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Dairy Lines

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Upcoming Events

All Kansas Holstein Show
April 26
Hutchinson, Kansas

Questions and Answers About Ovsynch

by Jeff Stevenson and John F. Smith

Ovsynch, the newest programmed breeding system, is being used by more and more dairy producers. Dairy reproductive specialists and veterinarians continue to get questions from dairy producers, consultants and other veterinarians about its success and failures. Following, are commonly posed questions and their answers.

What is Ovsynch?

The research team of Richard Pursley and Milo Wiltbank at the University of Wisconsin coined the term, "Ovsynch" (ovulation synchronization), after conducting numerous experiments in dairy cows. Their protocol was based on developing a follicle that would ovulate in response to gonadotropin-releasing hormone (GnRH) after $PGF_{2\alpha}$ is injected to regress the corpus luteum. This protocol was thoroughly described in an article in the April 1996 Dairy Lines. It requires two injections of GnRH; one 7 days before and another 2 days after an injection of prostaglandin (Figure 1).

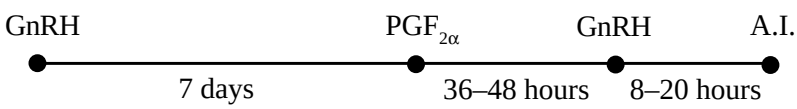
How does Ovsynch work?

The first GnRH injection alters follicular growth by causing the dominant follicle to ovulate within 24 to 32 hours after injection of GnRH. Following ovulation, the empty follicle becomes a new corpus luteum. Thus, estrus does not usually occur until after the prostaglandin injection regresses the natural corpus luteum and the secondary corpus luteum (formed from the follicle induced to ovulate by the first GnRH injection).

Within 2 days of the first GnRH injection, a new group of follicles begin to grow rapidly from which one follicle dominates, matures and is capable of ovulating within 2 days after the prostaglandin injection. The second GnRH injection given after prostaglandin then causes this new follicle to ovulate within 24 to 32 hours after the second GnRH injection to produce a viable egg that can be fertilized by sperm that are placed in the uterus by A.I.-breeding at one fixed time after the second GnRH injection.

Continued on page 2

Figure 1. **Ovsynch protocol (adapted from Pursley and Wiltbank, 1994).**



Heart of America Dairy Herd Improvement Summary (February)

	Quartiles				Your Herd
	1	2	3	4	
Guernsey					
Rolling Herd Average	16,216	13,577	11,831	1,090	
Summit Milk Yield 1st	56.7	48.6	42.8	37.8	
Summit Milk Yield 2nd	69.5	59.8	50.1	47.7	
Summit Milk Yield 3rd	71.2	61.5	56.3	47.0	
Summit Milk Yield Avg.	65.1	56.1	51.3	44.1	
Income/Feed Cost	1,575	1,152	846	872	
SCC 1st LACT	192	255	649	542	
SCC 2nd LACT	224	202	435	367	
SCC 3rd+ LACT	375	387	588	804	
SCC Average	260	286	570	605	
Days to 1st Service	84	89	89	93	
Days Open	146	148	153	137	
Projected Calving Interval	432	434	438	422	
Brown Swiss					
Rolling Herd Average	19,635	16,016	14,561	12,639	
Summit Milk Yield 1st	61.2	52.6	48.7	44.7	
Summit Milk Yield 2nd	78.9	67.6	62.4	55.0	
Summit Milk Yield 3rd	83.4	75.5	67.6	60.5	
Summit Milk Yield Avg.	74.2	66.4	60.7	54.7	
Income/Feed Cost	1,510	1,432	1,250	1,010	
SCC 1st LACT	329	181	310	380	
SCC 2nd LACT	322	327	359	353	
SCC 3rd+ LACT	468	447	521	495	
SCC Average	386	349	433	435	
Days to 1st Service	86	86	86	94	
Days Open	138	129	143	144	
Projected Calving Interval	426	417	431	432	
Holstein					
Rolling Herd Average	21,809	18,793	16,824	13,762	
Summit Milk Yield 1st	70.5	63.2	57.8	49.6	
Summit Milk Yield 2nd	89.8	79.6	72.0	60.1	
Summit Milk Yield 3rd	94.6	84.4	76.0	64.6	
Summit Milk Yield Avg.	84.1	75.4	69.0	59.1	
Income/Feed Cost	1,874	1,568	1,612	1,020	
SCC 1st LACT	257	285	342	403	
SCC 2nd LACT	270	309	367	496	
SCC 3rd+ LACT	426	475	561	711	
SCC Average	325	369	444	575	
Days to 1st Service	91	93	95	99	
Days Open	144	141	137	142	
Projected Calving Interval	424	421	417	422	
Jersey					
Rolling Herd Average	15,664	13,279	11,827	9,854	
Summit Milk Yield 1st	50.3	44.8	40.3	35.5	
Summit Milk Yield 2nd	62.2	54.2	49.2	41.9	
Summit Milk Yield 3rd	66.2	57.4	52.9	45.6	
Summit Milk Yield Avg.	59.6	52.5	48.4	41.9	
Income/Feed Cost	1,534	1,177	1,002	877	
SCC 1st LACT	265	253	224	474	
SCC 2nd LACT	254	247	308	440	
SCC 3rd+ LACT	435	473	489	628	
SCC Average	334	351	383	541	
Days to 1st Service	87	86	90	88	
Days Open	125	119	128	121	
Projected Calving Interval	403	398	407	400	

Ovsynch, continued from page 1

What hormone products can be used?

