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Prevalence of Helminthiasis in Etawa Crossbreed Goat in Kalipuro Sub-District Banyuwangi Regency

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Abstract

Etawa crossbreed goat are meat and milk-producing livestock that can adapt to the climate in Indonesia. The barriers to raising goats include the problem of disease which is a direct influence on livestock life. This study aims to determine the prevalence of helminthiasis in Etawa Crossbreed Goat in Kalipuro District, Banyuwangi Regency. The study conducted in January until February 2019 using 100 fecal samples. The samples examination in was performed the laboratory of Instrument Airlangga University PSDKU in Banyuwangi Prodi of Veterinary Medicine, using native, sedimentation and floatation methods. Data obtained from this study presented descriptively and analyzed by Chi-Square test. Based on examination results, prevalence of helminthiasis in Etawa Crossbreed Goat was 43 %, which is dominately by *Moniezia spp*. (17%), *Haemonchus spp*. (15%), *Trichuris spp*. (9%), *Strongyloides spp*. (7%), *Trichostrongylus spp*. (7%). Furthermore, it suggested that anthelmintic and inspection of helminthiasis in those area given periodically and continuously.

Keywords: Banyuwangi, Etawa Crossbreed, Goat, Helminthiasis, Prevalence

Introduction

Etawa Crossbreed Goats are meat and milk-producing livestock that can adapt to the climate in Indonesia (Sodiq and Abidin, 2007). Its maintenance and cultivation are easy, it does not require large land so it can be used as a side business for the family (Setiawan, 2002). Barriers to raising goats include disease problems that directly affect livestock life. In several countries in the world, parasitic infection is one of the biggest causes of disease, so it must be controlled (Vercruysse and Claerebout, 2001). Helminthiasis is a big problem for livestock. The types of worms that often infect are from the Trematoda, Cestoda and Nematoda classes (Raza *et al*., 2012) Kalipuro District is one of the sub-districts in Banyuwangi Regency which has a large population of goats. The total number of goats in Kalipuro District according to the Banyuwangi Regency Agriculture Service in 2017 was 13,300 heads (Banyuwangi Regency BPS, 2018). Until now there has been no research on the incidence of helminthiasis in Etawa crossbreeds in Kalipuro District, Banyuwangi Regency.

The incidence or prevalence of helminthiasis in the city of Padang, West Sumatra reaches 64% (Yufa *et al*., 2018). While in Boer goat farms in Banyumas Regency it is 93.33% (Indradji *et al*., 2018). According to Azlan *et al*., (2018) the prevalence of helminthiasis reached 97.36% in two goat farms in Kuala Trengganu, Malaysia. The prevalence of helminthiasis in goats in South Punjab, Pakistan reached 52% (Ayaz, 2013) while according to Dagnachew (2011) the prevalence of helminthiasis in the northern zone of Gondar, Northwest Ethiopia from November-January 2008 reached 55%. Direct losses caused by helminthiasis are acute illness and death, while indirect losses include reduced production potential such as decreased growth and weight loss (Swai *et al*., 2006). Athar *et al*., (2011) stated that the economic loss due to gastrointestinal parasites was US$ 0.47/head/day and Kothalawala *et al*., (2007) reported that in Sri Lanka the loss reached 230 million Rupees per year. Meanwhile, according to Charlier *et al*., (2008) global economic losses due to liver fluke infection in livestock estimated at 36 billion rupiah per year. Losses due to worm infestation according to the Directorate General of Livestock (2010) reach 4 billion rupiah per year and are a disease that can affect productivity, decreased production power even in severe infections can

cause digestive disorders to stunted growth of the animal itself. Another effect caused is weight loss due to diarhea.

The incidence of helminthiasis is closely related to environmental conditions, hosts and disease agents or the worm itself, therefore based on the above background, it is necessary to conduct research on the prevalence of helminthiasis in Etawa crossbreed goats in Kalipuro District, Banyuwangi Regency.

