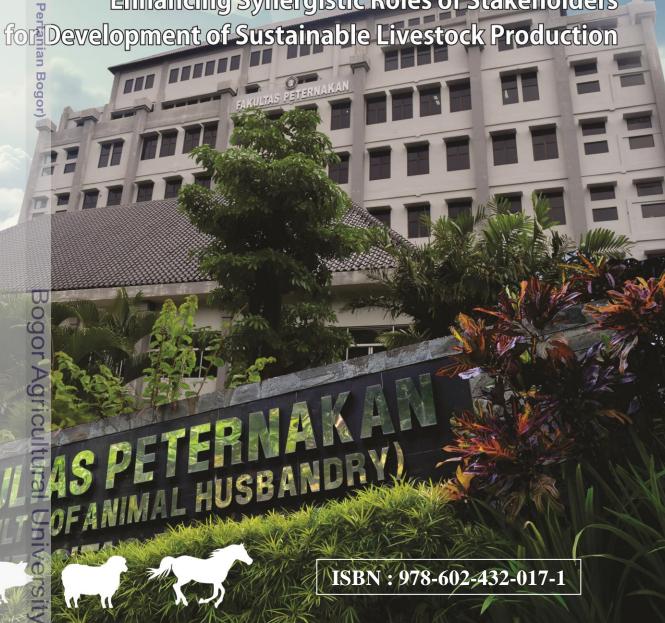


The 3rd Animal Production International Seminar The 3rd ASEAN Regional Conference on Animal Production 3rd APIS & 3rd ARCAP – 2016

Hak cipta milik IPB (Institut Enhancing Synergistic Roles of Stakeholders



Hak Cipta Dilindungi Undang-Undang

b. Pengutipan tidak merugikan kepentingan yang wajar IPB.

Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber:

a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah

2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB

TER

Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber:



Perpustakaan Nasional: Katalog dalam Terbitan (KDT)

Proceeding 3rd Animal Production International Seminar (3rd APIS) & 3rd ASEAN Regional Conference on Animal Production (3rd ARCAP)

O pt C UB Press

Cetakan Ketiga, 2016

Had Cipta dilindungi Undang-Undang

HAll Right Reserved

(Institu

: Dr.Ir. Marjuki, M.Sc (Ed.) Penulis

Aswah Ridhowi, M.Sc (Ed.) Wike Andre, M.Si (Ed.)

Perancan Sampul : Tim Prosiding Penata Letak : Tim UB Press Pracetak an Produksi: Tim UB Press

Penerbit:



Jl. Veteran 10-11 Malang 65145 Indonesia

Gedung INBIS Lt.3

: 0341-554357, Fax: 0341-554357 (call) Telp E-mail : ubpress@gmail.com/ubpress@ub.ac.id

Website : http://www.ubpress.ub.ac.id

ISBN: 978-602-432-017-1 viii +724 hlm, 21 cm x 29,7 cm

> Dilarang keras memfotokopi atau memperbanyak sebagian atau seluruh buku ini tanpa seizin tertulis dari penerbit

Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber

RECTOR SPEECH

Assalamualaikum warohmatullahi wabarakatuh
Distinguished Guests and Delegates, Ladies and Gentlemen,

It gives me great previlege and pleasure to extend to you all a very warm welcome on behalf of Brawijaya University and to say how grateful we are to the organizing committee of Animal Production International Seminar (3rd APIS) and The Third ASEAN Regional Conference on Animal Production (3rd ARCAP) who made this important event happening from today onward. Your attendance in this conference will not be enough before exploring the serendipity of Batu city which has attracted so many visitors in the recent years. It offers you many attractive places to visit varying from leisure facilities to smallholder dairy farms that relevant to the topic of this conference.

The issues of livestock production and food security have been a hot topic of debates all over the world to challenge our capability to feed human population living on earth that is believed will reach 25 billion people by the middle of this millineum. The global call on quality human resources especially in developing countries may not be achieved without adequate supply of animal protein. This has urged animal scientists to make significant effort to increase animal production by inventing new technologies and approaches but have no negative impact on our natural resources because the majority of smallholder farmers face with scarcity of cultivable land to produce adequate quantity and quality fodder for their animals. The practice of uncontrolled fodder scavenging from forest and open land may provoke a serious natural disaster such as landslide, flood and loss of water resources for human beings. Through this stage I would like to extend my concern to all distinguished guests and delegates to pay more attention on sustainable development of animal production that assures our young generation lives on earth safely and happily.

