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The Combination of Progesteron Sponge, PMSG and Minimal Dose PGf2 Alfa toward Sheep Pregnantion

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ABSTRACT

Background: The goal of this study was to confirm the effects of the engineering design of the vaginal progesterone implant capsule, which had a 2 cm sponge with a diameter of 5 cm, a 2 cm porous capsule with a dose of 50 mg MAP in the centre and 13 cm nylon cord for keeping the sponge in position.

Methods: A full concentrate total protein 17% consumed at 0.05 kg/day/head was previously administered to as many as 30 overweight ewes with a body score of at least 3 and those who were positively identified as having ever given birth to help them improve their body score condition. It was found that T0 consisted of 10 obese female sheep that underwent a normal oestrous cycle without oestrus synchronization therapy and waited for natural oestrus, while T1 and T2 consisted of 10 sheep that received progesterone implant capsule vaginal sponges with a dose of 50 mg MPA on day 0 getting 100 IU sc PMSG folligon intervet Holland in addition.

Result: On day 35, the oestrous response was 100% and the pregnancy rates were 70%, 80% and 80% in T0, T1 and T2 groups, respectively (p>0.05). Progesterone levels in the groups non pregnant are 1,66±0.8; 1,23±0.78 and 1,60 ± 0.90 ng/ml (p> 0.05).

Key words: Capsule vaginal sponge, Maternal heath, Pregnancyprogesterone, Reproductive synchronization of oestrus, Tail fat ewes.

INTRODUCTION

Administration of a 50 mg MPA sponge combined with PGf2, PMSG countercourses and/or PMSG in small dosages intravulvarly using a SC-9880 (trade name for a progesterone hormone molecule) injection into a sheep's vagina (Bacha *et al*., 2014). Techniques for synchronizing oestrus can include intra vaginal progesterone sponge preparations (Pérez-Clariget *et al*., 2021). Within 14-16 days, this progesterone might be gently absorbed through the vaginal mucosa (Berginc *et al*., 2012).

Oestrus and ovulation will occur once the sponge has been removed at that point (Jarquin *et al*., 2014). Another report claims that using Cronolone for 14-16 days at a dose of 30-40 mg intravaginally will result in lust 24-72 hours after the drug is stopped (Sönmez *et al*., 2009). While sheep's synchronized lust (Einer-Jensen and Hunter, 2005), due to the loss in genetic quality of fat-tailed sheep in Indonesia as a result of natural mating and waiting for natural estrus, synchronization of estrus and mass pregnancy is obviously necessary (Hattab *et al*., 2000).

Particularly, the use of progesterone-based family planning drugs sold under the brand names depo privera and depo progrestin in Indonesia (Singhal *et al*., 2014). This particular sort of progesterone hormone is actually secreted by corpus luteum cells, progesterone is a steroid hormone with 21 carbon atoms in its chemical composition (Pregna-4-en-33 : 20-Dione) (Kolatorova *et al*., 2022). Progesterone implant capsule vaginal sponge production is a straightforward process that is always imported from professionals who discuss Medroxy Progesterone Acetate (MPA) intra vaginal sponge, a simple to obtain raw material in Indonesia, implanting MPA (Simonetti *et al*., 1999). The vaginal capsule is a sponge that is 3 cm in length and 2 cm in width, according to the least dose required, a porous MPA progesterone capsule is put into the sponge vagina for 11 days (Garoussi *et al*., 2020). It is equipped with a nylon pulling thread to make it simple to remove the capsule from the vagina (Hashemi *et al*., 2006; Santos *et al*., 2010; Ungerfeld *et al*., 2003).

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To increase pregnancy in sheep, A low-cost research project can be conducted in conjunction with PMSG (pregnant mare serum gonadotropine) 4 at a low dose of 100 IU performed one day prior to the removal of the sponge on the 11th day (Kausar *et al*., 2009; Zeleke *et al*., 2005). At that time, a minimal dose of PGf2α countercurrent was injected trans vulva and pregnancy was observed after artificial insemination for 35 days (Dogan *et al*., 2004; Viñoles *et al*., 2001). The aim of this research is examine fixed timing removed progesterone implant capsule vaginal sponge combined with a minimal dose of PGF2α intra vulva and PMSG as a solution model for increasing pregnancy mass fat tail sheep.

