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Management Considerations to Control Estrus

University of Missouri animal scientist gives recommendations to improve fixed-time artificial insemination.

by Kasey Brown, associate editor

Fixed-time artificial insemination (FTAI) protocols work, but attention to detail for use in both heifers and cows is absolutely necessary for success, said David Patterson, professor of animal science at the University of Missouri. At the 2015 Applied Reproductive Strategies in Beef Cattle (ARSBC) symposium in Davis, Calif., this fall, he shared management considerations to improve the success rates of these protocols.

Using FTAI has increased producer profits

by helping more cows calve earlier in the calving season, Patterson said. He cited data from high-producing herds documenting that because of FTAI, 61% of calves were born by Day 21 in the calving season, 85% by Day 42, and 94% by Day 63.

Heifers that conceive earlier during their first breeding season stay in the herd longer and produce more pounds of beef over their lifetime, so it's important to set them up for success, Patterson noted. Management considerations include health, prebreeding evaluation, estrus synchronization, and sire selection, but he emphasized prebreeding evaluation the most. Target weight, reproductive tract scores (RTS) and pelvic measurements are some of the most unused tools that could contribute to reproductive success.

RTS range from 1 to 5, with 4 and 5

being the most mature reproductive tracts. Patterson recommended that an RTS be collected four to six weeks before breeding or two weeks before synchronization. Additionally, synchronization should not be done until at least 50% of heifers have an RTS of 4 or 5. Data from the Show-Me-Select Replacement™ Heifer Program indicate FTAI pregnancy rates dramatically improve with higher RTS, showing RTS 1 with 8% pregnancy rate, RTS 2 with 32%,

Fig. 1: Fixed-time AI protocols

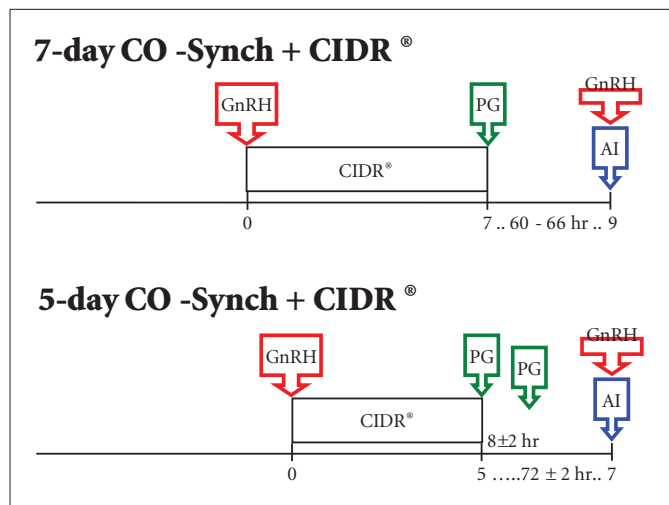


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► One of the advantages of using FTAI among cows is that it tends to jump-start cycling of cows that are anestrous, or have not yet expressed estrus after calving, said David Patterson, University of Missouri animal scientist.

