Serial use of Estrotect™ estrous detection patches as a reproductive management tool


Story in Brief

Estrous detection patches are routinely used as an aid for detection of estrus before artificial insemination (AI). This study was conducted to determine if Estrotect™ estrous detection patches also could be used as a basic reproductive management tool to identify cyclic animals before breeding, to distinguish between cows or heifers conceiving to AI versus the herd bull, and to determine seasonal pregnancy rate after bull removal. When worn for a four-week period, patches were 79% and 86% accurate in identifying cyclic and non-cyclic heifers respectively, prior to breeding, and over 95% accurate in identifying pregnant cows and heifers after insemination. Estrotect™ estrous detection patches were 76% and 87% accurate in identifying pregnant heifers and cows respectively, after the breeding season. The predictive accuracy of the patches is dependent on normal cyclicity of the monitored animals. Although estrous detection patches can give producers peace of mind regarding the reproductive status of their herd, palpation or ultrasound approximately 45 to 60 days after the end of the breeding season remains the preferred method for pregnancy determination.

Introduction

Reproductive management is the most important factor contributing to the economic success of beef producers (Trenkle and Willham, 1977). Unfortunately, many small family-owned operations underutilize practices such as reproductive tract scoring of heifers, pre-breeding evaluation of cows, estrous synchronization, artificial insemination (AI) and pregnancy detection (USDA NAHMS, 1994). Beef producers would be more likely to utilize such reproductive management practices if their application were more practical, inexpensive and easy to use. Basic reproductive management could be achieved by the serial use of estrous detection patches for: 1) identification of cyclic animals before the breeding season, 2) detection of estrus before insemination, 3) distinguishing between cows or heifers conceiving to AI versus the herd bull and, 4) determining the seasonal pregnancy rate after bull removal. Therefore, the objective of this study was to evaluate effectiveness of a simple, cost effective reproductive management tool, based on estrous detection patches.

Material and Methods

Angus based heifers (n = 81) and cows (n = 149) from the University of Arkansas Savoy Beef Research Station were used in this study. Thirty days before the start of the breeding season, transrectal ultrasonography was used to reproductive tract score (Pence et al., 1999) each heifer, as an indicator of reproductive cyclicity status. At the time of ultrasonography, each heifer received an Estrotect™ estrous detection patch (Estrotect™; Rockway Inc., Spring Valley, Wis.) to be worn for a 4-week period. Hair was clipped in the area where the patch was to be placed on the rump, sprayed with a multipurpose spray adhesive (3M Super 77 Spray Adhesive), and allowed 30 to 45 seconds for the adhesive to get “tacky”. Patches were then placed on the rump with the front edge of the patch in line with the hipbones.

For consistency, the same person individually evaluated patches weekly for 4 weeks. An estrous detection patch was considered activated when a minimum of 50% of the center portion of the patch was completely clean. Patches with minor wear due to scratching or environmental conditions were considered non-activated. Any estrous detection patches missing or torn loose were noted. After the 4-week evaluation period, accuracy of estrous detection patch data was compared to known cyclic status, as determined by ultrasonography.

Estrus of cows and heifers was synchronized using a modified 14-day progesterone protocol (Powell, et al., 2011). Briefly, all heifers and cows received an intravaginal progesterone controlled internal drug release (CIDR) insert on day 0. The CIDR was removed on day 14, followed by administration of gonadotropin releasing hormone within 24 h of CIDR removal, and prostaglandin F₂α (PGF) a week later. All heifers and cows received an Estrotect™ estrous detection patch at the time of PGF treatment and were monitored for onset of estrus every 2 h from 8:00 a.m. until 8:00 p.m., then at 12:00 and 4:00 a.m., over a 72-h period. Cows and heifers observed in estrus were inseminated with conventional semen approximately 12 h after detected estrus. Ten days after the last insemination, cows and heifers received another estrous detection patch and were turned out with bulls for a 45-day breeding season. Estrous detection patches were evaluated weekly for 4-weeks. Approximately 45 days after the last insemination, ultrasonography was used to determine AI pregnancy status.

