The following guidelines are designed to give you the latest in estrus synchronization systems. From these guidelines, management decisions can be made on the system that best suits your herd’s reproductive goals. No cost analysis was done on the drugs involved. The features described are based on technical merit only. The synchronization protocols will be listed along with the features of each system.

To understand estrus synchronization, we need to review the hormonal control of reproduction. During a normal estrus cycle, gonadotropin releasing hormone (GnRH) is produced by the hypothalamus resulting in the release of follicle stimulating hormone (FSH) and luteinizing hormone (LH). These hormones act to cause the growth and development of follicles, which are structures on the ovary housing the developing eggs. Most of the follicles will regress, but one will become dominant and eventually ovulate. After ovulation, a corpus luteum (CL) is formed in place of the follicle. The CL is responsible for the production of progesterone, which is a hormone necessary to maintain pregnancy. If pregnancy does not occur, another hormone, prostaglandin, is released and acts to regress the CL, thereby initiating another cycle.
CIDR

CONTROLLED INTRAVAGINAL DRUG-RELEASING DEVICE
Approved for use on all dairy and beef animals.

Functional description:
- Artificial Corpus Luteum
- Natural progesterone
- Manually administered and easily removable
- Rapid increase in peripheral progesterone concentration following administration. Rapid decline in peripheral progesterone at removal.
- Similar actions as/alternative to:
  - MGA
  - Syncro-Mate-B®

FEATURES:
- Progesterone release through controlled diffusion within the insert.
- Plasma progesterone level rises to 4ug/ml in one hour.
- One use only for biosecurity control of venereal and blood borne diseases.
- PGF2 allows for regression of the CL, follicular maturation, estrus behavior, and ovulation.
- Progesterone induces anestrus animals to cycle.

EAZI-BREED CIDR® Insert + PGF2 S.S. Program

CIDR
Inject with PGF2
Remove CIDR
Inseminate on detected estrus

Day 0
Day 6
Day 7
Days 8 - 10

FAST BACKSM with CIDR

Use EAZI-BREED CIDR® to synchronize return to estrus
Approved for use on lactating animals.

Functional description:
- Remove EAZI-BREED CIDR® seven days after administration (21 days after first A.I. service.)
- Detect for heat during next four days.
- Breed/Inseminate on detected heat.

FEATURES:
- Designed to utilize EAZI-BREED CIDR® to synchronize those dairy cows that were inseminated but did not conceive and are returning to heat.
- Create a second synchronized heat and gain a better opportunity for heat detection, resulting in a higher pregnancy rate.

DO NOT USE LUTALYSE® (Dinoprost Tromethamine) STERILE SOLUTION WHEN USING THE FAST BACKSM BREEDING PROGRAM.

FAST BACKSM Program using EAZI-BREED CIDR® Insert

1st A.I.
Insert CIDR
Remove CIDR
Heat Detect 2nd A.I.

Day 0
Day 14 (± 1 day)
Day 21 (± 1 day)
Days 22-25
OVSYNCH/CO-SYNCH

**OVSYNCH**

Ovsynch uses PGF<sub>2α</sub> and GnRH to synchronize ovulation in lactating dairy cows. Ovsynch was the first synchronization protocol developed that allowed for a TAI resulting in conception rates similar to that of A.I. after a detected estrus.

- GnRH causes ovulation and initiation of a new follicular wave.
- Prostaglandin causes regression of the corpora lutea.
- The second GnRH synchronizes the time of ovulation of the dominant follicle of the follicular wave that began growing after the first GnRH injection.
- Cows don’t necessarily need to respond to the first GnRH injection to synchronize to the second GnRH injection.

**CO-SYNCH**

Co-Synch is a specific form of Ovsynch in which the timed A.I. occurs at the time of the second GnRH injection. The advantage of Co-synch is that one less handling is required for each cow compared to Ovsynch; the disadvantage of Co-synch is that conception rates may not be optimized compared to timed A.I. at 12-18 hrs. after Ovsynch.

- Pregnancy loss is less for the Co-Synch System as compared to the other systems.
- Breeding too late (+/- 32 hours post second GnRH injection) decreases conception rate.
- Due to reduced pregnancy loss with Co-Synch, the calving rate is comparable to the Ovsynch System.

