mo and 29 mo.

Age-of-dam effects were present from weaning to and including 23 mo of age. The magnitude of those effects decreased with age of steers, and from 12 mo onwards reflected differences between dams less than 5 yr of age and dams 5 yr and older.

Disregarding age-of-dam adjustments at 17 mo or older would probably not seriously reduce genetic gains for weight in a selection programme. However, when numbers are sufficient, grouping progeny from dams less than 5 yr and 5 yr and older would reduce errors attributable to dam age.

Age-of-dam correction factors for weaning weight approximated those used by the National Beef Recording Scheme. When the regression of age-corrected weaning weight on day of birth was fitted a closer approximation was obtained.

INTRODUCTION

In a breeding programme correction for age-of-dam effects is important to maximise genetic gain (Jones and Hopkins 1979).

The need for correction factors at weaning is documented, but there is annual and herd variation in age-of-dam effects on weaning weight (Barlow et al. 1974). Selection on the basis of weight for age at 18 mo to 20 mo offers a practical method of improving genetic worth in terms of liveweight performance (Seifert 1975). Commercial use of this technique depends on culling only a proportion at weaning for management considerations and selection at 18 mo to 20 mo independently of age-of-dam effects.

Age-of-dam correction factors currently used for weaning weight are based primarily on experience from *Bos taurus* cattle in temperate environments. There is a need to establish correction factors using tropically adapted genotypes in tropical and sub-tropical environments.

Age-of-dam effects on live weight at different ages after weaning require further documentation. A number of reports have suggested that from approximately 16 mo of age onwards these effects are either absorbed or markedly reduced (Seifert 1975; Lapworth *et al.* 1976; Bean and Seifert 1979).

This paper examines age-of-dam effects on steer progeny at various ages and discusses their implications for selecting breeding cattle.

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ANIMALS AND METHODS

Live weights of tropically adapted steers from a commercial herd at Mount Eugene, Jambin, Queensland were recorded. Location, pastures, climate and management at Mount Eugene have been previously described (Lapworth et al. 1976).

The data used were from steers born 45 days either side of the mean calving date to conform with guidelines recommended by the National Beef Recording Scheme (Anon.1978). The mean birth date of the steers observed was September 23 ± 26 days. Live weights were recorded at average ages of 6 mo (weaning), 12, 17, 23 and 29 mo, and were analysed on the basis of age-corrected weight at those ages and gains using a standard birth weight of 32 kg.

Age-corrected live weights and liveweight gains were analysed by the least squares method (Harvey 1960) to account for year, breed of sire, breed of dam as well as age of dam and all first order interactions. Day of birth and dam weight at weaning were fitted as covariates to some models to estimate their effect.

RESULTS AND DISCUSSIONS

Age-of-dam effects were significant for weight of age at 6 mo, 12 mo, 25 mo ($P < 0.005$) but not at 29 mo. Table 1 indicates that differences at older ages were due to differences between four yr old and younger cows relative to cows 5 yr and older.

Separate analyses showed that there was no age of dam effect among the 2 yr, 3 yr and 4 yr old groups after 6 mo, and there was no age of dam effect among the 5 yr and older age groups at any age.

TABLE 1 Least squares means for weight for age and gains at different ages for steers from 2,3,4,5, 6-9 and 10+ year old dams.

Dam Age	No.	Corrected weight (kg) per head					Gain (kg) per head 6 mo to			
		6 mo	12 mo	17 mo	23 mo	29 mo	12 mo	17 mo	23 mo	29 mo
2 yr	85	187	223	315	360	456	34	126	171	263
3 yr	99	197	231	318	361	456	38	127	171	261
4 yr	94	199	228	317	358	454	29	118	157	250
5 yr	78	210	242	331	374	460	33	121	165	253
6-9 yr	183	207	245	331	372	465	34	118	161	245
10 yr+	41	210	269	331	386	466	49	118	168	253

Since a year by dam age interaction was present at 6 mo corrections based on long term data could be a source of error in selection programmes in some years. The magnitude of this error could be expected to be small if the information was used to cull only up to about 50 percent at weaning. Conversely, it could be expected to assume greater importance if it was used to select only a small proportion of the heaviest weight for age weaners.

Inclusion of the regression had no effect on the relativity between age of dams after 6 mo weight. At weaning (6 mo) the regression of corrected weight or age on day of birth was highly significant (b = 0.18 ± 0.0397; $P < 0.005$) and ended to alter the relativity between the 3 yr dams and the other age groups. Multiplicative factors derived from least squares means without the regression of day of birth (Table 1) were 1.12 for 2 yr, 1.06 for 3 yr, 1.05 for 4 yr, 1.00 for 5 yr and older dams. When the regression was fitted the factor for the 3 yr dams was 1.08. This was attributable to the later date of birth of progeny from the 3 yr cows which conceived as 2 yr lactating cows; this is a group that often tends to conceive later in the joining period (Rudder et al. 1976). These correction factors are in reasonable agreement with the commonly used 1.15, 1.10, 1.05 and 1.00 for 2 yr, 3 yr, 4 yr and 5 yr and older dams (Anon.1978), and fall into the range reported by Barlow et al. (1974), and are in general agreement with those found by Seifert et al. (1974).

While the corrected weights at ages older than 12 mo show a marked reduction in age-of-dam effects there is a residual effect up to and including 686 days in the 4 yr and younger, relative to the 5 yr and older age of dam groups. Inclusion of the regression of cow weight at weaning removes an increasing proportion of the difference as age increases and agrees with previous work (Seifert 1975). The difference between this work and that of Seifert (1975) and Bean and Seifert (1979) where age of dam effects were absorbed by 12 months and older ages, may be due to using heifers instead of steers. Alternatively, environmental and breeder selection differences between the two herds may account for the different results obtained.

Age-of-dam effects on post-weaning gain were significant at 6 mo to 23 mo and 6 mo to 29 mo ($P < 0.01$) but not at earlier periods (Table 1). This was attributable to generally higher gains in the steers from 2 yr to 3 yr dams. When day of birth was fitted as a covariate the age of dam effects were not significant indicating that variations in day of birth between age of dam groups accounted for a large proportion of the variation in gain. Steers born later in the season tended to gain faster than those born early (b = 0.15 to 0.30; $P < 0.005$).

The results confirm that age of dam effects decline with age after weaning but the rate of decline may be different for males and females, or in different herds maintained in different environments and selection policies. At 17 mo and older ages they are relatively small and it may be tolerable to disregard them when selecting animals on the basis of weight for age. However, in large herds it could be advantageous to group animals into those from 4 yr and younger dams and those from 5 yr and older dams.

These results indicate that computing final weight for age at 18 mo or older by adding post-weaning gain to age-corrected weaning weights (Anon.1978) may bias final weight for age of progeny from younger cows upwards.

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