THE REPRODUCTIVE AND MATERNAL PERFORMANCE OF
YOUNG HEREFORD AND FRIESIAN COWS

J.H.L. MORGAN*, L.J. CUMMINS* and G.R. SAUL*

Summary

The performance of young cows of Hereford and Friesian breeds was examined when grazed together in Western Victoria and inseminated to the same bulls.

Oestrus was detected in a greater proportion of Friesian than Hereford yearling heifers and of those inseminated a higher proportion of Friesian heifers calved. Relatively fewer of the calves born to young Friesian cows died at birth and those that survived obtained more milk and grew faster to weaning than those born to young Hereford cows. The results also suggest that the incidence of calving difficulty may be lower in young Friesian than in young Hereford cows. However, a lower proportion of Friesian than Hereford two year old cows suckling calves was detected in oestrus and of those inseminated a lower proportion of Friesian cows calved.

I. INTRODUCTION

Little information is available on the reproductive and maternal performance of young, single-suckled Hereford and Friesian cows under common conditions. It has been reported that while young Friesian cows provide a superior maternal environment, mainly more milk, their fertility may tend to be reduced under unfavourable feed conditions (Hight et al. 1971; Hight 1973; Willham 1972).

This paper reports some results on the reproductive and maternal performance of young Hereford and Friesian females grazed together in Western Victoria.

II. MATERIALS AND METHODS

In 1970, 177 Hereford and 158 Friesian heifers were purchased in several lots from private farms. In August and September 1970 and 1971, when aged 13-16 and 25-28 months, respectively, those detected in oestrus by sterilized bulls were inseminated, at random, with semen from Hereford, Friesian, Charolais and Brahman bulls. Thirty six Hereford and eleven Friesian cows were omitted for various reasons from the second mating.

The animals of the two breeds were grazed together. For convenience the herd was divided into two groups according to calving date. A fixed stocking rate was not feasible. Pasture conditions were generally good except for the autumn and winter of 1971 when the grazing area was restricted. During calving in May, June and July, the cows were inspected two or three times per day and new born calves weighed. Assistance was provided if calving was prolonged beyond three hours after the appearance of the placental membranes or if the calving was not progressing satisfactorily. Cows and calves were weighed direct from pasture each month and calves were weaned at an average age of 8.0 and 8.5 months in 1971 and 1972, respectively. Milk production was measured on three year old cows on three occasions in 1972 by weighing the calves before and after suckling following separation of cows and calves for approximately 17 hours.

The effects of dam breed, sex, sire breed, time of calving, parity and their interactions on birth weight, gestation length, milk production and age adjusted weaning weights were examined by a stepwise regression analysis.

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Differences in cows of each breed inseminated, calved, cows assisted at calving and calf mortality were examined by chi-square analysis. Cow breed differences in weight change from before calving to mating were analysed by 't' test.

Dam breed did not interact with bull breed in the aspects studied, hence, the data for all bull breeds were combined. The results presented are the mating, calving and weaning performance of Hereford and Friesian cows when mated as yearlings and as two year old females.

III. RESULTS

The Hereford and Friesian heifers were of similar average live weight at mating in 1970 and in 1971 (Figure 1) but Friesians that suckled calves lost more live weight than Herefords during and after calving in both years (P < 0.001).

Fig. 1. Pattern of liveweight change of young Hereford and Friesian dams. Only those cows that reared live calves to weaning have been included.

- - - Hereford and O-O Friesian dams which first conceived in 1970 at c.15 mths.
- - - Hereford and ▲-▲ Friesian dams which failed to conceive in 1970 and first conceived in 1971 at c.27 mths.

A greater proportion of Friesians than Herefords was detected in oestrus and inseminated as yearling heifers and the Friesians also had a higher conception rate (Table 1). In the following year, as two year old dams suckling calves, a lower proportion of Friesians than Herefords was detected in oestrus and the Friesians also had a lower conception rate than Herefords.

