LAPORAN AKHIR
PENELITIAN UNGGULAN PERGURUAN TINGGI

STRATEGI PENGEMBANGAN DOMBA EKOR GEMUK (DEG) BERBASIS TANAMAN KETELA POHON DI DATARAN RENDAH DAN DATARAN TINGGI

Tahun ke 2 dari rencana 3 tahun

Ketua/Anggota Tim

Prof.Dr.Ir.Kusmartono (NIDN 006045908)
Prof.Dr.Ir.Siti Chuzaemi,MS (NIDN 0014055303)
Prof.Dr.Ir.Hartutik,MP (NIDN 0003065604)

Dibiayai oleh :
Direktorat Jenderal Pendidikan Tinggi,
Kementerian Pendidikan dan Kebudayaan, Melalui DIPA Universitas Brawijaya
Nomor : 023.04.2.414989/2014, Tanggal 5 Desember 2013, dan berdasarkan
SK Rektor Universitas Brawijaya Nomor 157 Tahun 2014 tanggal 10 April 2014

UNIVERSITAS BRAWIJAYA

Nopember 2014

HALAMAN PENGESAHAN
PENELITIAN UNGGULAN PERGURUAN TINGGI

Judul Penelitian	:	Strategi Pengembangan Ternak Domba Ekor Gemuk Berbasis Tanaman Ketela Pohondi Dataran Rendah dan Dataran Tinggi
Kode/Nama Rumpun Ilmu	:	213/Nutrisi dan Makanan Ternak
Bidang Ilmu Unggulan	:	Ketahanan Pangan
Topik Unggulan	:	Pengembangan Hijauan Pakan
Ketua Peneliti		
A. Nama Lengkap	:	Prof.Dr.Ir. Kusmartono
B. NIDN	:	0006045908
C. Jabatan Fungsional	:	Guru Besar
D. Program Studi	:	Peternakan
E. Nomor HP	:	08123582887
F. Surel (e-mail)	:	kusmartono_ansi@ub.ac.id
Anggota Peneliti (1)		
A. Nama Lengkap	:	Prof.Dr.Ir. Siti Chuzaemi, MS
B. NIDN	:	0015055303
C. Perguruan Tinggi	:	UNIVERSITAS BRAWIJAYA
Anggota Peneliti (2)		
D. Nama Lengkap	:	Prof.Dr.Ir. Hartutik, MP
E. NIDN	:	0003065604
F. Perguruan Tinggi	:	UNIVERSITAS BRAWIJAYA
Lama Penelitian	:	3 Tahun
Penelitian Tahun ke	:	2
Biaya Penelitian Keseluruhan	:	Rp. 255.000.000,00
Biaya Tahun Berjalan	:	- diusulkan je DIKTI Rp. 90.000.000,00
		- dana internal PT Rp. 0,00
		- dana institusi lain Rp. 0,00
		- inkind sebutkan