As the rector of Brawijaya University, I am also delighted to welcome you in our green campus sometime in the middle of the conference to hasten mutual collaboration between Brawijaya University and either national or international partners. We are fully aware that in a modern life higher education quality should be built on the basis of collaboration for many reasons. Brawijaya University has 14 faculties that can be grouped into four science trees, that is engineering, humanity, economics, and life sciences. They have been growing significantly not only in the number of student enrollements but many prestigeous achievement on research findings, student competitions and administrative transparency are our flagships in the last ten years. Nevertheless, we also realize that first and foremost constraint for any institution is the limit of resources and thereby underpinning the importance of establishing mutual collaboration. It is our opportunities to meet delegates from varying places of origin that open initial discussion for further networking on relevant topics of interests concordance to the main topic of this conference and beyond.

To conclude my address, once again I would like to express my sincere gratitudes to all delegates, partners and conference committee who have made this important international conference occurs. I do hope that your stay and partcipation in these seminar and conference will be fruitful and unforgettable.

University

Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber:



By the name of Almighty Allah Swt. I declare that The Third Animal Production International Seminar (3rd APIS) and The Third ASEAN Regional Conference on Animal Production (3rd ARCAP) are officially open.

Thank you very much
Wassalamualaikum warohmatullahi wabarokatuh.

Batu, 19 October 2016 Brawijaya University

Rector

Prof.Dr.Ic. Mohammad Bisri, MS.

ta milik IPB (Institut Pertanian Bogor)

. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber:

CONGRESS COMMITTEE

STEERING COMMITTEE

- Hak (• Prof.Dr.Sc.Agr. Suyadi, MS. (Brawijaya University, Indonesia)
 - Prof.Dr. Kusmartono (Brawijaya University, Indonesia)
 - Prof. Ifar Subagiyo, Ph.D. (Brawijaya University, Indonesia)
 - Prof. Hendrawan Soetanto, Ph.D. (Brawijaya University, Indonesia)
- Cipta Dilindungi Undang-Undang • Prof.Dr. Abdul Razak Alimon (Universiti Putra Malaysia, Malaysia)
 - Prof.Dr. Ali Agus, (Indonesian Society of Animal Science)
 - Dr. Abu Hasan (Malaysian Society of Animal Production)
 - Prof. Liang Chou Hsia, Ph.D. (National Pingtung University of Science and Technology, Taiwan)
 - Prof. Dr. E.R. Ærskov (International Feed Resources Unit, Macaulay Land Use Research Institute-MLURI, Scotland, UK).
 - Assoc Prof. Dr. Suntorn Wittayakun (Faculty of Science and Agriculture Technology, Rajamangala University of Technology Lanna, Thailand)
 - Prof.Dr. Zaenal Fanani (Brawijaya University, Indonesia)
 - Prof. Dr. Djalal Rosyidi (Brawijaya University, Indonesia)
 - Prof. Dr. Budi Hartono (Brawijaya University, Indonesia)
 - Prof. Dr. Luqman Hakim (Brawijaya University, Indonesia)

