

Utilisation of cassava leaf and carica papaya leaf as feeds and anthelmintics for goats

K Adiwimarta¹, J Daryatmo¹, E R Orskov², R W Mayes², H Hartadi¹

¹Faculty of ANimal Science University of Gadjah Mada, Yogyakarta, Indonesia

²Macaulay Institute, Aberdeen, United Kingdom

Email: kustantinah@ugm.ac.id

Introduction Cassava is an important agricultural product harvested in the dry season of Indonesia. The national production of cassava was about 19.90 tonne/ha in 2007, increasing to 21.99 tonne/ha in 2009. The main product of cassava is tuber for human food; farmers use the leaf and tuber skin for animal feeds, especially for cattle and goats. Previous research has shown that cassava leaf could be used as a protein supplement for goat production. Young carica papaya leaf is mainly used for human food, but more mature leaf may be used as an animal feed. Although its production is lower than cassava, papaya leaf has a high protein content (19.9%, DM basis). A major problem concerning animal production in the rural areas of Indonesia is parasite infestation. Farmers have difficulty in facing the problem, due to the high price of anthelmintic drugs. Dietary tannins may have an anthelmintic effect. Kustantinah *et al.* (2008) reported that older cassava leaf has a higher tannin content (2.42%) than the younger leaf (1.72%), while carica papaya leaf contains 1.52% of total tannin. The aim of this study was to assess the potential of cassava and papaya as sources of feed and, as anthelmintics for goats.

Materials and methods Eighteen individually housed female Bligon goats were used in this study. The animals, which had not been previously treated with anthelmintic drugs and were naturally infected, were divided into three groups (n=6). One group (Control) was offered only grass *ad libitum*. A second group (Treatment I) was offered, *ad libitum*, a mixture of 70% grass and 30% cassava leaf, and the third group (Treatment II) offered a 70% grass and 30% (DM basis) papaya leaf mixture, *ad libitum*. The feeds were offered for 6 weeks, with total collections (feed, refusals and faeces) carried out over the final 10d. Data measured were feed intake, nutrient digestibility, liveweight (LW) gain and, faeces collected directly from the rectum on days 0, 15, 30 and 45 of the feeding period. The number of worm eggs and *Coccidia* oocyst were counted. The data obtained were analysed using analysis of variance and the LSD test at the 0.05% significance level.

Results The daily dry matter intakes for Treatment I, Treatment II and Control were 3.53%, 3.54% and 3.30% of LW, respectively. Intakes of organic matter, and crude protein were also increased by supplementation with cassava or papaya leaves, as was the average daily LW gain (Table 1). For Treatments I and II, counts of worm eggs and *Coccidia* oocytes progressively decreased (respective slopes of regressions for treatment I were -291.67, P>0.05 and -325.00 (P>0.05) and for treatment II the slopes of regressions were -170.00 (P<0.05) and -714.17 (P<0.05); whereas the counts increased (slope of regressions were: 216.67 (P<0.05) and 246.67 (P>0.05) for goats on the Control treatment (Table 2).

Table 1 Mean nutrient intakes and LW gain in goats receiving grass and cassava or papaya leaf

Nutrient intake	Treatment I	Treatment II	Control
Organic matter (g/kg LW)	30.59±0.51 ^a	30.21±0.59 ^a	28.80±0.76 ^b
Crude Protein (g/kg LW)	5.26±0.10 ^a	5.06±0.12 ^b	4.20±0.10 ^c
Crude fibre (g/kg LW)	8.13±0.14 ^a	7.43±0.12 ^b	8.15±0.21 ^a
Total digestible nutrient (%)	59.14±1.50 ^a	60.92±1.88 ^a	55.81±3.76 ^b
Average daily LW gain (g)	38.51±0.59 ^a	39.08±0.44 ^a	27.01±0.69 ^b

Table 2 Worm egg and *Coccidia* counts (means± S.E) in faeces from goats receiving grass and cassava or papaya leaf (no./g faeces)

Treatment	Days since beginning of experimental feeding			
	0	15	30	45
Worm egg count:				
Control	217±147	267±163	533±240	850±259
Treatment I	1250±1445	542±562	475±555	300±298
Treatment II	700±547	500±494	400±421	167±108
<i>Coccidia</i> count:				
Control	208±201	283±380	300±354	1025±1948
Treatment I	1108±1267	233±140	108±89	67±51
Treatment II	2108±3589	1108±1757	142±106	50±44

Conclusion Supplementation of grass with the leaf of cassava or carica papaya both increased nutrient intakes and had an anthelmintic effect as observed by decreasing faecal EPG and *Coccidia* oocyte counts.

Reference

Kustantinah, H. Hartadi, B. Suhartanto, N. Danardono and R. Fithraya 2008. Anti Nutritional Factor of Cassava Product. Proceedings of the 13th Animal Science Congress of the Asian-Australasian Association of Animal Production. Hanoi, Vietnam.