Fig. 2: Cow protocol modified for split-time AI, Thomas et. al. 2014

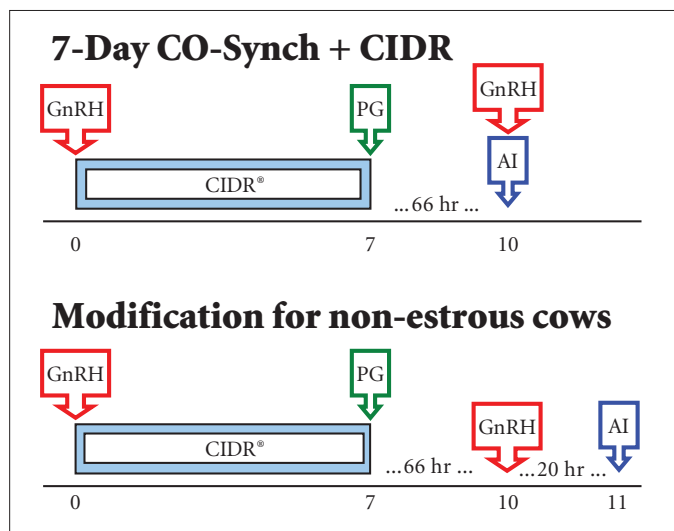
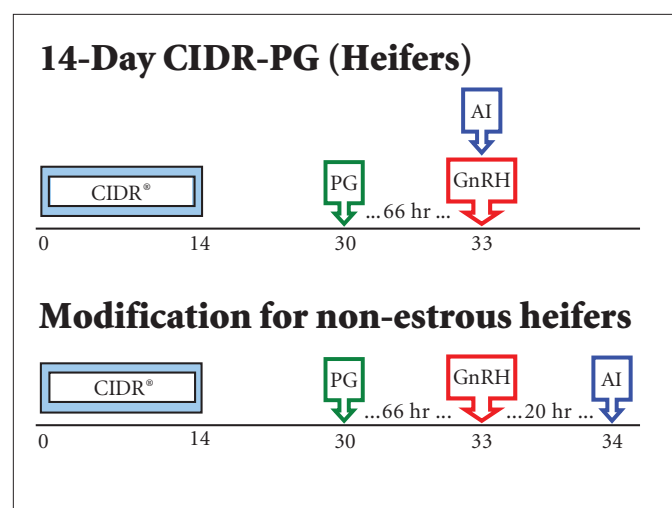


Fig. 3: Heifer protocol modified for split-time AI, Thomas et. al. 2014



RTS 3 with 46%, RTS 4 with 49%, and RTS 5 with 52%.

In choosing a protocol for FTAI in heifers, he suggested considering pretreatment estrous cyclicity status and reiterated performing an RTS four to six weeks before breeding. Protocol compliance — product administration and timing of insemination — determines success.

In cows, when considering a choice between the five-day and seven-day protocols (see Fig. 1), he shared that both protocols work effectively in postpartum beef cows with evidence of up to a 3% advantage to the five-day protocol. However, he warned that cattlemen should consider the increased labor and treatment costs associated with the five-day protocol.

One of the advantages of using FTAI among cows is that it tends to jump-start cycling of cows that are anestrous, or have not yet expressed estrus after calving. Patterson shared data revealing a 72% pregnancy rate to FTAI among cows that had expressed estrus and a 49% pregnancy rate among cows that had not expressed estrus.

This data led to a research project to delay AI after GnRH of females that do not express estrus prior to FTAI. Intended to optimize fertility by better aligning the window of sperm fertility to ovulation, this management strategy is called split-time AI. The researchers evaluated the technique using both conventional and sex-sorted sperm, as well as cows and heifers (see Figs. 2 and 3).

Split-time AI increased pregnancy rates by 34% among non-estrous cows inseminated with sex-sorted semen. When using conventional semen, Patterson explained that it worked better in heifers than in cows. Split-time AI increased pregnancy rates

by 15% among non-estrous heifers using conventional semen. There was no significant improvement in pregnancy rates with split-time AI using conventional semen in non-estrous cows.

In cows, the delayed administration of gonadotropin-releasing hormone (GnRH) increased total estrous response by 5%, but there was no improvement in pregnancy rate, he shared.

It is not necessary to administer GnRH to heifers or cows that express estrus prior to 66 hours, using the 14-day CIDR-PG in heifers and the seven-day CO-Synch + CIDR in cows. He added that GnRH could be administered concurrently with AI at 90

hours for heifers or cows that fail to express estrus prior to 66 hours. This results in a greater overall estrous response in cows.

Patterson spoke during Monday's ARSBC session focused on the basics of reproduction. For more information, visit the Newsroom at www.appliedreprostrategies.com to view his PowerPoint, read the proceedings or listen to the presentation.



Editor's Note: Comprehensive coverage of the ARSBC symposium is available online at www.appliedreprostrategies.com. Compiled by the Angus Journal editorial team, the site is made possible through sponsorship by the Beef Reproduction Task Force.