

Conference Paper

Artificial Insemination on the Etawah Grade Goats Using Frozen Semen of Gembrong Goat

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Abstract

One of the efforts to conserve Gembrong Goats is through a crossbreeding with Etawah Grade Goats uses the artificial insemination (AI). This aim of the study was to find the result of AI using the frozen semen of Gembrong Goat on the Etawa Grade does. Eight heads selected Etawah Grade does age above 4 yr, weighted 32 kg to 57 kg and BCS 3–4 were estrous synchronized using 0.5 mL pgf2 α hormone (lutelyze[®]) injected in intramuscular. The estrous observation was done during 60 h after synchronized by the histology epithelial cells of the vagina and the visual sign of estrous. AI was conducted after the onset of estrous through intravaginal. Gestation determined by transrectal ultrasonography (USG) on 50 d after AI. Descriptive analysis was applied in the study. Sperm quality of the frozen semen shows that a good condition with motility and viability is 80 % and 85 %. All Etawah Grade does show the onset of estrous based visual signs, such as agitated, flicked the tail, the vulva was swelling, reddish and slimy. The observations of epithelial cells of the vagina to the characterized phase of estrous cycles. The result of the AI was not showed gestation after USG test, maybe caused by inseminator skills.

Keywords: Artificial insemination, Estrous synchronization, *Etawah* grade goat, Frozen semen, *Gembrong* goat.

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Received: 10 November 2018

Accepted: 6 January 2019

Published: 10 March 2019

Publishing services provided by Knowledge E

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Selection and Peer-review under the responsibility of the UASC Life Sciences 2016 Conference Committee.

1. Introduction

The various goat breed raised by Indonesian traditional farmers with the level of the spread of widespread in the whole of Indonesia. Pamungkas [1], stated that there are 13 the goat across Indonesia and the present condition showed that some of the Indonesia local goats have steadily decreased and endangered, one of them is a Gembrong Goat. Based on the report the World Watch List for Domestic to Animal, in 1997 a population

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of Gembrong Goat as many as 100 heads [2], while the population is not currently more than 50 heads [3, 4].

One of the efforts to rescue and conserve Gembrong Goats is crossbreeding with another goat breed, likely Etawah Grade (EG) for maintaining existence Gembrong Goats through the offsprings, result of the grading-up with Etawah Grade Goats [4, 5]. Etawah Grade does be chosen as acceptor because it is the most dominant local goat in Indonesia and have a good productivity. In this case, expected from the crossbreeding program was obtained a new breed that has the relationship or blood composition approaching Gembrong Goat with high productivity, and so that it will develop widely.

The Crossbreeding program through artificial insemination (AI) can be used as one of the activities ex-situ conservation and selection program to the improvement of the genetic quality [6]. The level of gestation by AI program on goats in Indonesia was variated greatly, it can reach up to 78 % [7]. This aim of the study was to find the result of AI using the frozen semen of Gembrong Goats on the Etawa Grade does.

2. Material and Methods

This research was conducted for 4 mo (March 2016 to June 2016) at the Faculty of Animal Science, UGM. Eight heads Etawah Grade does was selected, i.e. four heads with black and white hair color (HP) and four heads with brown and white hair color (CP). Etawa Grade does age above 4 yr, with the range of weight 32 kg to 57 kg and body conditioning score (BCS) 3 till 4 (five scales). The goats were individually pen (0.75 m × 1.5 m). The basal feed was consisted an elephant grass chopping and concentrate feed (Nutrivit®), the feed was given 3.5 % on dry mater (DM) based, twice daily at 08.00 am and 03.00 pm. the water was given adlibitum.

All of the Etawah Grade does be estrous synchronized using 0.5 mL prostaglandin $f2\alpha$ hormone (lutelyze®) that injected once in intramuscular. The estrous observation was done during 60 h after synchronized by the histology epithelial cells of the vagina and the visual sign of estruos such as behavior and vulva condition. AI was conducted after the onset of estruos through intravaginal used the frozen semen of Gembrong Goat which produced by Centre of Artificial Insemination Bureau (*Balai Besar Inseminasi Buatan*) Singosari, East Java, Indonesia. Spermatozoa quality of frozen semen of Gembrong Goat evaluated in a microscopically before it was used. Gestation determined by transrectal ultrasonography (Honda Electronics Toyohashi Aichi Japan) on 50 d after AI. Descriptive analysis was applied in the study.