Research Methods

The study of the prevalence of helminthiasis in Etawa crossbreeds through examination of feces in Kalipuro District, Banyuwangi Regency, used a survey-type research design and a cross-sectional study design, the data obtained were presented descriptively. Samples that have been examined and found worm eggs are declared positive, if no worm eggs are found, they are declared negative. The data obtained in the form of positive or negative results of worm infection based on age and sex were then analyzed using the chi square test (X2) with the IBM SPSS 24 application.

The sample used was Etawa crossbreed goat feces taken by random sampling. The quantity is calculated using the following formula (Selvin, 2004; Darmin *et al*., 2016).

$$\boldsymbol{n = \frac{4P(1-P)}{L^2} = \frac{4(0,5)(1-0,5)}{(0,1)^2} = 100}$$

Information: n = The amount of Etawa crossbreed goat feces taken, P = Assumption of the estimated incidence of helminthiasis (50%), L = Error rate (10%).

Results and Discussion

The results of the helminthiasis detection research conducted from January to February 2019, based on laboratory examinations using native, sediment and floating methods on 100 fecal samples consisting of 35 male Etawa crossbreed goat feces samples and 65 female Etawa crossbreed goat feces samples. From 100 samples, 43 positive samples were obtained consisting of 16 males and 27 females, with this the prevalence of helminthiasis in Etawa crossbreeds was 43%. The types of worm eggs that infect come from the classes Nematoda and Cestoda. Types of worm eggs from the class Nematoda were *Haemonchus spp*., *Trichuris spp*., *Trichostrongylus spp*., *Strongyloides spp*. while for the cestodes class the type of worm eggs found was *Moniezia spp*.

Based on the results of the statistical analysis of the chi square test (X2) with the IBM SPSS 24 application, there was no significant relationship between the age difference in the Etawa crossbreed goat and the incidence of helminthiasis because the p value> 0.05 was 0.885. The results of the statistical analysis of the chi square test (X2) with the IBM SPSS 24 application to determine the relationship between gender and the incidence of helminthiasis resulted in a p>0.05, which is 0.687, this means that there is no significant relationship between gender and the incidence of helminthiasis.

The prevalence of helminthiasis in Kalipuro District, Banyuwangi Regency is still not too high when compared to other areas such as the prevalence of worms in Etawa crossbreeds in farmer groups, Gedong Tataan District, Pesawaran Regency, Lampung reached 85.71% (Mulyadi *et al*., 2018). According to the results of research by Purwaningsih *et al*., (2017) in Amban Village, West Manokwari District, Manokwari Regency, West Papua Province, it reached 100%. According to Zalizar (2017) Indonesia's environmental conditions are favorable for parasitic life, therefore livestock in Indonesia cannot be free from parasitic infections. Indonesia's warm and wet tropical climate provides favorable conditions for egg development and larval survival. The worms from the nematode class that infect the most are *Haemonchus spp*. that is as many as 15 samples. This is in accordance with the opinion of Pfukenyi and Mukaratirwa (2013) worms from the nematode class that most often infect ruminants are *Haemonchus spp*. This type of worm has a wide distribution, especially in the tropics. This opinion is reinforced by the statement of Lastuti *et al*., (2006) *Haemonchus spp*. is a pathogenic parasite, its spread and infection rate can reach 80%.

Table 1. Types of Worm Eggs Detected in Stool Samples of Etawa Crossbreed Goats in Kalipuro District, Banyuwangi Regency

Types of worms	Male			Female		
	0-1 year	1-2 year	>2 year	0-1 year	1-2 Year	>2 year
Haemonchus spp.	1	0	0	2	3	3
Moniezia spp.	4	1	0	3	2	3
Strongyloides spp.	1	0	0	0	1	1
Trichuris spp.	2	2	0	0	0	0
Trichostrongylus spp.	0	2	0	0	0	2
Strongyloides spp. + Haemonchus spp.	0	0	0	0	0	1
Haemonchus spp. + Trichostrongylus spp.	0	0	0	1	0	1
Haemonchus spp. + Trichuris spp.	0	0	0	0	1	0
Strongyloides + Moniezia spp.	0	0	0	0	1	0
Moniezia spp. + *Trichuris* spp.	1	1	0	0	1	0
Trichuris spp. + *Haemonchus* spp. + *Strongyloides* spp.	0	0	0	1	0	0
Strongyloides spp. + Trichostrongylus spp. + *Haemonchus* spp.	1	0	0	0	0	0
Total	10	6	0	7	9	11

