Performance of Oxfendazole in Nematode-Infected Post-Weaning Lamb on Pasture

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Abstract. A study was conducted to determine the effectiveness of drug anthelmintic intensity oxfendazole against gastrointestinal nematode worm infections in weaned lambs. Experiments conducted on 18 lambs weaned off, randomly divided into 3 groups namely P_0: grazed sheep, untreated as controls, P_1: grazed sheep treated with oxfendazole, and P_2: un-grazed sheep, not treated with oxfendazole. The total worm eggs per gram (TEG) in the feces until 9 weeks before treatment 9 with no significant differences ($P<0.05$) and up to week 12 was not significantly different ($P>0.05$), means that the grazing treatment oxofendale treatment have real impact on the intensity of infection at week 9 post-treatment. This is related to the maturing of young worms and the intensity of infection depends on the influence of time outside the body of sheep. Of total plasma protein (TPP) and packed cell volume (PCV) until week 12 showed that antibiotic treatment measures and grazing is very real effect ($P<0.01$), between the treatment group P_1 with different P0 is very real ($P<0,01$), between P_2 with different P0 very real ($P<0.01$) and between P_1 and P_2 is not significantly different ($P>0.05$). Means treatment with oxfendazole helminthic very real effect on total plasma protein and packed cell volume in both the shepherd and the sheep who did not shepherd.

Key Words: oxfendazole, grazing and gastrointestinale nematod

Introduction

Sheep is one of the ruminants that farmers like to raise. Some of the superiorities of sheep characters is its high adaptability to bad environment, more selective in grazing than that of other ruminants, live in groups as communities, prolific, its feces can be used for compos making, and as one of animal protein sources.

Gastrointestinal nematode is a worldwide parasite that is detrimental for the productivity of sheep. The economic disadvantage is due to the decrease in production, the additional cost for curing the disease, and animal death due to infection with the symptom of bleeding in the abomasum, therefore, the number of red blood cells decreases that may cause anemia, anorexia, depression, worsened condition, and can cause death (Miller and Horohov, 2006). There are some kinds of methods to detect the phase /stadium of nematode infection, one of which is via counting of nematode eggs in feces, the result shows that the number of the eggs in sheep is higher than that in cattle, especially during wet seasons, namely in March, April, and October (Nginyi et al., 2002).

There is a trend that the prevalence of nematode infection depends upon the existence of infective larva on grass; therefore, a special strategy to control the nematode disease is required (Latief et al., 2005, Qomar et al., 2009). To decrease the infection on pasture grasses, there is a need to cure the ewes after delivered; therefore, can decrease infection in young animals, lambs as well as calves. The use of anthelmintic repeatedly is required for adult sheep as well as for lambs. The number of nematode eggs in lambs increases when the animals were slaughtered at the age of 8 months, compared to that if the animals were slaughtered at younger ages (Lindqvist et al., 2001, Boa et al., 2001).

In Indonesia, nematodiasis is endemic, loses due to digestive tract nematode infection are abundant, even reach millions annually. To overcome this problem, the nematode medicine (anthelmentic) should be given repeatedly, because the grazing animal can be infected several times through grass consumption. However, the intake of the medicine for long period can cause a problem by the emergence of new strain of nematode

species that has higher resistance to the medicine, although the period of time that the resistance happens varies (Ahmad et al., 2002).

The concentrations of OFZ and its metabolites were similar in infected, as well as non-infected sheep. In the infected sheep, there is generally an increase in abomasum fluid passage, another effect is the excretion of OFZ in feces and urine. In sheep, hepatic metabolism is faster than that in goat, as indicated by the speed of OFZ elimination (Hannessy et al., 2008). The life cycle of nematode ranges from 3 to 6 weeks, the curing of the worm during critical period is the most effective action. However, the periodical intake of medicine in a group of grazing animals can be used as a reference to eradicate the worm, and to control or decrease the number of nematode eggs (Bakanzi and Serumangga-Zake, 2004).

The purpose of this research was to know the effect of curing (medical action) on the total number of nematode eggs / g of feces (TNEPG), packed cell volume (PCV), and total serum protein (TSP) and the affectivity of anthelmentic oxfendazole on the intensity of gastro-intestinal nematode of grazing and non-grazing post-weaned lambs. It is expected that the results of this research could be used as a reference, guidance, or consideration for the farming/management of post-weaned lambs; for fattening as well as for breeding/ parent stock. The relationship among TNEPG, PCV, and TSP, is expected to be the reference/ estimation for disease diagnoses without doing autopsy.

