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The Effect of Purwoceng Extract on the Etawa Crossbreed Bucks Mating

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Authors' contributions

This work was carried out in collaboration among all authors. Author SAS designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author IAY managed the analyses of the study. Author ABWN managed the literature searches. All authors read and approved the final manuscript.

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Original Research Article

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ABSTRACT

Aims: This research aims to determine the effect of purwoceng extract on Etawa crossbreed bucks
Study Design: Completely randomized non-factorial design with 4 treatments given to bucks (ethawa crossbreeds), namely Purwoceng (*Pimpinella alpina* KDS or *Pimpinella pruatjan* Molk.) extract
Place and Duration of Study: Ikhsan Farm, Sei Glugur Village, Pancur Batu District, Indonesia, between December 2023 and March 2024.
Methodology: The research was carried out by administering various doses of purwoceng extract to Etawa crossbreed bucks and then observing mating with Etawa crossbreed doe. The treatment given was administration of purwoceng extract in amounts P0 (0 mg), P1 (400 mg), P2 (800 mg), and P3 (1400 mg). The research parameters were the frequency of mounting does, the frequency of penetration, the number of doe mounted and the number of doe penetrated.
Results: There was an increase in the values of all parameters. The lowest frequency of mounting doe is P0, namely 17 and the highest is P3, namely 32. The lowest frequency of penetration is P0,

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namely 12 and the highest is 20. The lowest number of doe mounted is P0 and P1, namely 5 and the highest is P3, namely 7. The lowest number of doe penetrations is P0 and P1 are 5 and the highest are P2 and P3, namely 6.
Conclusion: The best treatment is the addition of 800 mg of purwoceng extract (P2), Because the highest number of penetrating doe has the same value between P2 and P3, it will be more efficient if the treatment used is P2.

Keywords: Buck; etawa crossbreed; mating; purwoceng extract; crossbreed bucks mating; crossbreed goat.

1. INTRODUCTION

The Etawa crossbreed goat is a improved dual purpose goat breed that has adapted well to environmental conditions in Indonesia [1]. However, until now the distribution of the Etawa crossbreed goat is still very limited with a total population of around 14 million heads, spread unevenly throughout Indonesia and only 57% of the population is on the islands of Java and Madura. The Etawa crossbreed goat as a dual-purpose type of goat has a low level of productivity. Therefore, efforts to increase productivity need to be made, one of which is an approach to improving the management of raising mother and kid goats so that the child mortality rate can be reduced [2].

Etawa crossbreed goats are the result of a cross between Etawah goats from India and Kacang goats which are 50% taller than Etawah goats. The Etawa crossbreed goat has potential to be developed as a provider of meat and milk. Etawa crossbreed goats crossed with local goats have productivity and several superior characteristics, namely being easy to adapt to tropical environments [3]. Productivity is the ability of goats to produce production for each specified period, including litter size, weaning weight, service per conception, age at first mating, kidding interval, days open [4].

To improve good reproductive performance, a quality plant is needed that can help reproduction in mating male goats (etawa breeds), namely the purwoceng plant. Purwoceng (*Pimpinella alpina KDS or Pimpinella pruatjan Molk.*) is a medicinal plant native to Indonesia that lives endemically in the highlands. This plant is often found in mountainous areas such as the Dieng Plateau and Mount Lawu in Central Java, Mount Pangrango and Mount Galunggung in West Java, as well as in the Tengger and Iyang Mountains in East Java. The plant has medicinal properties as an aphrodisiac, diuretic and tonic [5].

It is hoped that giving purwoceng extract to mating buck goats will have an effect on satisfactory results from the purwoceng plant. This activity is initial research because purwoceng extract has never been applied in other research related to buck goat mating. Based on the background above, researchers are interested in conducting research related to the administration of purwoceng extract on the mating of buck (etawa crossbreeds).

2. MATERIALS AND METHODS

The research was carried out by administering various doses of purwoceng extract to bucks (etawa crossbreed) and then observing mating with does (etawa crossbreeds). The treatment given was administration of purwoceng extract in amounts P0 (0 mg), P1 (400 mg), P2 (800 mg), and P3 (1400 mg). Purwoceng extract is given orally to bucks. The research parameters were the frequency of mounting doe, the frequency of penetration, the number of doe mounted and the number of doe penetrated. Observations were made one week after the buck was given purwoceng extract.

The method used in this research was a non-factorial Completely Randomized Design method with 4 treatments given to bucks (etawa crossbreeds), namely Purwoceng plant extract. The livestock samples were selected using purposive sampling, namely Etawa crossbreed goats whose reproduction was not disturbed. The materials used in this research were 5 bucks and 50 does Etawa crossbreed that had given birth at least twice. Etawa crossbreed goats are at least 10-12 months old and their weight has reached 55-60 kg.

3. RESULTS AND DISCUSSION

The research that was carried out showed that Etawa crossbreed buck were not given a dose of purwoceng. From the results of this table, there were 5 bucks and 50 does used for research on

Table 1. Recapitulation of Research Results

Treatment	Parameter			
	frequency of mounting doe (times)	frequency of penetration (times)	the number of doe mounted (does)	The number of doe penetrated (does)
P0	17±1.24	12±0.92	5±0.00	5±0.00
P1	22±1.34	16±1.23	5±0.00	5±0.00
P2	24±1.71	18±1.54	6±0.00	6±0.00
P3	32±1.56	20±1.61	7±0.00	6±0.00

Note: Different superscripts on the column show very significant differences (P <0.01)

the mating of Etawa crossbreed bucks. Judging from the research results, there are several differences between the 5 bucks in the frequency of mounting doe, the frequency of penetration, the number of doe mounted and the number of doe penetrated.