SCIENTIFIC COMMITTEE

- Prof. Dr. Trinil Susilawati (Brawijaya University, Indonesia)
- Prof. Dr. Abdul Razak Alimon (Universiti Putra Malaysia, Malaysia)
- Prof.Dr. Ramli Abdullah (Universiti Malaya, Malaysia)
- Cynthia D.K. Bottema, Ph.D. (University of Adelaide, Australia)
- Prof. Marsetyo, Ph.D. (Tadulako University, Palu, Central Sulawesi, Indonesia)
- Dr. Umar Paputungan (Sam Ratulangi University, Manado, North Sulawesi, Indonesia)
- Assist. Prof.Dr. Wilaiporn Chanchai (Faculty of Science and Agriculture Technology, Rajamangala University of Technology Lanna, Thailand)
- Prof.Dr. Siti Chuzaemi (Brawijaya University, Indonesia)
- Dr. Gatot Ciptadi (Brawijaya University, Indonesia)
- Dr. Lilik Eka Radiati (Brawijaya University, Indonesia)
- Dr. Osfar Sjofjan (Brawijaya University, Indonesia)
- Dr. Masdiana Ch Padaga (Brawijaya University, Indonesia)
- Dr. Eko Widodo (Brawijaya University, Indonesia)
- Dr. Mashudi (Brawijaya University, Indonesia)
- Dr. Ha Wahyu N (Brawijaya University, Indonesia)
- Hari Dwi Utami, Ph.D (Brawijaya University, Indonesia)
- Anie Eka K., M.Sc (Brawijaya University, Indonesia)

karya tulis ini tanpa mencantumkan dan menyebutkan sumber:



sebagian atau seluruh

ORGANIZING COMMITTEE

Honorary Chairperson

Prof.Dr. Mochammad Bisri (Rector/President, Brawijaya University, Malang, Indonesia)
Prof.Dr. Kusmartono (Vice-Rector of Academic Affair, Brawijaya University, Malang, Indonesia)
Prof.Dr.Sc.Agr.Ir. Suyadi (Dean, Faculty of Animal Husbandry, Brawijaya University, Malang, Indonesia) Prof.Dr. Kusmartono (Vice-Rector of Academic Affair, Brawijaya University, Malang,

Prof.Dr.Sc.Agr.Ir. Suyadi (Dean, Faculty of Animal Husbandry, Brawijaya University,

5Chairman Dr.Ir. Marjuki, M.Sc.

General Secretary

Chairper Member Chairperson Aswah Ridhowi, M.Sc. Members Wike Andre, M.Si

Chairperson Asri Nurul Huda, MP., M.Sc Vice-chairperson Dr. Ir. V. M Ani N., M.Sc

Secretariat Team

Chairperson Firman Jaya, MP Vice chairperson Dr. M. Halim Natsir

Members Jaisy Aghniarahim Putritamara., MP

Mr. Arifatul Hafidz Achsan

Fund Raising and Sponsorship Committee

Chairperson Aulia Puspita A. Y., MP., M.Sc

Vicechairperson Dr. Kuswati,

Member Yuli Frita N., MP., M.Sc

Program Committee

Dr. Herly Evanuarini Chairperson

Dr. Siti Azizah **Members**

Trianti Djoharjani, M.Agr. St

Awang Tri Satria, ME

Consumption Committee

Chairperson Dr. Tri Eko Susilorini

Members Dr. Sri Minarti

Aris Sri Widati, MS

Ria Dewi Andriani, MP., M.Sc

Receptionist Team

Chairperson Poespita Sari Hazanah N., MP Premy Puspitawati R., MP Members Mulia Winirsya Apriliyani, MP

Field Trips Committee

Chairperson Firmansyah Tri MP Dr. Agus Susilo Members Mr. Djarot Sunarto

10



Transportation Committee

Chairperson Dr. Agus Budiarto Members Mrs. Nadhiroh Mr. Sutikno

Members

Mr. Sutikno
Mr. Yusuf

Wenue and Documentation Committee

Chairperson
Members

Hely Tistian
Mr. Rosyidi
Mr. Rosyidi
Mr. Zaenal
Ms. Dita Aı Nanang Febrianto, MP Hely Tistiana, MP Mr. Kusno Waluyo

Mr. Rosyidi

Mr. Zaenal Abidin Ms. Dita Anggraini

Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber:

2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB

a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah. b. Pengutipan tidak merugikan kepentingan yang wajar IPB.