Materials and Methods

The materials of this research were 18 heads of post-weaned lambs, with body weighs ranged from 10 kg to 12 kg. The lambs were divided into 3 groups, each of which consisted of 6 heads. The diets consisted of wild grasses and concentrate. The used anthelmetic was oxfendazole preparation. The implements were 18 units of housing, 12 piles for concentrate and drinking water container, a unit of centrifuge, reaction tubes, microscopes, micro haematocryte, and a set of tools for autopsy.

Observation of TNEPG (Mark Master's Method)

Sheep feces was collected from anus, weighed (1gram), mixed with 10 ml of dilute sugar solution, and stirred until the mixture was homogen. The mixture (feces solution) was then filtered , the filtrate fluid was poured into Erlenmeyer tube and stirred. As much as 0.3 ml Selter sugar solution was poured into double object glasses, and 0.3 ml of homogen feces solution was also added onto the glasses, and stored undisturbed for 3 minutes. The number of nematode eggs was counted by putting the object glasses under a microscope. To get the value of TNEPG, the results were multiplied by 50.

Observation of PCV using micro-haematocryte method

A micro-capillary tube was filled with blood, one end of it was closed with a special cover. Put the tube into a centrifuge settled in 16,000 rpm for 3-5 minutes. The haematocryte value was read by using special graphic.

The counting of total serum protein (Refractometer method / TS meter)

Plasma was poured into TS meter, and see the concentration of total protein using the available scale (g/100 ml of blood).

Research design and data analysis

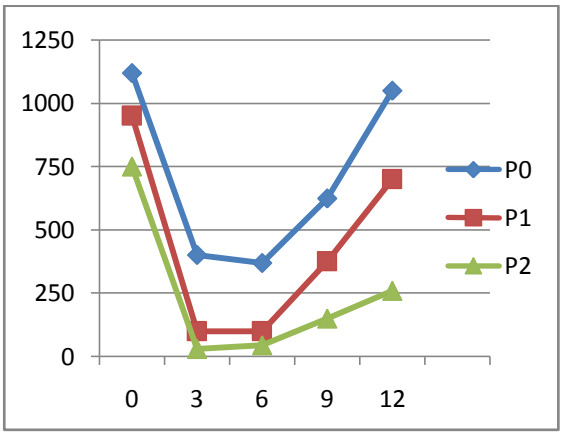
Experimental method was used in this research, by applying completely randomized design (CRD). There were three treatments; grazing post-weaned lambs without curing with OFZ (P0), grazing post-weaned lambs cured with OFZ (P1), and non-grazing post-weaned lambs cured with OFZ (P2), each of which comprised of 6 experimental units (replicates). The TNEPG was measured before, and 3 weeks, 6 weeks, 9 weeks, and 12 weeks after curing with OFZ. The measurements of PCV and TSP were conducted 12 weeks post-curing. Analysis of Variances was used to analyze the data, with 5% and 1% guilty probabilities. Least significance differences (LSD) test was used if there were at least two treatments showing different effects ($P<0.05$ or $P<0.01$).

Results and Discussion

Total nematode eggs of feces

The results showed that the curing using OFZ anthelmetic for post-weaned lambs significantly affected (P<0.05) on the number of eggs in feces. There were highly significant differences (P<0.01) between the number of eggs in the feces of cured sheep at weeks 3 and 6 post-curing compared to that in sheep without curing. The results indicated that the curing was able to decrease the number of adult worms in the gastro-intestine. The results of test among treatments showed that there was a highly significant difference (P<0.01) between grazing post-weaned lambs that received OFZ compared to that did not receive any curing. However, the difference was not found (P>0.05) between the grazing, post-weaned lambs that received OFZ compared to the housed, post-weaned lambs that received OFZ It meant that the curing program using OFZ was able to decrease the number of nematode eggs in feces, in the grazing as well as in non-grazing (housed), post-weaned lambs at week 6 post-curing. The life cycle of the nematode is between 6 up to 6 weeks, therefore, the curing of the worm during this critical period is the most effective action. However, the curing at a certain period for a group of grazing sheep can be used as a reference to control or eradicate the worm or to decrease the number of worm eggs (Bakanzi and Serumangga Zake, 2004). For effective control of nematode infection, farmers need to use a wide spectrum anthemintic and to keep the equilibrium between the controls to the parasite and long-term productivity (Valssoff,et al., 2001). According to Courteney and Robertson (1995), the majority of ruminant gastro-intestinal nematodes are eliminated by benzimidazole substitutes; more than 90% of the 4 larva stadia and young worms of gastro-intestinal nematodes is eliminated by this preparation.