3. Result and Discussion

The frozen semen of Gembrong Goat was evaluated by microscopically to find out the motility and viability. The result of the spermatozoa motility is 80 %, with the criteria that the mass movement of spermatozoa is still very active and fast towards the front, the little sperms that are not moving (dead). The result of the spermatozoa viability is 85 %. The results showed that spermatozoa in the frozen semen of Gembrong Goat which used in the program were good condition and quality to applied. Bintara [4] reported that the motility and viability of spermatozoa Gembrong Goat was extended with three different kinds of extender in East Java (the raw material of frozen semen was produced by Centre of Artificial Insemination Bureau Singosari) are 82 % till 89 % and 88 % till 92 %.

The estrous observation was done for 60 h (+12 h, +24 h, +48 h, and +60 h) after estrous synchronized to find out about response and successful. Observations on the epithelial cells of the vagina is a simple method can be used to characterize the phase of estrous cycles in livestock based on the form and characteristics of the cell. The epithelial cells of the vagina categorized into three types, that are parabasal, intermediate and superficial cells [8]. The estrous phase-based observation of the histology epithelial cells of the vagina of the Etawah Grade does in the research is shown in Table 1.

TABLE 1: Estrous phase based observation of the histology epithelial cells of the vagina of the Etawah Grade does be estrous synchronized using pgf2 α hormone.

Number of identification	Observation time of estrous phase				
	Before injected	+12 h	+ 24 h	+48 h	+60 h
CP2	diestrus	proestrus	proestrus	estrus	metestrus
CP3	proestrus	proestrus	estrus	metestrus	metestrus
CP4	proestrus	proestrus	estrus	metestrus	metestrus
CP5	diestrus	diestrus	proestrus	estrus	metestrus
HP3	proestrus	proestrus	estrus	metestrus	metestrus
HP4	proestrus	proestrus	proestrus	estrus	metestrus
HP9	proestrus	proestrus	proestrus	estrus	metestrus
HP11	diestrus	diestrus	proestrus	proestrus	metestrus

The phase of estrous cycles cannot be separated from the process of a change that occurs in the epithelial cells of the vagina. Every phase of estrous cycles has a different each of percentage and proportion of the epithelial cells of the vagina. In non-estrous phase, the percentage of the intermediate cells is very dominant, while in estrous phase the superficial cell is greater. Metestrus phase was characterized by the most percentage

an intermediate cells, but if the number of the superficial cells have many, so categorized in proestrus phase. In diestrus phase the percentage of the parabasal cells is dominant. The superficial cells found very much in estrous phase than other cells [9]. The imaging result based on observation of the histology epithelial cells of the vagina of the Etawah Grade does in the research is shown in Fig. 1.

The Etawa Grade does was used in the research indicated the symptoms and signs of estrus very clear based on visual observation. The visual observation was done with behavior and vulva condition of the Etawa Grade does. The goats behavior was estrous are agitated, sounded and flicked the tail, while the vulva conditions as the estrous signs that is happened swelling, reddish colored and slimy (produce the mucus or a clear liquid). The percentage of Etawa Grade does be estrous synchronized has the onset of estrous is equal to 100 %. This result indicates that 0.5 mL PGF2 α hormones injection in intramuscular be effective to estrous synchronization on the goats.

Artificial Insemination was conducted 12 h to 20 h after the the onset of estrous [10]. Artificial insemination was done with the intravaginal method, where the deposition of spermatozoa directly into parts of the vagina using insemination gun and speculum who had been lubricated vaseline gell. In general, the methods of goats AI both intravaginal and intracervix easier carry out compared with intrauterine, that requires expertise and equipment specifically [11]. The does position with the conditions of hind legs appointed in order to facilitate the AI process.

The result of the AI program can be seen based the number of does pregnant, gestations of does carry out using ultrasonography (USG) with the transrectal method on the 50 d after inseminated. The implementation of transrectal ultrasonography had been by entering the probe into the rectum of goats to see the uterus conditions, probe first lubricated using vaseline gel. The gestation number of Etawah Grade does after USG test is 0 or not occurring gestation. Gestation was not obtained on this AI program, caused technical factor likely inseminator skills. The inseminator is key factor and very determine the successful of AI program for goat because the implementation of the AI program for goat is required the special skill and commonly different from artificial insemination in cattle and buffalo.

