SUMMARY

One hundred and ninety-one beef females were administered Syncro-Mate B for estrus synchronization. At the time of implant removal, females were administered either a KaMar Heatmount device or Heat-Mark marking paint. Immediately before AI, 48 hours after implant removal, the status of the devices and paint were evaluated. The status of the KaMar Heatmount device was recorded as white, partial (both red and white), red, and missing. The status of the Heat-Mark marking paint was recorded as < 10% paint removed, 10-89% paint removed, and ≥ 90% paint removed. Overall, 43-44% of the females calved from the synchronized AI. Frequencies of females calving within categories differed (P < .01) for both methods of monitoring mounting activity. Fifty-four percent (52/97) and 30% (24/79) of the females classified in estrus (red KaMar Heatmount device or ≥ 90% Heat-Mark marking paint removed) or not in estrus (partially red or white devices or < 90% paint removed), respectively, calved. Females classified in estrus had a higher (P < .01) calving rate than females classified not in estrus; however, a valuable number of females not in estrus calved. Results from this study support the recommendation that females synchronized with Syncro-Mate B be bred at a predetermined time, about 48 hours, after norgestomet implant removal. Both methods of identifying females in estrus were similar (P > .10), but because 12.5% of the females (n=15) lost their KaMar Heatmount devices, the Heat-Mark marking paint may be more useful if estrus detection is needed to select females with optimal fertility.

INTRODUCTION

Estrus synchronization provides producers a means to utilize AI, improve reproductive management, produce uniform groups of calves, hasten ovarian cycles (Hixon et al., 1981), etc. Syncro-Mate B is an estrus synchronization procedure that provides a high degree of synchrony, thus allowing for a single timed insemination (Kesler and Favero, 1996). Anderson et al. (1982) reported similar pregnancy rates for heifers that exhibited estrus and heifers that did not exhibit estrus after Syncro-Mate B treatment, and mass insemination of females 48 to 52 hours after implant removal is recommended by the manufacturer (Darling, 1993).

Estrus detection is time intensive and subject to error particularly when large numbers of females are in estrus at a given time as occurs after estrus synchronization. Various estrus detection aids have been developed (Williamson et al., 1972; Williams et al., 1981). The objective of this study was to evaluate two estrus detection aids (KaMar Heatmount device and Heat-Mark marking paint) after synchronization with Syncro-Mate B and to evaluate calving rates of females that exhibited estrus and females that did not exhibit estrus after Syncro-Mate B treatment.
METHODS AND MATERIALS

One hundred and ninety-one beef females (71 heifers and 120 cows) from five herds were administered Syncro-Mate B for estrus synchronization. Syncro-Mate B consists of an intramuscular injection of norgestomet (3.0 mg) and estradiol valerate (5.0 mg) in a sesame oil and benzyl alcohol carrier and a hydron implant that contains 6.0 mg norgestomet. The implant was subcutaneously inserted into the dorsal surface of the ear. The injection and implant were administered at the same time. The norgestomet implants were removed nine days after insertion and all females were artificially inseminated about 48 hours after implant removal.

At implant removal, females at four of the herds were randomly assigned to receive either a KaMar Heatmount device or Heat-Mark marking paint. All females at one herd received KaMar Heatmount devices. The KaMar Heatmount device is a white patch that turns to a red color when adequate pressure is applied for sufficient time. Heat-mark marking paint is a stick of soft green paint that when applied to the tail head is removed when animals are mounted. The KaMar Heatmount devices were glued and Heat-mark marking paint was applied between (± 5 cm) the points of the hip bones on the midline. Heat-mark marking paint was applied in three 20 cm strokes along the midline. Immediately before AI the status of the devices and paint was evaluated and recorded. The status of the KaMar Heatmount devices was recorded as white, partial (both red and white), red, and missing. The status of the marking paint was recorded as < 10% paint removed, 10-89% paint removed, and ≥ 90% paint removed. Pregnancy rates were based on calving the following calving season (Domatob et al., 1997).

Data were analyzed by chi-square analysis (cell probabilities-Mendenhall, 1971; categorical data-Cochran and Cox, 1957). Results were similar for heifers and cows and among the locations and were pooled for analysis.

