If you’ve ever felt overwhelmed by the number of different protocols available for synchronizing estrus, I’m afraid I must report that it’s not likely to get any less confusing in the near future.

The annual meeting of the American Animal Science and Dairy Science associations was held the third week of July in Quebec City in conjunction with the Canadian Animal Science Association. At this meeting there were about 60 abstracts presented that discussed estrus synchronization in cattle. While this added information will not help you keep your sanity, it hopefully is adding information that will help us get more cows pregnant.

HEATSYNCH VERSUS OVSYNCH

There were a baker’s dozen abstracts related to the use of estradiol cypionate (ECP) in protocols for estrus synchronization. ECP is a commercially available form of the natural hormone, estrogen. Estrogen is the hormone that causes cows to show the many signs of heat when they come into estrus, and it creates a surge-type release of gonadotropin-releasing hormone (GnRH) from the brain. GnRH, in turn, causes the release of luteinizing hormone (LH), which results in ovulation of the mature follicle. GnRH is the hormone that is used to induce ovulation in the popular timed-A.I. protocol known as Ovsynch.

Heatsynch is a newly developed synchronization protocol that uses the less-expensive hormone ECP in place of the second GnRH injection of the Ovsynch protocol. However, because of differences in how these hormones work, there also are several important differences in protocol implementation.

To induce ovulation in cattle, we must first induce a surge of LH. The difference between using GnRH or ECP to induce an LH surge is equivalent to the difference between flying from Los Angeles to New York on a direct flight versus a connecting flight.

There are two main differences to consider:

1. The hormone injection intervals must also be altered when substituting ECP for GnRH. Both Ovsynch and Heatsynch call for a GnRH injection followed seven days later with an injection of PGF. Heatsynch then prescribes a one-milligram injection of ECP 24 hours later, while Ovsynch-treated cows receive GnRH 48 hours later (Figure 1).

2. Because of the delayed interval to the LH surge, the recommended interval to fixed-time A.I. is 72 hours after PGF (48 hours after ECP) for Heatsynch, compared with 56 to 64 hours after Ovsynch.
after PGF (eight to 16 hours after GnRH) for Ovsynch.

The biggest difference that producers immediately will notice between Heatsynch and Ovsynch is the percentage of cows that will show visual signs of estrus. ECP, as all estrogens, stimulates estrus expression following injection. Heatsynch cows detected in estrus should be bred according to the “a.m./p.m. rule” or at 72 hours after PGF, whichever comes first. In contrast, the second GnRH injection of Ovsynch induces the LH surge and ovulation almost immediately, shutting down estrogen production from the growing follicle and thus, very few cows will show heat even though they are ovulating.

The increased estrous activity from Heatsynch certainly makes producers and technicians feel better about breeding cows, but that does not necessarily mean it’s a better synchronization protocol. In one study, even though 40 percent of Heatsynch cows were detected in estrus compared to only 8 percent for Ovsynch, only 59 percent of Heatsynch cows ovulated following PGF injection compared to 83 percent for Ovsynch. Additionally, some producers have found this increased estrous activity of Heatsynch is not necessarily a positive if footing surfaces are less than optimal. This is particularly impor-

tant to remember during the icy winter months.

Although cows that show heat almost always will have better conception rates than those that don’t, all controlled studies directly comparing Heatsynch and Ovsynch basically have achieved identical overall pregnancy rates. The major advantages of Heatsynch compared to Ovsynch are reduced hormone costs, more efficient use of expensive semen in higher conception-rate cows that are allowed to express estrus, and somewhat easier scheduling and implementation, since all injections and A.I. are at 24-hour intervals.

Even though you’ll be a few hours later when using connecting flights, they will get you to your final destination as well as direct flights, provided all goes well. However, you don’t have to fly very often before you realize that connecting flights present an increased opportunity for “things to happen.” When things happen (weather delays, missed connections, lost baggage), you often find yourself wishing you had taken the more expensive direct flight.

