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## PRODUCTION OF PROGESTERONE IMPLANTS TO MASS ESTRUS SYNCHRONIZATION AND OPTIMIZATION LEVELS PREGNANCY ON FAT TAILED SHEEP OF STRAINS SAPUDI MADURA ISLAND

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### ABSTRACT

Short-term goal of this research was to find a method of determining the design model of plastic progesterone implants, while the long-term goal was to support programs for improving the genetic quality of sheep and increase productivity through estrus induction technology and treatment of infertility without waiting for the occurrence of natural estrus. Methods of investigation were carried out on experimental animals as many as 20 healthy, non pregnant, adult female of sheep in a state of lust. Experimental design used was completely randomized design which is divided into four treatment groups. Each group consisted of 5 sheep. Data were analyzed by Analysis of Variance and followed with the least significant difference test. The groups consisted of P0 as a control group receiving injections of 7 mg PGF<sub>2</sub> $\alpha$ , P1 group received 50 mg progesterone, P2 60 mg, and P3 70 mg. Subsequent diagnosis of estrus was performed start from day 11 then observed in the onset of symptoms estrus and thus to artificial insemination performed. Pregnancy examinations performed 30 days after artificial insemination by ultrasound and blood serum progesterone levels. The results showed that the administration of PGF<sub>2</sub> $\alpha$  and plastic implant had effect on time of estrus onset. On examination progesterone levels after 30 days after artificial insemination, progesterone levels are highest in the P2 treatment (60 mg), but not significantly different from the P3 treatment (70 mg dose). While P3 treatment was not significantly different with P1 treatment (dose of 50 m). Low progesterone levels occur in treatment P0 is significantly different from other treatments. For pregnancy test results indicate that all Fat Tailed Sheep experienced pregnancy, either by ultrasound or blood serum progesterone levels..

**Key words:** progesterone implants, PGF<sub>2</sub> $\alpha$ , estrus, pregnancy

### 1. INTRODUCTION

An increase in the quality of fat-tailed sheep strains Sapudi Madura island in East Java is one of the main aspects in the development of plasma nuffah original farms in Indonesia. Some cutting-edge technologies are applied, has been used to improve the reproductive efficiency of livestock is: estrus induction, infertility treatment, artificial insemination, snapping lust and super ovulation and embryo transfer.

In addition to the low population, livestock production in Indonesia, particularly sheep tail fat is often a problem of reproductive disorders and livestock management factors such as: frequent occurrence of repeated mating estrus followed by waiting for the next 21 days, the incidence of estrus calm and postnatal infections, internal calving over 6 months, pregnancy and birth rates are low, often found using a stud for natural mating, artificial insemination is only done when there is a natural desire, and technology estrus induction and synchronization of estrus has not performed optimally and fat-tailed sheep business conducted livestock farmers in Java east is still in early stages of developing that particular breed seems to be the treatment of reproductive management by providing the correct approach between paramedics, engineers reproduction, inseminator and ranchers (3).

To improve reproductive efficiency and increased population, it is necessary treatment of reproductive disorders, bullying efforts lust combined with IB. The use of hormonal preparations, especially progesterone implant implants for the purpose of reproduction repairs done in the field one is for induction of estrus.

Mechanical induction of estrus synchronization or snapping estrus or estrus when done simultaneously in a cattle population in an effort to obtain lust using PGF<sub>2</sub> $\alpha$  and progesterone hormone (8; 2).

Currently on the market preparation is Progesterone Release intravaginal progesterone device (PRID), Control of Internal Drug Release (CIDR) and implant Synchronate B (12). PRID is a hormone progesterone the tool spiral CIDR came from France and New Zealand the use of which is stored in the vagina of cattle containing 1.55 g progesterone contained in the silicon surface in a capsule containing 10 mg of estradiol and appearance benzoas real results will be seen 12 days of storage in the vagina. Currently PGF2 $\alpha$  recommended for use after 7 days stored and removed from the vagina on day 7 to ensure the synchronization of estrus (12).

The use of the hormone progesterone group by pasting into intravaginal sponge conducted for 10-14 days in sheep and goats produce lower conception rate when mated to the appearance of the first estrus, when done at the next estrus period will get a high conception rates (9). For that we need to do research on estrus induction using progesterone implant implants combined with artificial insemination in sheep, as a substitute for imported drugs such PIRD progesterone, CIDR and Synchronate B, in addition to rare harganyapun quite expensive.

## 2. MATERIALS AND METHODS

It takes as many as 20 sheep tail fat females give birth and have certainly never more than 1 year of age who were randomly divided into four groups with each treatment get 5 replications and last after artificial insemination (revocation of progesterone implants implant day 11) and about the 13th day will happen next lust artificial insemination. Pregnancy examinations performed on day 30 after artificial insemination with RIA method and combined with ultrasound.

The treatment of P0 (control): sheep given PGF2 $\alpha$  injection of 7 mg IM, P1: sheep given a subcutaneous implant of 50 mg of progesterone implants, P2: sheep given subcutaneous implants of 60 mg of progesterone implants, P3: sheep given subcutaneous implant of 70 mg of progesterone implants.

