**BEEF COW PROTOCOLS - 2018**

**HEAT DETECTION**

**Select Synch**

- GnRH 0
- PG 6
- Treatment day 13

Heat detect & AI

**Select Synch + CIDR®**

- GnRH 0
- PG 7
- CIDR® 13

Heat detect & AI

**PG 6-day CIDR®**

Heat detect and AI days 0 to 3. Administer CIDR to non-responders and heat detect and AI days 9 to 12. Protocol may be used in heifers.

- PG 0
- GnRH 3
- CIDR® 9

Heat detect & AI

**HEAT DETECT & TIME AI (TAI)**

**Select Synch & TAI**

Heat detect and AI day 6 to 10 and TAI all non-responders 72 – 84 hr after PG with GnRH at TAI.

- GnRH 0
- PG 72 – 84 hr
- Treatment day 10

Heat detect & AI

**Select Synch + CIDR® & TAI**

Heat detect and AI day 7 to 10 and TAI all non-responders 72 – 84 hr after PG with GnRH at TAI.

- GnRH 0
- PG 72 – 84 hr
- CIDR® 10

Heat detect & AI

**PG 6-day CIDR® & TAI**

Heat detect & AI days 0 to 3. Administer CIDR to non-responders & heat detect and AI days 9 to 12. TAI non-responders 72 – 84 hr after CIDR removal with GnRH at AI. Protocol may be used in heifers.

- PG 0
- GnRH 3
- CIDR® 9

Heat detect & AI

**FIXED-TIME AI (TAI)* for Bos Indicus cows only**

**7-day CO-Synch + CIDR®**

Perform TAI at 60 to 66 hr after PG with GnRH at TAI.

- GnRH 0
- PG 60 – 66 hr
- CIDR® 10

**5-day CO-Synch + CIDR®**

Perform TAI at 72 ± 2 hr after CIDR removal with GnRH at TAI. Two injections of PG 8 ± 2 hr apart are required for this protocol.

- GnRH 0
- PG 72 ± 2 hr

- GnRH 5
- PG 8 ± 2 hr

- GnRH 8

**FIXED-TIME AI (TAI)* for Bos Indicus cows only**

**PG 5-day CO-Synch + CIDR®**

Perform TAI at 66 ± 2 hr after CIDR removal with GnRH at TAI. Two injections of PG 8 ± 2 hr apart are required for this protocol.

- GnRH 0
- PG 66 ± 2 hr
- CIDR® 8

- GnRH 5
- PG 8 ± 2 hr

- GnRH 8

* The time listed for “Fixed-time AI” should be considered as the approximate average time of insemination. This should be based on the number of cows to inseminate, labor, and facilities.

Approved 8-28-2017

Beef Reproduction Task Force
**Heat Detection**

**1 Shot PG**

1 treatment day

- Heat detect & AI

**7-day CIDR®-PG**

- CIDR®

1 treatment day

- Heat detect & AI

**MGA®-PG**

- MGA

14 treatment day

- Heat detect & AI

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**Heat Detect & Time AI (TAI)**

**Select Synch + CIDR® & TAI**

Heat detect and AI day 7 to 10 and TAI all non-responders 72 - 84 hr after PG with GnRH at TAI.

**MGA®-PG & TAI**

Heat detect and AI day 33 to 36 and TAI all non-responders 72 - 84 hrs after PG with GnRH at TAI.

**14-day CIDR®-PG & TAI**

Heat detect and AI day 30 to 33 and TAI all non-responders 72 hrs after PG with GnRH at TAI.

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**Fixed-time AI (TAI)**

**Short-term Protocols**

**7-day CO-Synch + CIDR®**

Perform TAI at 54 ± 2 hr after PG with GnRH at TAI.

**5-day CO-Synch + CIDR®**

Perform TAI at 60 ± 4 hr after CIDR removal with GnRH at TAI. Two injections of PG 8 ± 2 hr apart are required for this protocol.

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**Long-term Protocols**

**14-day CIDR®-PG**

Perform TAI at 66 ± 2 hr after PG with GnRH at TAI.

**MGA®-PG**

Perform TAI at 72 ± 2 hr after PG with GnRH at TAI.