Hak cipta milik IPB (Institut Pertanian Bogor)



OUTLINE OF THE CONGRESS

Congress Name:

3rd Animal Production International Seminar (3rd APIS) & 3rd ASEAN Regional Conference on Animal Production (3rd ARCAP)

Themes:

Enhancing Synergistic Roles Of Stakeholders for development Of Sustainable Livestock Production

Echairman:

Dr.Ir. Marjuki, M.Sc (Brawijaya University, Indonesia)

Date:

₫19-21 Oc**t**ober 2016

Venue:

Royal Orchid Garden Hotel and Condominiums The Shining City of Batu

Official Website:

http://apis.ub.ac.id

Secretariat for APIS 2016:

Faculty of Animal Husbandry Brawijaya University, Malang Indonesia

Telephone +62 341 553513

Mobile/ Eine/ WA: +62 857 076 327 91

E-mail: info.apis@ub.ac.id



BRAWIJAYA UNIVERSITY



Hak cipta milik IPB (Institut Pertanian Bogor) INDONESIAN SOCIETY OF ANIMAL SCIENCE



UNIVERSITI PUTRA MALAYSIA



MALAYSIAN SOCIETY OF ANIMAL PRODUCTION



RAJAMANGALA UNIVERSITY OF TEHCNOLOGY LANNA



Hak Cipta Dilindungi Undang-Undang

Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber: Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah

Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB Pengutipan tidak merugikan kepentingan yang wajar IPB.



Friday, 21 October 12:30-14:40 Room: Pa	anderman 2
---	------------

Time	AND ACCURACYOPING	Title	Presenter	Code
<mark>ਪ</mark> 2.30−		Legumes wafer for improvement the post-weaning	Brilian Desca 🗸	FN - 352 V
Q 2.40		etawah crossbreed goats performance ¹	Dianingtyas	
ota		¹ Brilian Desca Dianingtyas, Yuli Retnani, and		
D ≅:		Dwierra Evvyernie		
12.40-		Utilization of cricket meal in creep feed diet of	Dewi Apri	FN - 332
2.50		growing etawah cross breed goats ¹	Astuti	
C _n		¹ Dewi Apri Astuti, Widya,L Khotidjah, A.		
dar	На	Angraeny, K.Komalasari, and Dewi Apri Astuti	non-manufact of differen	
년2.50-13	(P)	Performance of first cutting of Pennisetum purpureun	David A.	FN - 360
Jno	cipta	cv.Mott under different level of light and nitrogen	Kaligis	
ang		fertilizer ¹	and the second s	
0	<u> </u>	¹ David A. Kaligis, Selvie D. Anis, Johanis R.	Angele and a second a second and a second and a second and a second and a second an	
	milik IP	Tulung, and Sahrun Dalie	deficient formation of the second of the sec	
13.00-	ū	Amino acid characterization of tofu waste	Eka Fitasari	FN-325
13.10	(Ins	fermentation using effective microorganism-4 and	(MODERATOR	
	Institut	Lactobacillus plantarum culture ¹	2)	
	H.	¹ Eka Fitasari and Budi Santosa	and/or - market	
13.10-	er	In vitro digestibility profiles of cricket meal as	Dewi Apri	FN-331
13.20	ertan	protein source in the ration ¹	Astuti	
	ian	¹ Dewi Apri Astuti, M. Miftakhul Solikhin, and Yuni		
	Во	Cahya Endrawati	Ago mangangan ang mangangan	
13.20-	gor)	Production of roughage feed under different drying	Jayaweera B. P.	FN - 333
13.30	ت	methods and evaluation of the feeding value1	Α.	
		Jayaweera B. P. A.	mayaray anan	
13.30-		In vitro nutrient digestibility of Chromolaena	Yelly M. Mulik	FN - 335
13.40		odorata-based silage treated with Corypha gebanga		
	in the second	meal and rumen content ¹	nemoninary property and the second se	
		Yelly M. Mulik, Muhammad Ridla, Iwan		
		Prihantoro, and Marthen L. Mullik	,	
13.40-		Production, characterization and purification of	Indah Wijayanti	FN - 336
13.50		xylanase from Staphylococcus aureus MBXi-K4 ¹	(MODERATOR	
	W	¹ Indah Wijayanti, Maggy T Suhartono, Khaswar	1)	
	0	Syamsu, and Yulin Lestari		
13.50-	90	To estimate intestinal truly absorbed protein of	Parisa	FN - 340
14.00	7	alfalfa hay and alfalfa silage using new dutch system	Kheyrandish	
	D	(DVE/OEB) ¹		
1970 timo o y manto milandy a finale o conse	9	¹ P. Kheyrandish, M. Danesh Mesgaran and A. Vakili		
14.00-	0	Chitosan protection to saga leaves extract (Abrus	Dwierra 🗸	FN - 342 V
14.10		precatorius Linn) and Lingzhi mushroom	Evvyernie	
	Itura	(Ganoderma lucidum) from rumen microbial		
	7	degradation ¹		
	<u>a</u>	¹ Evvyernie D., Sukria H. A., Harlina E., Suningsih		
	d	N., and Zetira H.		
14.10-	7	Effects of different types of cakes in rations on the	Amani Osman	FN - 348



