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INFLUENCE OF GNRH AND ITS TIMING OF APPLICATION ON THE FERTILITY OF ARTIFICIALLY INSEMINATED DAIRY COWS SYNCHRONIZED WITH DOUBLE DOSES OF PGF2α

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Abstract: The objective of this research was to analyze the effect of GnRH applied at the beginning of estrus or in artificial insemination, considering that low fertility problems in dairy herds is one of the factors that most affects production and profitability levels. 146 Jersey cows with 2.2 lactations, 40.2 days in milk and 2.8 of body condition were used, which were synchronized with two applications of prostaglandin F2α, at the beginning of estrus, they were randomly assigned to one of three treatments, T1: GnRH/I.A; n = 51, T2: GnRH/SD; n=49; and T3: Without GnRH, the pregnancy percentage was analyzed by logistic regression with the glm procedure with the R software. The percentage of pregnancies was not different between treatments, with values of 45, 59 and 46 respectively, possibly because in this exploitation, nutrition, management, health and heat detection are optimal. Therefore, it is concluded that in the conditions in which this research was carried out, GnRH did not improve fertility.
Keywords: Fertility, Gonadorelin, Prostaglandin F2Fα, Reproduction, Jersey cows.

INTRODUCTION

The low fertility constitutes the most important reproductive problem in dairy herds and represents an important economic aspect to consider to improve milk production per cow per year; It also allows to determine with other productive indicators the profitability of livestock companies (Gutiérrez-Añez et al. 2005). For this reason, different protocols with the use of exogenous hts have been implemented to synchronize zeal and ovulation such as; Progestogens alone or in combination with estradiol, prostaglandin and chorionica equine gonadotropin, always with the intention of improving the gestation rate (Yaniz et al. 2004). The use of

the GNRH is an alternative to face the fault in the conception, because it synchronizes the ovulation by increasing the frequency of luteinizing hormone (LH) with positive feedback to the hypothalamic, pituitary, gonadal axis and favoring ovulation (Bon Durant et al. 1991). In addition, it prevents delayed ovulation problems and improves the development of the luteum body (Gutiérrez et al. 2005). Systematic applications have been used immediately after the delivery of a dose of a luteolithic prostain. 2004). With this treatment, an increase in fertility was obtained to the first insemination of the cows treated in relation to the control group of 44.4 to 58.8%. (Garverick et al. 1980). However, the results of the use of this hormone are variable depending on the active component type used among other factors (Sterry et al. 2006).

GOAL

The present investigation aimed to analyze the effect of the GNRH application at the time of the detection of estrus or at the time of artificial insemination (AI) in the pregnancy rate of Jersey synchronized cows with double dose of PGF2α.

MATERIAL AND METHODS

The work was carried out the "The Bison" dairy located in North Dakota in the United States of America. 146 Jersey cows were used with one or two lactation, a body condition of 2.8 (on a scale of 1 to 5), clinically healthy and cycling. The cows were in stable and received an integral diet, with 17 % protein and 2.8 Mcal Kg-1 of dry matter. Jealous synchronization with two PGF2α injections with fourteen days of interval was performed, starting the first between 40-46 postpartum (PP), this scheme based on the prostaglandin system program called "Monday morning" implemented in the unit production (Figure 1). Visual detection of Estros was performed, in addition to the use of paint in the sacrum-coccygeal region, the uterine tone and the estral mucus were evaluated. The suitable cows were artificially inseminated 12 hrs after the zeal began, commercial semen was used. At the time of Stan detection the cows were randomly divided into three treatments (Figure 1): T1 (n = 51) received GNRH (gonadorelin in dose of 0.1 mg; FERTALGYL®) at the time of AI, T2 (n = 49) GNRH at the time of detected the estrus and t3 (n = 46) did not receive GNRH. The diagnosis of gestation was performed by ultrasound between days 30 and 36 after insemination.

STATISTIC ANALYSIS

The gestation percentage was analyzed by logistics regression with the GLM procedure with the R 4.1.3 software, for a completely random design (R Core Team, 2022).

