

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 AI pregnancy rates were lower than expected in an existing program? The guidelines below are designed to address these issues.

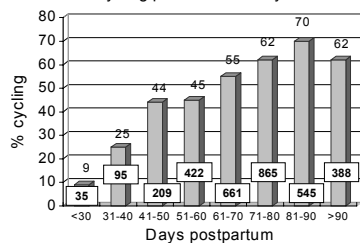
Normal Reproductive Response

- Pregnancy rates (number pregnant / number exposed) after a 60-day breeding season should be 85-90% 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 as well.

Calving Distribution \Leftarrow Calving season length \Leftarrow Breeding season length

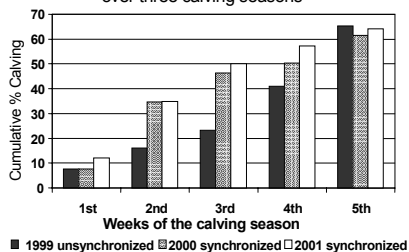
- The greater the proportion of cows calving in the first 21 days of the calving season, the better the response expected from a synchronization and AI program (Figure 1).

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



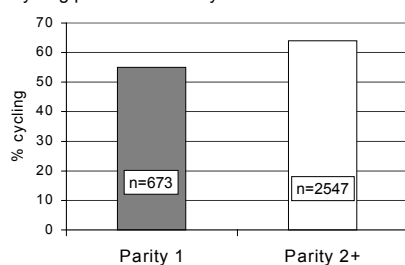
- Although some synchronization protocols can induce estrus and ovulation in some non-cycling cows, cows that calved during the 30 days just before the start of the breeding season are unlikely to respond.

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



- Using a synchronization protocol every year, gradually increases the proportion of cows that calve in the first 30 days of the calving season, subsequently increasing the pregnancy rates to AI in a parallel fashion (Figure 2).
- With longer breeding seasons (>70 days) and less than 60% of 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.

Figure 3. Effect of parity on proportion of cows cycling prior to estrous synchronization treatments

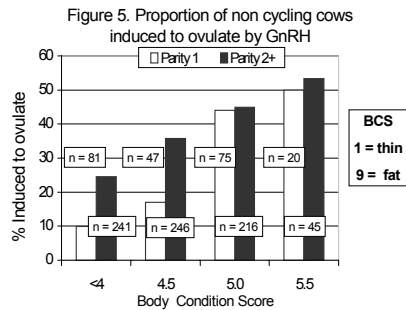
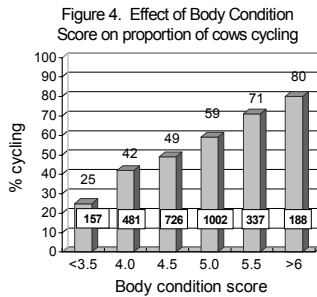


- Duration of postpartum anestrus averages 20 days longer for first-calf heifers than mature cows. Even in herds that calve heifers ahead of cows, the proportion of primiparous cows cycling at the start of the breeding season was 9% less than multiparous cows (Figure 3. Stevenson, 2001).

Cow Age

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), proportion of cows cycling increased 18% for each unit increase in body condition score (Figure 4. Stevenson, 2001). This response would likely level out for cows with BCS over 6.5. The cow's ability to conceive early in the breeding season also increases over this range of BCS.



- Consider using multiple methods to induce anestrus cows to cycle (e.g., calf removal and a progestin).

Mature Cows

- ❑ BCS 5 – Good candidates for synchronization and AI.
- ❑ BCS 4 – 4.5 – AI pregnancy rates will be lower, risk of poor response may be lessened if plane of nutrition has been increasing 3-4 weeks prior to the onset of the breeding season. Timed AI is not recommended.
- ❑ BCS < 4 – Poor candidates for synchronization. Timed AI is not recommended.

First Calf Heifers

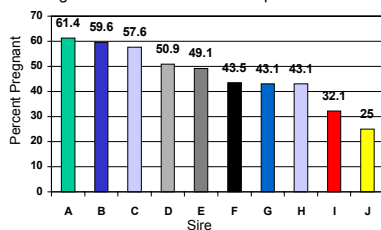
- ❑ BCS 5.5 – Good candidates if calved 3 weeks ahead of mature cows.
- ❑ BCS 4.0 – 4.5 – Higher risk.
 - Response to induction of ovulation with GnRH is about half of that in mature

cows at similar BCS (Figure 5. Stevenson, 2001).

Semen

- A thorough breeding soundness exam (BSE) should be performed on bulls prior to 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.

