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Information, 2015 CrossMark fclick for updates Potency of Fresh  
Cassava Leaves (*Manihot esculenta* crantz) as Natural  
Anthelmintic on Goat Performances Salam N. Aritonang and Elly  
Roza Department of Animal Production, Faculty of Animal  
Husbandry, Andalas University, Padang-25163, Indonesia  
completely Kperimental n analyze the Abstract: The research  
aims to determine the potency of fresh cassava leaves (*Manihot  
esculenta* crantz) as natural anthelmintic on the goat  
performances. Cassava leaves is an important cash crop widely  
grown in tropical area, contained high level of protein and could  
be used as a protein supplement and natural anthelmintic in  
ruminants. The research was conducted in experimental methods  
by using 20 six and seven months old PE female goat weighing 18  
-19 kg. Completely Randomized Design (CRD) was used with four  
treatments and five replications to analyze the data. The

treatments were the length of fresh cassava leaves feeding as much as 8% from live weight for 0 week (A), 3 weeks (B), 6 weeks (C) and 9 weeks (D). The variable was observed the performances of goat that consisted of the faecal egg count, dry matter intake and average daily weight gain. The result of this research indicated that the feeding of fresh cassava leaves for a long time was significantly decreased the faecal egg count and increased the dry matter intake and average daily weight gain. It is concluded that cassava leaves can be used as natural anthelmintic in the ration and can be given in the long term because it is very significant to increase the goats performance and reduce the faecal egg count. Key words: Cassava leaf, anthelmintic, animal feed, goat

**INTRODUCTION** Goat is the commodity that has a substantial contribution to cover the fulfillment of national meat, but in its development in Indonesia, goats population growth is quite slow. One of the goats inhibitor of growth is an infection caused by a nematode worm. Nematodes are parasites known to infect ruminants especially small ruminants such as goats and sheep. This is due to the growth of nematodes which are difficult to avoid especially in tropical climates with high rain fall such as Indonesia. In Indonesia infectious disease caused by nematodes often be one significant problem, because it can affect the body as well as lower hematologic livestock production, can even cause death (Beriajaya and Copeman, 1996). To control the worm disease in cattle is generally done using existing worming (anthelmintic), which is given periodically. But the worm medication continuously for long periods of time can cause resistance in cattle, so that new types of nematodes will be more resistant to subsequent treatment (Hashmi and Connan, 1989) and the presence of residues due to the accumulation in the tissues of the host (Gronvold et al., 1996) which may be harmful for consumers. As an alternative in the treatment of infectious diseases caused by nematodes is to use biological agents, namely to provide cassava leaves in goat rations. Cassava leaf is a plant that is widely grown in tropical/sub-tropical, with a by product that pretty much every harvest and can be used as animal feed. Cassava leaves contain many amino acids are relatively similar to the amino acids in soybean meal (Wanapat, 2009). In addition there are tannins in cassava leaves which can reduce the number of worm eggs in the feces of cattle so that health status be increased (Granum et al., 2003). However, the utilization often cause problems, because cassava leaves contain anti-nutrients such as tannins and chemotoxic substance and hydrocyanic acid (Sokerya et al., 2009). However, the results showed that cows and goats can tolerate undesirable effect of phytochemicals ([Seng et al., 2001](#); [Seng and Rodriguez, 2001](#)). The advantages of the use of cassava leaves have an influence on the suppression of internal parasites with an indication of a decrease in faecal egg count of worm (Netpana et al., 2001). This is because the direct effect of the presence of condensed tannins or indirect effect as an increase in the supply of protein to the gastrointestinal tract. Forage containing condensed tannins have a good influence on ruminant protein to enhance nutrition and body weight gain (Wanapat, 2000). Seng et al. (2007) reported that the feeding of fresh cassava leaves for 3 weeks can reduce nematode faecal egg count in goats were penned during the period of treatment.

Similarly, the feeding of cassava leaves 1 kg/head/day in cattle grazing (Granum et al., 2003). The feeding of cassava leaves as much as 50-100% for a few months can reduce the faecal egg count of Corresponding Author: Salam N. Aritonang, Department of Animal Production, Faculty of Animal Husbandry, Andalas University, Padang-25163, Indonesia 358 Pak. J. Nutr., 14 (6): 358-361, 2015 nematode up to 50% (Seng and Preston, 2003). Wanapat and Khampa (2006) reported that the faecal egg count of nematode in dairy cows fed cassava leaves decreased 27.6%. shown in Table 1. Statistic analysis shows that the average daily weight gain of goats fed fresh cassava leaves for 9 weeks on treatment D was significantly highest (199.20 g/day) followed by treatment C, B and the lowest in treatment A is 149.40 g/day but did not different with treatment B (Table 1).

**MATERIALS AND METHODS** This research is an experimentally method using twenty of PE females goat aged 6-7 months, 18-19 kg of weight were penned individually. The experiment was arranged in a completely randomized design with 4 treatments and 5 replications. The treatment is the feeding of fresh cassava leaves for: 0 weeks (A), 3 weeks (B) 6 weeks (C) and 9 weeks as much as approximately 8% of body weight, in addition to the basal ration. The variables measured were the faecal egg count was measured by using a counting chamber Whitlock, feed consumption/dry matter intake was measured daily and average daily weight gain was measured once a week. The data obtained were analyzed by using analysis of Variance (ANOVA). If there were the difference between the effect of treatments followed by Duncan's multiple range test (Steel and Torrie, 2007).

