



Short communication

Does introduction of rams during the late luteal phase promote the estrus response in cyclic ewes?



J. Meilán, R. Ungerfeld*

Departamento de Fisiología, Facultad de Veterinaria, Universidad de la República, Lasplacas 1620, Montevideo 11600, Uruguay

ARTICLE INFO

Article history:

Received 18 November 2013

Received in revised form 25 February 2014

Accepted 27 March 2014

Available online 8 April 2014

Keywords:

Estrous synchronization

Luteal phase

PGF2alpha Reproduction Physiology

Sheep

Socio-sexual signals

ABSTRACT

The administration of two doses of PGF2 α is widely used for estrous synchronization in cyclic ewes. The introduction of rams to previously isolated ewes (ram effect) induces an increase in LH pulsatility which stimulates estradiol secretion. Consequently, the introduction of the rams may trigger the luteolytic process through the increase of estradiol. Therefore, the aim of our first experiment was to determine if the second dose of a two PGF2 α treatment can be substituted by half PGF2 α dose plus the ram effect. Ewes were randomly assigned to 3 experimental groups. Ewes from 2 of those groups (E1-PGFD: $n = 91$, and PGHD: $n = 110$) remained in permanent contact with 16 vasectomized males since Day-40 (Day 0 = introduction of the rams). Both groups received a dose of PGF2 α on Day-13. On Day 0, E1-PGFD ewes received a second dose of PGF2 α , and PGHD ewes received a half-dose. Ewes from the third group (HD + RE; $n = 95$) remained isolated from males until Day 0, and received a dose of PGF2 α on Day-13, and a half-dose on Day 0. On Day 0, the three groups were joined. The introduction of the rams increased the number of ewes that came into estrus early after the second dose, but this difference was not maintained the following days. Thus, we designed another experiment to determine if the day of the late luteal phase in which ewes are stimulated by the rams (12–15 days after a dose of PGF2 α dose) influences the response. The ewes were randomly assigned to five groups, from which only the control group ($n = 44$) remained in contact with males; the other 174 ewes remained isolated from males since Day-30. Estrous cycles were presynchronized with 2 PGF2 α doses separated 7 days, and received a third dose 13 days later (Day 0) (control group), or a half-dose plus the introduction of rams 12, 13, 14 or 15 days later (Day 0). However, we did not observe any differences in the estrus response according to the estrous cycle day. In conclusion, the ram effect was effective substituting half PGF2 α in part of the flock, but the response was unrelated to the day of the late luteal phase in which the ewes are stimulated.

© 2014 Elsevier B.V. All rights reserved.

1. Introduction

The administration of the PGF2 α to cyclic ewes induces luteolysis in those animals that are in their luteal phase. The

administration of a second dose ensures that most ewes come in estrus in a very short time period. The good synchronization of estrus obtained, and a relatively low cost makes the administration of two doses of PGF2 α 7–11 days apart one of the most widely used technique for estrous synchronization in cyclic ewes (see review: Fierro et al., 2013). However, actual market tendencies push to minimize the use of hormones and other chemicals in animal

* Corresponding author. Tel.: +598 26286955; fax: +598 2628 0130.
E-mail address: rungerfeld@gmail.com (R. Ungerfeld).

production (Martin et al., 2004). Therefore, it is important to substitute hormonal treatments by other alternatives, like socio-sexual stimulation. In sheep, the introduction of males to a flock of previously isolated anestrus females (the ram effect) induces ovulation, estrus, and might end in out-of-season pregnancies (for reviews, see: Ungerfeld et al., 2004; Delgado et al., 2009). The introduction of rams induces an increase in LH pulsatility in both, anestrus (Martin et al., 1986) and cyclic (Hawken et al., 2007) ewes. This increase is even observed in ewes treated with progestagens (Evans et al., 2004), and in pregnant ewes (Al-Gubory, 1998). However, although the use of the ram effect has been widely studied in seasonal anestrus ewes, its' possible applications in cyclic ewes have been scarcely studied.

It has been demonstrated that luteolysis is triggered by an increase in estradiol concentrations during the second half of the luteal phase (Hawk and Bolt, 1970) by the following pathway: (1) the increase in estradiol concentrations induce the synthesis of uterine oxytocin receptors, so the uterus becomes responsive to oxytocin stimulation (Hixon and Flint, 1987); (2) the uterus responds to oxytocin secreting PGF2 α (Flint et al., 1986); (3) this triggers a positive feedback between luteal secretion of oxytocin and uterine secretion of PGF2 α , which ends with peaks of PGF2 α concentrations (Bazer et al., 1991; Flint and Sheldrick, 1982), responsible for the regression of the corpus luteum (McCracken et al., 1972). Therefore, if we consider that the increase in LH pulsatility stimulates estradiol secretion by the larger follicles present in the ovaries (Baird, 1978; Spencer et al., 1995), the introduction of males may elicit the luteolytic process. Supporting this hypothesis, Chemineau (1983) observed a bimodal estrual response after the introduction of bucks to cyclic goats, suggesting that luteolysis was provoked in part of the flock. Also in goats, Mellado and Hernández (1996) observed an important concentration of estrus in cyclic goats stimulated by males, which may be consequence of by the advancement of the luteolysis in some does.

