The 3rd International on Sustainable Animal Agriculture for Developing Countries. 496 pages.

First Published: 2011
700 books

Year 2011
496 pages

Printed at: JAOPRAYA PRINTING Ltd.
312 Soi 66/1, Charan Sanit Wong Rd., Khet Bang Phlat, Bangkok 10700, Thailand

The individual contributions in this publication and any liabilities arising from them remain the responsibility of the authors.

The publisher is not responsible for possible damages, which could be a result of content derived from this publication.

International Advisory Committee
Chairman: Assoc. Prof. Dr. Liang Juan Boo (Malaysia)
Secretary: Prof. Dr. James Chin (Australia)

Committee:
Assoc. Prof. Dr. Pongchan Na-Lampang (Thailand)
Prof. Dr. E.R. Ørskov (UK)
Prof. Dr. Ge Changrong (China)
Prof. Dr. Long Ruijun (China)
Prof. Dr. Hsai Liang Chou (Taiwan)
Prof. Dr. Junichi Takahashi (Japan)
Prof. Dr. Reza Valizadeh (Iran)
Prof. Dr. Wiranda G. Piliang (Indonesia)
Prof. Dr. Pietro Celi (Australia)

Organizing Committee: The 3rd International Conference on SAADC 2011

President:
Prof. Dr. Prasart Suebka (Rector of SUT)

Advisor:
Prof. Dr. Metha Wanapat

Chairperson
Assoc. Prof. Dr. Pongchan Na-Lampang

Secretary:
Assist. Prof. Dr. Pramote Paengkous

International Scientific Committee:

Chairperson:
Assoc. Prof. Dr. Wisitiporn Sukansom

Secretary:
Assist. Prof. Dr. Chalermporn Yuangklang

Committee:
Prof. Dr. E.R. Ørskov (UK)
Prof. Dr. Reza Valizadeh (Iran)
Prof. Dr. Pietro Celi (Australia)
Prof. Dr. James Chin (Australia)
Prof. Dr. Akio Takenaka (Japan)
Assoc. Prof. Dr. Chalong Wachirapakorn (Thailand)
Assoc. Prof. Dr. Nuanchan Paraksa (Thailand)
Assoc. Prof. Dr. Jatuporn Krajaysri (D.V.M.) (Thailand)
Prof. Dr. Uthairat Na-Nakorn (Thailand)
Assoc. Prof. Dr. Monchai Duangjinda (Thailand)
<table>
<thead>
<tr>
<th>Social Culture</th>
<th>Assoc. Prof. Neung Teanmuong</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dr. Samorn Ponchunchoovong</td>
</tr>
<tr>
<td><strong>Fund-Raising/Finance</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assist. Prof. Dr. Bauchorn Likitdecharote</td>
</tr>
<tr>
<td></td>
<td>Dr. Wittawat Molee</td>
</tr>
<tr>
<td><strong>Public Relations</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assoc. Prof. Dr. Rangsan Wongsan</td>
</tr>
<tr>
<td></td>
<td>Assist. Prof. Dr. Surintorn Boonanuntanasarn</td>
</tr>
<tr>
<td><strong>Website manager</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assoc. Prof. Dr. Surintorn Boonanuntanasarn</td>
</tr>
<tr>
<td><strong>Accommodation</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dr. Sitsa Khempaka</td>
</tr>
<tr>
<td><strong>Registration</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dr. Amonrat Molee</td>
</tr>
<tr>
<td><strong>Exhibition/Venue/poster displays</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assist. Prof. Dr. Pakanit Kupittayanont</td>
</tr>
<tr>
<td><strong>Transportation/Tour</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assist. Prof. Dr. Pipat Lounglawan</td>
</tr>
<tr>
<td><strong>Treasurer</strong></td>
<td>Warang Weerasakint</td>
</tr>
</tbody>
</table>