**RESULTS** Faecal egg count: Statistical analysis shows that the faecal egg count of PE goats was significantly ( $p < 0.01$ ) influenced by the length of fresh cassava leaves feeding, where if longer the fresh cassava leaves feeding the faecal egg count is lower (Table 1). It could be seen in the faecal egg count of goats before and after being treated with the treatment has decreased following by the length of fresh cassava leaves feeding. The faecal egg count in goats fed fresh cassava leaves for 9 weeks on treatment D is lowest (50) followed by treatment C, B and the highest of the faecal egg count in treatment A is 360

**DISCUSSION** The decrease of faecal egg count of goats fed fresh cassava leaves for 9 weeks (D), because cassava leaves contain tannins which can reduce the migration of larvae by destroying larvae development by the inclusion of tannin and interact with the external surface of the larvae (Granum et al., 2003). So the longer the feeding of cassava leaves the higher the decrease of faecal egg count of goat. This results is in line with the report of Seng and Preston (2003) who reported that there was a significant decrease in nematode faecal egg count (FECs) of goats were fed 100 or 50% of fresh cassava leaves for a few months, compared to animals that only given grass. Likewise, the results of Seng et al. (2007) research that the fresh cassava leaves feeding for 3 weeks can reduce nematode FEC in goats were penned during the period of treatment. The increase of dry matter intake on PE goats fed fresh cassava leaves for 9 weeks (treatment E) indicated that cassava leaves contain high protein thereby increasing the palatability of the ration, followed by increased feed consumption. As has been suggested by Owen and Goetsch (1988) the high protein content in the ration will increase palatability, which

encourages goats to consume more. More number of forage consumed, the higher mobility of forage in the digestive system so quickly empty. As a result, livestock will continue to consume the ration so that the consumption of dry matter and nutrients increases. In accordance with the results of Kounnavongsa et al. (2010) studied that the feeding of fresh cassava leaves ad libitum resulted in higher dry matter intake in young goats aged 6-7 months. While connected to the standards dry matter require for goats in NRC (Cheeke, 1999) is as much as 480 g/head/day, the dry matter intake for all treatments in this study is sufficient for maintenance, which is about 468.53-810.49 g/head/day. When it is associated with dry matter intake in dairy goats as much as 4% of body weight (Setiawan and Tanisus, 2005), with initial body weight of FE goats around 18-19 kg (dry matter require about 760 g/head/day), so the dry matter intake of goats fed cassava leaves for 9 weeks (D) which fulfil the requirement. The lowest of dry matter intake in control (A) and goat fed fresh cassava leaves for 3 weeks (B) because up to 3 weeks in fresh cassava leaves feeding is not sufficient for protein requirement. Consequently the animal does Dry matter intake: The length of fresh cassava leaves feeding significantly increased the dry matter intake ( $p < 0.05$ ) of PE goats. It could be seen in the consumption of dry matter of ration was increased following the length of fresh cassava leaves feeding (Table 1). Statistic analysis on Table 1 shows that the dry matter intake of goats fed fresh cassava leaves for 9 weeks was highest (810.49 g/head/day followed by treatment C (695.87 g/head/day), B (543.30 g/head /day) and A (468.53 g/head/day), in which the dry matter intake of goats PE treatment B to treatment A did not significantly ( $p > 0.05$ ).

Average daily weight gain: The length of fresh cassava leaves feeding very significantly increased the average daily weight gain ( $p < 0.05$ ) of PE goats. It could be seen in the average daily weight gain of goats has increased along with the length of fresh cassava leaves feeding as 359 Pak. J. Nutr., 14 (6): 358-361, 2015 B

Table 1: Influences of fresh cassava leaves as natural anthelmintic on the goat performances

Variables	Faecal egg count
Pre treatment	460 420
Post treatment	360a 2006
Dry matter intake (g/head/day)	468.53a 543.30
Average daily weight gain (g/head/day)	149.40a 168.00a
	500 90 695.876 185.400 460 500 695.875 810.49

ACKNOWLEDGEMENT The author are very grateful for the financial support of Fundamental fund, Directorate General of Higher Education, Ministry of National Educational, Republic of Indonesia (DIPA No.023.04.2415061/2013). not like the ration with insufficient protein content that followed by decrease of ration consumption. Accordance to Wallace and Newbold (1992) statement that goat have a habit to choosing the feed to be consumed. While the dry matter consumed is influenced by several factors such as palatability, digestibility of fiber, feed flow rate and the status of the protein ration. The increase average daily weight gain of goats fed cassava leaves for 9 months (D) cause of the consumption of the ration dry matter in this treatment was the highest, which is 810.49 g/head/day. With the increasing of dry matter intake will be followed also by increasing the intake of protein ration into the body required for growth. As stated by McDonald et al. (1988), that the growth of the cattle would be better if the number of ration consumed according to the livestock required. In addition, cassava leaves

contain amino acid and tannin that can help the microbial synthesis in the rumen which will indirectly affect a growth. As noted by Wanapat (2000) that the indirect effect of condensed tannins presence in cassava leaves is an increase of protein supply to the gastrointestinal tract. According to Niezen et al. (1996) condensed tannins in forages have a good influence on ruminant protein to enhance nutrition and body weight gain. In addition, cassava leaves is effective as a source of bypass protein in the digestive tract so that it can increase the growth (Keo Sath et al., 2008). Thus the longer the fresh cassava leaves feeding, more and more protein and amino acids into the body. As a result, the chance of ruminal microbial to usage of Nitrogen and free fatty acids are formed as the protein used for the synthesis and deposition of protein during growth, will be increase. So that the average daily weight gain of goats on treatment D which is fresh cassava leaves feeding for 9 weeks showed the highest rate. In accordance with the Munier et al. (2006) and Munier (2007) studies that the ration feeding with protein content exceeds the maintenance can increase body weight gain of PE female goats. As indicated in this study, the cassava leaves feeding with high protein content cause the average daily weight gain of goat is higher (149.40 to 199.20 g/head/day) than the goat without a high protein, namely 123.10 g/head/day (Rahim, 2012).

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