MATERIALS AND METHODS

This research was carried out in November 2021. Meanwhile, the research location for vaginal progesterone implant capsule was carried out at the Reproduction Laboratory, Faculty of Veterinary Medicine, Airlangga University and the research trial was carried out at the Sidoarjo sheep farm, East Java. A full concentrate total protein 17% consumed at 0.05 kg/day/head was previously administered to as many as 30 overweight ewes with a body score of at least 3 and those who were positively identified as having ever given birth to help them improve their body score condition (Kumar *et al*., 2018). It was found that T0 consisted of 10 obese female sheep that underwent a normal oestrus cycle without oestrus synchronization therapy and waited for natural estrus, while T1 and T2 consisted of 10 sheep that received progesterone implant capsule vaginal sponges with a dose of 50 mg MPA on day 0 while also receiving 100 IU sc PMSG Folligon intervet Holland. At T1 and T2, each was injected with 2.5 mg (0.5 CC) PGF2α submucosa vulva on day 5 after removal (T1) and on day 11 (T2) (Einer-Jensen and Hunter, 2005), observation of the beginning of oestrous on days 5 (T1) and 11 (T2) following removal of the MPA implant, followed by the expectation that on days 7 (T1) and (T2) on day 14, lust occurs and artificial insemination is performed insemination using fresh semen is performed when signs of estrus. Artificial insemination was performed with a single dose of fresh semen on egg yolk skim milk dilluters. Females were introduced to males for controlled mating 48 hours after the removal of the sponges and ten T1 and T2 females per treatment had rectal ultrasound evaluation at 35 days following AI. On day 35, jugular vein blood samples were collected in order to measure progesterone levels using the indirect ELISA model to support the interpretation of the pregnancy diagnosis in fat-tailed sheep, as seen in Fig 1 (Boscos *et al*., 2003).

Complete randomization of the study's design was used and quantitative and qualitative rate analyses of estrus and pregnancy in fat-tailed sheep were used for data analysis (Yagoubi and Atti, 2020). Analysis of variance (ANOVA) and the test of true difference were two different types of data analysis that methods employed Statistical Package for the Social Sciences (SPSS) 2022.

RESULTS AND DISCUSSION

The findings revealed no differences that were statistically significant (p>0.05) in the oestrus sign, with the average estrus of the seventh and thirteenth treatment groups all

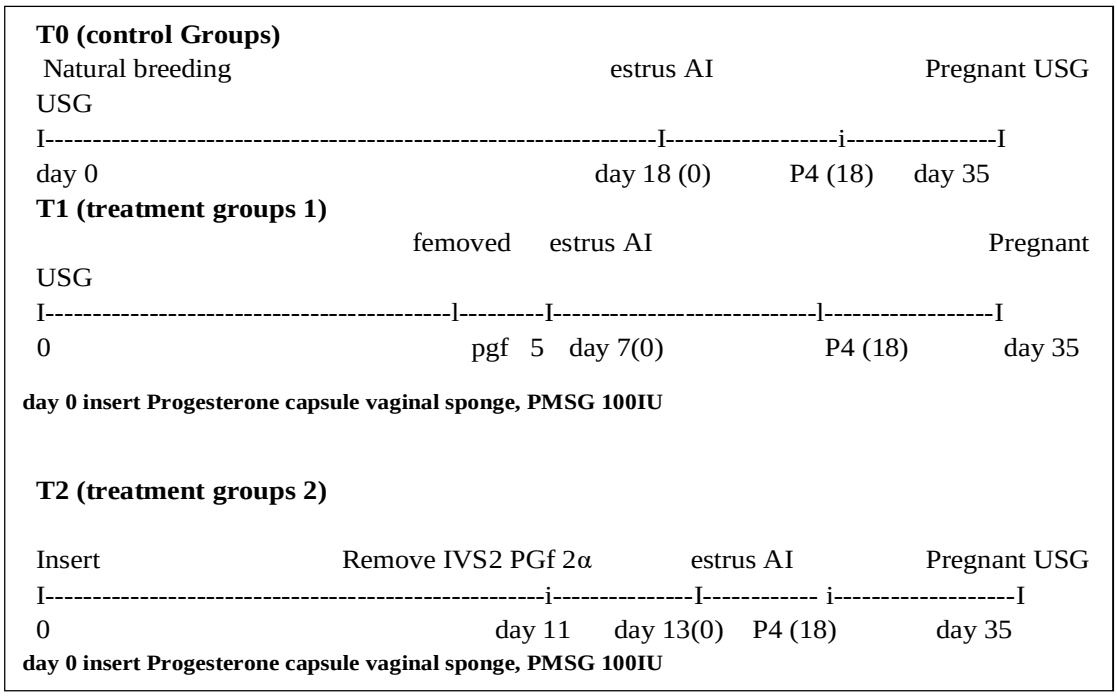

Fig 1: Schedule progesterone capsule vaginal sponge for model, PMSG and PGf2 combinated.