**Committee:**

Assoc. Prof. Dr. Chalong Wachirapakorn
Assist. Prof. Dr. Anut Chantiratikul
Assoc. Prof. Dr. Songsak Chumpawadee
Assoc. Prof. Dr. Opat Pimpa
Dr. Jamlong Mitchoathai
Assist. Prof. Dr. Chalermpoon Yangklang
Assist. Prof. Dr. Kraisit Vasupen
Walaikul Kaewwongsa
Assist. Prof. Dr. Jakrit Yaeram
Dr. Sumerjai Bureenok
Assist. Prof. Dr. Surintorn Boonanuntanasarn
Tanasamonwan Pornmun
Dr. Panlada Tittabutr
Supreena Srisaihkhin

Dr. Siwaporn Paengkoum
Anan Petnum
Dr. Onanon Pougchompun
Dr. Sasiphan Wongsuthavas
Rachakris Lerttakomol
Jiravan Khotsakdee
Dr. Sutsa Khempaka
Srinthip Traiyakun
Phumart Noosen
Rattikan Suwannasang
Dr. Onanon Pougchompun
Dr. Kaemwich Jantama
Saranpong Thongruang
Kanokwan Kamkajon
List of Reviewers:

Assoc. Prof. Dr. Joongsoo Chang  
Korea National Open University
University of Natural Resources and Applied Life Sciences
University of Guelph

Dr. Gabor Mészáros

Dr. Astrid Koeck

Assoc. Prof. Boonlom Cheva-Isarakul  
Emeritus from Chiang Mai University

Assoc. Prof. Dr. Chalong Wachirapakorn  
Khon Kaen University

Assoc. Prof. Dr. Chainarong Navanukraw  
Khon Kaen University

Assoc. Prof. Dr. Suporn Katarawin

Assoc. Prof. Dr. Wisittiporn Sukombat  
Suranaree University of Technology

Assoc. Prof. Dr. Rangsan Panpai  
Suranaree University of Technology

Assoc. Prof. Dr. Pramote Paengkoum  
Suranaree University of Technology

Dr. Amonrat Molee  
Suranaree University of Technology

Assoc. Prof. Dr. Surintron Boonanutanasarn  
Suranaree University of Technology

Assoc. Prof. Dr. Chareeya Yimrattanabovorn  
Suranaree University of Technology

Assoc. Prof. Dr. Nopadon Pirarat

Dr. Prapansak Srisapoome,  
Chulalongkorn University

Dr. Nittaya Chatiyane  
Kasetsart University

Assoc. Prof. Dr. Songsak Chumpawadee  
Burapha University

Assoc. Prof. Dr. Anut Chantaritkul  
Mahasarakham University

Dr. Khanita Ruangwittayanusorn  
Mahasarakham University

Dr. Chakrapong Chaikong  
Mahasarakham University

Assoc. Prof. Dr. Chalermporn Yuangklang  
Rajamangala University of Technology Isan

Assoc. Prof. Dr. Kraislit Vastupen  
Rajamangala University of Technology Isan

Dr. Sasiphan Wongsuthavas  
Rajamangala University of Technology Isan

Assoc. Prof. Dr. Somchit Guntaprom  
Rajamangala University of Technology Isan

Assoc. Prof. Dr. Chummarawit Promkote  
Rajamangala University of Technology Isan

Assoc. Prof. Dr. Jakrit Yaeram  
Rajamangala University of Technology Isan

Dr. Kacwta Sootsuwan  
Rajamangala University of Technology Isan

Dr. Smerjai Bureeok  
Rajamangala University of Technology Isan

Dr. Onanong Poungchompu  
Rajamangala University of Technology Isan

Dr. Chaluntorn Vichasilp  
Rajamangala University of Technology Isan
List of Reviewers (cont.)