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### OVSYNCH

- **GnRH**: 7 days
- **PGF<sub>2α</sub>**: 48 hrs.
- **GnRH & TAI**: 16 hrs.
- **Ovulate follicle**: Start a new follicular wave

#### Calendar

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<th>Sunday</th>
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<tr>
<td>Inject GnRH</td>
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<td>7</td>
<td>Inject PGF&lt;sub&gt;2α&lt;/sub&gt;</td>
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**Notes:**
- Observe estrus and breed accordingly.

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<td>Inject Prostaglandin</td>
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**Notes:**
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MGA

FEATuRES:
- Ease of administration (assuming daily feed bunk feedings are not additional management practices.)
- Cost effective (assuming very little additional feeding management practices.)
- High fertility.
- Works best on heifers.

Feed .5 mg/head/day of MGA (Melengestrol Acetate) for 14 days. MGA is generally fed in a grain carrier and either top dressed onto other feed or batch mixed with larger quantities. Inject a prostaglandin 31 days following the first MGA feeding.

CPG SYNCH

FEATURES:
- CIDRs provide progestins as a means to deal with variation in cyclic and anestrus females increasing their probability of a fertile ovulation.
- Early heats are prevented.

Insert CIDR and GnRH to start. Pull CIDR and inject PGF<sub>2α</sub> 7 days later. Observe for heat for up to 5 days after removal or TAI option below.

TAI: After CIDR removal, inject GnRH 2 days later. TAI is either at the time of the last GnRH injection (CO-Synch) or after 16 hours (Ovsynch).
Pre-Synch is a modification of Ovsynch in which two PGF$_{2a}$ injections 14 days apart are administered 14 days before initiation of the first GnRH injection of Ovsynch. Pre-Synch improves first service conception rate compared to Ovsynch and is a good strategy for programming cows to receive their first postpartum timed A.I.

**FEATURES:**

- This system requires a long duration and timing. It is good for dairy cows that will receive their first postpartum timed A.I.
- Not a good resynchronization tool because of the long duration.
- Studies have shown that conception rate was greater for cows receiving Pre-Synch vs. Ovsynch.
Heat-Synch is an alternative to Ovsynch/Pre-Synch in which 1.0 mg of estradiol cypionate (ECP) is administered 24 hours after the PGF$_{2\alpha}$ injection of Ovsynch to induce ovulation rather than administering GnRH 48 hours after PGF$_{2\alpha}$. Overall, Heat-Synch results in similar reproductive performance to Pre-Synch but may not be effective for synchronizing anovular cows.

**FEATURES:**

- ECP is administered 24 hours after the final Lutalyse$^\text{®}$ (PGF$_{2\alpha}$) injection instead of 48 hours for GnRH.
- Timed A.I. is 48 hours after the ECP injection.
- Not as effective as GnRH for inducing ovulation in anovular/anestrus cows.
- Lower cost compared with GnRH.
- Study recommendation is to breed any cows detected in standing estrus by 24 hours after the ECP injection to improve overall response to the protocol. Cows not detected in estrus at 24 hours then receive timed A.I. at 48 hours after ECP.
7/11 Synch
- Feed MGA for 7 days.
- Inject Lutalyse® (PGF₂α) on the last day of MGA feeding.
- Inject GnRH 4 days later.
- Inject Lutalyse® (PGF₂α) 7 days later.
- Observe for heat and breed.

PGPG Synch
- Inject Lutalyse® (PGF₂α) to start.
- Inject GnRH 4 days later.
- Inject Lutalyse® (PGF₂α) 8 days later.
- Inject GnRH 2 days later.
- TAI - heifers 4 hours, cows 8 hours later.

Rapid Resynch (RR)
- Pregnancy checks 28 - 30 days.
- Inject Lutalyse® (PGF₂α) in OPEN cows at pregnancy check time.
- Inject GnRH 2 days later.
- TAI - heifers 4 hours, cows 8 hours later.

