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RESEARCH REPORT:
**EVALUATION OF THE EFFICACY OF A COMMERCIAL GnRH IN INDUCING
OVULATION IN CATTLE**

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Introduction

Although GnRH has been used since it became available in the 1970's as a treatment for follicular cysts (1), it has been widely used recently for estrous synchronization and induction of ovulation in beef and dairy cattle. An ovulation synchronization scheme utilizing GnRH for fixed-time AI called "Ovsynch" was developed by Pursley et al. (2). The first injection of GnRH is followed 7 days later with an injection of PGF which is followed in 48 h by a second injection of GnRH; timed AI is performed 12-16 h later (Ovsynch; 2) or at the same time as the second GnRH injection (Cosynch; 3). Although this treatment is very popular around the world, pregnancy rates have been shown to be dependent on the successful induction of ovulation after the first GnRH injection (4). Recent studies have shown that the first GnRH results in ovulation in about 44 to 54% of dairy cows (5,6), 56% of beef heifers (7) and approximately 60% of beef cows (8). Pre-synchronization with either one dose or two doses of PGF 14 days apart and administration of GnRH 12 days after the second dose of PGF has improved pregnancy rates (9). However, that study and others showed again that if the first GnRH does not induce ovulation, the ovulation following the second GnRH may be poorly synchronized (10,11).

Objective

The objective of this study was to compare the efficacy of two commercial gonadorelins (GnRH) in the induction of ovulation in cycling beef cows previously synchronized with two injections of PGF 14 d apart.



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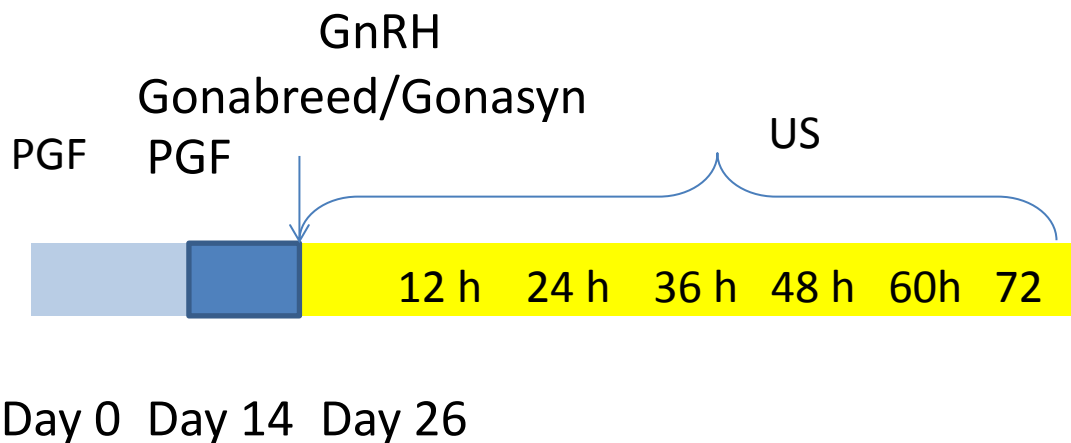
Materials and Methods

Animals and location of the study

The study was performed at IRAC Research and Training Center, located in General Paz, Cordoba, Argentina. Thirty-two (32) cycling mature beef cows were selected to be used in this study, based on the presence of a CL and uterine tract normalcy examined by real time ultrasonography. The cows weighted 450 to 550 kg and were fed a maintenance diet, composed of balanced feed and Lucerne hay and with free access to water. All the cows were identified by an ear tag and were randomly allocated to two treatment groups.

Treatments

At the beginning of the study, all cows were synchronized with two injections of prostaglandin (PGF; 500 µg cloprostenol, Ciclase, Syntex S.A. Argentina) by intramuscular (i.m.) injection 14 d apart (days 0 and 14). On day 26 (i.e. 12 days after the second PGF injection) cows were assigned to the treatment groups to receive 100 µg of gonadorelin acetate from two commercial manufacturers: 2 ml of Gonasyn, Syntex S.A. or 1 ml of Gonabreed (Parnell PTY. LD, Australia) by i.m. injection.



