# Tips for a Successful Synchronization Program

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*Do you know if your herd is a good candidate for synchronization of estrus? Can you identify potential problems if artificial insemination (AI) pregnancy rates are lower than expected in an existing program? These guidelines are designed to address these issues.*

### *Reproductive Response*

Pregnancy rates (number pregnant per number exposed) after a 60-day breeding season should be 85 to 90 percent before considering an intensive 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*

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 *(Figure 1)*.

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 unlikely to respond.

Using a synchronization protocol every year gradually increases the proportion of cows that calve in the first 30 days of the calving season, and subsequently increases the pregnancy rates to AI in a parallel fashion *(Figure 2, page 2)*.

With longer breeding seasons (more than 70 days) and less than 60 percent 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.

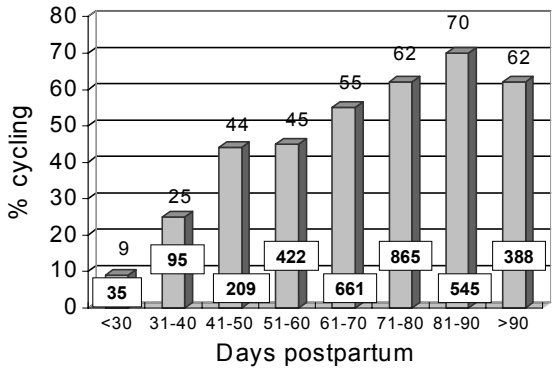
### *Cow Age*

Duration of postpartum anestrus averages 20 days longer for first-calf heifers than mature cows. Even in herds that calve heifers ahead of cows, the proportion of primiparous cows cycling at the start of the breeding season was 9 percent less than multiparous cows *(Figure 3, page 2)*.

### *Body Condition*

Body condition influences the length of postpartum anestrus and thus the proportion of cows cycling at the start of the breeding season. Cows need to 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 percent for each unit increase in body condition score *(Figure 4)*.

Figure 1. Relationship of days postpartum to proportion of cows cycling before estrous synchronization.



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 lower. The risk of poor response may be reduced if plane of nutrition has been increasing three to four weeks before the onset of the breeding season. Timed AI is not recommended.
- BCS < 4 – Poor candidates for synchronization. Timed AI is not recommended.

Figure 2. Calving distribution for the same herd over three calving seasons.

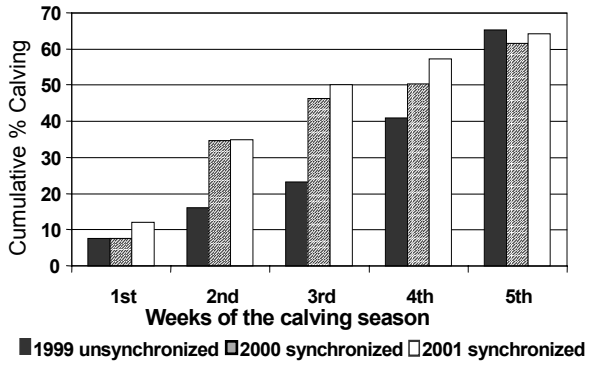



Figure 3. Effect of parity on proportion of cows cycling before estrus synchronization treatments.

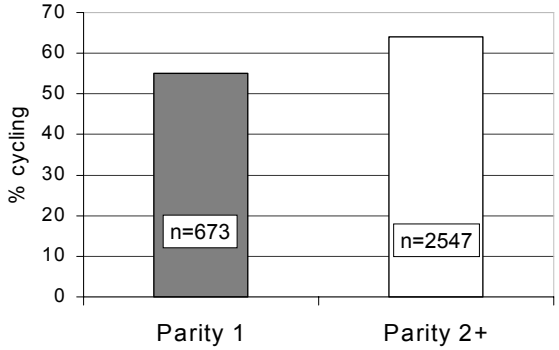
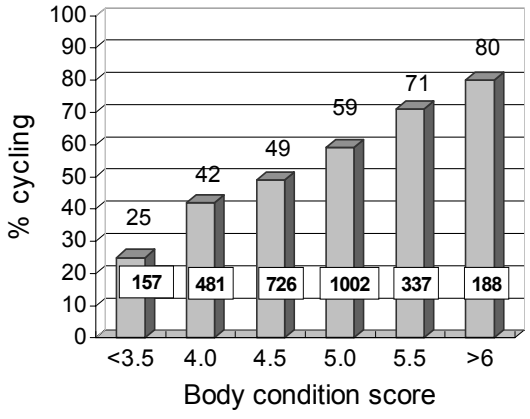



Figure 4. Effect of body condition score at breeding on proportion of cows cycling.




### *First-calf Heifers*

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

### *Semen*

A thorough breeding soundness exam (BSE) should be performed on bulls before freezing semen, including assessment of concentration, motility and morphology of sperm. This 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.

Be aware that considerable sire-to-sire variation in pregnancy rates exist for bulls even when they have passed a BSE.

