Reducing the Cost of Using Ovsynch

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In 1995, a hormonal protocol was introduced that precisely synchronizes the timing of ovulation in lactating dairy cows (*Hoard's Dairyman*, August 25, 1995). Because this protocol synchronizes ovulation rather than estrus, it was called Ovsynch, and it is now commonly referred to by that name.

Ovsynch begins with an injection of GnRH that can be given to lactating dairy cows at any stage of the estrous cycle. Seven days later, an injection of prostaglandin $F_{2\alpha}$ ($PGF_{2\alpha}$) is given followed two days later by a second injection of GnRH. Cows then receive a timed AI between 8 and 24 hours after the second GnRH injection without regard to estrus behavior. Our previous research shows that conception rates to Ovsynch are similar to conception rates to AI after a detected estrus. In other words, if 40 percent of your cows are pregnant after an AI to a standing estrus, then you can expect similar results when using Ovsynch. Using Ovsynch as a reproductive management tool is beneficial because reliance on estrus detection for breeding cows can be minimized. Although Ovsynch works well for lactating cows, conception rates to Ovsynch in heifers are reduced compared with conception rates to AI after a detected estrus. Therefore, we do not recommend using Ovsynch for breeding dairy heifers.

Our research indicates that aggressive use of Ovsynch to initiate the first postpartum AI and manage the voluntary waiting period in a dairy operation results in improved reproductive efficiency compared with relying on visual estrus detection alone for AI. Despite the benefits of using Ovsynch as a reproductive management tool, we have found that many dairy producers only use Ovsynch to treat problem cows that fail to conceive after several AI services or are never detected in estrus.

Reducing the cost of Ovsynch

The current recommendations for Ovsynch call for using the standard doses of $PGF_{2\alpha}$ (5 ml or 25 mg) and GnRH (2 ml or 100 μg) recommended by the product manufacturers. The retail cost of GnRH contributes the majority of the hormone costs associated with using Ovsynch. Based on previous research, we felt that reducing the dose of $PGF_{2\alpha}$ would probably decrease the effectiveness of the Ovsynch protocol. However, our preliminary data suggested that one half the dose of GnRH might work equally as well as the full dose of GnRH in the Ovsynch protocol.

To determine if reducing the dose of GnRH would be an effective way to decrease the cost of using Ovsynch, we conducted a field trial on a 630-cow dairy herd located in south-central Wisconsin. Lactating dairy cows were randomly assigned so that 119 cows received the full-dose (100 μg) of GnRH for both injections, and 118 cows received a half-dose (50 μg) of GnRH for both injections. The amount of $PGF_{2\alpha}$ given to cows in both groups was the same (25 mg). All cows in the study were bred by timed AI at 12 to 18 hours after the second GnRH injection without regard to estrus behavior.

The first method we used to compare the effectiveness of the full-dose and half-dose Ovsynch protocols was to determine the percentage of cows in which ovulation was synchronized in response to the second GnRH injection. We call this the synchronization rate,

and we determined it by using ultrasound to detect the presence of a follicle on the day of the second GnRH injection and ovulation of that follicle at an ultrasound examination 48 hours later. There was no difference in synchronization rate between the full-dose and half-dose treatment groups (Table 1).

Ovsynch synchronized about 84% of the cows receiving the protocol in this study. The synchronization rate is less than 100% because cows respond differently based on the stage of the estrous cycle when Ovsynch is begun and on the number of follicular waves that occur during each cycle within a cow. So far, no practical method has been developed to improve the synchronization rate to Ovsynch. Fortunately, an 84% synchronization rate results in acceptable conception rates when using Ovsynch under most field conditions.

A second method we used to compare the effectiveness of the full-dose and half-dose Ovsynch protocols was to determine the conception rate at 28 and at 56 days after the timed-AI by using ultrasound to diagnose pregnancy. Again, there was no difference in conception rates at 28 or 56 days post AI between cows in the full-dose and half-dose Ovsynch groups (Table 1).

Although some pregnancy loss occurred from 28 to 56 days post AI in both treatment groups, the rate of loss did not differ between groups. Several research studies show that pregnancy loss is substantial during early pregnancy, and we feel the loss in this study reflects a rate of pregnancy loss that is normal for lactating dairy cows.