Assoc. Prof. Dr. Komson Amnuaysit
Assoc. Prof. Dr. Panrapee Amnuaysit
Assist. Prof. Dr. Warisa Sintaweewarkul

Assist. Prof. Dr. Thanongsak Mamom
Assist. Prof. Phinikida Cha-umphol
Dr. Jamlong Mitchoathai
Assist. Prof. Dr. Walaiporn Tompitak
Dr. Pongsitwa Sotthibandhu
Dr. Doungjit Kanungpean
Dr. Duangjai Rianrakwong
Suppaikorn Kaewkwan

Dr. Jetsada Ruangnupradit
Dr. Jirabongjon Wiengcharoen
Dr. Danai Sangthong
Thanakorn Poirprasath
Thuchadaporn Chaikhan
Dr. Supapatch Sophon
Rachakrit Lertpatanakomol
Tassaneew Trairatapiyan

Dr. Supawadee Manatriphon
Daorung Sila-on
Dr. Siwaporn Pacungkorn
Dr. Anan Chukaur
Dr. Narin Preayanichayapugdee

Assist. Prof. Rittichai Pilachai
Anan Petnum
Walaiuiuk Kaewwongsa

Assist. Prof. Dr. Phassakom Nuntapanich
Assoc. Prof. Dr. Opar Pimpu
Dr. Sittisak Khampa

Rajamangala University of Technology Lanna
Mahanakorn University of Technology
Mahanakorn University of Technology
Mahanakorn University of Technology
Mahanakorn University of Technology
Mahanakorn University of Technology
Mahanakorn University of Technology
Mahanakorn University of Technology
Mahanakorn University of Technology
Mahanakorn University of Technology
Mahanakorn University of Technology
Mahanakorn University of Technology
Mahanakorn University of Technology
Mahanakorn University of Technology
Mahanakorn University of Technology
Mahanakorn University of Technology
Mahanakorn University of Technology
Silpakorn University
Silpakorn University
Silpakorn University
Silpakorn University
Silpakorn University
Silpakorn University

Udon Thani Rajabhat University
Udon Thani Rajabhat University
Udon Thani Rajabhat University
Lobn Ratchatani Rajabhat University
Prince of Songkla University, Surat Thani Campus
Mahasarakham Rajabhat University
Contents

Message from the President of the SAADC 2011 .................................................................................. a
Message from President SAADC International Advisory Committee .................................................. b
Message from the President of the SAADC 2011 .................................................................................. c
Academic Committee Chairman's Message .............................................................................................. d
International Advisory Committee .......................................................................................................... e
List of Reviewers: .................................................................................................................................... f

SUSTAINABLE / ORGANIC

-OP0001- The implementation of the integrated sustainability farming systems on feedlot beef cattle farmer groups in Central Java Province, Indonesia .......................................................... 2
  Riyanto, J., A.I. Sari & Lutojo

-OP0002- Locally derived sustainability indicators for Bali cattle farming systems on Ceram Island, Indonesia ................................................................................................................................. 3
  Attamimi, F., M. Siegmund-Schultze & A. Valle Zárate

-OP0004- Development of sustainable livestock production systems in Serbia ................................... 4
  Petrovic, P.M., M.M. Petrovic, V. Caro Petrovic, D. Ruzic Music, M. Zujovic, Z. Tomic & N. Maksimovic

-OP0005- How to improve the Brazilian dairy chain through productivity indicators to get a sustainable supply chain? ................................................................................................................. 5
  Okano, M.T., O. Vendrametto & O.S. Santos

-OP0006- Ladies, livestock and social status: Agricultural education of women livestock farmers towards status anxiety ...................................................................................................................... 6
  Lioutas, E.D., C. Charatsari, I. Tzimitra-Kalogianni & A. Papadaki-Klavadianou

-OP0008- Improving linear type traits to improve production sustainability and longevity in purebred Sahiwal cow .................................................................................................................... 7
  Dubey, A. & S. Mishra

-OP0010- Potential of dairy cattle development in Boyolali Central Java, Indonesia ......................... 8
  Hidayah, N., B. Gunarto, E. Sulastrï & Y. Suranindyah

-OP0012- Social integration and socio-economic gains of farmers' associations with cattle dispersal program in Dolores, Quezon, Philippines .................................................................................. 9
  Davillo, R.G.