exhibiting true oestrous. This occurs after mating on days 7 (T1) or 13 (T2) and allows the ovaries to give the chance for subordinate follicles to develop into de Graaf follicles in the injected PGF2α lysis can be stimulus of corpus luteum periodicum on days 5 (T1) and 11 (T2) that on that's all of them group showed symptoms of 100% oestrus sign. Artificial insemination with hCG triggering for ovulation is carried out 24 hours after the oestrous sign using PMSG folligon that contains FSH and LH to encourage follicle growth during the follicular phase from days seven through eleven (Zeleke *et al*., 2005). After increasing the duration of exposure to exogenous progesterone during estrus stimulation, the yield and quality of the estrus response are assessed. Estrus rate is the outcome displayed in the Table 1.

The treatment showed a mixture of vaginal sponge progesterone and PGF2, sheep oestrous deposits and a 100% oestrus response in all sheep in the control group. The average time after removal of the device was 30 hours and estrus persisted for 37 hours. The following comes to mind when discussing our opinions on some of the study's findings: PGF2 with sub mucosavaginal progesterone sponge in combination with PMSG can successfully improve estrus synchronization and a number of reproductive and productive traits in fat-tailed sheep (Ungerfeld *et al*., 2003; Sasa *et al*., 2002). To establish the effectiveness of the optimum estrus synchronization strategy on reproductive success in goats, another study was carried out on goats using the same progesterone approach (Holtz *et al*., 2008; Knights *et al*., 2001; Monteiro *et al*., 2010).

When the MPA sponge is released, synchronized oestrus is a helpful tool for managing and reproducing vaginal sponges for 11 days, their reproductive performance was evaluated based on Pregnancy Rate, Kidding Rate, Litter Size and Twin Rate after receiving 60 mg of PGF2á. The findings of this study show that 100 dairy goats treated with vaginal sponges for 11 days with PMSG had great reproductive performance. Their reproductive efficiency was assessed at the time of sponge removal using the pregnancy rate, kidding rate, litter size and twin rate. This study's findings indicate that the pregnant group had great reproductive function (Hervé *et al*., 2004). Score 81.25% the purpose of this research is to examine the accuracy of detection of pregnancy using transrectal ultrasound (US) in fat-tailed sheep synchronized with a 5 or 11 day progesterone progesterone capsule vaginal sponge by PGF2α after the sponges were removed on Days 5 and 11 (Kumar *et al*., 2018; Anghel *et al*., 2011).

In the evolutionary programs of modern organisms, synchronization of estrus and ovulation is crucial. These methods are crucial for helping spread innovations, monitoring produced insemination and regulating hatchling commerce, all of which can boost production. In the current investigation, norgestomet-containing subcutaneous additions were given to 70 crossbred ewes undergoing timed artificial insemination for long (14 days), medium (9 days) and short (5 days) (Madani *et al*., 2009; Blaschi *et al*., 2014). Thus, the effects of the future on estrus synchronization and birth rates were examined. 85.7% (60/70) of the synchronized ewes exhibited oestrus during a period of 72 hours following the cessation of progestagen administration (Pietroski *et al*., 2013; Dogan *et al*., 2004; Fonseca *et al*., 2005; Greyling and van der Nest, 2000).

The coordination of eCG and progestagen ensured the occurrence of rich ovulations in all the creatures following either short-term or long-term treatment. Alternatively, it was discovered that ovulatory success without eCG was dependent on the length of treatment, with the highest rate of ovulation occurring after five days of treatment (83.3%) and the lowest rates occurring after six or seven days of treatment (40 and 20%, respectively) (Rosa and Bryant, 2002; Martinez-Ros *et al*., 2018). Ovulation rate and progesterone emission were similar among ovulating species, but ovulation failures predicted the maturity of the yields obtained in response to the medications (Evans *et al*., 2004; Martin *et al*., 2004).

