THE EFFECT OF POST-LAMBING INTERVAL ON FERTILISATION IN LACTATING EWES TREATED WITH PROGESTAGEN IMPREGNATED SPONGES AND GONADOTROPHIN

S.T. DAVE* and I.C. FLETCHER†

Summary

Two flocks of lactating ewes (94 Border Leicester x Merino, 60 Merino) in widely different locations were treated with progestagen impregnated sponges and gonadotrophin at intervals after lambing. Following treatment they were joined to entire harnessed rams. Occurrence of oestrus was recorded, eggs were recovered, and fertilisation rates were estimated.

For Border Leicester x Merino ewes joined in October in their normal anoestrous period at 5 and 8 weeks post partum, the percentages raddled by rams within seven days after sponge removal were 78 and 82. The percentages of ewes with fertilised eggs (of raddled ewes yielding eggs) were 27 and 70. In Merino ewes joined at 4 and 8 weeks post partum, in July, the percentages of raddled ewes were 97 and 93; and of ewes with fertilised eggs were 8 and 72. In both flocks all oestrous ewes ovulated.

The attempt to induce fertile oestrus within five weeks of lambing was clearly unsuccessful, and within eight weeks still unsatisfactory for commercial practice. These results were due mainly to poor fertilisation.

I. INTRODUCTION

Efficient production of lambs within intensive systems will necessitate greater reproductive performance in ewe flocks. One major factor affecting reproductive efficiency is frequency of lambing which is limited by the ability to conceive soon after parturition.

Attempts to induce fertile oestrus in lactating ewes by treatment with exogenous hormones have produced variable results (Hunter 1968). Some of this variation was associated with interval from parturition to treatment. For example very low conception rates have been reported following hormonal treatment at 2-3 weeks post partum (Pretorius 1967; Thimonier et al. 1968), yet treatment at six weeks (Pretorius 1969), 6-8 weeks (Wagner 1964), or 9-13 weeks (Dawe, Roberts and Killeen 1969; Roberts and Boyes 1970) has resulted in satisfactory levels of fertility.

Hunter (1968) also drew attention to the lack of data on the occurrence of ovulation following hormonal treatment of lactating ewes. He reported that the limited evidence indicated that ovulation did not necessarily occur even in oestrous ewes.

This paper reports a study of the effects of post-partum interval on the reproductive performance of lactating ewes treated with progestagen and gonadotrophin and provides data on the subsequent occurrence of oestrus, ovulation and fertilisation.

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II. MATERIALS AND METHODS

Mature Border Leicester x Merino ewes at Leeton, New South Wales, and mature strongwool Merino ewes at Turretfield, South Australia, were treated with progestagen impregnated intravaginal sponges and Pregnant Mare Serum Gonadotrophin (PMSG) at various intervals after lambing. At Leeton, 45 ewes were treated at three weeks and 49 at six weeks, with both treatments commencing on September 21. At Turretfield, 30 ewes were treated at two weeks and 30 at six weeks, commencing on June 29.

Sponges containing 30 mg progestagen were inserted for 14 days and PMSG was administered at sponge removal (Border Leicester x Merino) or 24 hours later (Merinos). Sponges were prepared by one of us (I.C.F.) and contained 30 mg of Cronolone™. At sponge removal, treatment groups were run together and joined with 10-15 per cent of harnessed Dorset Horn (Leeton) or Merino (Turretfield) rams. Semen from all rams showed good semen density and motility when examined prior to joining.

Raddled ewes were recorded daily at 0900 hours and 1600 hours. Ewes were laparotomied at 48-72 hours after oestrus was detected. Border Leicester x Merino ewes which were not raddled were laparotomied one week after sponge removal, but only oestrous Merino ewes were laparotomied. Eggs were recovered and assessed for fertilisation on the basis of cleavage.

Differences between treatments within each location were examined by the Chi square test.