Ovarian Ultrasonography

All cows were examined by real-time ultrasonography on days 0, 14 (Honda HS 101-V 5MHz; Chison 600vet, 5 MHz) and then twice daily from the day of GnRH administration



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until ovulation. All follicles >5 mm in diameter and CL present in each ovary were identified, measured and recorded in a diagram at the time of each examination. Ovulation was defined as the disappearance of the dominant follicle present in one of the ovaries on the previous examination. The number of cows ovulating after GnRH treatment and the interval from GnRH was recorded for further analysis. It was expected that cows responding the GnRH treatment ovulate between 30 to 48 h after treatment. Therefore, failure to respond to the treatment was considered in cows not ovulating by 72 h after GnRH.

Statistical Analysis

The interval from treatment to ovulation was compared between groups by t-test and the proportion of cows ovulating to the different GnRH treatments was compared by Chi-Square test. All data was analyzed using the Software Infostat (National University of Cordoba, 2013).

Results

The proportion of cows ovulating within 72 h of GnRH treatment, the mean interval from GnRH treatment to ovulation and the diameter of the largest follicle at PGF treatment and the ovulatory follicle in the last examination prior to ovulation (named the preovulatory follicle) are depicted in Table 1. Ovulation rates were 50% for cows treated with Gonabreed and 68% for cows treated with Gonasyn ($P=0.2802$) and there were no significant differences between treatment groups in all the end points evaluated. Furthermore, the ovarian characteristics of cows that failed to ovulate are indicated in table 2. Again there were no differences between groups in any of the end points evaluated. When cows were divided in those that did or did not have a CL at the time of GnRH treatment, there were only two cows in the Gonasyn group without a CL and those ovulated, whereas all the cows in the Gonabreed group had a CL at GnRH. Again there were no differences in ovulation rates between groups when only the cows with a CL at GnRH treatment were considered (Table 3).



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Table 1. Proportion of cows ovulating within 72 h of GnRH treatment, mean (\pm SD) interval from GnRH treatment to ovulation, diameter of the largest follicle at PGF treatment and diameter of the preovulatory follicle in cycling beef cows treated with Gonabreed or Gonasyn.

	Gonabreed	Gonasyn	P value
N	16	16	
Ovulated cows (%)	8/16 (50%)	11/16 (69%)	0.2802
Interval from GnRH to ovulation (h)	37.5 \pm 10.0	34.9 \pm 6.5	0.5015
Largest follicle diameter at GnRH (mm)	12.6 \pm 3.3	11.8 \pm 2.9	0.5806
Preovulatory follicle diameter (mm)	13.4 \pm 2.3	14.4 \pm 2.1	0.3474

Table 2. Mean diameter (\pm SD) of the largest follicle at the time of treatment in cows that failed to ovulate within 72 h after the administration of Gonabreed or Gonasyn.

	Gonabreed	Gonasyn	P value
N	16	16	
Cows that did not ovulate (%)	8/16 (50%)	5/16 (31%)	0.2802
Largest follicle diameter at GnRH (mm)	10.8 \pm 2.4	11.4 \pm 3.0	0.6742

Table 3. Proportion of cows ovulating within 72 h of GnRH treatment based on the presence of a CL at the time of treatment.

	Gonabreed	Gonasyn	P value
N	16	16	
Cows with CL at GnRH (%)	16/16 (100%)	14/16 (88%)	0.1441
Cows with CL at GnRH that ovulated (%)	8/16 (50%)	9/16 (56%)	0.2527

Conclusion

The ovulation rate found in this experiment was similar to that reported in beef and dairy cattle (Colazo et al., 2009; Martinez et al., 1999). Furthermore, both commercial



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gonadorelin acetates (i.e. Gonabreed and Gonasyn) were equally efficacious in inducing ovulation in cycling beef cows.

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