The other study in sheep examined the impact of reusing a progesterone (P4) device during the long and short transcervical timed artificial insemination protocols in 275

Table 1: Progesterone capsule vaginal sponge to induce estrus and pregnancy of fat-tailed sheep.

Group of treatments	T0 (Naturally estrus)	T1 (Removed device at 5 days)	T2 (Removed device at 11 days)
Number of Sheep	10	10	10
Estrus rate %	100.00 (10/10)	100.00 (10/10)	100.00 (10/10)
Duration of estrus (h)±S.D	37.00±12.06	37.00±4.08	37.0±11.01
Time of estrus When the device removed	31.8±01.00	30.41±13.8	30.43±8.09
Pregnancy rate %	70.00 (7/10)	80.00 (8/10)	80.00 (8/10)

Table 2: Research Results progesterone levels and examination of pregnancy with ultrasound.

Group	T0	T1	T2
Average P4 level at day 18 to pregnant ng/ml	4.56±0.19	4.06±0.42	4,02±1.03
Average P4 level at day 18 to non pregnant	1.66±0.88	1.23±0.78	1,60±0.90
USG 35 days %	70 (7)	80 (8)	80 (8)

multiparous nursing sheep. Each sheep received 300 IU of eCG and 6.70 mg of dinoprost tromethamine. Both groups had a similar pregnancy rate (about 84%) at the conclusion of the reproductive time. Thus, repeated administration of the procedure was not anticipated to have an adverse effect on pregnancy rates and was likely to enhance reproductive function (Boscos *et al*., 2002; da Silva *et al*., 2021). When artificial insemination was used on day 0, level P4 was 0.2 ± 0.1 ng/ml and continued until day 18 of pregnancy, level P4 was 3.3 ± 0.9 ng/ml (Karen *et al*., 2003).

There are some suggestions in usage research progesteron FGA sponger and CIDR In treatment, devices are efficient in synchronizing estrus in ewes, CIDR provided higher pregnancy rate, fertility rate, twining rate and fecundity than FGA. Progesterone pessary or sponge is essential for pregnancy maintenance and one of the important functions of the blastocyst is to ensure that the uterine luteolytic mechanism is counteracted. Progesterone and estrogen determine the proper function of the uterus in preparation for embryo development and implantation. Therefore, increasing of progesterone level during early pregnancy reduce embryonic losses and increase pregnancy rate and fertility (Ataman *et al*., 2013).

Vaginal discharges showed consider as a response of vaginal mucosa to the presence of foreign body (Sponge or CIDR) and these discharges depend on the size and material used in manufacture of this foreign body. In current study, the increased retention rate and vaginal discharge rate after progestagen removal in the FGA group were due to the nature of the intravaginal sponge texture and size compared to the CIDR dispenser. The intravaginal sponge absorbs vaginal secretions and become more bulky compared to the non-absorbent silicone of the CIDR. This allows growth and multiplication of microorganisms that produces a foul smell and some of the sponges adhered tightly to the vaginal mucosa causing a higher drawstring breakage rate after progestagen removal in FGA than CIDR treatment (Swelum *et al*., 2015).

There was an idea of a trial of adding progesterone in addition to intravaginal therapy when it was carried out to examine the effect of progestagen supplementation 24 hours before discontinuation of intravaginal pessaries on the reproductive performance of seasonal anestrus ewes. The ewes in each trial were allocated to treatment and control and all were induced to estrus using intravaginal MPA sponges (Exp. 1; n=24) or CIDR-G (Exp. 2; n=28) pessaries for 12 days. Half of the ewes in each trial were supplemented 24 hours prior to pessary withdrawal with MPA tablets of 10 mg oral (Exp. 1) or 25 mg intra muscular progesterone administration. Fertile rams were allowed with ewes on sponge removal (Day 0) and oestrous was monitored at 6 h intervals for 3 days. Blood samples were collected for measurement of P. In both experiments, the percentage of ewes that were in heat was greater (P<0.05) (Husein and Ababneh, 2008).