LIST OF CONTENT

	R SPEECH	
	ORD DEAN THE FACULTY OF ANIMAL HUSBANDRY	
	MESSAGE	
<u>-:</u>	FROM CHAIRMAN OF APIS 2016	
0	ME SPEECH FROM MSAP PRESIDENT	
	ESS COMMITTEE	
<u>U</u>	NE OF THE CONGRESS	
0	WLEDGMENTS	
_	(S)	
^	INFORMATION OF BATU	
1	INFORMATION OF THE CONGRESS	
_	CLOSING CEREMONIES	
	ASTION AND CONFERENCE DETAILS.	
	E FOR POSTER PRESENTATION CONFERENCE	
	RESENTATION PROGRAM	
	CONTENT.	
LISI OI	DON'TENT	55
	Keynote Speakers Presentation	
(IZC 1)		
(KS-1) (KS-2)	Review of Researches for Development of Sustainable Livestock Production	
(NS-2)	ustainable Livestock Production	
(KS-3)	durrent Analysis on Beef Self Sufficiency Program in Indonesia	
(KS-4)	urrent Development Trends in Global Broiler Production	
(KS-5)	Feeding Management of Ruminant Animals to Reduce Their Contribution for Gas	
(115-5)	Emission	
(KS-6)	Manipulation of Ruminal Fermentation and Methane Mitigation by Feeding	
(110 0)	Management: Strategic Success Keys for Smallholder Dairy Farm with	
	Environmentally Friendly	
	21. 1. c. 1.	
	Oral Presentation 1 Focus Session: Feed and Nutrition (1)	
(FN-392)	Smallholder dairy cattle farmer capacity in providing feeds and nutrient in several	
	population densities of villages of Sleman Regency DIY Province – Indonesia	95
(FN-393)	utritional properties of several seaweeds species for dairy cattle	
	enclusion of various levels of peanut hay (rendeng) in the rabbit diet	
	The use of corn fodder for rabbit production	
(FN-359)	Development of beef cattle using agricultural by-product in West Java	107
(FN-361)	hanges in nutrition and fibre silage water hyacinth (Eichornia crassipes) as ruminant	
	Leed fermented with several fermentative materials	110
	Ω	
	Oral Presentation 1 Focus Session: Feed and Nutrition (2)	
(FN-374)	Ferformance of broiler chickens fed diets supplemented with several palm	
	1 olysaccharides	116
(FN-369)	Supplementation of the diets with rich - selenium feedstuffs on the performance of 4	
	eeks old broiler chickens	121
	₹	
	\Box	55