Considering all this information, it may be expected that the introduction of rams in a flock of previously isolated ewes during the late luteal phase will trigger the luteolytic process, and thus, it might be included in estrous synchronization protocols. However, it has been observed that the introduction of rams 13 days after a single PGF2 α administration could not substitute the administration of a second PGF2 α dose (Ungerfeld, 2011). This author considered that the strength of the ram effect may have been not enough to completely substitute the administration of the second PGF2 α . Thus, it was proposed that the ram effect may be combined with low doses of PGF2 α to induce luteolysis during the late luteal phase (Ungerfeld, 2011). Although this implies only a slight decrease in total hormonal use, possible positive results would provide a basis to continue in the development of treatments with less hormonal content. Therefore, our hypothesis was that the ram effect may substitute the administration of a second half-PGF2 α dose during the late luteal phase in a treatment of two doses administrated 13 days apart. Although the treatments in which both PGF2 α doses are shortly separated (7–8 days) provide the best results in estrus synchronization and

pregnancy rates (Olivera-Muzante et al., 2011; Menchaca and Rubianes, 2004) in this study both PGF2 α were separated 13 days to ensure that the ewes were in their late luteal phases, and then that the response to the ram effect may end in luteolysis. Then, the aim of the experiment was to determine if the second dose of a two PGF2 α treatment can be substituted by half-dose plus the ram effect. As with this alternative we observed advancement of estrus but only in a small part of the flock, we designed a second experiment to determine if the day of the late luteal phase in which ewes are stimulated influences the response to the treatment.

2. Materials and methods

2.1. Experiment 1

2.1.1. Animals and management

The experiment was performed on a farm located near Artigas, Uruguay (30° S), with 296 nulliparous Merino \times Corriedale (1–2 years; 33.5 \pm 2.0 kg) ewes during the mid-breeding season (March, late summer-early autumn). All ewes grazed on native pastures.

2.1.2. Experimental treatments

Ewes were randomly assigned to 3 experimental groups. Ewes from 2 of those groups (E1-PGFD: $n=91$, and PGHD: $n=110$) remained in permanent contact with 16 vasectomized males since Day-40 (Day 0 = introduction of the intact rams). Both groups received a full dose of a PGF2 α analogue (10 mg, Dinoprost tromethamine, Lutalyse®, Pfizer, Kalamazoo, MI, USA) on Day-13. On Day 0, E1-PGFD ewes received a second full dose of PGF2 α , and PGHD ewes received a half-dose (5 mg). Ewes from the third group (HD + RE; $n=95$) remained isolated from males until Day 0 (sight, sound, smell; minimum distance: 1000 m), and received 10 mg of PGF2 α on Day-13, and a half-dose (5 mg) on Day 0. On Day 0, the three groups were joined and 8 marking vasectomized rams were added to maintain the male:female ratio (one male for every 12 females; 8%). Sexual receptivity was estimated from marks on the rumps twice daily until Day 5.5.

2.2. Experiment 2

2.2.1. Animals and management

The experiment was performed on a farm located in Trinidad, Uruguay (33° S) with 218 multiparous Corriedale ewes (3–5 years) during the breeding season (February–March). All ewes grazed on native pastures.

2.2.2. Experimental treatments

The ewes were randomly assigned to five experimental groups, from which only the control group (E2-PGFD; $n=44$) remained in contact with 16 androgen-treated wethers since Day-40 (Day 0 = introduction of the rams). Wethers were weekly treated with testosterone cyclopentil propionate (30 mg/kg; Testosterona Ultra Lenta Fuerte, Dispert, Montevideo, Uruguay). The other 174 ewes remained isolated from males since Day-30. Estrous cycles of the five groups were presynchronized with 2 PGF2 α doses (Dinoprost tromethamine, Lutalyse, Pfizer, Kalamazoo, MI, USA) separated 7 days, and received a third full dose 13 days later (Day 0) (E2-PGFD ewes), or a half-dose plus the introduction of rams 12, 13, 14 or 15 days later (Day 0) for groups LP12 ($n=43$), LP13 ($n=43$), LP14 ($n=44$), LP15 ($n=44$) respectively. The general scheme of the experiment is presented in Fig. 1.

On Day 0 all ewes were joined with marking androgen-treated wethers with a male:female ratio of one male for every 13 females (7%). Sexual receptivity was estimated from marks on the rumps twice daily from Day 1 to Day 5.5.

2.3. Data analysis

In Experiment 1, the daily accumulated frequency of marked ewes in the 3 groups was compared with chi square test. In Experiment 2, the daily accumulated frequency from each experimental group (LP12, LP13, LP14

Download English Version:

<https://daneshyari.com/en/article/5795653>

Download Persian Version:

<https://daneshyari.com/article/5795653>

[Daneshyari.com](https://daneshyari.com)