Another study on Shaal sheep breed in Iran reports that exposing breed ewes to rams for 3 days followed by PMSG administration in progestogen programming is highly effective for inducing fertile estrus activity during the nonbreeding season. When used off-season with MPA and eCG, it appears that lower than P4+ PMSG or P4 ram were not able to stimulate anovular ewes to spin off-season. Male exposure has great potential for synchronized oestrus in seasonal Shaal breeds during the non-breeding season. This leads us to consider a new research perspective on the issue of isolation of females from males in non-breeding programming.

In Table 2, there was a significant difference in pregnancy rates among ewes in the control and treatment groups (P<0.050). Pregnancy rates increased 96% and 88% in the treatment subgroup, respectively) compared to the control group (60%) using MPA. Different treatment subgroups received MPA with experimental variables. Pregnancy rates in the MPA, PMSG and ram exposure subgroups were the highest (P=0.002). However, it was higher in the MPA and PMSG subgroups compared to the control group (P=0.02). However, there was no significant difference in the MPA and ram exposure treatment subgroups compared to the control group (P>0.05). This suggests that the ewes genital system may be affected by exposure to ram and PMSG outside of the breeding season. In addition, twinning, calving, fecundity and proliferative rates were increased in the P4, PMSG and ram exposure treatment subgroups compared to the control group. The possible results obtained are not significant (Garoussi *et al*., 2021).

The progesterone capsule vaginal sponge was removed and the USG figure of oestrus revealed signs of 100% estrus between the control group (T0) and the treatment group (T1, T2) demonstrating the same oestrus outcomes. Pregnancy ultrasound on day 35 following artificial insemination with a

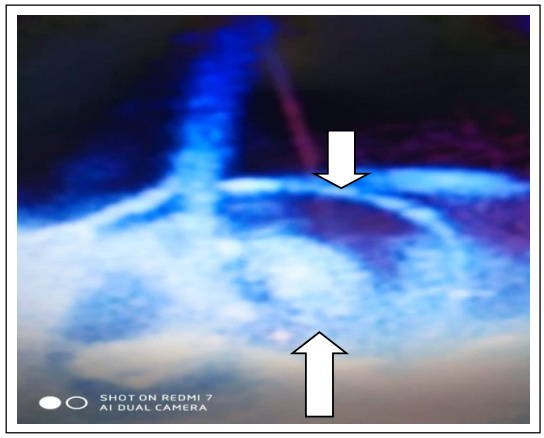

Fig 2: 35 days along Amniotic fluid and hyperecogenic are present in the ion fetus. Early pregnancy in sheep: hypoechogenic, amniotic membranes up arrow, ultrasonography Dawey 6VET China, electronic linear array 10-5 MHz transducer uterus and growing conceptus.

trans rectal linear probe reveals that the amniotic fluid in the group T0 (80%), T1 (70%) and T2 (70%) pregnancy showed no significant difference, as seen in Fig 2. The pregnancy picture reveals that the white color is hyperecogenic in the fetus (early pregnancy) (Fonseca *et al*., 2008; Evans *et al*., 2004; Scott, 2012). The past reproductive history of the female genitalia in fat tail sheep was not investigated in this study, but reproductive health tests performed throughout the experiment yielded normal results and progesterone levels on day 35 did not alter significantly from baseline (p>0.05) (Dogan *et al*., 2004). In Sheep, the transrectal USG test's sensitivity for detecting pregnancy at days 31-40 was 96.8% (Karen *et al*., 2004).

CONCLUSION

Timing eliminated as a solution model for boosting pregnancy mass, progesterone implant capsule vaginal sponge was paired with a low dose of intra vulvar PGF2á and PMSG. There was no difference (p>0.05) between the control and treatment groups in oestrous and pregnancy on the seventh day following the fifth day of sponge removal and the eleventh day of sponge extraction. Signs of lust also appeared on the thirteenth day. On the 35th day, pregnancy was determined using ultrasound and progesterone levels. ELISA's indirect blood serum progesterone examination revealed T1 and T2 values of 4.56 ±0.19, 4.06±0.42 and 4.02±1.03 ng/ml in the group of women who were pregnant. Progesterone vaginal sponges were used to induce oestrous and pregnancy in ewes, increasing the oestrous or pregnancy rate. Deleted timing The use of a progesterone implant capsule vaginal sponge in conjunction with a low dose of PGF2α intra vulva and PMSG is a solution model for boosting pregnancy mass. Five days of sponge removal and seven days of artificial insemination can be cut from the fat tail sheep procedure.

Conflict of interest: None.

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