These results support that the dose of GnRH used in the Ovsynch protocol can be reduced by half without compromising the effectiveness of the protocol. It is important, however, that the full dose of $PGF_{2\alpha}$ is used in the half dose Ovsynch protocol. Next, let's look at the cost savings associated with using the half-dose Ovsynch protocol.

Table 1. Synchronization rate and conception rates in lactating dairy cows in response to timed-AI after Ovsynch using either 100 μg (full-dose) or 50 μg (half-dose) of GnRH per injection.

	Treatment group	
Item	**Full-dose of GnRH**	**Half-dose of GnRH**
Synchronization rate (synchronized / total)	84.9% (101/119)	83.1% (98/118)
Conception rate		
28 days post AI (pregnant / total)	41.0% (48/117)	41.1% (46/112)
56 days post AI (pregnant / total)	33.6% (38/113)	35.1% (39/111)

Per cow and per pregnancy costs are reduced

The cost savings associated with using the half dose Ovsynch protocol for your farm depends on the amount you pay for a dose of GnRH. Retail costs of GnRH vary widely and generally have been decreasing over the past several years. For our calculations, we used a cost of $6.40 per 100 μg GnRH and a cost of $3.30 for $PGF_{2\alpha}$. These cost estimates are based on two independent surveys of bovine practitioners; one conducted in Wisconsin, the other in Virginia. For the sake of comparison, we calculated hormone costs on a per cow and a per pregnancy basis.

Per pregnancy cost estimates were based on the observed conception rates at 56 days post AI for each treatment group in the study (Table 1). At 56 days post AI, there were 38 pregnant cows

out of 113 cows that received the full-dose Ovsynch protocol (33.6% conception rate) and 39 pregnant cows out of 111 cows that received the half-dose Ovsynch protocol (35.1% conception rate). Table 2 summarizes our cost estimates for this study. The total cost of hormones for the full dose Ovsynch protocol was $16.10 compared with only $9.70 for the half dose Ovsynch protocol. This represents a per cow savings of $6.40, which is equal to the retail cost of a full dose of GnRH. The total cost of hormones per pregnancy for the full dose Ovsynch protocol was $47.88 compared with only $27.61 for the half dose Ovsynch protocol. This represents a per cow savings of $20.27 per pregnancy. If reproduction for all of the 630 cows in this herd was managed using the half dose Ovsynch protocol, this farm would realize an annual savings of over $12,000 per year in hormone costs compared with using the full dose Ovsynch protocol.

These cost estimates only take into account the hormone costs of using the full dose or the half dose Ovsynch protocols. For the purposes of this study, no semen or labor costs were included because these costs were similar for both treatment groups. You can make similar calculations for your farm by using the amount you pay for hormones and the current conception rate for your herd. No matter what you currently pay for a dose of GnRH, you can save money by using the half dose Ovsynch protocol.

Table 2. Estimated hormone costs of synchronization of ovulation in lactating dairy cows using either 100 μg (full-dose) or 50 μg (half-dose) of GnRH per injection.

	Treatment group	
Item	**Full-dose of GnRH**	**Half-dose of GnRH**
Cost of GnRH		
Per cow	$12.80	$6.40
Per pregnancy	$38.06	$18.22
Cost of $PGF_{2\alpha}$		
Per cow	$3.30	$3.30
Per pregnancy	$9.81	$9.39
Total cost of hormones		
Per cow	$16.10	$9.70
Per pregnancy	$47.88	$27.61

Conclusion

If you currently use Ovsynch to manage reproduction in your herd, you can save money by switching to the half dose Ovsynch protocol without sacrificing the effectiveness of the protocol. One consideration when using the half dose Ovsynch protocol, is that it is important to ensure that each cow receives the entire volume of GnRH. To accomplish this, we recommend using a 20-gauge 1½-inch needle for administering the GnRH injections. Furthermore, we routinely administer half doses of GnRH using intramuscular injections into the gluteus maximus muscle. It is not necessary to administer GnRH intravenously for effective results. Finally, using the half dose Ovsynch protocol to manage reproduction is a cost-effective method for improving reproductive efficiency in your dairy operation.