

Time of PMSG administration: Effect on progesterone and estradiol concentration in synchronized ewes.

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Abstract

The objective of this study was to observe the effect of Pregnant Mare Serum Gonadotrophin (PMSG) administration time on progesterone (P4) and estradiol (E2) concentrations in synchronized ewes. The experimental animals used in this study were Cameroon hair sheep and Thai Long Tail wool sheep crossbreds. Controlled Internal Drug Release (CIDR) device was implanted intravaginally to 40 ewes for 11 and 13 days. Pregnant Mare Serum Gonadotrophin (PMSG), 200 I.U. was administered at CIDR withdrawal and 24 hours prior to CIDR withdrawal. Blood samples were collected between 3 to 4 day intervals for 6 weeks after CIDR implantation. The P4 and E2 blood plasma concentrations were measured by radioimmunoassay (RIA). Ewes that received PMSG at CIDR withdrawal gave significantly higher P4 and E2 concentrations as compared to ewes that received PMSG at 24 hours prior to CIDR withdrawal in both 11 and 13 days CIDR implantation. In conclusion, PMSG administration at 24 hour prior to or at CIDR withdrawal would affect the concentrations of blood plasma P4 and E2 in synchronized ewes and subsequently would affect the reproductive performance in ewes.

Keywords: Progesterone, Estradiol, CIDR, PMSG, ewes

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Introduction

In small ruminants, estrus synchronization was achieved either by extending the cycle with exogenous progesterone or its analog progestagen or reducing the length of the luteal phase of the estrus cycle with prostaglandin (F_{2α}) [1]. These synchronization regimes were orally implanted or intravaginal sponges insertion. These devices would exert negative feedback on Luteinizing Hormone (LH) secretion that inhibited the endocrine events and lead to the maturation of preovulatory follicles and ovulation [2].

The most general synchronization technique in sheep was progestagen intravaginal devices which was implanted for 12 to 14 days, followed by administration of equine chorionic gonadotrophin (eCG). This method would synchronize estrus in cyclic ewes or induced and synchronized estrus during the anestrus period in sheep. This method of intravaginal progestagen was the most practical for sheep reproductive management programs, but the fertility rates were highly variable [3]. Titi *et al.* [4] reported that a combination of progestagen sponge with Gonadotrophin Releasing Hormone (GnRH) administration was effective in estrus synchronization and increased fecundity in small ruminants. The administration of GnRH in estrus syn-

chronization technique could facilitate synchronized ovulation or luteinization of most large dominant follicles and initiated follicular growth [5].

Yu *et al.* [6] recorded a high correlation between the development of follicles with serum progesterone (P4) and estradiol (E2) concentrations. Previous studies reported that progesterone concentration might affect the follicular size [7]. Estradiol concentration was also reported to have positive correlation with the number of large follicles during the estrus cycle [6].

Therefore, present study was conducted to observe either administration of PMSG 24 hours prior to CIDR sponge withdrawal or administration of PMSG at CIDR sponge withdrawal would result in better progesterone and estradiol concentrations. Also to test the efficiency of combined CIDR sponge implantation and time of PMSG administration to potentially facilitates fix timed artificial insemination (FTAI).

Materials and Methods

Cameroon hair sheep and Thai Long Tail wool sheep crossbreds were synchronized with CIDR device. This