There was a significant difference (P<0.05) between week 9 post-curing compared to that before curing. However, it was no significant difference (P >0.05) between week 12 post-curing relative to that before curing. The results of difference test showed that no difference was found (P>0.05) between curing and without curing of the grazing, post-weaned lambs. There was a highly significant difference (P<0.01). between OFZ-cured, housed post-weaned lambs compared to that of not-cured, grazing post-weaned lambs, and there was a significant difference (P<0.05) between cured, housed lambs relative to that of cured, grazing lambs. It meant that the treatment of grazing of the OFZ-cured lambs affected significantly on the intensity of infection at week 9 post-curing. This case has relationship with the growth of young worms and infection intensity whose period depends on the external factors.



(P_0: grazed sheep, untreated as controls, P_1: grazed sheep treated with oxfendazole, P_2: un-grazed sheep, not treated with oxfendazole).

Figure 1. The graphic of the changes in TNEPG before and after curing using OFZ.

Gastro-intestinal worms are able to cause much loses, one of which is body weight loses (thinning of body sizes), that may cause death of the given sheep and goat. The gastro-intestinal nematodes that were found in goats and sheep at the Banda Aceh abattoirs were: *Trichotrongylus* spp*, Oesophagostomum* spp*, Bonustonum* spp, *Chabertia* spp, *Trichuris* spp*, and Haemoncus* spp in goats, and *Gaigeria* spp*, Strongiloides* spp*, Bonustonum* spp, *Oesophagostomum* spp*, Haemoncus* spp, *Chabertia* spp, *and Trichuris* spp *in sheep* (Hanafiah et al., 2002).

Total serum protein

The TSP was measured in gram.dL, using refractometer method at week 12 post-curing.

The TSP is a dependent bvariable that is affected by body total protein that has relationship with the stadium of adult worm infection of the object animals.

The analysis of variances showed that curing using OFZ for post-weaned lambs affected highly significantly (P<0.01) on the TSP. The curing using OFZ for the grazing lambs affected highly significantly (P<0.01)on TSP. There was also a highly significant difference (P<0.01) in TSP between the housed, OFZ-cured post-weaned lambs to that in grazing, non-cured lambs. However, there was no significant difference (P>0.05) in TSP between the grazing, OFZ-cured post-weaned lambs with that of un-grazed and not treated with oxfendazole (P2). It meant that the treatment of curing the lambs using OFZ had a highly significant effect on TSP.

Subclinic infection of nematode worms decreases feed intake, digestive efficiency, and hypoproteinemia as indicated by low concentration of total plasma protein, and hypoalbuminemia, indicated by low concentration of albumin (Costa et al., 2007). Total serum protein was observed from the group of lambs that were infected and not infected with *Haemoncus contortus.* The infected lambs experienced decreasing TSP, the lowest concentration was found at week 4 post-infection. The decrease was caused by haemo-dilutine as a compensation of bleeding in abomasums due to larva infasion, followed with the losing of serum protein in great amount at the gastric due to the fractionation of albumin (Mir et al., 2007).

Packed Cell Volume (PCV)

The analysis of variances showed that the curing of worm infection using OFZ and grazing had a highly significant effect (P<0.01) on PCV. The results of among treatment test (LSD test) showed that; there was a highly significant difference (P<0.01) in PCV between OFZ-cured, grazing lambs relative to that of grazing lambs without any curing, and between P2 with that of grazing lambs without any curing (P<0.01). There was a significant differences in PCV (P <0.05) between grazing, OFZ-cured lambs compared to that of housed, OFZ-cured lambs. It meant that the curing of worm infection in lambs using OFZ had highly significant effects on PCV both for housed and grazed lambs.

Mer et al. (2007) state that the value of PCV in the *Haemonchus contortus* infected lambs decreases rapidly and reaches the lowest at week 4 post-infection. There is a decrease in the value of haematocryte, the amount of red blood cells and hemoglobines in the infected lambs, as a result of bleeding in abomasums due to wounds caused by the parasite. Nematollahi et al. (2007) report that most of the infected sheep experience various anemia symptoms and decrease of body weight in lambs. The light anemia symptom was indicated by the pale color of conjunctive mucous membrane that happened at day 21 post-infection, this period was indicated by the decrease in PCV value. As the infection proceeded up to 60 days, the clinical symptom enter into phase 3 stadium, cahexia, and death. Costa et al. (2007) state that at 35-day post infection of experimental nematodes, lambs of Suffolk as well as Ile de France experienced the decrease in PCV. To anticipate the increase of the number of worm eggs in feces, curing by using anthelmintic at 49 days post-infection was required.

Conclusions

Curing by using OFZ anthelmintic for post-weaned lambs can decrease gastro-intestinal nematode's TNEPG of feces up until week 6 post-curing. The treatment of curing using OFZ for grazing, post-weaned lambs resulted in reinfection at week 9 post-curing. The use of OFZ for curing post-weaned lambs is able to increase total serum protein and PCV up until week 12 post-curing.

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