-OP0013- The survey of the production cost and marketing channel for the beef in Taiwan ............ 10
  Lee, S.Y. & M.C. Lee

-OP0105- Estimation of economic values for some important traits in native black goat in Iran ...... 11
  Vatankhah, M.

-OP0109- Evolution of the land use efficiency by Brazilian bovine husbandry during the last three decades ........................................................................................................................................... 12

-OP0115- Exploring collective action among dairy cattle farmers in Getasan Regency, Central Java Indonesia ........................................................................................................................................ 13
  Gayatri, S., J.T. Dizon, C.M. Rebancos & N.J.V.B. Querijero
-OP4123- Effects of enzyme levels in total mixed ration containing oil palm frond silage on intake and growth performance of male goat ................................................................. 230
  Wahyuni, R.D., W. Ngampongsa, C. Wattanachant, W. Visessanguan & S. Boonpayung
-OP4124- Effect of ground krabok seed on feed intake, nutrient digestion and growth performance in sheep ................................................................. 231
-OP4125- Nitrogen utilization of Thai native cattle fed various metabolizable energy levels .......... 232
  Tangkittawattanachai, N., & K. Sommart
-OP4126- Metabolism and rumen parameters of Taiwan meat goat fed silage made from oyster mushroom (Pleurotus ostreatus) cultivation residue ........................................ 233
  Rangubhet, K.T., N.A. Nguyen & Y.K. Fan
-OP4127- Screening yeasts from ruminal fluid of dairy heifer fed a different ratio roughage to concentrate diets ................................................................. 234
  Sirisan, V. & V. Pattarajinda
-OP4128- Effect of roughage to concentrate ratio on rumen fermentation, bacterial population and microbial protein synthesis in dairy steers ................................................................. 235
  Gunnam, P. & M. Wanapat
-OP4130- Study on the antioxidative activity of beef in Hanwoo Steers (Bos taurus coreanae) fed mulberry silage ................................................................. 236
-OP4131- Evaluation of polyclonal antibodies in cattle adapted or not to highly fermentable carbohydrates diets ................................................................. 237
-OP4133- Effect of different protein level on feed intake, average daily gain and feed conversion ration of beef heifers ................................................................. 238
-OP4135- Effect of proportion of total mixed ration and fermented total mixed ration on feed intake, nutrient digestion and rumen fermentation in dairy cows ................................................................. 239
  Yuangklang, C., K. Vasupen, S. Bureenok, S. Wongsuthavas, P. Panyakaew, C. Wachirapakorn & J. Khotsakdee
-OP3137- Exploration of urinary creatinin to determine the carcass and its protein weight in beef cattle ................................................................. 240
  Purtonomadi, A., T. Wahyuningsih & E. Rianto
-OP4138- Utilization of cassava leaves as supplement to improve Bligon goat performance .......... 241
  Kustantinah, A., H. Hartadi & A.N. Wibowo
-OP4139- Management and productivity of Ettawa grade goats in Kaligesing Sub-district, Purwojorejo Regency, Central Java Province, Indonesia ................................................................. 242
  Rianto, E., A. Purtonomadi, M. Ariffin, C.M. Sri Lestari & S. Dartosukarno
Utilisation of cassava leaves as supplement to improve Bligon Goat performance
Kustantinah A.*, H.Hartadi, A. N. Wibowo
Faculty of Animal Science, University of Gadjah Mada, Yogyakarta, Indonesia
*Adresse: Faculty of Animal Science, University of Gadjah Mada, Jl. Fauna no 3, Bulaksumur,
Yogyakarta 552551 Indonesia
e-mail: kustantinah@ugm.ac.id