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*The times listed for “Fixed-time AI” should be considered as the approximate average time of insemination. This should be based on the number of heifers to inseminate, labor, and facilities.*

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Approved 8-28-2017

Beef Reproduction Task Force

Cystorelin®, Factrol®, FertaQ®, OvaCyst®, GONABreed®,
estroPLAN®, Estrumate®, In-Synch®, Latafive®, Latafive® HighCon, ProstaMate®, SYNCHSURE™
TIPS FOR A SUCCESSFUL SYNCHRONIZATION PROGRAM

Sandy Johnson, John Jaeger and Jeff Stevenson
K-State Research & Extension

Do you know if your herd is a good candidate for synchronization of estrus and ovulation? Can you identify potential problems if AI pregnancy rates are less than expected in an existing program? The guidelines below are designed to address these issues.

Normal Reproductive Response

- Pregnancy rates (number pregnant / number exposed) after a 60-day breeding season should be 85 to 90% or better before considering the application of a synchronization and AI program. Lower fertility may indicate that some other aspect of management such as nutrition or health is less than optimal and would reduce the success of an AI program.

Calving Distribution and Breeding Season Duration

- The greater the proportion of cows calving in the first 21 days of the calving season, the better the response expected from a synchronization and AI program. In Figure 1, cows that calved 71 days or more before breeding are more likely to be cycling and become pregnant to AI.

- Although some synchronization protocols can induce estrus and ovulation in some non-cycling cows, cows that calved during the 30 days just before the start of the breeding season are less likely to respond.

- Using a synchronization protocol every year, gradually increases the proportion of cows that calve during the first 30 days of the calving season, and subsequently increases the pregnancy rates to AI in a parallel fashion. In Figure 2, the cumulative percentage calved at 3 weeks is 22% higher in year 2 than year 1.

- With longer breeding seasons (>70 days) and less than 60% of the herd calving in the first 42 days of the calving season, expect much lower AI pregnancy rates. Timed AI of the entire herd would not be recommended. To shorten a long calving season, use two synchronization periods 20-30 days apart to help move up late calving cows.
Cow Age

- Duration of postpartum anestrus averages 20 days longer for 2-year-olds than mature cows. Even in herds that calve replacement heifers ahead of cows, the proportion of 2-year-old cows cycling at the start of the breeding season was 9% less than mature cows (Figure 3).

Body Condition

- Body condition influences the duration of postpartum anestrus and thus the proportion of cows cycling at the start of the breeding season. Cows should be in a positive energy balance to resume normal estrous cycles. Over a range of body condition scores (BCS) of 4 to 5.5 (1=thin to 9=fat), the proportion of cows cycling increased 18% for each one body score unit increase in body condition (Figure 4). This response would likely level out for cows with BCS greater than 6.5. The cow’s ability to conceive early in the breeding season also increases over this range of BCS.

Mature Cows

- BCS ≥ 5 – Good candidates for synchronization and AI.
- BCS 4 to 4.5 – AI pregnancy rates will be less, risk of poor response may be reduced if plane of nutrition has been increasing 3 to 4 weeks before the onset of the breeding season. Timed AI is risky.
- BCS < 4 – Poor candidates for synchronization. Timed AI is not recommended.
First-Calf

- BCS ≥5.5 – Good candidates if calved 2 to 3 weeks ahead of mature cows.
- BCS 4.0 to 4.5 – Higher risk.
  - Response to induction of ovulation with GnRH is about half of that in mature cows at similar BCS (Figure 5).
  - Consider using multiple methods to induce anestrus cows to cycle (e.g., calf removal and a progestin).

![Figure 5. Proportion of non-cycling cows induced to ovulate by GnRH](image)

Figure 5. Proportion of non-cycling cows induced to ovulate by GnRH

<table>
<thead>
<tr>
<th>Body condition score at breeding</th>
<th>1st calf</th>
<th>All Mature</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0</td>
<td>10</td>
<td>24</td>
</tr>
<tr>
<td>4.5</td>
<td>17</td>
<td>44</td>
</tr>
<tr>
<td>5.0</td>
<td>36</td>
<td>45</td>
</tr>
<tr>
<td>5.5</td>
<td>50</td>
<td>53</td>
</tr>
</tbody>
</table>

Semen

- A thorough breeding soundness exam (BSE) should be performed on bulls before freezing semen, including assessment of concentration, motility and morphology of sperm. A complete semen analysis may not be done as a routine part of the semen freezing process by smaller independent collection operations. Semen should be processed at a CSS certified lab such as the Kansas Artificial Breeding Service Unit in Manhattan.

![Figure 6. Timed AI pregnancy rates by sire (average inseminations n=55).](image)

Figure 6. Timed AI pregnancy rates by sire (average inseminations n=55).