Based on the Table 1, at P0 to P3 there is a change in each parameter observed. From the frequency of mounting does, the number of mating ejaculations and bucks being able to mount does increased from P0 to P3. The increase in the observed parameters was due to the administration of purwoceng extract to Etawa crossbreed bucks.

Purwoceng (Pimpinella alpina Molk) is one of Indonesia's medicinal plants which can only be found endemically in the Dieng plateau, Wonosobo, Central Java. Taxonomically, this plant belongs to the Apiaceae family of the genus Pimpinella, several other species are P. anissum, P. Saxifraga, P. thellungiana, P. villosa, and others. This plant from the Apiaceae family has biological activity as antimalarial, antimicrobial, antifungal and antioxidant [6].

Purwoceng (Pimpinelle alpine Molk) is a herbal plant from the genus Apiaceae which is famous for its stamina-enhancing properties. Purwaceng is a native Indonesian plant that lives in mountainous areas such as Dieng, Central Java. The root of the purwaceng plant is a taproot that enlarges to form a tuber-like structure in the ginseng plant with a smaller size and a brownish white color. The stem of tanawan purwaceng is a pseudostem that is round and soft with a pale green color. The base of the stalk of this purwaceng plant is brownish red and some are greenish red. The leaves of the purwaceng plant are compound leaves in pairs and face each other to form a heart with a length of ± 3 cm and a width of 2.5 cm. The flowers of the purwaceng plant are umbrella-shaped compound flowers with cylindrical stems and are ± 2 cm long [7].

Based on its genetic erosion status, the purwoceng plant can be grouped into the endangered or endangered category. This crisis is mainly caused by excessive exploitation without being balanced by conservation efforts. Most traditional medicine (jamu) companies take or harvest purwoceng plant material directly from their habitat without rejuvenation efforts. Considering that the main ingredient of the plant being harvested is the root, the act of harvesting automatically damages the plant as a whole. This crisis is also caused by the destruction of conservation forests which are the purwoceng's natural habitat. Apart from that, the crisis is also caused by the scarcity of purwoceng cultivation at the farmer level due to theft related to the high price of this commodity. Another obstacle is the high price of seeds which can reach Rp. 4,000-Rp. 10,000 per stem, even the price of seeds can reach millions of rupiah per ounce [8].

Purwoceng is widely used as a herbal medicine which is useful in increasing stamina and increasing the vitality of adult men. The ingredients in this plant include aphrodisiac substances which contain derivative compounds such as saponins, alkaloids, tannins and other compounds which have the effect of strengthening the body and improving blood circulation [9]. Because of this, purwoceng can also be used as a medicine or potion to increase or increase stamina. The aphrodisiac substance in the purwoceng plant is the focus of research because it is this substance that causes increased sexual desire in adult men. After research, the roots of the purwoceng plant actually contain derivatives of sterol, saponin and alkaloid compounds.

Etawa crossbreed goats are the result of a cross between Etawah goats from India and Kacang goats which are 50% taller than Etawah goats. PE goats have potential to be developed as meat and milk providers [10]. PE goats crossed with local goats have productivity and several

superior characteristics, namely they are easy to adapt to tropical environments. Productivity is the ability of goats to produce production from each specified period, including litter size, weaning weight, service per conception, age at first mating, kidding interval, empty period [11].

In terms of benefits, this livestock is classified as dual-purpose livestock which is capable of producing main products in the form of milk and meat for use by humans. Etawa crossbreed goats can produce milk ranging from 0.5-1 liter/day/cow at a price of IDR. 25,000.00/liter [10]. The specialty of goat's milk compared to cow's milk is that it has many benefits, including curing various kinds of asthma, hepatitis, tuberculosis, anemia, muscle and stomach problems. Apart from that, goat's milk also contains complete nutrients that humans need for growth and development, such as fat, lactose, protein and minerals. The characteristics of livestock can be seen from the inside (Internal) and outside (External) which are expressed by genetic expression and the environment. Genetic contributions contribute 30% and the environment which includes management in the maintenance process is 70% [12].

The type of birth influences the pre-weaning body weight of Etawa crossbreed goats, where Etawa crossbreed goats born single have a higher body weight than Etawa crossbreed goats born twins. Apart from the type of birth, the gender of the goat is known to influence weaning weight. The weaning weight of buck Etawa crossbreed goats is 11.7 ± 1.83 kg and 11.5 ± 2.18 kg for doe Etawa crossbreed goats. Other information states that the weaning weight of doe Etawa crossbreed goats is 8.30 kg and males are 9.50 kg. Weaning weight at 90 days of age for buck Etawa crossbreed goats (18.15 kg) is higher than for does (14.53 kg [13].

Mating in goats is carried out to continue the offspring and/or to produce better offspring according to expectations both in quantity and quality. Mating does that are in heat should be mixed with bucks in one cage and the right time to mate goats is 12-18 hours after the first heat. Sexual maturity in buck is at the age of 8 months, while in doe it is at the age of 15 months. For this reason, does can begin to be bred for the first time starting at the age of 15 months. Meanwhile, the ideal buck to mate as livestock is after reaching the age of over 12 months [11].

Providing herbal extracts can improve sperm quality in bucks [14]. The quality of feed ingredients, especially forage, must be in accordance with the reproductive needs of bucks [15]. Nutritional during estrus also need to be considered so that they are not disturbed [16]. This will affect the farmer's profits [17]. The sperm quality of bucks will increase if they are given herbal extracts at the right dose [18].

4. CONCLUSION

The best treatment is the addition of 800 mg of purwoceng extract (P2), because the highest number of penetrating does has the same value between P2 and P3, it will be more efficient if the treatment used is P2.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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