Mengetahui
Dekan,

(Prof.Dr.Ir.Kusmartono)
NIP. 19590406 198503 1 005

Malang, **6 Nopember 2014**
Ketua Peneliti

(Prof.Dr.Ir.Kusmartono)
NIP. 19590406 198503 1 005

Menyetujui,
Ketua LPPM UB

(Prof.Dr.Ir. Woro Busono, MS)
NIP. 19560403 198103 1 002

HALAMAN PENGESAHAN
PENELITIAN UNGGULAN PERGURUAN TINGGI

Judul Penelitian	:	Strategi Pengembangan Ternak Domba Ekor Gemuk Berbasis Tanaman Ketela Pohondi Dataran Rendah dan Dataran Tinggi
Kode/Nama Rumpun Ilmu	:	213/Nutrisi dan Makanan Ternak
Bidang Ilmu Unggulan	:	Ketahanan Pangan
Topik Unggulan	:	Pengembangan Hijauan Pakan
Ketua Peneliti		
A. Nama Lengkap	:	Prof.Dr.Ir. Kusmartono
B. NIDN	:	0006045908
C. Jabatan Fungsional	:	Guru Besar
D. Program Studi	:	Peternakan
E. Nomor HP	:	08123582887
F. Surel (e-mail)	:	kusmartono_ansi@ub.ac.id
Anggota Peneliti (1)		
A. Nama Lengkap	:	Prof.Dr.Ir. Siti Chuzaemi, MS
B. NIDN	:	0015055303
C. Perguruan Tinggi	:	UNIVERSITAS BRAWIJAYA
Anggota Peneliti (2)		
D. Nama Lengkap	:	Prof.Dr.Ir. Hartutik, MP
E. NIDN	:	0003065604
F. Perguruan Tinggi	:	UNIVERSITAS BRAWIJAYA
Lama Penelitian	:	3 Tahun
Penelitian Tahun ke	:	2
Biaya Penelitian Keseluruhan	:	Rp. 255.000.000,00
Biaya Tahun Berjalan	:	- diusulkan je DIKTI Rp. 90.000.000,00
		- dana internal PT Rp. 0,00
		- dana institusi lain Rp. 0,00
		- inkind sebutkan

Mengetahui
Dekan,

(Prof.Dr.Ir.Kusmartono)
NIP. 19590406 198503 1 005

Malang, **6 Nopember 2014**
Ketua Peneliti

(Prof.Dr.Ir.Kusmartono)
NIP. 19590406 198503 1 005

Menyetujui,
Ketua LPPM UB

(Prof.Dr.Ir. Woro Busono, MS)
NIP. 19560403 198103 1 002

ABSTRAK

Penelitian yang berjudul Strategi Pengembangan Domba Ekor Gemuk (DEG) Berbasis Tanaman Ketela Pohon di Dataran Rendan dan Dataran Tinggi telah dilaksanakan dengan tujuan untuk mengevaluasi potensi tanaman ketela pohon (bagian umbi, batang, kulit dandaun) sebagai sumber pakan. Pengamatan utama fokus pada produksi biomasa, kandungan zat nutrisi dan tingkat produktifitas DEG. Hasil penelitian tahun ke II mendapatkan hasil bahwa proporsi silasi kulit (40%), umbi (30%) dan daun (30%) angka retensi N tertinggi (11,19 dan 12,04 g/ekor/hari) diikuti dengan angka PBB tertinggi (56,77 dan 61,64 g/ekor/hari) di dataran rendah dan tinggi secara berurutan.

ABSTRACT

A study entitled “Strategy of Developing Fat-tailed sheep Based on Cassava Plant in Lowland and Highland was conducted aming for evaluating its potential as feed sources fo ruminants. The observation was focussed on biomass production, nutrient contents and productivity of shep receiving ration based on cassava plant. The study concluded that the growing sheep received peel silage (40%), ground chip (30%) and leaf meal (30%) achieved highest N retention (11.19 and 12.04 g/head/day) followed by highest ADG (56.77 and 61.64 g/head/day) in lowland and highland areas respectively.

RINGKASAN

Penelitian yang bertujuan untuk mengevaluasi potensi tanaman ketela pohon sebagai sumber pakan ternak domba ekor gemuk (DEG) telah dilaksanakan di Laboratorium Nutrisi dan Makanan Ternak, Fakultas Peternakan, Universitas Brawijaya Malang, kandang peternak di Kecamatan Gondang, Pasuruan dan Kecamatan Pakis, Malang. Materi penelitian berupa komponen tanaman ketela pohon yaitu daun, batang, kulit dan umbi diperoleh dari penanaman di wilayah dataran rendah (Kecamatan Gondang, Pasuruan) dan dataran tinggi (Kecamatan Pakis, Malang) dengan umur penanaman 12 bulan. Adapun percobaan pertumbuhan ternak digunakan domba ekor gemuk (DEG) sebanyak 30 ekor di masing-masing wilayah penelitian.

Hasil pengamatan terhadap produksi biomasa masing-masing komponen tidak terdapat perbedaan yang nyata terhadap produksi daun, umbi, kulit dan batang untuk kedua wilayah. Begitu pula dengan kandungan zat nutrisi (BK, BO, PK, SK, LK, BETN, ADF dan NDF) ternyata tidak ada perbedaan yang nyata diantara materi tanaman yang diproduksi di berbagai wilayah dengan ketinggian yang berbeda. Dengan demikian hasil produksi BK dan PK juga tidak berbeda nyata dan berdasarkan hasi perhitungan ketersediaan biomasa didapat hasil bahwa tanaman ketela pohon mampu menampung 50-60 ekor DEG per hektar luasan lahan dengan asumsi bobot badan terbak DEG 25 kg dan konsumsi BK/hari sebesar 3% dari BB.