Figure 6. Timed AI pregnancy rates by sire for lactating cows synchronized with CIDR+EB+PGF. Average number of inseminations per sire was 55.



- Be aware that sire to sire variation in pregnancy rates exist for bulls even when they have passed a BSE (Figure 6. Yelich 2001).
 - Keep accurate records to check individual sire conception rates. Bull studs consider at least 250 inseminations before evaluating fertility

at this level. 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

- Experienced technicians generally produce more pregnancies than technicians in their first season.
- Variation in conception rates between experienced technicians can range up to 20% 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 15-25 head is recommended to minimize effects of fatigue.
 - Size of inseminator's forearm, particularly for heifers, can be negatively related to ability to inseminate large numbers. The pressure of the rectal sphincter on a large forearm speeds fatigue.

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.
- Injections given immediately after insemination may be best administered with smaller gauge needles and syringes than normally on hand (20 or 21 gauge needles, 3-cc syringes). Do not inject in the top butt. Make sure you have the proper equipment in sufficient supplies (at least 1 needle per 10-15 cows).
- Have a specific place to discard old needles. An old milk jug will work well.

CIDRs

- Follow package directions, cleanliness is important during insertion.
- In confined situations and/or for heifers, you may wish to cut all except 2.5" off the tail of the CIDR so pen mates do not play with the tail and remove the CIDR early.
- Do not re-use CIDR's.

MGA

- Uniform, consistent daily consumption is increased when adequate bunk space is available (18 – 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 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. Split feeding 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 completely the MGA feed. To improve consumption, remove free-choice salt from the pasture prior to 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. Most vaccinations should be completed several weeks in advance of the breeding season.
- 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. http://www.ibc.iastate.edu/content/synch_planner.htm



Date to Start Breeding: 4/24/03
 Expected Start of Calving Season: 1/30/04
(Assumes 281 day gestation)

10 = Co Synch System - Cow Program Only (GnRH + PGF2a + GnRH)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
4/13/03	4/14/03	4/15/03	4/16/03	4/17/03	4/18/03	4/19/03
		* 1 dose GnRH to all females				
4/20/03	4/21/03	4/22/03	4/23/03	4/24/03	4/25/03	4/26/03
		* 1 dose PGF2a to all females		* Timed AI w/ GnRH injection 48-54 hrs following PGF2a	* Turn in Bull Power	

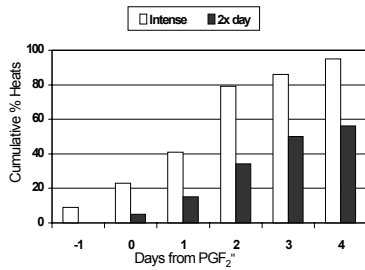
- If you intend to identify AI vs. natural service calves, wait at least 10 days after the synchronized period to turn out bulls and employ early pregnancy detection. Pregnancy detection at 30 to 50 days after AI will minimize errors in proper identification of AI pregnancies.

Heat Detection

During synchronized estrus

- Detection for 2 hours morning and evening and 1 hour at noon identified 40% more cows in estrus than checking twice daily for 30 minutes (Figure 7. Geary, 1999).

Figure 7. Effect of time spent detecting heat



- 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 more easily identified.
- 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.
- Recommend at least one person observing heat per hundred head during peak hours. Heat detection in very large herds may be more effective if subdivided into groups of 200 or less.
- Heat detection aids may be useful, but not as effective as a visual observation.

During naturally occurring estrus

- Detecting for 30 minutes, twice a day is considered a minimum.
- 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.

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.
- 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.

Facilities

- ❑ Well-designed facilities in good repair minimize stress on animals and people to optimize results.
- ❑ If breeding on heat, areas for easy sorting and holding animals are needed.
- ❑ Cows generally stand quietly in a breeding box without heads caught.
- ❑ Have a plan for rainy weather.
- ❑ Semen handling and thawing should be done out of direct sunlight.

Characteristics of successful estrous 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

References

Geary, T. 1999. Heat Detection Systems and Estrus Management. National Association of Animal Breeders Symposium: Improving Reproductive Performance, Proceedings, June 16, 1999, Roanoke, VA
Stevenson, J.S. 2001. Incidence of anestrus in suckled beef and milked dairy cattle. J. Anim. Sci. 79:(Suppl 1): 116
Yelich, J. 2001. A Vaginal insert (CIDR) to synchronize estrus and timed AI. In: M.J. Fields, R.S. Sands and J.V. Yelich (ed.) Factors Affecting Calf Crop: Biotechnology of Reproduction. p 87-100. CRC Press, Boca Raton, FL

NOTES