7	(FN	1-390	Effect of storage time and physical form of diet with formulated from local feed based	
			on nutrient composition of the diets	530
	(FN	1-385	on nutrient composition of the diets Enrichment of Feedstuff With Fermented Soybean Peel to Increase Rabbit Body Weight Broiler chickens performance as affected by animal fat and plant oil under hot arid conditions of Sudan	
	유		Weight	533
	OFN	1-344	Broiler chickens performance as affected by animal fat and plant oil under hot arid	
٠.	ptc		conditions of Sudan	539
-	QFN	-391	Calcium and phosporous absorption of field grass during the dry season at medium	
	⊒.		altitude in Comet	543
	FIN	-347	Isolation and screening of lactic acid bacteria from dadih for glutamic acid production	
(<u> </u>	. ~	S precursor of γ-Amino Butyric Acid (GABA) induced heat stress in broiler	
-	DEN	1-357	The effect of fertilizers on soil characteristics of sand-mining land and nutrients content	0 10
-	ang-	(-557,	of sorghum patir 3.7 (Sorghum bicolor (L) Moench)	550
		1-365	2 Arbuscular mycorrhizal fungi and rock phosphate role on plant growth of sorghum	
	nd	(-305)	Sorghum bicolor L.) as a forage	553
- (gng	264	The Potential of Local Feed Sources for Silage Production in Supporting The Cattle	555
	1117	-304		556
-			Raising Business in East Ranotongkor Village	330
			Oral Presentation 5 Focus Session: Feed and Nutrition (2)	>
1	(FN	-352	Legumes wafer for improvement the post-weaning etawah crossbreed goats	TO TO THE TOTAL OF
			performance	
-	(FN	-332	tilization of cricket meal in creep feed diet of growing etawah cross breed goats	/
-			Performance of first cutting of Pennisetum purpureun cv. Mott under different level of	
			Bight and nitrogen fertilizer	
	(FN	-325	mino acid characterization of tofu waste fermentation using effective microorganism-	
	(and Lactobacillus plantarum culture.	570
	(FN	(331)	vitro digestibility profiles of cricket meal as protein source in the ration	
			Production of roughage feed under different drying methods and evaluation of the	010
	17.11	-222)	feeding value	576
	/EN	225)	In vitro nutrient digestibility of Chromolaena odorata-based silage treated with	010
-	(11)	-333)	Corypha gebanga meal and rumen content	570
	(EN	226		317
	(LIV	-330)	Production, characterization and purification of xylanase from Staphylococcus aureus	503
	/ TT 1 1	2.40)	MBXi-K4	383
	(FN	-340)		COM
1	(77)		dutch system (DVE/OEB)	38/
1	(FN	-342)	Chitosan protection to saga leaves extract (Abrus precatorius Linn) and Lingzhi	****
			ushroom (Ganoderma lucidum) from rumen microbial degradation	588
	(FN		Effects of different types of cakes in rations on the performance of culled Cyprus shami	
			loes in Half Elgadeda, Kassala State, Sudan	592
	(FN	-361)	Thanges in nutrition and fibre silage water hyacinth (Eichornia crassipes) as ruminant	
			Meed fermented with several fermentative materials	598
	(FN	-400)	ffect of Phanerochaete chrysosporium to enzymatic activity and lignin on	
			Fermentation process of cocoa pod (Theobroma cacao)	603
			Oral Presentation 5 Focus Session : Feed and Nutrition (3)	
			O'All resettation 2 rocus Session - reco and Author (2)	
	(FN	-329)	ffect of fish oil and its combination with tomato powder supplementation on laying	
			Operformance of native chicken	610
	(FN	-354)	Effect of substitution of meat bone meal with protein concentrate of mealworm	
			Tenebrio molitor L) on performance of broilers	611

Ω . Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah

mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber

Dilarang

Chitosan Protection To Saga Leaves Extract (Abrus Precatorius Linn) And Lingzhi Mushroom (Ganoderma Lucidum) From Rumen Microbial Degradation

Evvyernie D^{1,2}, Sukria HA^{1,2}, Harlina E^{1,3}, Suningsih N², and Zetira H²

¹Biopharmaca Research Center Bogor Agricultural University. Bogor 16128. West Java. Indonesia.

Department of Nutrition and Feed Technology, Faculty of Animal Science, Bogor Agricultural University. Bogor 16680. West Java. Indonesia.

³Department of Clinics, Reproduction and Pathology. Faculty of Veterinary Medicine, Bogor Agricultural University. Bogor 16680. West Java. Indonesia. Corresponding author: erniedea8492@gmail.com