Hasil analisis statistik menunjukkan bahwa perlakuan pakan memberikan pengaruh nyata ($P<0,05$) terhadap nilai konsumsi, kecernaan zat nutrisi (BK, BO dan PK) di semua wilayah penelitian. Nilai konsumsi dan kecernaan tertinggi terjadi pada ternak-ternak domba yang diberi ransum perlakuan P5. Artinya bahwa dengan semakin menurunnya kuantitas batang dan meningkatnya kuantitas silase kulit dalam ransum terjadi peningkatan nilai konsumsi. Secara konsisten jumlah nitrogen yang diikat (retensi) dalam jaringan tubuh juga tertinggi pada P5 (11,19 g/ekor/hari), sehingga nilai PBB ternak-ternak domba yang diberi pakan P5 juga tertinggi (56,77 g/ekor/hari). Dapat disimpulkan bahwa komponen tanaman ketela pohon, khususnya umbi, kulit dan daun mempunyai potensi yang sangat tinggi digunakan sebagai pakan sumber serat, protein dan enersi untuk ternak ruminansia. Perlakuan P5 dengan proporsi umbi (40%), kulit (30%) dan daun (30%) merupakan kombinasi yang terbaik yang ditandai dengan nilai retensi N (11,19 g/ekor/hari) dan PBB (56,77 g/ekor/hari) tertinggi.

SUMMARY

A study aiming for evaluating potentials of cassava plant as feed source for fat-tailed sheep was done in Nutrition laboratory, Gondang district Pasuruan regency and Pakis district Malang regency. Materials used were components of cassava plants (root, stem, peel and leaf) taken from Gondang district, Pasuruan regency representing lowland area and Pakis district, Malang regency representing highland area harvested at 12 months old. Thirty growing male sheep in were used each area.

Biomass production measured was not different between the two areas. Similarly, nutrient contents (DM, OM, CP, CF, Fat, NFE, ADF and NDF) of cassava plant components were not different. Therefore, DM and CP productions were not different and based on the calcuation of biomass availability, it can be predicted that the area is able to accomodate 50-60 heads of sheep using the following assumptions (BW 25kg; DMI 3% of BW).

Statistical anaylisis showed that treatments did not give significant effect ($P<0.05$) on feed consumption, digestibility (DM, OM and CP) in the two areas. Highest feed consumption and digestibility values were achieved by sheep receiving P5 treatment, which means the sheep given ration contained lowest stem and highest peel silage had highest feed consumption and digestibility. As a consequence, the amount of nitrogen (N) retained in the body was higest in P5 ((11.19 g/head/day), folowed by highest ADG (56.77 g/head/day). It can be concluded that cassava plant components especially tuber, pee and leaf are highly potential as fibre, energy and protein sources for ruminants. Treatment P5 (40% tuber), (30% peel), and (30% leaf) is the best combination resulting in highest N retention (11.19 and 12.04 g/day) and ADG (56.77 and 61.64 g/day) in lowland and highland areas repectively.

SUMMARY

A study aiming for evaluating potentials of cassava plant as feed source for fat-tailed sheep was done in Nutrition laboratory, Gondang district Pasuruan regency and Pakis district Malang regency. Materials used were components of cassava plants (root, stem, peel and leaf) taken from Gondang district, Pasuruan regency representing lowland area and Pakis district, Malang regency representing highland area harvested at 12 months old. Thirty growing male sheep in were used each area.

Biomass production measured was not different between the two areas. Similarly, nutrient contents (DM, OM, CP, CF, Fat, NFE, ADF and NDF) of cassava plant components were not different. Therefore, DM and CP productions were not different and based on the calcuation of biomass availability, it can be predicted that the area is able to accomodate 50-60 heads of sheep using the following assumptions (BW 25kg; DMI 3% of BW).