Upon bull removal at the end of the breeding season, all cows and heifers received another estrous detection patch that was scored weekly for 4-weeks. Approximately 30 days after bull removal ultrasonography was used to determine seasonal pregnancy rate and confirm conception date, based on fetal crown to rump length. Estrous detection patch data were compared with actual pregnancy data, as determined by ultrasonography. Statistical analysis was performed using Chi-square analysis, comparing ultrasound data with estrous detection patch scores collected the 4th week of each evaluation period to determine the accuracy of predicting pre-breeding cycling status in heifers, and AI and seasonal pregnancy rates in heifers and cows.

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Results and Discussion

Reproductive management is the single most important factor contributing to the economic success of beef production, but is underutilized by many producers. The purpose of this study was to determine if estrous detection patches could be used to implement reproductive management practices in a manner that is practical, inexpensive and easy to use. Estrotect™ estrous detection patches were used to monitor heifers for cyclic fertility before the start of the breeding season, for detection of estrus before insemination, to differentiate between animals bred by AI versus clean-up bulls, and to determine seasonal pregnancy rates at a cost of about 6 dollars per head.

Heifers. Of the 81 heifers used in this study, reproductive tract scoring (ultrasonography) identified 53 heifers as cyclic and 28 heifers as non-cyclic prior to start of the breeding season. In comparison, 42 of 53 (79.3%) of the cyclic heifers were correctly identified based on activated estrous detection patches. Of the 28 non-cyclic heifers, 24 (85.7%) were correctly identified, based on non-activated patches. In an effort to keep the estrous detection patches on the heifers for at least 28 days, and to reduce the chance of incidental patch activation, the patches were placed further up on the rump of heifers as compared to the typical placement about mid way between the hips and tail head. Patch placement further up the back may have reduced the activation rate, especially on larger, cyclic heifers.

Estrotect™ estrous detection patches were used as an aid in estrous detection before AI. All heifers with fully activated patches were also observed in estrus. Forty-eight heifers were detected in estrus and artificially inseminated. Ultrasonography confirmed that 24 heifers were pregnant after insemination (Table 1). The estrous detection patches correctly identified 23 of 24 (95.8%) pregnant heifers. However, only 15 of 24 (62.5%) of the heifers identified as open after insemination were correctly identified by the estrous detection patches. Failure to detect more open heifers could have been due to detection patch placement as described above. Upon removal of bulls at the end of the breeding season, all heifers received another estrous detection patch to determine seasonal pregnancy rates based on those animals returning to estrus. Ultrasonography confirmed that 59 of 81 heifers were pregnant at the end of the breeding season. Three heifers were noted to have lost their estrous patches. In a comparison of estrous detection patches placed on heifers that were confirmed pregnant and the other 5 were confirmed open. Of the 19 cows that lost estrous detection patches, 14 were confirmed pregnant and the other 5 were confirmed open. Therefore, it cannot be assumed that cows that lose patches have been in estrus or had the patch torn lose by mounting activity. Cows or heifers that lose estrous detection patches are as likely to be pregnant as open. When patches are lost, they should be replaced. Following the recommended label instructions for patch application is sufficient when patches only need to stay on for a few days, such as after estrous synchronization and before insemination. However, patches are more likely to remain on cows for long periods of time (up to a month) when the hair is clipped, sprayed with adhesive and the front edge of the patch placed in line with the hipbones.

In conclusion, estrous detection patches are useful for determining the cyclic status of the herd before the breeding season, for identifying cows or heifers returning to estrus after AI, and for identifying pregnant cows after bull removal at the end of the breeding season. Accuracy is dependent on having the cows or heifers cycling normally. An inactivated patch after AI or after bull removal indicates the animal is pregnant. However, non-cyclic animals will also have inactivated patches, so the patches cannot differentiate between non-cyclic and pregnant animals. While estrous detection patches can give producers “peace of mind” that their cows are cycling, as well as provide a good estimation of calving date, either palpation or ultrasound approximately 45 to 60 days after the end of the breeding season is still the most reliable method for pregnancy determination in cattle.

Implications

Estrotect™ estrous detection patches can be used to monitor the cyclic status of the herd before breeding, to identify animals conceiving after artificial insemination, and to determine seasonal pregnancy rate. Predictive accuracy of estrous detection patches is dependent upon patch retention on cows or heifers over a four-week period and having the herd cycle normally.

Literature Cited


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