Abstract

The purpose of research was study the use of 2% chitosan as a protector of herb saga leaves extract (Abrus precatorius Linn) and lingzhi mushroom (Ganoderma lucidum) from microbial degradation in the rumen in vitro. Randomized block design with five ration treatments and three times collection of rumen fluid as a block. The treatments were R0 (control) \$\frac{a}{2}\$ basal ration (35% forage and 65% concentrates), R1: R0+ saga leaves extract, and R2: R0+ saga leaves extract protected by 2% chitosan, R3: R0+ lingzhi mushroom extract, and R4: R9+ lingzhi mushroom extract protected by 2% chitosan. Parameters observed were total poputation of rumen microbes (protozoa and bacteria), concentrations of total VFA and NH₃, dryand organic matter digestibility (DMD and OMD). The results showed chitosan protection to both extracts were not influence the population of bacteria and protozoa as well as NH₃ concentration, but decreased 16,4% VFA total (P<0.05) and 35% average digestibility (P<0.05) in saga leaves extract and also decreased 20% VFA total (P<0.05) in lingzhi mushroom extract without interfere the digestibility. As conclusion, 2% chitosan can be used as protector to lingzhi mushroom extract than to saga leaves extract from degradation of rumen microbes due to its ability maintaining the digestibility.

Keywords: chitosan, digestibility, in vitro, lingzhi mushroom (Ganoderma lucidum)

Introduction

Improvement of animal productions can be triggered by feed additive addition into the ration. The use of synthetic additives is common in the farm due to their continue availability, although they still left the residue in the animal products. Nowadays, as the development of health knowledge, the kind of residue has potency as carcinogenic factor for human who consume that kind of animal products. To reduce that risk, the investigation of save feed additives as an alternative should be done continuously.

Many herbs and mushroom have capacity as feed additives for anti bacteria, antioxidant, anti mastitis and anthelmintic. The use of them in animal ration is restricted by their anti-nutrition content, which interferes the fermentation process in the rumen, for example sponin reduced the growth of protozoa (defaunation), hence impacts decreased the methane production (Guo et al., 2008). Rahminiwati et al. (2010) said that kemuning and saga leaves extracts could be as prebiotic because their ability to reduce non-pathogenic



bacteria such as Lactobacillus rhamnosus, L. agilis and L. amylophilus. Moreover, addition of saga and kemuning leaves meal in goat lactation rations caused reducing only some amount of somatic cell count and EPG as well as the use of lingzhi mushroom meal in ration of dairy cow lactation (Evvyernie et al. 2012; Tresia et al. 2015). Although those finding desults showed that herbs and mushroom have potency as anti mastitis and anthelmintic on glairy goat and cow, but the use of them were not more than 1% in ruminant ration due to their role as anti bacteria will kill the microorganisms in the rumen. So that, in this present gresearch, herbs and mushroom in high level were used after they protected by chitosan. Schitosan is a natural biopolymer derived from the deacetylation of chitin and is not degraded In the rumen (Fadel El-Seed et al. 2003).

The purpose of research was study the use of 2% chitosan as a protector of herb saga geaves extract (Abrus precatorius Linn) and lingzhi mushroom (Ganoderma lucidum) from

microbial degradation in the rumen in vitro.

microbial degrad microb This research used randomized block design with 3 (three) kinds of ration as a treatment and 3 (three) times collection of fresh dairy goat rumen fluid or inoculums as a block. The treatments were: R0 (control) = basal ration; R1: R0+ saga leaves extract, and R2: R0+ saga eaves extract protected by 2% chitosan, R3: R0+ lingzhi mushroom extract, and R4: R0+ Engzhi mushroom extract protected by 2% chitosan. The basal ration contained 35% forage and 65% concentrate which fulfill the requirement of dairy goat lactation 55% TDN and 12% crude protein. The forage was consist of 25% Napier grass and 10% Indigofera spp, and the concentrate was consist of coconut meal, tempeh waste, dates fruit waste, rice bran, premix, ECP and CaCO₃ (Yuniarti et al. 2014). Extraction of saga leaves and lingzhi mushroom used infuse method with water as a solvent. Spray dry method was used to protect the both extracts using 2% chitosan.

The variables measured for in vitro studies were: protozoa and bacteria total populations (Ogimoto and Imai 1981); VFA total concentration (General Laboratory Procedure 1996), NH₃ concentration (General Laboratory Procedure 1996), dry matter digestibility (DMD) and organic matter digestibility (OMD) (Tilley and Terry 1963). Data were analyzed using ANOVA and contrast orthogonal (Steel dan Torrie 1993).