Abstract
Agricultural by-products, especially from cassava (Manihot esculenta Crantz), can be easily
found all over Indonesia. Parts of cassava that can be used for animal feed are leaves, stem skin
covering, tuber (in dry or wet condition, with or without skin). Cassava leaves cannot be used
freely as animal feed, because of the persistence of anti-quality, i.e. Cyanide Acid (HCN) and
tannin substance. Cassava leaves can be found easily in the dry season, when generally the
presence of forage as ruminant’s diet is so limited. This research used 24 mature Bligon goats. The
goats were divided into 3 treatments, those are: C as Control Diet (conventional diet which usually
be given by the farmers); T1 or Treatment 1 (Control Diet + 300 g cassava leaves); and T2 or
Treatment 2 (Control Diet + 260 g cassava leaves + 200 dried cassava tuber). The result showed
that cassava leaves supplementation increased either extract (EE) and total digestible nutrients
(TDN) consumption. From total consumption, cassava leaves and dried cassava tuber increased
dry matter (DM), organic matter (OM), crude protein (CP), EE, and TDN digestibility, but reduced
 crude fibre(CF) digestibility. The effect of anti-coccidia did not come up optimally shown no
significant differences of the number of coccidian oocyte in the goat faeces.

(Key words: Coccidiostat, Farmer, Feed Supplement, Local feed
You may have to define each of the abbreviations)

Introduction
Indonesia is a large producer os cassava (Manihot esculenta Crantz), in 2008 the total
production was 21,756,991 ton, in 2009 the total production was 22,039,145 Ton and in 2010 the
total production was 23,908,459 Ton. Cassava has the potential to be used in ruminant nutrition but
there are some potential toxic effects due to cyanide acid (HCN). Product of cassava that can be
used for feedstuffs are leaves, stem, skin of stem, roots and skin of roots. The percentage of leaves
were 8.71%, stem were 32.20% and tuber were 58.81% (Suharsono 2011, unpublished). In using
the products of cassava, we have to pay attention to the existence of cyanide (HCN and tannin).
Cassava leaves contain HCN of about 0.77% to 0.84%, while Widyanasti (2005) found that the
content was high namely about 0.58% to 0.63%. Ngamsacng et al (2006) found that the condensed
tannin (CT) was about 2.2% DM and the crude saponin was (SC) 1.7% DM while Kiyongthong
and Wanapat (2003) showed that cassava leaves contain CT up to 3.3% (DM). Tannin can be used
as anti parasite agent of gastro intestinalis namely coccidia and worm (Seng Sokerya et al. 2003).

The purpose of the research is to study the effects of cassava products (leaves and dried
tuber/gaplek) as a protein source supplement and a source of energy of small ruminant and as
Coccidiostat of digestion tract.

Material and Method
This research was conducted in Wonolegi village, Gunungkidul Regency, Indonesia. Cassava
were planted intercropped with peanut or maize. The treatments were T1: a supplement of
300 g of cassava leaves (CP 21.60% TDN 67.40%) and T2 provided a supplement of 260 g of
cassava leaves and 200 g of dried tuber cassava (CP 13.10%, TDN 75%) and the control (without
supplement) where basal feed (CP 12 % TDN 65 %) was given in the proportion usually used by
farmer. Each treatment consists of 8 mature Bligon goats in early pregnancy, age 20 month old.
average live weight were 24.50 kg. The goats used were raised by Sumber Rejeki Female Farmer
Group that is under the supervision of the Animal Science Faculty, University of Gadjah Mada. The
rations were given for two months, in the last two weeks, the data of feed offered, feed remaining
and faeces were collected successively. Forage given as the basal were observed and the quantity given was noted daily.

The variables observed were the species of forage given by the farmers, the chemical composition analyses were use proximate (dry matter/DM, organic matter/OM, crude protein/CP, extract ether, EE, crude fiber/CF (AOAC., 2005) and calculation of TDN used the equation of Hartadi et al., 1997. Nutrient intake and digestibility were calculated for DM, OM, CP, EE, CF, and TDN, and the number of coccidial oocyste found in the faeces. The data obtained were analyzed by one-way variance, and the differences due to different treatments were analyzed by Duncan's test (Astuti, 1981).