- Be aware that sire-to-sire variation in pregnancy rates exist for bulls even when they have passed a BSE (Figure 6).
- Keep accurate records to check individual sire conception rates. Bull studs consider at least 250 inseminations before evaluating fertility at this level. Suspected problems observed after fewer inseminations, however, warrant further examination.

- Ask semen salesperson to identify high fertility sires before making final genetic decisions, especially for timed breeding.

- Use a semen inventory system to minimize exposure of semen to elevated temperatures in a search process.
• Canes or canisters should not be exposed any longer than 8 seconds above the frostline in the neck of the tank. Have liquid nitrogen tank full at start of AI season to raise the frostline and minimize semen exposure to damaging temperatures during high use.

• If using an electronic thaw unit, test temperature before each season with a calibrated dial thermometer and replace card thermometers annually.

• Only thaw as much semen as you can inseminate in 10 to 15 minutes. Do not allow straws to touch during thawing.

• Use semen providers’ recommendations for thaw temperature and time. Use a timer, don’t guess.

• Keep thaw box, AI gun, scissors and all equipment clean. Straw cutters can be hard to clean. Do not use dirty straw cutters.

Technicians

• Track conception rates by technician so adjustments can be made if a problem arises. When inseminating large numbers of females during timed AI, ensure you have enough technicians to complete the job. If it is your first large group, be conservative in your estimate of how long your arm will last if you don’t palpate regularly.

• Alternate tasks to minimize fatigue. Inseminate 15 to 25 head then rotate jobs.

• Size of inseminator’s forearm, particularly for heifers, can be negatively related to ability to inseminate large numbers of heifers. The pressure of rectal sphincter on a large forearm enhances arm fatigue.

Selection of protocols

• Recommended protocols for synchronization of estrus and ovulation are described in publication MF2573. Diagrams of these protocols are found in major sire catalogs, and at www.beefrepro.info and www.KSUBeef.org. These group recommendations are based on extensive research and field trials. Ask for comparative data with large numbers of observations before being convinced to use a protocol not on these listings.

Administration of treatments

Injections

• Use appropriate sizes of syringes and needles, follow label directions and Beef Quality Assurance guidelines. Accuracy is the goal, not speed.

• If using a breeding box, make injections before they enter box if at all possible. Do not inject in the top butt. Make sure you have the proper equipment in sufficient supplies. If bovine leukemia or anaplasmoses are issues, change needles between each animal. At a minimum have 1 needle per 10-15 cows. Have a specific place to discard old needles. An old milk jug will work well.

Intravaginal Progesterone Insert (CIDR)

• Follow package directions. Cleanliness is important during insertion. Wear plastic gloves when handling.

• In confined housing, especially for use in heifers, you may wish to cut off the part of the CIDR tail, leaving about 2.5” exposed so pen mates do not play with the tail and pull it out early.

• Re-use of CIDR’s is not recommended.
MGA

- Uniform, consistent daily consumption is increased when adequate bunk space is available (18 to 24" for heifers and cows, respectively).
- Make sure all animals are up to the bunk or gathered before feeding.
- Feed MGA mixed with a small amount of grain (3 to 5 lbs) that can be consumed in a relatively short time yet still allow for proper dose consumption by each animal.
- When feeding MGA in a high volume total mixed ration, deliver half or less of the daily ration at first feeding with the entire MGA dose, then deliver the remaining ration later in the day. This feeding method increases the odds that those females with lower intakes will consume the entire daily dosage.
- Females grazing spring grass may lack interest in any supplement. To improve consumption, remove free-choice salt from the pasture before MGA feeding and include ½ oz of salt per head per day in the MGA supplement.

Timing

- Do not combine administration of synchronization drugs with routine vaccination, especially with modified live vaccines. Check with your veterinarian for appropriate timing and type of vaccine. Most vaccinations should be completed at least 30 days before initiating the synchronization program.

- Make sure to give the appropriate synchronization treatment on the appropriate day. Changes by even a day may seriously harm results. The Iowa Beef Center Estrus Synchronization Planner contains all the recommended protocols and allows you to print a calendar of treatment days for the system of your choice. See http://www.iowabeefcenter.org/estrussynch.html or use the mobile version found at www.estrussynch.com.