Blood serum progesterone levels were analyzed by Radio Immuno Assay (RIA) using a solid phase radioactive atoms 125i as marked. Propylene tubes measuring 70 x 12 mm which has been coated with antibodies progesterone in them according to the protocol used in the examination made. Binding (NBS) respectively without antibody, binding or binding maximum (MB / B<sub>0</sub>), a standard or calibrator 0-20 mg at high levels of quality control (Qc-h). Low levels of quality control (Qc-1), the sample to be measured and re-filled with Qc-h tube. Qc-1 and MB (5).

Further (5) states that all checks are made to duplicate tubes into the tube that has been labeled according to the protocol given all checks made with duplicate tubes into the tube that has been labeled with the appropriate given the standard protocol. Blood serum samples and quality control of each of 100 ml with scale 10-100 mL pipette (Eppendorf Varipette 4710). Furthermore, in 1000 mL of tracer solution 125I-P-4 inserted into the tube using a pipette examination scale 100-1000 mL (Eppendorf Repeater 4780).

After mixing for 5 to 10 seconds on an electric shaker (Ika-Werk VF2) then all the checks were left at room temperature a minimum of three hours. After this time missed all the liquid in the tube inspection surface disposed of by turning the tube into the storage of radioactive waste. Further examination of the tubes were left upside down on blotting paper for 5 minutes to allow the free tracer out of the tube inspection. Calibration is done by inserting the hormone levels of each tube for one minute in a gamma-counter (type Miniassay 6-20. Mini-Instrument) (5). Ultrasound (USG) for pregnancy diagnosis used is Korean ex sonovet type 1324 with VGA monitor capability the probe display intercutan in sheep.

The research design used was a completely randomized design and data analysis performed using quantitative and qualitative analysis proportionally. Several kinds of data analysis that will be used are: Analysis of variance (ANOVA) and Test Honestly Significant Difference (HSD) (10).

## 3. RESULTS AND DISCUSSION

### Estrus Symptoms

The decrease in progesterone levels until reaching the lowest levels in the blood, can stimulate the release of LH from the anterior pituitary. The presence of LH secretion from the positive feedback of estrogen can occur ovulation (Hafez, 1993). Further, he said when ovulation has occurred, LH levels will decline rapidly to the lowest levels in the blood. Decreased LH will be followed by a gradual increase in the production of FSH and FSH needed to stimulate follicle growth. According (7) growing follicles enhances estrogen levels in the blood, the uterine prostaglandins produced in the absence of fertilization. Furthermore, prostaglandins will cause regression of the corpus luteum and progesterone production declined sharply and estrogen dominant cause lust for reproduction.

On the absorption of subcutaneously administered MPA will run slowly because of the gelatin Croda, so that on the 11th day of the hormone progesterone in the blood with high levels. According to (2) that high progesterone causes the uterus quiet. Therefore, when progesterone implant implants removed there will be a drastic drop in progesterone which will be followed by a contraction of the uterus due to the production of prostaglandins.

Sexual arousal caused by the injection of PGF2 $\alpha$  caused by the ability of PGF2 $\alpha$  to meluteolisiskan venokonstriksi corpus luteum by hypoxia, resulting in the production of progesterone decreases sharply and finally dominated by the hormone estrogen in the reproductive organs so there is lust (4).

Marriages are performed after injecting Fat Tailed Sheep (DEG) showed symptoms of estrus. Statistical analysis estrus onset time (hours) after the revocation of progesterone implants implant can be seen in table 1. Mating injection is done by the DEG DEG vaginal opening with the help of a tool called a speculum, then the

sperm is inserted with the help of gun. To determine the success of the pregnancy 30 days after mating injection performed with ultrasound examination and examination of blood serum progesterone levels of DEG.

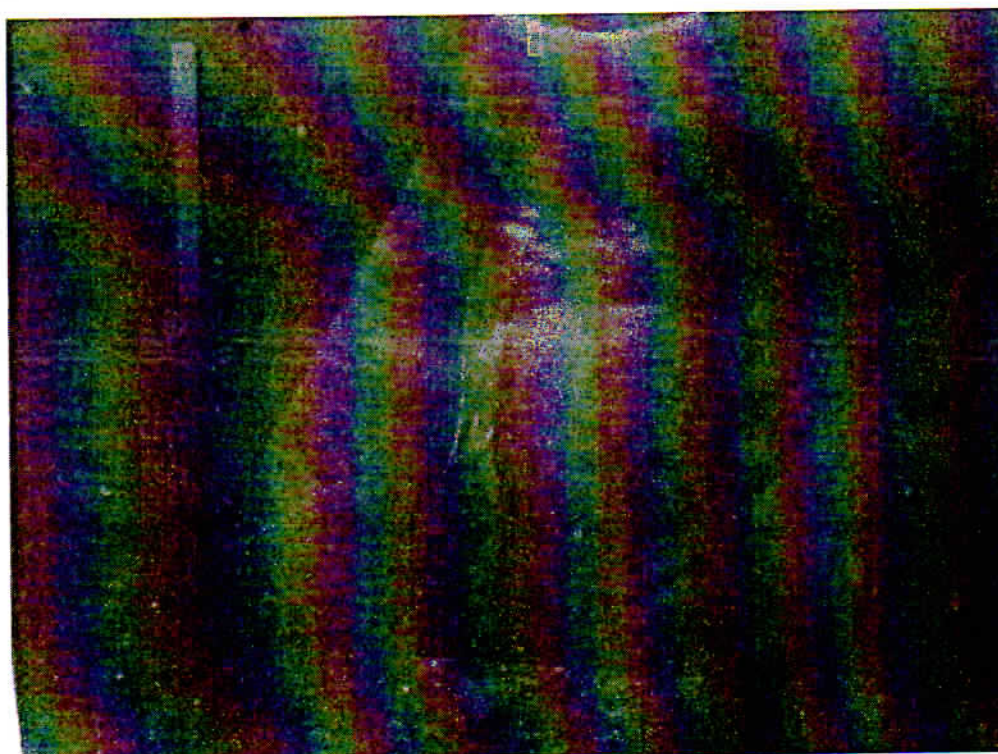
**Table 1.** Time onset of estrus symptoms after progesterone implant revocation on Fat Tailed Sheep of strains Sapudi Madura island