A high proportion of two year old heifers, of both breeds, was assisted at calving in 1971 while in 1972, Herefords calving for the first time at three years of age had to be assisted more often than Friesians. Of the calves which were stillborn or dead within three days of birth in 1971, significantly more were born to Herefords than Friesians and there was a similar trend in 1972. Also, more of the calves born to the Herefords than to those born to the Friesians died between three-days of age to weaning in 1971. Most of these latter deaths were associated with colibacillosis (white scours).
TABLE 1
Mating and calving performance of young Hereford (H) and Friesian (F) cows

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Yearling heifers 1970-71</th>
<th>Two year old females 1971-72</th>
<th>Three year old females 1972</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H</td>
<td>F</td>
<td>H</td>
</tr>
<tr>
<td>No. joined</td>
<td>177</td>
<td>158</td>
<td>74</td>
</tr>
<tr>
<td>% bred</td>
<td>70.1</td>
<td>92.4***</td>
<td>98.6</td>
</tr>
<tr>
<td>% calved</td>
<td>60.4</td>
<td>71.8*</td>
<td>75.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. calved</td>
<td>75</td>
<td>105</td>
<td>55</td>
</tr>
<tr>
<td>% assisted</td>
<td>25.3</td>
<td>16.2 ns</td>
<td>18.2</td>
</tr>
<tr>
<td>% deaths</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 3 days</td>
<td>22.5</td>
<td>6.9***</td>
<td>14.5</td>
</tr>
<tr>
<td>&gt; 3 days</td>
<td>16.4</td>
<td>1.1***</td>
<td>2.1</td>
</tr>
</tbody>
</table>

** = cows calved as a percentage of cows inseminated
† = calf deaths after 3 days as a percentage of calves alive at 3 days of age
ns = not significant; § = P < 0.1; * = P < 0.05; *** = P < 0.001.

Friesians gave birth to heavier calves than Herefords (Table 2) but there was no dam breed difference in gestation length, the overall means and standard deviations being 284 ± 9.9 days in 1971 and 285 ± 7.0 days in 1972. Estimates of milk production indicate that calves suckled by Friesians obtained substantially more milk than calves suckled by Herefords. Calves born to and suckled by Hereford and Friesian dams, respectively, grew at an average rate of 0.58 and 0.88 kg per day in 1971 and at 0.75 and 0.98 kg per day in 1972.

TABLE 2
Production values of calves born to and suckled by young Hereford and Friesian cows as calculated by regression

<table>
<thead>
<tr>
<th>Measurement</th>
<th>1971-72</th>
<th>100R²</th>
<th>1972-73</th>
<th>100R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth weight (kg)</td>
<td>29.1</td>
<td>33.7</td>
<td>42.0 (172)</td>
<td>33.2</td>
</tr>
<tr>
<td>Weaning weight (kg)</td>
<td>169.1</td>
<td>245.1</td>
<td>75.2 (141)</td>
<td>213.6</td>
</tr>
<tr>
<td>Milk production (kg/day)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.2</td>
</tr>
</tbody>
</table>

† Production values adjusted for effects of sex, sire breed, time of calving and parity; there was no significant interaction involving dam breed. Values in parenthesis are the number of observations included in each multiple regression analysis and 100R² gives the percentage of variation accounted for by each equation.

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The higher proportion of Friesian than Hereford yearling heifers detected in oestrus during mating and the higher proportion of Friesian than Hereford heifers calving following insemination indicates that the Friesians had advanced further towards sexual maturity than had the Herefords.

The lower incidence of stillbirths and of deaths between birth to three days of age in calves born to first calving Friesian cows, together with the tendency for a lower proportion of young Friesian cows to be assisted at calving suggests that the incidence of calving difficulty was lower in the young Friesian cows than in the young Hereford cows despite the higher birth weights of their calves. Even though the incidence of calving difficulty in Friesian cows themselves was not low in this and other experiments (Everitt and Jury 1972; Monteiro 1969), the apparent difference between the two breeds in this respect may be important. The incidence of calving difficulty and calf mortality in first calving two year old heifers may have been increased by their low live weights and seasonal conditions but our results nevertheless highlight an important source of loss to the beef industry.

The fertility of the two year old Friesian cows was reduced more than that of the two year old Hereford cows when suckling their first calves under unfavourable feed conditions. It is suggested that this may have been associated with the higher milk production and greater weight loss of the young Friesian cows. Lactational anoestrus is believed to be influenced by breed and plane of nutrition (Baker 1969) and is recognized as a particular problem in lightweight cows suckling their first calf.

The higher weaning weight of the calves born to and suckled by the young Friesian cows compared with that of calves born to and suckled by Hereford cows is likely to be a consequence of their higher birth weights and their higher milk consumption.

In both breeds, the animals studied were derived from several different herds. The differences in the results, therefore, are likely to be representative of breed rather than herd differences.

V. ACKNOWLEDGMENTS

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VI. REFERENCES