RESULTS

The systematized use of prostaglandin F2α in this exploitation has generated favorable results in terms of the number of cows that show stan after the second application in a period of 64 hrs on average and with what has achieved an average of 68 days to the first service, 2.0 Service for Concepción with 72 percent of pregnant cows and open days are 112, considering all these acceptable reproductive variables to reach a 13 -month -old interpart interval, this is consistent with what is indicated by (López et al. 2004 : Bello et al. 2006).

The gestation percentage was no different between treatments (Table 1), with values of 45, 59 and 46 percent for T1, T2 and T3 respectively. The general average gestation rate was 50 percent considered acceptable as Morgan and Lean (1993) points out; Macmillan (2010), considering that sexed commercial semen was used as they point out (Lucy 2001; López 2003).

DISCUSSION

The percentage of gestation was no different between treatments, this possibly because in the exploitation good nutritional management and optimal detection of fundamental conditions to improve fertility in dairy cattle as established (Looper et al. 2003) can be seen. In addition, a factor that can favor fertility in cows treated with GNRH is the fact that the application of this hormone when starting zeal or at the time of insemination, probably synchronizes the time of ovulation with the service; If this condition is mainly located in herds with the detection of estros, in which the only criterion to inseminate is the information provided by the activity of the cow or the characteristics of the genital organs, in cows with endocrine or nutritional problems then It could be contributing to improve fertility as indicated (López et al. 2005). In this investigation although the percentage of pregnancy in cows that received GNRH at the beginning of the zeal was more numerically, no significant differences were found with respect to the other treatments. The average percentage of pregnancy of the three treatments was 50 percent and considers acceptable, this possibly because inseminations were made in favorable months; December and January, in addition that the management, body condition, detection of estros and nutrition were optimal, this result is consistent with what is reported by (Cavalieri et al. 2006).

CONCLUSION

Under the conditions in which this investigation was carried out, the analogous GNRH applied the beginning of the zeal or in AI had no effect on the fertility of jersey dairy cows with body condition of 2.8, artificially inseminated previously synchronized with double doses of PGF2α.

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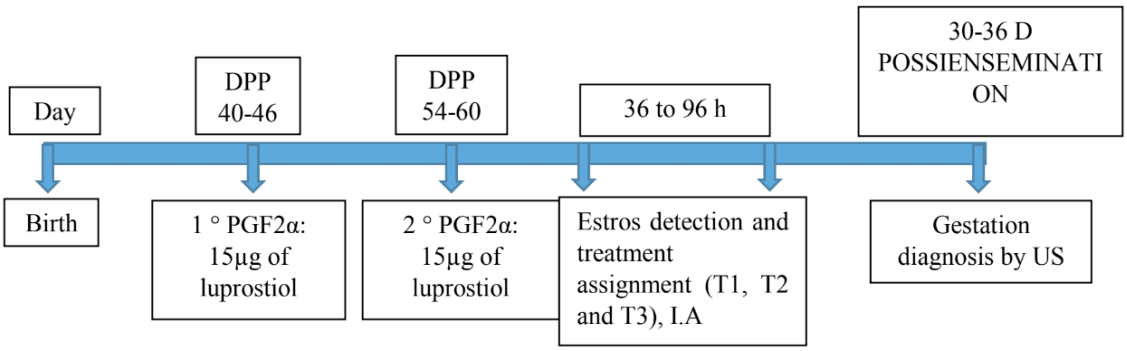

PGF2α: Prostaglandin F2α

DPP: postpartum days (application of PGF2α, Monday morning)

I.A: Artificial insemination

US: Ultrasound

Figure 1. Estros Synchronization Protocol and treatments allocation

Treatment	n	Number and percentage of gestation
(T1: GnRH/I.A)	51	(23) = 45 %
(T2: GnRH/D.C)	49	(29) = 59 %
(T3: Sin GnRH)	46	(21) = 46 %

T1: GNRH/I.A; APPLICATION OF GNRH AT THE TIME OF INSEMINATION.

T2: GNRH/A.D.; GNRH application to heat detection.

T3: Witness; Without GNRH

Table 1. Percentage of gestation of jersey inseminated with sexed semen, with and without gnrh application.