The same might be said for Heatsynch and Ovsynch. Perhaps because of the more direct effects of GnRH on LH secretion, researchers in Florida found that Ovsynch is more effective in cystic cows, while Heatsynch appeared more effective in cows that were in heat a few days before start of treatment. The original Heatsynch publication observed interactions between synchronization treatment and both parity (Figure 2) and cycling status (Figure 3). The bottom line of the Heatsynch/Ovsynch debate is: “they both work.” So do several other systematic breeding programs. We need
that a problem exists in terms of realistic expectations. Although the rumors of 90 percent estrous-response rates are true, these are exceptions and not the averages. One of the studies\(^3\) that was used to demonstrate efficacy for the U.S. Food and Drug Administration (FDA) approval is presented in Table 1. Although pregnancy rates in excess of 50 percent are certain-ly possible, the data suggests that even when working with the improbable case of 100 percent cyclicity, pregnancy rates in excess of 50 percent are not guaranteed. However, no mat-ter how you measure it, the CIDR works better than LUTALYSE alone.

Numerous other studies have evaluated the use of the CIDR within the Ovsynch or Cosynch protocols (e.g., Insert CIDR and inject GnRH; remove CIDR and inject LUTALYSE seven days later). Most studies, including the one outlined in Figure 5, suggest improved reproductive performance in beef cows using this approach.

Stop “splitting hairs” about which protocol “works the best.” The important thing is to pick a program that fits your management.

The EAZI-BREED™ CIDR®

The EAZI-BREED CIDR Cattle Insert, or CIDR as it’s most commonly called, is the newest synchronization product available in the U.S. market. Developed and used extensively in New Zealand and marketed in the United States by Pharmacia Animal Health, the CIDR is a vaginal insert that delivers the natural hormone progesterone throughout the seven-day implant period. This progestin stimulation helps to induce cyclicity in anestrous beef cows and advances puberty in beef heifers.

Used with an injection of LUTALYSE\(^\circ\) on day six after insertion and implant removal on day seven, research has shown the CIDR to be an effective means of synchronizing estrus in virgin beef and dairy heifers, and in postpartum beef cows (Figure 4). The CIDR is not approved for use in lactating dairy cattle.

Animals may either be bred to detected estrus for three or four days after CIDR removal or fixed-time inseminated at 48 to 54 hours after implant removal. Although labeled for a day six LUTALYSE injection, practical implementation in most other countries usually involves moving the LUTALYSE to day seven, which eliminates one animal handling with no indications of reduced efficacy. While the CIDR is certainly an interesting and effective new tool for synchronizing estrus in cattle, it appears from the rumor mill that a problem exists in terms of realistic expectations. Although the rumors of 90 percent estrous-response rates are true, these are exceptions and not the averages. One of the studies\(^3\) that was used to demonstrate efficacy for the U.S. Food and Drug Administration (FDA) approval is presented in Table 1. Although pregnancy rates in excess of 50 percent are certain-ly possible, the data suggests that even when working with the improbable case of 100 percent cyclicity, pregnancy rates in excess of 50 percent are not guaranteed. However, no mat-ter how you measure it, the CIDR works better than LUTALYSE alone.

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Table 1. Effects of EAZI-BREED CIDR or PGF alone on reproductive performance of dairy heifers and cycling or non-cycling beef cows and heifers.

