

# Kansas Agricultural Experiment Station Research Reports

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Volume 0  
Issue 1 *Cattleman's Day (1993-2014)*

Article 441

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1999

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### Recommended Citation

Lamb, G.C.; Cartmill, J.A.; Hensley, B.A.; Marple, T.J.; and Stevenson, Jeffrey S. (1999) "Fixed-time insemination of suckled beef cows. 2. Cosynch and progesterone," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 1. <https://doi.org/10.4148/2378-5977.1844>

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## Fixed-time insemination of suckled beef cows. 2. Cosynch and progesterone

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## **FIXED-TIME INSEMINATION OF SUCKLED BEEF COWS. 2. COSYNCH AND PROGESTERONE<sup>1</sup>**

*J.S. Stevenson, G.C. Lamb, J.A. Cartmill,  
B.A. Hensley, and T.J. Marple*

### **Summary**

The Cosynch protocol (GnRH 7 days before and again 48 h after PGF<sub>2</sub> with AI at the second GnRH injection) produced pregnancy rates in suckled beef cows that exceeded 50% without heat detection and with only three handlings of all cows. The addition of an intravaginal progesterone insert to the Cosynch protocol improved pregnancy rates in two of the three breeds of cows studied.

(Key Words: Cows, AI, Estrus-Ovulation Synchronization, GnRH, PGF<sub>2</sub>.)

### **Introduction**

Recent studies have identified the effectiveness of using GnRH + PGF<sub>2</sub> to synchronize estrus and ovulation in beef cattle (1998 Cattlemen's Day Report; pp 34-36). This protocol (known as Select Synch) requires an injection of GnRH 7 days before PGF<sub>2</sub>, which is given on the first day of the breeding season. Cows then are observed for estrus and inseminated. This protocol requires three separate handlings through the working chute (two for hormone injections and one for AI). The handling depends on when heat occurs. Pregnancy rates (number of pregnant cows/number of cows treated) have exceeded 50% using this protocol in other studies.

This protocol was refined further to allow for one fixed-time breeding, still with only three trips through the working chute. In this protocol, referred to as Cosynch, AI at

48 h after PGF<sub>2</sub> is combined with a second injection of GnRH to induce ovulation. Work in Colorado consistently produced good pregnancy rates (approximately 50%) with the Cosynch protocol, whereas our pregnancy rates in Kansas field trials using Cosynch were lower (see page 61). We believe part of the reason for greater success in the Colorado studies is better body condition of their cows. In addition, about 10% of the cows treated with GnRH + PGF<sub>2</sub> are observed in heat 1 or 2 days before the PGF<sub>2</sub> is administered or 6 to 7 days after the first GnRH injection. To prevent these cows from showing heat prematurely, we applied an intravaginal progesterone insert during the 7-day interim between injections.

Our objective was to determine if progesterone would enhance pregnancy rates in the Cosynch protocol compared to using Cosynch alone.

### **Experimental Procedures**

Purebred Simmental, Angus, and Hereford cows were assigned randomly to each of two treatments (Figure 1): 1) 92 cows received (i.m.) 100 µg of GnRH (Fertagyl®), followed in 7 days with 25 mg of PGF<sub>2</sub> (Lutalyse®), followed by a second injection of Fertagyl and one fixed time insemination at 48 h after Lutalyse (Cosynch); or 2) 95 cows were treated with the Cosynch protocol plus they received one intravaginal progesterone insert (IPI; CIDR-B, InterAg, Hamilton, NZ). The insert contained 1.9 g of progesterone and was in place during the 7

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<sup>1</sup>We acknowledge the assistance of student workers at the KSU Purebred Beef Unit.

days between the first injection of GnRH and the injection of PGF<sub>2</sub> (Cosynch + IPI).

Days postpartum at the fixed-time insemination averaged 73 days (31 to 110 days). Blood samples were collected 10 days before the first GnRH injection and prior to each hormonal injection, for later determination of progesterone by radioimmunoassay. Pregnancy was diagnosed by transrectal ultrasound 35 days after the fixed-time insemination.

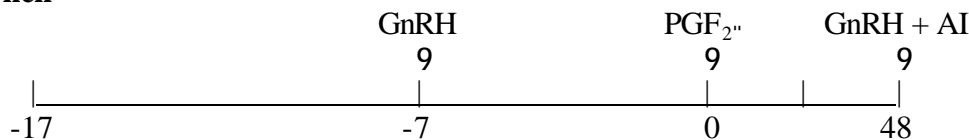
## Results and Discussion

Blood progesterone concentrations revealed that over 77% of these cows were cycling at the beginning of the 1998 breeding season. This rate is much greater than we have observed in previous yearly studies since 1994, where approximately 50% of the cows were cycling at the beginning of the breeding season. The rate of cyclicity in the Herefords (78%) was slightly (but not significantly) greater than that of the Angus (70%) and Simmental (66%) cows.

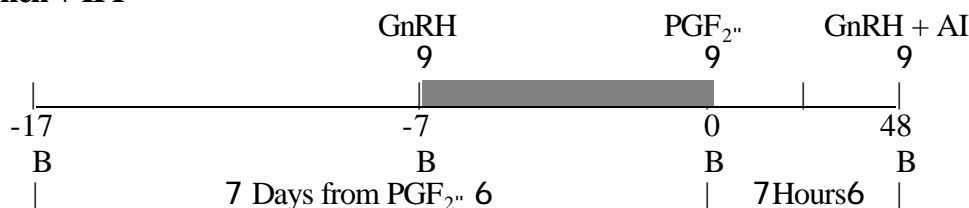
Because all cows that were treated also were inseminated (no heat detection), conception rates and pregnancy rates were synonymous. Summarized in Table 1 is the effect of treatments on pregnancy rates in the 2-year-old and mature cows. In both age groups, the progesterone insert tended ( $P=.12$ ) to increase pregnancy rates by 26%.

However, the increase in pregnancy rate was different among the three breeds (Table 2). In the Hereford and Simmental cows, the progesterone insert increased ( $P=.06$ ) pregnancy rates, whereas in the Angus cows, pregnancy rates were not different. Because the rates of cyclicity among breeds were nearly identical, there is no simple explanation for the differing pregnancy rates. Nevertheless, pregnancy rates exceeded 50% in both treatments without any heat detection, and cows were handled only three times to achieve a 100% AI submission rate. We plan further replication of this work in 1999.

### Cosynch



### Cosynch + IPI



B = Blood collection

Days of progesterone exposure via the IPI =

**Figure 1. Experimental Protocol Used to Synchronize Ovulation in Suckled Beef Cows.**

**Table 1. Pregnancy Rate of Suckled Beef Cows after Cosynch or Cosynch + Progesterone: Parity Effects**

Parity	Treatment <sup>1</sup>	
	Cosynch	Cosynch + IPI
	----- % (no.) -----	
1	43.5 (28)	67.0 (29)
2+	58.3 (64)	67.8 (66)
3	53.2 (92)	67.4 (95)

<sup>1</sup>Treatment effect (P = .12).

**Table 2. Pregnancy Rate of Suckled Beef Cows after Cosynch or Cosynch + Progesterone: Breed Effects**

Breed	Treatment <sup>1</sup>	
	Cosynch	Cosynch + IPI
	----- % (no.) -----	
Angus	65.1 (51)	58.5 (53)
Hereford	44.8 (23)	75.4 (24)
Simmental	49.7 (18)	68.4 (18)

<sup>1</sup>Treatment × breed interaction (P = .06).