Heat Detection

During synchronized estrus

- Detection for 2 hours morning and evening and 1 hour at noon (intensive) identified 40% more cows in estrus than checking twice daily for 30 minutes (Figure 7).
- Many successful operations have someone watching cows during all daylight hours of the recommended synchronized observation period.
- During days of peak estrus, females that are identified in heat should be sorted off several times during the day. This sorting allows animals that are just coming into heat to be more easily identified, increases the chances of detecting heat in timid animals, and may prevent injury in aggressively mounting females.
• Attempting to watch cows in large pastures is nearly impossible. Gathering cattle into a smaller pasture, moving cattle into a corner of the pasture or large pen always facilitates better heat detection. Moving and sorting stimulates heat activity, especially when calves are sorted off of cows.

• Animals need legible, readable, clean ear tags or other forms of identification so they can be identified at a reasonable distance and accurately recorded for later sorting.

• Have at least one person observing heat per 100 head during peak hours. Heat detection in very large herds may be more effective if subdivided into smaller groups.

• A variety of heat detection aids are available and vary in cost, ease of use and effectiveness. Some make excellent sorting aids but still require twice-daily observation.

During naturally occurring estrus

• Detecting for 30 minutes, twice daily is considered a minimum. The frequency of mounting activity is considerably less for naturally occurring estrus than a synchronized estrus, increasing the need for diligent observation.

• Gomer animals, tail chalking, or heat detection patches may be useful aids, but their effectiveness depends on examining each animal twice daily for signs of standing activity.

Use of heat detection patches

Proven, rub-off heat detection patches can be used in several ways in an AI program. When more than 50% of the patch is rubbed off, the animal is considered to be in heat.

• Supplement to visual heat detection and aid in sorting.

• Monitor response to synchronization when inexperience, inadequate body condition, or nutritional status give cause for concern.

• Use to determine which females get higher cost semen in a fixed-time AI program. Pregnancy rates will be higher in females that have been in heat before insemination.

• Save on cost to give GnRH. In a fixed-time AI program, females with more than 50% of the patch rubbed off at fixed-time AI do not need GnRH at AI.

• Use in a split-time AI program where only females with more than 50% of the patch rubbed off at the time of normal fixed-time AI are inseminated (no GnRH needed) and the remaining group has AI delayed for 20-24 hrs. Give GnRH to females without activated patches at AI.

Timing of AI

• The highest conception rate to AI has been noted 4 to 12 hours after the onset of standing activity as detected by the Heat Watch® system (24 hour monitoring system). For producers using intense visual observation and thus having an accurate estimation of when standing estrus began, insemination by the AM/PM rule is a good guide.
• Unless heat detection occurs twice daily, an accurate estimate of the initiation of standing activity will not be achieved and insemination once daily may provide similar results to detecting estrus twice daily.

• If animals continue to exhibit standing estrus for long periods (12 to 14 hours) after the initial insemination, the conservative approach is to re-inseminate.

• Sexed sperm can degrade more quickly than non-sorted sperm. Use sexed semen on females known to be in heat and inseminate 6 to 12 hours later than with non-sorted.

Facilities
• Well-designed facilities in good repair minimize stress on animals and people to optimize results. If breeding on observed estrus, areas for easy sorting and holding animals are needed. Often cows bred on observed estrus are moved immediately after AI, which generally makes heat detection on the remaining group easier. If cows can be moved to an adjacent pasture, a creep gate may work to let calves sort themselves, saving considerable time and effort.

• Cows generally stand quietly in a breeding box without restraint of their heads. Have a plan for rainy weather. Semen handling and thawing should be done out of direct sunlight.

• As a synchronized group of cows begins to show signs of estrus, even the best fence may not deter neighboring bulls. If direct fence line contact with bulls cannot be avoided, a hotwire set back a reasonable distance from the permanent fence may prevent unplanned matings.

For first experience with synchronization
• Make sure animals are in adequate BCS
• Start simple with a smaller group (heifers or early calving cows).
• Consider synchronizing and using bulls' natural service the first year. A single injection of PG will provide some synchronization and often will not require additional bull power. Seek advice on best synchronization approach and bull management for your situation.
• Consult an expert when selecting a synchronization system.
• Trade help with an operation that has experience with AI and synchronization to learn how they do things and to have expertise on hand when it's your turn.

Characteristics of successful estrus-synchronization programs
• Good year-round nutrition program
• Cows are in a minimum BCS of 5 at calving time
• Total breeding season is 60 days or less
• Functional facilities for sorting, administration of treatments, and AI
• Skilled help
• Good record keeping
• Effective vaccination and health program
• Attention paid to details