Three GnRH products can be used for the first or second GnRH injections. These include 100 micrograms of Cystorelin®, Factrel® or Fertagyl®. Although Cystorelin has been used in most studies, any of three GnRH products should work equally well. Either Lutalyse® (25 mg or 5 cc) or Estrumate® (2 cc or 0.5 mg) can be used for the prostglandin injection. These products are all prescription drugs available from your veterinarian.

How important are intervals between injections and A.I.-breeding?

The interval between the first GnRH and prostaglandin injections is usually 7 days. Some research tested 6 days with success in beef cattle, but most agree that 7 days is the best interval between injections for dairy cattle. Seven days allows sufficient time for the new corpus luteum that forms after the first GnRH injection to regress in response to the prostaglandin injection.

Based on additional studies, the accepted variation in the time between prostaglandin and the second GnRH injection is 36 to 48 hours and that between the second GnRH injection and A.I.-breeding is 8 to 24 hours (Figure 1). We like to use 48 hours between prostaglandin and the second GnRH (Monday at 4 pm to Wednesday at 4 pm) and 16 to 18 hours between the second GnRH injection and A.I.-breeding (Wednesday at 4 pm to Thursday at 8 to 10 am).

Why do some cows show heat during or after the Ovsynch protocol?

A small percentage of cows may show heat before prostaglandin because the first GnRH injection fails to ovulate the dominant follicle or the dominant follicle is not sufficiently mature to ovulate. Two periods of the estrous cycle when the first GnRH injection fails to ovulate a follicle are: 1) 2 to 3 days after estrus and 2) mid cycle between days 10 and 15 (day 0 = heat and day 1 = spontaneous ovulation). Cows showing heat just before or just after prostaglandin tend to be those that are between days 13 and 15 of the estrous cycle at the first GnRH injection or they may be late-cycling cows that are coming into their first heat cycle after calving.

One other time a few cows are observed in heat is 9 to 11 days after the Ovsynch protocol (timed insemination). In some cases these cows may be late cycling cows at the start of the protocol and may have “short-cycled” after the ovulation induced by the second GnRH injection. Alternatively, if the corpus luteum failed to regress after $PGF_{2\alpha}$ injection, then cows come into heat at odd times after the timed insemination.

Should I A.I.-breed after these observed heats?

When a cow shows heat at odd times, you should always A.I.-breed the cow based on detected estrus and discontinue the remaining protocol in that cow. If the cow is detected in heat up to 12 hours before the second GnRH injection, A.I.-breed her; otherwise give the second GnRH injection and A.I.-breed her after GnRH.

Why do cows NOT show heat with Ovsynch?

About one-third of the cows may show heat between prostaglandin and up to 12 hours after the second GnRH injection. The reason more cows do not show estrus is because the second GnRH injection releases lutenizing hormone (LH) from the pituitary gland. LH is the natural ovulation-inducing hormone that causes the large follicle to ovulate between 24 and 32 hours after GnRH. LH also terminates estrogen production by the follicle (which naturally causes the cow to show heat) and stimulates the development of the corpus luteum from the empty follicle after the egg is released at ovulation.

Does Ovsynch work in replacement heifers?

The research done in heifers shows that Ovsynch does not work very well. Generally, conception rates achieved are about 35 to 50%, 20 to 40 percentage points less than what can be achieved when A.I.-breeding after detected estrus or after prostaglandin alone. Ovsynch is NOT recommended for use in replacement heifers.

How does fertility after Ovsynch compare to A.I.-breeding after detected heat?

In most studies, the actual average conception after Ovsynch is quite similar to that achieved when A.I.-breeding after a detected estrus. There will always be some variation in conception achieved after A.I.-breeding at estrus. However, conception and pregnancy rates are usually more consistent after Ovsynch than after other programs that rely on heat detection alone.

Remember that the total proportion of cows pregnant of those synchronized (pregnancy rate) with Ovsynch usually will be greater when conception is similar to other methods that rely on heat detection alone.

Don't forget to attend the All Kansas Holstein Show, see Upcoming Events, page 1, for date and time

A Look Back in Time. . .

Kansas State University, 1940
Students participating in the "Ag Barnwarmer" festivities

*Hay Prices**

	Location	*Quality*	*Price ($/ton)*
Alfalfa	Southwestern Kansas	Premium	125–145
Alfalfa	Southwestern Kansas	Good	115–125
Alfalfa	South Central Kansas	Premium	110–120
Alfalfa	South Central Kansas	Good	90–100
Alfalfa	Southeastern Kansas	Premium	110–120
Alfalfa	Southeastern Kansas	Good	95–110
Alfalfa	Northwestern Kansas	Premium	110–120
Alfalfa	Northwestern Kansas	Good	80–90
Alfalfa	North Central Kansas	Premium	110–120
Alfalfa	North Central Kansas	Good	100–110

Source: USDA Weekly Hay Report, *Week ending March 7, 1997*

*Premium Hay RFV = 170–200
Good Hay RFV = 150–170

Feed Stuffs Prices

	Location	*Price ($/ton)*
SBM 48%	Kansas City	267.80–272.80
Cotton Seed Meal	Kansas City	193–199
Whole Cottonseed	Memphis	141–142
Meat and Bone Meal	Central United States	273–280
Blood Meal	Central United States	525
Corn Hominy	Kansas City	98–102
Corn Gluten Feed	Kansas City	105
Corn Gluten Meal 60%	Kansas City	335–340
Distillers Dried Grain	Central Illinois	146–150
Brewers Dried Grain	St. Louis	134–136
Wheat Middlings	Kansas City	97–101

Source: USDA Weekly Feed Stuffs Report, *Week ending March 7, 1997*

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