Jumpstart Resynch
- GnRH injection 7 days before the day of pregnancy diagnosis.
- After pregnancy diagnosis, inject OPEN cows with PGF₂α.
- Inject GnRH 2 days later or ECP 1 day later.
- TAI either at the time of the last GnRH injection (Co-Synch) or after 16 hours (Ovsynch). In the case of ECP, breed on observed heat or 48 hours following ECP injection.
FEATURES

Feature Points of Estrus Synchronization

INSERT SYSTEM
- CIDR’s
  - Tighten estrus synchronization - heifers bred in a narrow window. A tremendous time saving.
  - Induces cyclicity in some anestrus animals.
  - Can bring prepubertal heifers into estrus.
  - Fertile heats regardless of the stage of their cycle.
  - More pregnancies.
  - Heats demonstrated:
    17% Controls
    37% Lutalyse® (PGF₂α)
    80% CIDR and Lutalyse® (PGF₂α)

SYNCH SYSTEMS
- Pre-Synch
  - Removes the effect of the day of the estrus cycle on which synchronization of ovulation was initiated.
  - Synchronization results were highest between days 5 to 12 of the cycle. The Pre-Synch protocol accomplishes this goal of synchronizing randomly cycling cows to be between days 5 to 12 for Ovsynch.
  - Significant increase in conception rates:
    29% Ovsynch
    43% Pre-Synch
  - Great for first postpartum TAI – 37 DIM, 51 DIM, 65 DIM, 72 DIM, 74 DIM, TAI 75 DIM.
  - Not a good resynchronization protocol because of the duration.

- Ovsynch
  - Ovulate - Regress CL - Ovulate - TAI
  - Synchronizes ovulation rather than estrus - No visual heat detection.
  - Similar results to breeding on observed heats.

- CO-Synch
  - Same regiment as Ovsynch but cows bred the same time as the second GnRH injection.
  - Conception rate slightly lower, but pregnancy losses significantly lower resulting in similar calving rates to the Ovsynch program.
  - Breeding late in synch cycles decreases conception rate (32 hours).

- Heat-Synch
  - ECP instead of GnRH stimulates GnRH release from the hypothalamus, which causes ovulation.
  - Results similar to Pre-Synch, but not as effective as GnRH for inducing ovulation in anovular/anestrus cows.
  - Cows receiving ECP usually exhibit estrus behavior as well as uterine tone.

Traditional Doses:
- Lutalyse® (PGF₂α) - 5 ml
- ECP - 0.5 ml
- GnRH - 2 ml
- MGA - 0.5 mg/animal/day
SUMMARY

- **CIDR** system provides consistent results and great for anestrus animals.
- **CPG Synch** works great on beef cows.
- **Ovsynch** system provides similar results with TAI as observed estrus.
- **Co-Synch** system provides one less handling than Ovsynch with slightly lower conception results, however, there is less pregnancy loss resulting in similar calving rates.
- **Pre-Synch** system provides great strategy for first postpartum TAI.
- **Heat-Synch** system provides similar performance to Pre-Synch but not effective on anovular cows.
- Prostaglandins are not effective in anestrus cows or during the first five days following estrus.
- Prostaglandins only regulate the lifespan of the CL but doesn’t synchronize follicular growth. Heats will show 1 to 7 days after injection, not at a specific time.
- **GnRH** causes ovulation and the initiation of a new follicular wave.
- **GnRH** treatment increased reproductive performance of cows undergoing slow uterine involution. Cows should be palpated 14 days after calving and classified as either normal or abnormal (slow cervical and uterine involution.) Treat abnormal cows with 100 ug GnRH.
- For timed A.I. (TAI), it is better to breed too early rather than too late.
- Once approved for lactating dairy cows, CIDR’s incorporated with the Ovsynch protocol increased fertility in non-cycling cows.
- Heat detection efficiency - For every 10% rise in A.I. service rate, conception rate rises 5%.
- Pregnancy rate is the number of eligible cows in a herd that conceive every 21 days.
THAWING PROCEDURE

All Accelerated Genetics semen should be thawed in warm water with careful attention given to the time a straw remains in the water and the temperature of the gun.

1. Shake a straw once or twice before placing it in a warm waterbath to help prevent the cotton plug from blowing out.

2. Thaw straws in a waterbath set at 95 degrees F. Automatic AC/DC thawing units, with thermometers, are available through Accelerated Genetics.

3. Place the frozen straw into the waterbath immediately after it has been removed from the liquid nitrogen unit. The plug end of the straw should go into the waterbath first and assure that the unit is totally submerged.

4. Straws are to be thawed in a 95 degree F waterbath for a minimum of 40 seconds. The straw can remain safely in the waterbath until you are in a protected area, then remove and dry thoroughly with a clean paper towel and place into a warm insemination gun. Cut the crimped end and cover with a sheath. Inseminate as soon as possible upon thawing.

PROPERLY THAW AS MANY STRAWS AS YOU CAN USE WITHIN 15 MINUTES.