EFFICACY OF ESTROTECT HEAT DETECTION PATCHES ON HOLSTEIN DAIRY HEIFERS HOUSED IN CONFINEMENT

Sarah Trombello and Roger D. Shanks

TAKE HOME MESSAGES

- For a 75 day time period, the cost of utilizing scratch-off heat detection technology with the use of a spray adhesive was roughly $800 for 120 open heifers whereas the use of tail chalk cost was approximately $235 for the same time frame and herd size.

- The false positive rate and use of reproductive aids among the groups were similar and indicated that both methods were accurate methods of heat detection.

INTRODUCTION

The purpose of this research was to determine the accuracy of Estrotect Heat Detection Patches as an estrus detection tool and whether their use could result in a decreased use of reproductive aids such as CIDRs and Lutalyse when used on Holstein dairy heifers housed in confinement. This research was conducted at S&S AG Enterprises Custom Heifer Raising LLC. in Sturgeon Bay, WI from May 31, 2008 to August 13, 2008.

MATERIALS AND METHODS

The Holstein heifers in the trial were virgin heifers between 11 and 19 months of age, at least 48” tall, and weighing at least 800 lbs. Two groups of 120 Holstein dairy heifers were chosen and housed in mirror image pens facing the feed alley. Each pen had headlocks, freestalls, available water, access to TMR ration, open air ventilation and fans. Heifers were assigned to a group based on the availability of freestalls and headlocks and each source farm was represented in both the research and the control group. Heifers in the research group were equipped with an Estrotect Patch. The tailhead was brushed with a rubber comb and tack clothed to remove any tail paint, dirt, and loose hair. Estrotect Patches were warmed to approximately 37.2°C (99°F), until soft and malleable for application laterally, midway between the hip and tailhead. Depending on the height on the tailhead, the location of the patch moves up to one inch back from this point to ensure proper location to indicate mounting behavior. The control group received tail chalking with Paintstik orange chalk applied in a vertical line down the tailhead.

Both groups of heifers were heat checked daily for 15 minutes by an S&S AG staff member and for an average 20 minutes by one of four trained CRI representatives. The research group was inspected for scratching on the patches and missing patches. Heifers with missing patches or patches displaying the bright orange color were palpated by CRI to confirm heat or false positive, bred if in heat and received a new patch. The control group was chalked each day while being checked for heats. No or decreased amounts of tail chalk, red swollen vulvas, and increased vaginal secretions indicated a potential heat. Potential heats were evaluated, potentially palpated and bred by CRI.
The veterinarian performed a once weekly herd check to monitor the reproductive status of all heifers in the breeding program. Reproductive aids (CIDR’s and Lutalyse) were used as diagnosed by a veterinarian to induce cyclicity and estrus behavior within the herd. CIDR’s were used to induce normal cyclicity patterns in heifers showing no estrus behavior or irregular patterns of cyclicity. CIDR’s were administered on day zero with a shot of GnRH and inserted intravaginally for 7 days. On day 7, CIDR’s were removed and heifers were given a shot of Lutalyse. Lutalyse was administered in 5 CC doses to heifers in order to induce ovulation for breeding in both groups.

The two groups of heifers were ultrasounded by a veterinarian after 30 consecutive days post-breeding of no detected heats or breedings. Pregnant heifers entered a gestation group. If a patch indicated mounting behavior had taken place, the heifer was removed from the gestation group and re-checked by the veterinarian. Heifers that received tail paint were monitored by visual observation for mounting behavior and re-checked if repetitive mounting behavior was observed. All animals in gestation groups were rechecked by the veterinarian at 60 days carrying calf by ultrasound.

RESULTS

Estrotect Patch Application observations

From May 31, 2008 to June 22, 2008, the Estrotect Patches were applied without the use of an additional adhesive. The average retention rate of the patches for this 23 day period was 46%. An average of 2.7 heats were detected with a false positive rate of 25%.

In order to improve the retention rate, rate of detected heats, and to decrease the false positive rate, 3M Spray Adhesive was applied to the tailhead, allowed to dry for 15 seconds, and then the Estrotect Patch was warmed and applied.

Once this procedure was enacted from June 22, 2008 to August 13, 2008, the retention rate increased to 93%. The average number of heats detected increased by 0.78 heats to 3.48 average heats detected. The average number of false positives decreased to 19%. In summary, the use of 3M Spray Adhesive increased retention rate and subsequently increased the average number of heats detected while decreasing the rate of false positives.

Expenses

An average of 4.03 chalks were utilized each day to chalk the control group at an average cost of $3.14 per day assuming a cost of $0.78 per stick of chalk. The total cost for the control group from May 31, 2008 to August 13, 2008, approximately 75 days, was $235.50.

For the research group, each patch cost $2 plus $15 for the 3M Spray Adhesive. One can of the 3M Spray adhesive lasted on average 4 weeks.

The total number of patches utilized from May 31, 2008 to June 22, 2008 without the use of spray adhesive was 1,452 patches at a total cost of $2,904. The total number of patches utilized from May 31, 2008 to August 13, 2008 with the use of spray adhesive was 198 patches at a cost of $396 plus $30 for 2 cans of spray adhesive for a total cost of $426. The total cost for utilizing
patches over this 75 day time frame was approximately $3330, however most of the cost was incurred prior to strategy of using a spray adhesive.

Reproductive success
Upon completion of this study, the research group equipped with Estrotect Heat Detection Patches had 49% of heifers confirmed pregnant by a veterinarian whereas the control group had 38% of the heifers confirmed pregnant (Table 1). Results for services per conception and services per open heifers are also listed in Table 1.

Reproductive Aids
Although the use of reproductive aids among the research group was nearly half that of the control group, differences were not significant primarily because of the low use of aids in both groups (Table 1.).

Table 1. Reproductive success and aids

<table>
<thead>
<tr>
<th></th>
<th>Research</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number pregnant</td>
<td>59 of 120 or 49%</td>
<td>46 of 120 or 38%</td>
</tr>
<tr>
<td>Services per conception</td>
<td>1.59</td>
<td>1.17</td>
</tr>
<tr>
<td>Open heifer services</td>
<td>2.30</td>
<td>1.16</td>
</tr>
<tr>
<td>Lutalyse</td>
<td>6 of 120 or 5%</td>
<td>12 of 12 or 10%</td>
</tr>
<tr>
<td>CIDR</td>
<td>7 of 120 or 6%</td>
<td>9 of 120 or 8%</td>
</tr>
</tbody>
</table>

SUMMARY
In conclusion, Estrotect Heat Detection Patches and tail chalking had similar false positive rate, 19% for the patches with adhesive and 17% for talk chalking. On average, 3 heifers were bred per day in the Estrotect Research Group and 2.7 heifers were bred per day in the tail chalk control group. The average number of services per conception was higher among the research group at 1.5 services per conception compared to the control group of 1.2 services per conception. However, the research group had 59 confirmed pregnancies by the completion of the trial whereas the control group had only 46 confirmed pregnancies. Estrotect Heat Detection Patches was an effective heat detection tool and was comparable to tail chalking in terms of the use of reproductive aids and services per conception. Another beneficial application of the patch was the ease of training commercial farm staff and employees to more quickly and easily detect animals in heat when compared to the training required to train staff and employees to detect heats by tail chalk.