Results and Discussion

The research was conducted in the dry season, namely from August to October. There were 18 forage species used by the farmers. They were classified as grass, leguminous, agricultural waste, and leaves (Table 1). Previous studies conducted by Ernawati (2003) found out that there were 22 forage species used in Kwarasan village in Gunungkidul regency.

Feed Intake and nutrient digestibility

There was no significant difference in terms of the DM, OM, CP and CF consumed by the two treatments (T1 and T2) compared to the C (Table 2). Basal feed added by the source of protein (T1) or added by the source of protein and source of energy did not show different result compared to C, although treatment feed tended to show higher value T1 and T2, showing 35.8 and 40.2 g/kg BW. The DM intake ranged between 36-40 g/kg BW/day. The daily need of DM for a goat with a body weight of about 30-40 kg, in the condition of early pregnancy ranges about 30-25 to 32.7 g/kgBW/day (NRC, 1981). Seen from that point of view, it can be concluded that the consumption of DM both in the treatments groups (T1 and T2) and the control group was higher than the one prescribed in the references. The consumption of OM of T2 (35.5 %) was higher compared to the one in T1 (31.6%). It was probably caused by the effect of adding dry cassava as a supplementary energy source. CP supplement addition (T1) and CP source and energy (T2) did not give a significant difference with the control. It was found that the consumption CP for control group was 4.32 g/kgBW/day, while the value for T1 and T2 were about 5 g/kg BW/day. According to NRC, the requirement of CP is only about 2.5 g/KgBW/day (NRC, 1981). Mulyanti (2004) stated that a Bligon goat with a similar physiology needed 2.77 g/kg BW/day.

<table>
<thead>
<tr>
<th>Table 1. Species of feedstuffs used by farmer</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
</tr>
<tr>
<td>----</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>16</td>
</tr>
<tr>
<td>17</td>
</tr>
</tbody>
</table>
The observation on nutrient digestibility showed that the digestibility of DM and OM for T2 and TDN was always higher than that in control and T1. Due to the effect of adding dried cassava, the T2 crude fiber was lower compared to that in C and T1 namely about 16.3% while C and digestibility of CF in T1 was about 22%. Dried cassava contain high ETN of about 92.9%, so that adding 200 g/day of dried cassava will not be beneficial for the development of cellulolytic microbes and it reduces the fiber digestibility. The finding is in accordance with the study of Orskov and Ryle (1990) that stated cellulolytic microbes are sensitive to the changes of pH. When the pH is less than 6.2 then the population will decrease, and the CF less degraded. Sokerya and Preston (2003) used dried cassava leaves as the sole feed or being mixed with grass (50:50 DM) showed that DM digestibility was 70.3% and increased to 81% when cassava leaves were mixed with grass with the same proportion (50:50). CP increased from 78.6 % to 88.6% when the feed was a mixture of cassava leaves and grass.

DM digestibility for C was 71.2% while adding cassava leaves increased the value to 76.5%, slightly higher than that in Sokerya and Preston (2003), which was 70%. It was also higher than the one found in the study of Thong Kouch et al (2003) whose value was 73% where cassava leaves were the only feed given to the goats. Tran Thi Thu Hong (2002) gave 100, 75, 50% cassava leaves to goats. They found that DM digestibility were 79.3, 76.3 and 78.3, successively but the leaves were hung.