The next highest infection came from the nematode class, namely *Trichuris* spp., infecting nine samples. *Trichuris* spp. often called whipworm, infection with *Trichuris* spp. not too pathogenic but in large quantities can cause diphtheriatic inflammation of the cecum and diarrhea. The habitat of adult worms is in the large intestine and cecum with eggs such as lemons with a cap at each end, in feces the eggs look brownish yellow (Zajac and Conboy, 2012). The fewest infections of the nematode class are infections of *Trichostrongylus* spp. and *Strongyloides* spp. each infected three samples. Natural infection *Trichostrongylus* spp. are generally chronic and difficult to distinguish from malnutrition or emaciation due to atrophy of the skeletal muscles. Clinical symptoms that appear from infection with *Trichostrongylus* spp. are cattle losing weight, emaciation, weakness, edema, and anemia (Reinecke, 1983). *Trichostrongylus* spp. infection. low because according to Levine (1994) *Trichostrongylus* spp. requires temperatures ranging from 13-18 ℃ to optimize transmission. This is contrary to the environmental conditions in Kalipuro District, Banyuwangi Regency, which have temperatures ranging from 19-34 ℃.

Strongyloides spp. is a worm from the nematode class with the adult worm habitat being in the small intestine mucosa. According to Viney and Lok (2007), eggs of *Strongyloides* spp. in feces preparations are very easy to distinguish from worm eggs of other types of nematodes, in eggs of *Strongyloides* spp. It has an oval shape, has thin albumin walls and contains larvae. Infection with *Strongyloides* spp. in large quantities in young animals can cause diarrhea (Zajac and Conboy 2012). In the Cestoda class, we get infection with the worm *Moniezia* spp. as many as 17 positive samples. *Moniezia* spp. is a parasitic worm of the cestodes class that is commonly found in ruminants and can cause clinical symptoms. Infection from *Moniezia* spp. This could be because livestock have eaten grass containing mites (mites) containing infective cysticercoids (Koesdarto *et al*., 2007), this indicates that environmental conditions in Kalipuro District, Banyuwangi Regency are suitable for the development of mites which are intermediate hosts of the worm *Moniezia* spp.

According to Levine (1990), mixed or single infections often occur in goats, so it is difficult to know the specific effect that is produced. Tantri *et al*. (2013) added that infections that occur are usually carried out by various types of worms

both in the abomasum, intestines and other organs, so that the effect can be a combination or a mixture of infecting parasites. Based on the identification of the parasite genus found in the fecal samples, it is known that there are no parasites that are potentially pathogenic or can be transmitted to humans because the findings are only worm eggs. The egg type can only describe the genus, not the species of parasite, so it cannot classify parasites as pathogenic (Tolistiawaty, 2016).

From the results of the study, it was found that the most worms infecting goats aged 0 to 1 year. This is in accordance with the opinion of Zulfikar *et al*. (2012) that helminth infections at a young age are higher than at an old age. At a young age they are more susceptible to helminth infections compared to old age, this is related to the lack of increased goblet cells in the intestine that inhibit the growth of parasitic infective larvae (Soulsby, 1986).

Conclusion

Based on research conducted on 100 samples of etawa crossbreed goat feces in Kalipuro district, Banyuwangi regency, 43 samples were found to be positive. Infected with helminthiasis with a prevalence of 43%. Types of worms that infect goats The etawa breeds in the Kalipuro district, Banyuwangi regency are *moniezia spp*., *haemonchus spp*., *trichuris spp*., *trichostorngylus spp*., *strongyloides spp*.

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