

Estrus Synchronization

Choose a protocol that is right for your herd, and plan for success.

by Helen Redli

Producers want to get the most from their investment in an artificial insemination (AI) program. Reproductive management by synchronization can improve the success of an AI program. Synchronization plus AI lets you gain genetics, tighten the calving distribution and increase your average calf age.

Synchronization eases heat detection because you know when the cows should come into heat and can focus your heat-detection efforts, which can result in higher pregnancy rates. It also shifts the peak of estrus to decrease the number of cows coming into heat at night, especially when darkness comes early.

Synchronizing heifers also helps with the problem of young cows having a harder time cycling back after first calving. A progestin can induce some noncycling cows to cycle, improving their chances of conceiving by AI.

There are a number of factors to consider when choosing which synchronization protocol is right for your operation. There are also tools available to help you plan and carry out your program. Sandy Johnson, associate professor and livestock specialist from Kansas State University (K-State) presented tips on synchronization protocols and planning at the Applied Reproductive Strategies in Beef Cattle conference Sept. 11, in Billings, Mont.

One consideration is how much heat detection you *want* to do and *have time* to do, Johnson says. Effective heat detection requires skill and is sometimes difficult. Inefficient and inaccurate heat detection results in fewer AI calves and more calves by the cleanup bulls. There are a number of products available to help with heat detection, such as HeatWatch®II and Estrotect,™ but you'll have to consider the additional cost when making your decisions.

The synchronization protocols recommended by the Beef Reproductive Task Force include three groupings based on the level of heat detection required. The first group requires seven to eight days of heat detection, the second combines three days of heat detection followed by cleanup timed-AI, and the third is fixed-time AI with no required heat detection. Johnson points out that fixed-time AI for cows is now equal in success to five days of heat detection.

Johnson advised producers to consider the length of the protocol, and whether or not you have the time and resources to complete it before your planned breeding date. How many trips through the chute will be required? Do you have the time, facilities and help to run your animals through the chute multiple times? Stress can lower your synchronization and AI success rate. Are

your facilities set up to cause minimal stress to the cows as they come through, especially if the protocol you choose requires them to be worked several times?

Cost is another factor when choosing a protocol. Semen, treatments and heat detection products cost money, and don't forget the cost of hiring extra help. You'll want to factor those costs against what you save by using fewer cleanup bulls and against the increased value of the AI-sired calves. Make sure you're coming out ahead.

Cows vs. heifers

Johnson says that different factors come into play when choosing a protocol for cows vs. heifers.

Heifers. She explains that two key factors that affect when heifers reach puberty and begin to cycle are age and weight. She recommends heifers should be at least 60% of their projected mature body weight before they are inseminated. Johnson warns producers to not underestimate the projected weights, since average mature cow size has increased over time.

Estrus synchronization programs are more successful if at least half of the heifers have a reproductive tract score of 3 or greater at least 50-60 days prior to breeding. Prepubertal heifers can be induced to cycle by choosing

Beef cattle estrus synchronization protocols

Sandy Johnson, associate professor and livestock specialist from Kansas State University (K-State), gave an overview of several synchronization protocols during the Applied Reproductive Strategies in Beef Cattle conference Sept. 11, in Billings, Mont.

These protocols were developed by the Beef Cattle Leadership Team. Johnson outlined protocols for heifers and cows, and some that work for both. The protocols are divided into three groups: heat detection for seven to eight days, heat detection for three days + cleanup timed-artificial insemination (AI), and fixed-time AI with no heat detection.

Heat detection protocols

For each heat detection protocol, peak activity will be 48-72 hours after administration of prostaglandin $F_{2\alpha}$ (PG). Heifers and cows should be inseminated six to 12 hours after the first observed standing heat. Heat detection should be done for a minimum of three times per day, an hour each time, but five to six or more total hours per day is even better. The success of these protocols is dependent on good heat detection.

Heifers: One-Shot PG. Begin heat detection and AI. On Day 5 administer PG only to heifers not already inseminated. Continue heat detection and AI for seven days. This is a low-cost protocol and will work well for those new to AI. This protocol has a lesser degree of

synchrony and twice as long a period of heat detection as the other methods. Prepubertal heifers will not respond to the PG.

MGA-PG. Begin feeding melengestrol acetate (MGA) 33 days before planned breeding. Feed MGA for 14 days, then stop. Wait 19 days, then administer PG. Heat detect and AI for six days. This method is very effective in heifers if MGA is delivered accurately, but it requires more advanced planning than other methods.

CIDR®-PG. Insert CIDR seven days prior to planned breeding. On Day 7 remove CIDR and inject prostaglandin. Heat detect and AI for six days. This protocol is simpler than some others since it does not require a gonadotropin-releasing hormone (GnRH) injection at the beginning of treatment.

Cows: Select Synch + CIDR. Inject GnRH and insert CIDR seven days before planned breeding. On Day 7 remove CIDR and inject PG. Heat detect and AI for six days. This method is recommended when cows are likely to be anestrous and/or when you can't do heat detection before administering PG.

Select Synch. Inject GnRH six days before planned breeding. Heat detect and AI for one day. On Day 7 administer PG only to those cows not yet Aled and continue to heat detect and AI for six days. This protocol is not recommended for heifers because of inconsistent response to the GnRH.

a protocol that includes a progestin such as melengestrol acetate (MGA®) or a CIDR.® She suggests producers new to AI begin with replacement heifers, since they are probably the easiest to work with.