III. RESULTS AND DISCUSSION

There was no effect of post-partum interval on the incidence of oestrus or ovulation, or on ovulation rate (Table 1). Differences did occur between the two locations, however, and could have been associated with the fact that Border Leicester x Merino ewes were treated during their normal seasonal anoestrous period, and the Merinos during the normal breeding season.

Oestrus without ovulation was not a factor contributing to low fertility in this experiment, which is contrary to the suggestion of Hunter (1968) that the occurrence of oestrus without ovulation could be a problem following hormonal treatment of lactating ewes. Failure of both oestrus and ovulation, however, did occur in 14-16 per cent of the Border Leicester x Merino ewes and contributed to the poor response to treatment.

A number of Border Leicester x Merino ewes joined at five weeks had very light raddle marks, but were found to have ovulated. Three ewes were not raddled at all. This suggests that oestrus may have been of shorter duration or lower intensity than usual, which would agree with the findings of Van Niekerk and Mulder (1965) in regard to post-partum oestrus. If oestrous periods are indeed shorter, failure of insemination (Lindsay 1966; Killeen 1974) could be implicated in the problem of low fertility in lactating ewes.

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The effect of post-partum interval on the hormonal induction of fertile oestrus in two flocks of lactating ewes

Eggs were recovered from approximately 85 per cent of ewes which had been raddled. The percentages of ewes with fertilised eggs were very low in those groups joined at four weeks (Merino) and five weeks (Border Leicester x Merino), and, although they were much higher at eight weeks in both flocks they were still unsatisfactory (Table 1). These results agree with the low fertility encountered by Pretorius (1967) and Thimonier et al. (1968) in ewes joined at 3-6 weeks, but are less favourable than those of Wagner (1964) for ewes treated at 8-10 weeks.

The use of cell cleavage as the criterion of fertilisation may have led to a slight underestimation of fertilisation rates. Moore and Shelton (1964) recorded that some fertilised eggs were still not cleaved when recovered at 48-60 hours after the detection of oestrus. It is considered, however, that the small number of eggs likely to have been involved would have had little effect on the overall results.

As there was no control group with which to assess the fertility of rams, the poor fertilisation rates obtained may not be attributable solely to the ewes. It is possible that the fertility or libido of the rams may have been suboptimal. This is unlikely, however, as the satisfactory semen characteristics noted in all rams prior to joining and the knowledge that the fertility of post-partum matings has generally been low (Hunter 1968), suggest that the ewes were more likely to be at fault. It would seem therefore, that treatment with progestagen and

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**TABLE 1**

The effect of post-partum interval on the hormonal induction of fertile oestrus in two flocks of lactating ewes

<table>
<thead>
<tr>
<th>Post-partum interval to treatment (weeks)</th>
<th>No. of ewes</th>
<th>Per cent ewes raddled at induced oestrus†</th>
<th>Per cent ewes ovulated at induced oestrus†</th>
<th>No. of ovulations per ewe raddled at induced oestrus</th>
<th>Per cent raddled ewes yielding fertilised eggs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Border Leicester x Merino</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>45</td>
<td>78</td>
<td>84</td>
<td>1.60</td>
<td>27</td>
</tr>
<tr>
<td>6</td>
<td>49</td>
<td>84</td>
<td>86</td>
<td>1.75</td>
<td>70</td>
</tr>
<tr>
<td>P</td>
<td>NG</td>
<td>NG</td>
<td>NS</td>
<td>NS</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Merino</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>97</td>
<td>97†</td>
<td>2.72</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>30</td>
<td>93</td>
<td>93</td>
<td>2.61</td>
<td>72</td>
</tr>
<tr>
<td>P</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

† Of treated ewes
‡ Only oestrous Merinos were laparotomied
NS Not significant

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PMS within six weeks of lambing is unlikely to produce satisfactory levels of flock fertility.

These results indicate that, when oestrus is induced in lactating ewes by progestagen-PMSG treatment, matings at eight weeks post partum are likely to give much greater fertility than at 4-5 weeks. The level of fertility obtained at eight weeks, however, is still unlikely to be commercially acceptable.

IV. ACKNOWLEDGMENTS

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V. REFERENCES