### Table 2. Intake and digestibility of nutrient (g/kg BW)

<table>
<thead>
<tr>
<th>Nutrient Intake (g/kg L.W)</th>
<th>DM</th>
<th>OM</th>
<th>CP</th>
<th>CF</th>
<th>EE</th>
<th>TDN</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>34.3±1.79</td>
<td>30.3±1.5</td>
<td>4.3±0.25</td>
<td>8.7±0.49</td>
<td>0.26±0.17</td>
<td>19.55±1.03</td>
</tr>
<tr>
<td>T1</td>
<td>35.8±2.22</td>
<td>31.6±1.94</td>
<td>4.9±0.34</td>
<td>9.0±0.57</td>
<td>0.63±0.36</td>
<td>20.06±1.17</td>
</tr>
<tr>
<td>T2</td>
<td>40.2±2.02</td>
<td>35.5±1.74</td>
<td>5.0±0.25</td>
<td>80.3±0.34</td>
<td>0.60±0.17</td>
<td>23.57±1.15</td>
</tr>
<tr>
<td>Digestibility (g/kg L.W)</td>
<td>C</td>
<td>22.16±0.4</td>
<td>73.23±1.56</td>
<td>9.78±0.23</td>
<td>22.42±1.15</td>
<td>0.48±0.14</td>
</tr>
<tr>
<td>T1</td>
<td>46.48±2.4</td>
<td>78.96±2.17</td>
<td>14.02±0.47</td>
<td>20.82±0.90</td>
<td>2.19±0.19</td>
<td>81.33±2.60</td>
</tr>
<tr>
<td>T2</td>
<td>51.3±2.47</td>
<td>82.75±2.26</td>
<td>10.3±0.18</td>
<td>16.27±0.94</td>
<td>1.49±0.05</td>
<td>84.61±1.31</td>
</tr>
</tbody>
</table>

* (P>0.05) showed no significant difference
** Different superscript in the same column showed significantly different (P<0.05)

![Number Oocyst coccidium (per gram faeces)](image)

**Oocyst coccidium**

*Coccidia* parasites are usually found in the goat raised in stables as usually done by the farmers in Gunungkidul (Kustantinah, et al., 2008). The value of oocyst coccidia in the faeces was 5000#1443, 3333#833 and 2500#0 respectively, for goats given control feed T1, and T2 (Picture 1). Lin et al (2003) showed the same pattern when using cassava leaves as the sole feed for the goats. Giving cassava leaves showed the value of 820±45 per g faeces compared to giving Guinea grass.
which showed the existence of oocyste cociddian of 4043±207 per gram feses. Although there was a decrease in the number of oocyste cociddian in the faeces, it was not a significant one (P<0.05). The research using cassava products showed that coccodiosstat effects expected from cassava products (leaves and dried cassava) did not come up optimally. Probably it was caused by the process of drying leaves that took 4 days under the direct exposure of the sun. The tannin expected to have coccodiosstat effect has been reduced by the drying process. The fact is in accordance with the studies conducted by Kustantinah et al (2004) who stated that drying process can reduce the tannin of fresh cassava leaves from 11% to 4% when they are dried for 4 days. The research conducted by Sokera and Rodriguez (2001) showed that cassava leaves contain some components (especially CT) having anti parasitic properties for goats. The findings can also be found in Butter et al (2000) and Kahn et al (2001).

Conclusion

The supplements derived from dried cassava (leaves and tuber) given to the goats raised by Sumber Rejeki Female Farmer Organization of Wonolagi District did not show significant differences in the intake of nutrients except for the EE and TDN. The expected effect of much lower coccodiosstat from cassava products was not found.

Acknowledgement

The research was a part of Higher Education Link cooperation between Gadjah Mada University and IFRU-MLURI – Aberdeen University, UK. It was a program of Department for International Development, UK through The British Council Indonesia

Reference


AOAC. 2005. Official Method of Analysis of the Association of Official Agriculturural Chemist. Published by the Association of Official Analytical Chemists, Maryland, USA.


Tran Thi Thu Hong., 2002. Digestibility and N retention by goats fed graded levels of cassava (Manihot esculenta Crantz) foliage. http://www.mekam.org/proc_kk/contents.htm


CERTIFICATE

THIS IS TO CERTIFY THAT

Kustantinah Adiwimarta

has participated in oral presentation

THE 3rd INTERNATIONAL CONFERENCE ON SUSTAINABLE ANIMAL AGRICULTURE FOR DEVELOPING COUNTRIES (SAADC2011)

JULY 26 - 29, 2011

NAKHON RATCHASIMA, THAILAND

ASSOC. PROF. DR. PONGCHAN NA-LAMPANG
CHAIRPERSON OF SAADC 2011