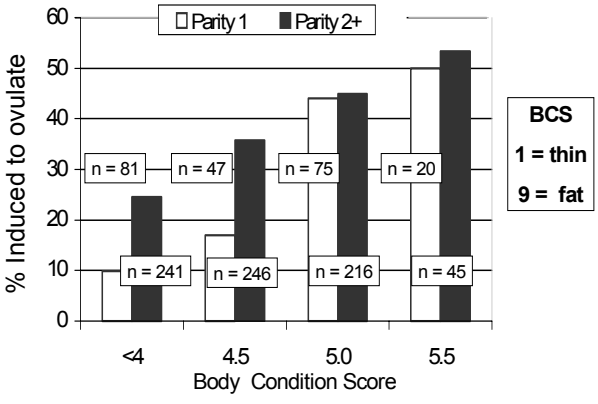
Keep accurate records to check individual sire conception rates. Bull studs consider at least 250 inseminations before evaluating fertility. However, suspected problems observed after fewer inseminations warrant further examination. Ask semen salesperson to identify high-fertility sires before making final genetic decisions, especially for timed breeding.

### *Technicians*

Variation in conception rates between technicians can range up to 20 percent or more. Evaluation of accurate records will allow problems to be recognized.

When inseminating large numbers of females during timed AI, ensure you have enough technicians to complete the job. Rotating jobs between loading guns and inseminating every 15 to 25 head is recommended to minimize effects of fatigue. Size of inseminator's forearm, particularly for heifers, can be negatively related to the

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



ability to inseminate large numbers. The pressure of the rectal sphincter on a large forearm speeds fatigue.

### *Treatments*

**Injections**

- Use appropriate sizes of syringes and needles, follow label directions and Beef Quality Assurance guidelines. Accuracy is the goal, not speed.
- Do not inject in the top butt. Make sure you have the proper equipment in sufficient supplies (at least one needle per 10 to 15 cows).
- Have a specific place to discard old needles. An old milk jug works well.

**CIDRs**

- Follow package directions. Cleanliness is important during insertion.
- In confined situations or for heifers, you may wish to shorten the tail of the CIDR, leaving 2.5 inches exposed, so pen mates do not play with the tail and remove the CIDR early
- Re-use of CIDRs is not recommended.

**MGA**

- Uniform, consistent daily consumption is increased when adequate bunk space is available (18 to 24 inches 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 cleaned up in a relatively short time, yet allows for everyone to get their share.
- 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, delivering the remaining ration later in the day. This increases the odds that those females with lower intakes will consume the entire daily dosage.
- Cows that are just getting new-growth grass in the spring at the time MGA feeding begins may ignore the MGA feed completely. To improve consumption, remove free-choice salt from the pasture before MGA feeding and include 0.5 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. Most vaccinations should be completed several weeks before the breeding season begins.

Make sure to give the appropriate treatment on the appropriate day. Changes by even a day may seriously harm results. The Iowa Beef Center Synchronization Planner will print out a calendar of treatment days for the system of your choice. You can find this tool at *www.iowabeefcenter.org/content/TOOLS.htm*.

If you intend to precisely identify AI versus natural service calves, wait at least 10 days after the synchronized period to turn out bulls and employ early pregnancy detection. Pregnancy detection at 30 to 50 days after AI will minimize errors in proper identification of AI pregnancies.

### *Heat Detection*

**Synchronized estrus**

Detection for two hours morning and evening, and one hour at noon identified 40 percent more cows in estrus than checking twice a day for 30 minutes (*Figure 6).*

Many successful operations have someone watching cows during all daylight hours of the recommended synchronized observation period.

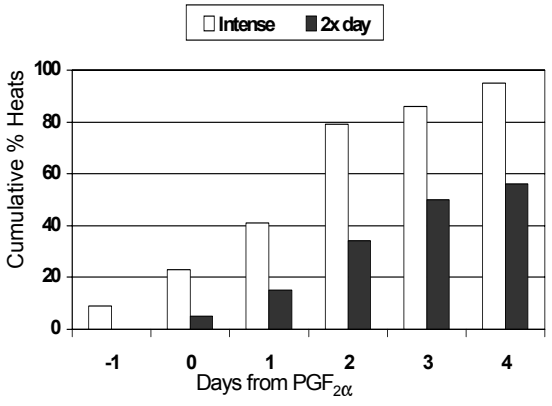
During days of peak estrus, females that are identified in heat should be sorted off several times during the day. This allows animals that are just coming into heat to be identified more easily and increases the chances of detecting heat in timid animals.

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.

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

Having at least one person observing heat per 100 head during peak hours is recommended. Heat detection in very large herds may be more effective if subdivided into groups of 200 or fewer. Heat detection aids may be useful, but are not as effective as visual observation.

Figure 6. Effect of time spent detecting heat.



**Naturally occurring estrus**

Detecting for 30 minutes, twice a day, 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-mount patches may be useful heat detection aids, but their effectiveness depends on examining each animal twice daily for signs of standing activity.

### *Timing of AI*

The highest conception rate to AI has been noted 4 to 12 hours after on the onset of standing activity as detected by the Heat Watch® system. Heat Watch® will detect onset an average of four hours before visual observation. So for producers using intense visual observation, and thus having an accurate estimation of when standing estrus began, insemination by the AM/PM rule should produce the highest conception rates.

If heat detection only occurs two times per day, an accurate estimate of the initiation of standing activity will not be achieved and insemination once a day may provide similar results to two times per day.

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

### *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 to make heat detection and sorting 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 heads caught. Make sure to have a plan for rainy weather. Semen handling and thawing should be done out of direct sunlight.

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

### *First-time Synchronization*

- Make sure animals are in adequate BCS.
- Start with a smaller group; heifers or early calving cows.
- Consider synchronizing and using bulls natural service the first year.
- 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 Estrous Synchronization Programs*

- Good year-round nutrition program
- Mature cows are in a minimum BCS of 5 at calving time and first-calf heifers a BCS of 6
- 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 to details

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