Treatment Group	Time (hours)
P0 (PGF2 $\alpha$ 7 mg)	53,20 <sup>a</sup> $\pm$ 0,8367
P1 (50 mg progesterone in implant)	48,40 <sup>b</sup> $\pm$ 1,1402
P2 (60 mg progesterone in implant)	48,60 <sup>b</sup> $\pm$ 0,8944
P3 (70 mg progesterone in implant)	48,60 <sup>b</sup> $\pm$ 1,3416

Based on the results of the statistical analysis above that the whole group Fat Tailed Sheep Strains Sapudi Madura Island to experience pleasure, but in the control group (P0) the occurrence of symptoms of estrus is delayed when compared with that getting implants implant treatment progesterone (P1, P2, P3). While getting treatment between the various doses of progesterone (P1, P2, P3) there is no real difference. So the use of progesterone with the smallest dose (50 mg) in P1 still produce symptoms of estrus was also good as the P3 with the largest dose of progesterone (70 mg).

#### Gestation Examination with Ultrasound and Blood Progesterone Levels

With this synchronization system, gestation herd DEG will be relatively the same, so it is the same physiological phase. Therefore, care during pregnancy become easier because of the needs of both the quality and quantity of feed between individual animals that are relatively similar to one another. During pregnancy, uterine growth and development is affected by increased concentrations of progesterone and estradiol (1). These hormones act to stimulate the growth and development of the mammary gland in order to prepare food sources (milk production) for the child to be born (11). Results of pregnancy with ultrasound examination showed that 20 DEG tails given various treatments experienced bunting everything (as shown picture in figure 1).



**Fig. 1.** Results of ultrasound Fat Tailed Sheep experiencing pregnancy

Furthermore, based on examination of blood progesterone were taken 30 days after mating injection showed that the average levels of progesterone in the blood DEG including bunting category. Results of statistical analysis of test results of the study of blood serum levels of progesterone strains Fat Tailed Sheep Sapudi Madura island can be seen in the following table 2 below.

**Table 2.** Blood progesterone levels of Fat Tailed Sheep strains Sapudi Madura island

Treatment Group	Progesterone Levels (ng/ml)
P0 (PGF2 $\alpha$ 7 mg)	3,06 <sup>a</sup> $\pm$ 0,06442
P1 (50 mg progesterone in implant)	3,18 <sup>b</sup> $\pm$ 0,08093
P2 (60 mg progesterone in implant)	3,31 <sup>c</sup> $\pm$ 0,05701
P3 (70 mg progesterone in implant)	3,27 <sup>bc</sup> $\pm$ 0,05523

Based on statistical analysis using Analysis of Variance, in this study showed a significant difference between the treatment of the results of progesterone levels after 30 days after artificial insemination performed. Progesterone levels are highest in the P2 treatment (60 mg), but not significantly different from the P3 treatment (70 mg). While P3 treatment was not significantly different with P1 treatment (50 mg). Low progesterone levels occur in treatment P0 is significantly different from other treatments.

Based on the results in table 2 show that progesterone levels are already high despite the significant differences between treatments. This is logical because the Fat Tailed Sheep in pregnant condition. The condition in line with the opinion (6), which states that the blood serum progesterone levels in pregnant condition of more than 2 ng / ml.

#### 4. CONCLUSION

Based on the results it can be concluded that:

1. Time onset of symptoms in the use of PGF2 $\alpha$  last slower when compared with the use of progesterone implants implant.
2. The use of progesterone and PGF2 $\alpha$  implants implant effective in the induction and synchronization of estrus good and can provide optimal pregnancy outcomes in Fat Tailed Sheep strains Sapudi island of Madura.
3. The dose of 50 mg of progesterone (MPA) in the form of progesterone implant implants have been effective to induce estrus and pregnancy success Fat Tailed Sheep strains Sapudi Madura island, so the dose is the most efficient dose treatment compared with the other doses.

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