<table>
<thead>
<tr>
<th>Animal</th>
<th>Treatment</th>
<th>Estrous Response</th>
<th>Conception Rate</th>
<th>Pregnancy Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy heifers</td>
<td>PGF</td>
<td>79/138 (57)</td>
<td>51/78 (65)</td>
<td>100/281 (36)</td>
</tr>
<tr>
<td></td>
<td>CIDR</td>
<td>103/122 (84)</td>
<td>55/102 (54)</td>
<td>55/121 (45)</td>
</tr>
<tr>
<td>Cycling cows</td>
<td>PGF</td>
<td>63/129 (49)</td>
<td>44/63 (70)</td>
<td>44/129 (34)</td>
</tr>
<tr>
<td></td>
<td>CIDR</td>
<td>102/141 (72)</td>
<td>64/101 (63)</td>
<td>64/140 (46)</td>
</tr>
<tr>
<td>Cycling heifers</td>
<td>PGF</td>
<td>56/151 (37)</td>
<td>29/56 (52)</td>
<td>29/151 (19)</td>
</tr>
<tr>
<td></td>
<td>CIDR</td>
<td>93/116 (80)</td>
<td>57/93 (61)</td>
<td>57/116 (49)</td>
</tr>
<tr>
<td>Non-cycling cows</td>
<td>PGF</td>
<td>30/154 (19)</td>
<td>17/30 (57)</td>
<td>17/154 (11)</td>
</tr>
<tr>
<td></td>
<td>CIDR</td>
<td>64/142 (45)</td>
<td>36/63 (57)</td>
<td>36/141 (26)</td>
</tr>
<tr>
<td>Prepubertal heifers</td>
<td>PGF</td>
<td>11/101 (11)</td>
<td>6/11 (55)</td>
<td>6/101 (6)</td>
</tr>
<tr>
<td></td>
<td>CIDR</td>
<td>50/105 (48)</td>
<td>29/50 (58)</td>
<td>29/105 (28)</td>
</tr>
</tbody>
</table>

Total                  | PGF       | 239/673 (36)     | 147/238 (62)    | 147/672 (22)    |
|                       | CIDR      | 412/626 (66)     | 241/409 (59)    | 241/623 (39)    |

(Adapted from Lucy, et al. 2001)
What about reusing CIDRs?

There are lots of rumors floating around about reusing CIDRs. However, there are a few important risks to consider. Aside from legal issues, one of the major reasons one might select the CIDR over other synchronization protocols is the ability to induce cyclicity in anestrous cows and prepubertal heifers. To my knowledge, there are no studies available to document the efficacy of a used CIDR to induce cyclicity. In fact, the U.S. version was designed to have minimal residual progesterone upon removal, which would not suggest them to be effective for this use.

Last, but certainly not least, regardless of how well you try to clean them, the sanitation of a used CIDR is compromised and increases the risk of disease transmission within the herd. Just like putting a fast sports car in the hands of a teenager, a used CIDR is a wreck looking for a place to happen. Is it really worth the risk?

Presynch

In the last issue of Selections, we reprinted a figure from a Dairy Herd Management article that described various protocols for estrus synchronization. The description of Presynch in that table generated enough confusion and telephone calls that I’d like to clarify the information.

Presynch, as the name would imply, refers to what happens before synchronization. Specifically, Presynch is simply two PGF injections given at 14-day intervals to set up cows so they will be the right stage of the estrous cycle for optimum response when the synchronization protocol is initiated some number of days later. The actual synchronization protocol used could be any of these: Ovsynch, Heatsynch, Cosynch or Select Synch.

The original Presynch research suggested the synchronization protocol should be initiated 12 days after the second PGF injection. However, a recent study confirmed that a 14-day interval between Presynch and synchronization (which is easier to schedule) will also improve pregnancy rates to fixed-time A.I.

Final Thoughts

Although it certainly gets confusing these days trying to keep up with research related to synchronizing estrus in cattle, it’s no doubt these techniques are becoming extremely valuable tools to help beef and dairy producers generate pregnancies in a more timely fashion. How do you know if you need a synchronization program for your herd? Simple. Do you have cows reaching 100 days or more in milk before their first breeding? If yes, you should be using some form of synchronization. The more cows you have reaching this threshold, the more intensive a synchronization program you should consider adopting. If you need help deciding which system is most adaptable to your herd management, contact your veterinarian or your local Select Sires Reproductive Solutions’ specialist.

Literature Cited


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