RESULTS AND DISCUSSION

Overall, 43-44% of the females calved to the synchronized AI and was similar to past research (Kesler and Favero, 1996). Frequencies of females calving within categories differed (P < .01) for both methods of monitoring mounting activity (Table 1). Fifty-four percent (52/97) and 30% (24/79) of the females classified as in estrus (red KaMar Heatmount device or ≥ 90% Heat-Mark Marking paint removed) or not in estrus (partially red or white devices or < 90% paint removed), respectively, calved. Females classified in estrus had a higher (P < .01) calving rate than females classified not in estrus; however, a valuable number of females not in estrus calved. A lower pregnancy rate for females not in estrus was expected because past research has demonstrated that Syncro-Mate B does not synchronize all treated females. A smaller percentage of metestrus females than diestrus females have responded to Syncro-Mate B treatment (Kesler et al., 1997).

More (P < .05) females with Heat-Mark marking paint were classified in estrus than females with KaMar Heatmount devices, but calving rates were similar (P > .10) for the two methods of detecting estrus. Therefore, there was a larger, although nonsignificant (P > .10), number of females with Heat-Mark marking paint classified in estrus that calved than females with KarMar Heatmount devices (Table 1). One negative attribute of the KaMar Heatmount devices was that 15 (12.5%) were missing 48 hours after administration. KaMar Heatmount devices may have been rubbed off
while females were being mounted because calving rates were similar to females with red KaMar Heatmount devices. If females that lost their KaMar Heatmount device were classified in estrus, the number females that were in estrus and the number of females that calved and were classified in estrus would be similar ($P > .10$) between the two groups.

There are situations in which producers may want to determine estrus. When expensive semen is used or when recipient females for embryo transfer are being selected, one may want to select females with optimal fertility. In most situations, the data in the present experiment would support the recommendation that females synchronized with Syncro-Mate B be bred at a predetermined time, about 48 hours, after norgestomet implant removal. Both methods of identifying estrus females were similar, but because 12.5% of the females lost their KaMar Heatmount devices in a 48 hour period, the Heat-Mark marking paint may be more useful if estrus detection is desired.

LITERATURE CITED


Table 1. Pregnancy rates and mounting activity of females with KaMar Heatmount Devices and Heat-Mark Marking Paint after synchronization with norgestomet and estradiol valerate

<table>
<thead>
<tr>
<th>Item</th>
<th>KaMar Heatmount Devices</th>
<th>Heat-Mark Marking Paint</th>
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<tbody>
<tr>
<td>Pregnancy Rate:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red or $\geq 90%$ Removed$^f$</td>
<td>30/54$^a$ (56%)</td>
<td>22/43$^a$ (51%)</td>
</tr>
<tr>
<td>Partial or 10-89% Removed$^g$</td>
<td>7/16$^b$ (44%)</td>
<td>5/15$^b$ (33%)</td>
</tr>
<tr>
<td>White or $&lt;10%$ Removed$^g$</td>
<td>8/35$^c$ (23%)</td>
<td>4/13$^c$ (31%)</td>
</tr>
<tr>
<td>Missing</td>
<td>7/15 (47%)</td>
<td>----</td>
</tr>
<tr>
<td>Combined</td>
<td>52/120 (43%)</td>
<td>31/71 (44%)</td>
</tr>
</tbody>
</table>

| Mounting Activity:          |                         |                         |
| Red or $\geq 90\%$ Removed, Total (%) | 54/120$^d$ (45%)        | 43/71$^e$ (61%)        |
| Red or $\geq 90\%$ Removed & Pregnant | 30/52 (58%)            | 22/31 (71%)            |

$^a,b,c$ Values with different superscripts within the same column indicate that the frequencies within categories differed ($P < .01$) from chance.

$^d,e$ Values within the same row with different superscripts differ ($P < .05$).

$^f,g$ Overall pregnancy rate (both mounting activity monitors combined) for females with red monitors or $\geq 90\%$ paint removed and females with partially red or white monitors or $<89\%$ paint removed was 54% (52/97) and 30% (24/79), respectively ($P < .01$).