Statistical anaylisis showed that treatments did not give significant effect ($P<0.05$) on feed consumption, digestibility (DM, OM and CP) in the two areas. Highest feed consumption and digestibility values were achieved by sheep receiving P5 treatment, which means the sheep given ration contained lowest stem and highest peel silage had highest feed consumption and digestibility. As a consequence, the amount of nitrogen (N) retained in the body was higest in P5 ((11.19 g/head/day), folowed by highest ADG (56.77 g/head/day). It can be concluded that cassava plant components especially tuber, pee and leaf are highly potential as fibre, energy and protein sources for ruminants. Treatment P5 (40% tuber), (30% peel), and (30% leaf) is the best combination resulting in highest N retention (11.19 and 12.04 g/day) and ADG (56.77 and 61.64 g/day) in lowland and highland areas repectively.

DAFTAR PUSTAKA

Anonimous. 2011. Laporan Tahunan Direktorat Jenderal Tanaman Hortikultura. Kementerian Pertanian RI.

Anonimous. 2012. Peternakan dan Kesehatan Hewan. Kementerian Pertanian.

Barry, T.N., 1989. Condensed tannins: their role in ruminant protein and carbohydrate digestion and possible effects upon the rumen ecosystem. In: Nolan, J.V., Leng, R.A., Demeyer, D.I. (Eds.), 51, Penambul Books, Armidale, NSW, pp. 153-169.

Bui van Chinh and Le Viet Ly. 2001. Study on the processing and use of cassava tops as animal feed. http://www .mekarn. org/prockk/chinh.htm

Devendra, C., and Leng, R.A. 2011. Feed Resources for Animals in Asia: Issues, Strategies for Use, Intensification and Integration for Increased Productivity, AJAS, vol.24 No.3: 303-321).

Duong Nguyen Khang, and Hans Wiktorsson. 2005. Performance of growing heifers fed treated fresh rice straw supplemented with fresh, ensiled or pelleted cassava foliage. Unpublished report.

Fasae, O.A., Akintola, O.S, Sorunke O.S., Adu I.F. 2006. Replacement value of Cassava foliage for Gliricidia sepium leaves in the diets of goat. Book of Abstracts Annual Scientific Conference (*Eds*. Fanimo A.O., Oguntona C.R.B., Alegbeleye W.O., Onabanjo O. O., Agbon C.A.). Nutrition Society of Nigeria, held at June 12 Cultural Centre, Abeokuta 8th–11th November, 2006.

Fayosi, AO, 2005. Nutritional evaluation of cassava (*Manihot esculenta*) leaf protein concentrates (CLPC) as alternative protein sources in rat assay. Pakistan Journal of Nutrition 4(1):50-56

Fernandez. A,, MacLeod. N.A, and Preston. T. R. 1977. Cassava forage as a combined source of protein and roughage for cattle fed on molasses/urea. *Tropical Animal Production* 2:195-199

Harris,L.E. 1970**.** *Nutrition Research Technique for Domestic and Wild Animal.* Vol 1 An International Record System And Procedures For Analyzing Sample. Animal Science Department. Utah State University. Logan Utah.

Heuzé H., Tran, G. Bastianelli D., Archimède H. and Lebas F. 2012. Cassava peels, cassava pomace and other cassava tubers by-products. Feedipedia.org and Tables Régions Chaudes. A project by INRA, CIRAD and AFZ with the support of FAO. http://www.feedipedia.org/ node/ 526. Accessed January 12, 2013.

Hogan, J. 1996. Principles of Supplementary Feeding. In: Ruminant Nutrition and Production in the Tripics and Subtropic. (Editors: B.Bakrie, J.Hogan, J.B. Liang, A.M.M. Tareque and R.C. Upadhyay). ACIAR, Canberra, Australia. Pp. 75-84.