Cows. Age, body condition and the length of time since calving affect how cows respond to synchronization and AI. For the best response, a cow should be mature, body condition score (BCS) 5 or greater, and 50 days or more beyond calving before the AI date. If a high percentage of your cows are young, in poor condition or calved late, they might not have resumed cycling in time for the beginning of the breeding season.

Progesterone will sometimes cause these types of cows to resume cycling, improving your AI success rate. Johnson suggests considering a protocol that includes a progestin, such as a CIDR. [The Food and Drug Administration (FDA) does not approve MGA for use on cows.] However, if a cow's body condition is extremely poor or she has calved very close to the scheduled AI date, the success rate may not be high enough to make synchronization worthwhile.

Johnson says the success of any protocol is dependent on the proper administration and timing of treatments. The Iowa Beef Center (IBC), in cooperation with the Beef Reproductive Task Force, has developed a planning tool that can help you figure out and carry out the estrus synchronization protocol that is right for your operation. The tool aids in organization and communication and lessens confusion for producers engaged in AI programs.

The planner will help you compare and choose from 24 synchronization protocols

or a short list recommended by the Beef Cattle Reproduction Leadership Team. Those protocols include a new, preferred system for heifers that was approved by the task force last fall. It provides recommendations about which systems are preferable for cows and which are preferable for heifers, and suggests protocols with varying amounts of heat detection.

The planner can also help you project and compare costs among various protocols based on your input costs. It also gives suggestions about the appropriate use and correct application of products.

Once you have input your information and have chosen a protocol and breeding date(s), the planner will produce printable budgeted cost analysis, a daily activity list and barn calendars that clearly show what the protocol requires, when to administer the product, and in what quantity.

The Estrus Synchronization (Synch) Planner will help you to implement even the more complicated protocols. Producers can refer to the proper timing for injections, CIDR insertions, and beginning and ending dates for feeding MGA. You'll also be able to schedule labor and facilities more efficiently and reach a planned breeding date(s) with as many cows as possible.

To use the Synch 2006 version of the planner you will need to have Microsoft Excel, or another spreadsheet program capable of translating Microsoft Excel 97 or later.

A copy of the planner can be purchased for \$25, plus \$10 shipping and handling. You can learn more about the planner at www.iowabeefcenter.org/content/EstrusSynchPlannerBrochure.pdf, or you can contact the Iowa Beef Center at beefcenter@iastate.edu or call 515-294-2333.



► Tips on synchronization protocols and planning were presented at the Applied Reproductive Strategies in Beef Cattle conference in Billings, Mont.

Heat detection + cleanup timed-AI

For each of these protocols you will inseminate six hours to 12 hours after observed heat for three to four days. Seventy-two hours to 84 hours after PG, inject all nonresponders with GnRH and AI. These protocols require less time spent on heat detection, and early responders have a better chance of conceiving to AI.

Heifers: *MGA-PG + cleanup timed-AI.* Begin feeding MGA 33 days before planned breeding date. Feed MGA for 14 days, then stop. Wait 19 days, then administer PG. Heat detect and AI for 72-84 hours. At the end of heat detection inject all nonresponders with GnRH and AI.

Cows: *Select Synch + cleanup timed-AI.* Administer GnRH six days before planned breeding. Heat detect and AI for one day. On Day 7 administer PG to cows that have not been Aled. Heat detect and AI for 72-84 hours. On Day 10 administer GnRH to all nonresponders and AI.

Cows and heifers: *Select Synch + CIDR + cleanup timed-AI.* Inject GnRH and insert CIDR seven days prior to planned breeding. After seven days, remove CIDR and inject PG. Heat detect and AI for 72-84 hours. Inject all nonresponders with GnRH and AI.

Fixed-time protocols

Fixed-time protocols have the benefit of no heat detection, and protocols for cows have resulted in comparable pregnancy rates to

protocols including heat detection. However, Johnson says, "we're not quite there yet with heifers."

Heifers: *CO-Synch + CIDR.* Inject GnRH and insert CIDR nine days before planned breeding. Remove CIDR after seven days and inject PG. After 52-56 hours, inject GnRH and AI all heifers. This protocol has the benefit of no heat detection and no reliance on accurate MGA consumption.

MGA-PG. Begin feeding MGA 36 days before planned breeding date. Feed MGA for 14 days, then stop. Wait 19 days, then administer PG. Administer GnRH and AI all heifers after 70-74 hours. No heat detection is required, but pregnancy rates are lower than with the CO-Synch + CIDR protocol.

CIDR Select. Insert CIDR 33 days before planned AI date. Remove CIDR after 14 days. Inject GnRH nine days after CIDR removal. On Day 30 inject PG. Inject GnRH and AI all heifers after 70-74 hours. No heat detection is required, and this protocol is promising, but more data is needed to compare it to CO-Synch + CIDR.

Cows: *CO-Synch + CIDR.* Inject GnRH and insert CIDR 10 days before planned breeding. Remove CIDR after seven days and inject with PG. After 60-66 hours, inject GnRH and AI all cows.

This short list of protocols was developed on the basis of field data and research. The Beef Cattle Leadership Team suggests other protocols should not be considered except on the advice of someone with extensive estrus synchronization experience.