The application of AI for goat in Indonesia still insecurity pilot project and research. The results of the study [7], reported that the application of AI through intrauterine with and without estrous synchronization on the Etawa Grade Goat, Kacang Goat, and BoerKa Goat was produced the percentage of successful in the first and second insemination (re-insemination) is 77.78 % and 78.33 % respectively and the S/C is 2.13, so the AI for the goat is feasible to do with the purpose of a crossbreeding. The main problems in

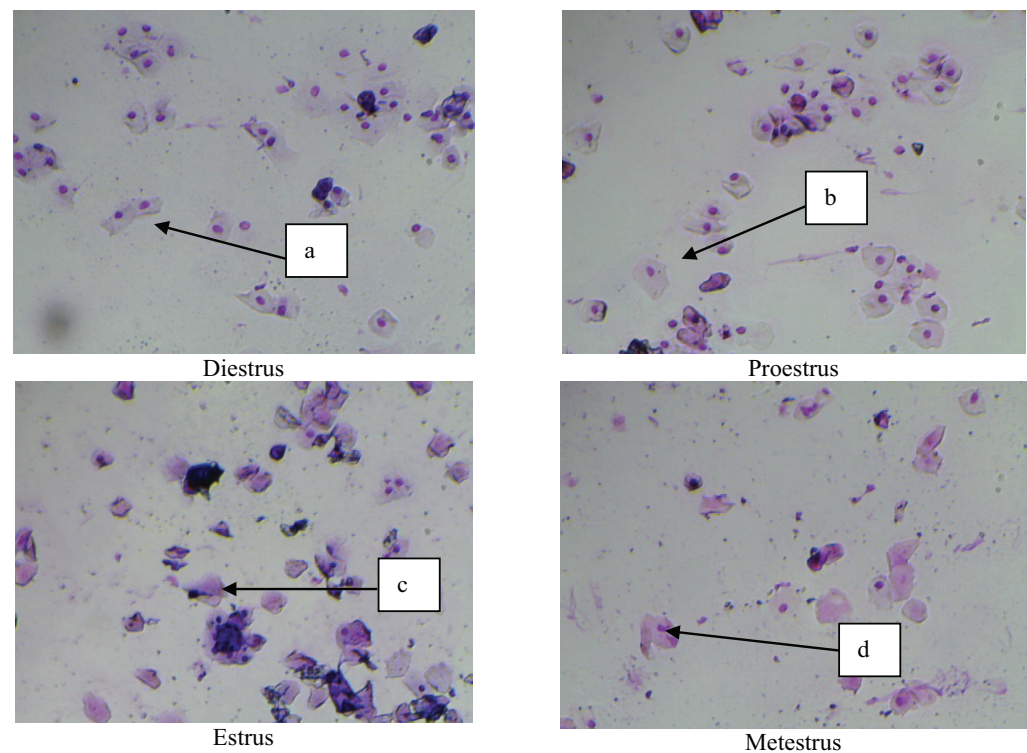


Figure 1: The phase of estrous cycles based imaging of the histology epithelial cells of the vagina of the Etawah Grade does be estrous synchronized using $pgf2\alpha$ hormone, (a) Parabasal cell, (b) Intermediate cell with many nuclei, (c). Superficial cell, and (d) Intermediate cell with few nuclei.

application of AI technology, are (i) the quality of frozen semen is low, (ii) the reproduction performance of does as an aseptor is varied, (iii) a technique and time of insemination is not right, and (iv) ineffective breeding management, especially reproduction management [12].

4. Conclusions

Artificial insemination program on the Etawah Grade does use frozen semen of Gembrong Goat was not produced gestation, although the frozen semen of Gembrong Goat has a good quality to applied AI and the response of estrous synchronization on the Etawah Grade does show 100 %.

Acknowledgments

The study was supported by the grant from Ministry of Research, Technology and Higher Education of Indonesia in PMDSU (Master Program of Education Leading to Doctoral Degree for Excellent Graduates) program scheme with contract no. 4588/UN1-P.III/LT/DIT-LIT/2016.

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