Ho Bunyeth, and Preston.T.R. 2006: Growth performance and parasite infestation of goats given cassava leaf silage, or sun-dried cassava leaves, as supplement to grazing in lowland and upland regions of Cambodia. Livestock Research for Rural Development. Volume 18, Article No. 28. http://www.cipav.org.co/lrrd/lrrd18/2/buny18028.htm

Kusmartono, 2007. Effects of supplementing jackfruit wastes with urea or gliricidia/casava leaves on growth, rumen digestion and feed degradability of sheep fed on rice straw basal diet, LRRD 19 (2)

Kusmartono dan Siti Chuzaemi. 2005. Pengaruh penambahan sumber condensed tanin (CT) terhadap efisiensi pemanfaatan protein dan penampilan kambing Peranakan Etawah (PE). *Jurnal Ilmu-Ilmu Peternakan* Volume 13, Nomor 3, Edisi September: 76-87

Kusmartono, Chuzaemi, S., Hartutik dan Mashudi. 2010. Ekstraksi condensed tannin dari tanaman semak dan pohon dan pengaruh penambahannya dalam konsentrat terhadap produksi dan kualitas karkas ternak domba ekor gemuk. Laporan Hasil Penelitian Strategi Nasional. Universitas Brawijaya, Malang.

Kusmartono., Chuzaemi, S., dan Mashudi, 2012. Pengaruh Jumlah dan Strategi Suplementasi Daun Ketela Pohon (*Manihot utilissima*) terhadap Pertumbuhan dan Nilai Ekonomis Domba Ekor Gemuk (DEG) yang Diberi Pakan Basal Jerami Jagung. Laporan Penelitian Hibah Bersaing Institusi Bacth I. Universitas Brawijaya, Malang

Makkar, H.P.S., Blummel, M., and Becker, K. 1997. Application of an in vitro gas method to understand the effect of natural plant products on availability and partitioning of nutrients. British Society of Animal Science. *Occasional Publication No. 22* Pp. 147-150.

Ngi, J., Ayoade, J.A., Oluremi, O.I.A. 2006. Evaluation of dried cassava leaf meal and maize offal as supplements for goats fed rice straw in dry season. *Livestock Research for Rural Development* 18 (9): 4

Prayitno, CH, Suwarno, and Rahardjo, T. 2006. Biodegradation of Cyanogenic Glycoside of Cassava Leaves (*Manihot esculenta* Crantz) Via Fermentation as A Mean of Ruminant Feed Supply. Animal Production 13(1):18-23

Preston, T. R. 1995. *Tropical Animal Feeding. A manual for research workers*. FAO Animal Production and Health Paper 126, FAO, Rome, Italy.

Preston, T.R., and Leng, R.A. 1987. *Macthing ruminant production with available resources in the tropics and sub-tropics.* Penambul Books, Australia.

Preston, T.R., and Ly, J. 2003. The use of Ensiled Cassava Leaves in Diets for Growing Pigs–2. The Influence of Type of Palm Oil and Cassava Leaf Maturity on Digestibility and N balance of Growing Pigs Chay. University of Tropical Agricultur Foundation. Cambodia.

Smith, O.B. 1988. A review of ruminant responses to cassava-based diets Cassava as livestock feed in Africa. Proceedings of the IITA/ILCA/University of Ibadan. Workshop on the Potential Utilization of Cassava as Livestock Feed in Africa. International Institute of Tropical Agriculture. Ibadan, Nigeria. http://agtr.ilri.cgiar.org/ documents/library/docs/ x5458e/x5458e07.htm.

Steel, R.G.D. and Torrie, J.A., 1980. Principles and Procedures of Statistics: a Biometrical Approach. McGraw-Hill Book Company (second edition). Toronto pp 663

Wanapat, M. 1999. Methods for improving the nutritive values of fibrous feeds and utilization of agricultural crop-residues for ruminants. In: Feeding of Ruminants in the Tropics based on Local Feed Resources. (Ed. M.Wanapat). Khon Kaen Publishing Company Ltd, Khon Kaen, Thailand

Wanapat M, Pimpa O, Sripuck W, Puramomgkol T, Petlum A, Boontao U, Wachirapakorn C and Sommart K, 2000 Cassava hay: an important on-farm feed for ruminants. In: Proc.International Workshop on Tannins in Livestock and Human Nutrition (Ed.J.D.Brooker), ACIAR Proc. No. 92, p.71-74

Wina, E., and Tangendjaja, B. 1993. The utilization of *Calliandra calothyrsus* as a forage for ruminants in Indonesia. Proceedings of a symposium on seed production an utilization of calliandra. ICRAF. Bogor – Indonesia. 14-16 Nopember 2000. Pp. 13-20.