Results and Discussion

The rumen microbes and their products by feeding rations contain saga leaves or lingzhi mushroom extracts with or without 2% chitosan protection is provided in Table 1. There were no differences among population of protozoa and bacteria rumen of all treatment rations compared to control. That means addition of herb or mushroom extracts not interferes the growth of rumen microbes in this research.

Ind (four) hours rumen fermentation in vitro, production of VFA total decreased around 18% when saga leaves and lingzhi mushroom were protected by chitosan (R2 Table 1 Rumen microbes and their products by feeding rations contain saga leaves and lingzhi mashroom extracts with and without chitosan protection

Variables	Treatments				
variables	R0	R1	R2	R3	R4
Protozoa total (log cell ml-1)	6.97 ± 0.07	6.78 ± 0.28	6.66 ± 0.20	6.85 ± 0.08	6.85 ± 0.11
Bacteria Otal (log CFU ml ⁻¹)	7.11 ± 1.30	7.18 ± 1.36	7.43 ± 1.46	6.95 ± 1.49	7.12 ± 0.98
VFA total	151.07b ±	164.62a ±	137.68c ±	164.97a±	131.34c ±

mencantumkan dan menyebutkan sumber-



Dilarang mengutip sebagian atau seluruh

(mM)* 12.76 11.33 12.89 11.79 10.94 12.78 ± 1.24 13.05 ± 4.91 9.91 ± 2.80 12.73 ± 2.90 NH₃ (mM) 11.25 ± 4.23 74.50a ± 74.69a ± 51.86b ± 74.06b ± 71.75b ± **T**DMD (%)* 1.92 2.30 2.34 1.19 0.52 42.24b ± 69.61a ± 66.76b ± 69.87a ± 70.18a ± OMD (%)* 2.56 2.77 2.49 1.21 0.41 Notes: R0: Control, R1: R0+ saga leaves extract, and R2: R0+ saga leaves extract protected by 2% chitosan,

Notes: R0: Control, R1: R0+ saga leaves extract, and R2: R0+ saga leaves extract protected by 2% chitosan, R3: R0+ lingzhi mushroom extract, and R4: R0+ lingzhi mushroom extract protected by 2% chitosan. VFA = Volatile fatty acids concentration, NH3= ammonia concentration, DMD= dry matter digestibility, OMD= VFA = VF

and R4) compared to R1 and R3 (P<0.05). The NH₃ concentration of R2 increased around 29%, but R4 decreased around 2%. Chitosan is alkaline due to high NH₂ content. Chitosan and solve in organic solvent like formic acid, acetic acid and glutamic acid by protonation NH₂ content to be NH₃ (Rinaudo, 2006). Through this mechanism, VFA production formic acid and acetic acid) from the chitosan protected-rations (R2 and R4) could be used to solve the chitosan and caused increasing the NH₃ concentration in R2, but almost not affected NH₃ concentration of R4 due to lingzhi mushroom content. However, the digestibility of R2 drastically decreased around 35% as consequently of alkaline ecosystem in the rumen (the fermentation process of digestion was 48 hours) (P<0.05). The average decreasing of R4 digestibility was only slightly around 4%, because rumen ecosystem almost the same to R3 after chitosan was solved by acid from VFA, where it might be caused by lingzhi mushroom content such as polysaccharide, peptidoglycan, beta-D-glukan, that have capacity to stabilized pH or rumen ecosystem.

Conclusion

Asconclusion, 2% chitosan can be used as protector to lingzhi mushroom extract than to saga leaves extract from degradation of rumen microbes due to its ability maintaining the digestibility.

References

- Evvyernie, D, Suprihantoro, A, Roni, M, Sutiarna, A, Awaliatin, L, Toharmat, T, Permana, I.G, Suryahadi, Diapari, D, Agustin F, Taniwiryono, D. 2012. Performance and Milk Quality of the Lactating Dairy Cow Consuming *Ganoderma lucidum*, Organic Chromium and CLA as Feed Supplement. Proceeding of The 2nd International Seminar on Animal Industry. Faculty of Animal Science. Bogor Agricultural University. Jakarta, 5-6 July, 2012.
- Fadel El Seed, A.N.M.A, Kamel, H.E.M, Sekine, J, Hishinuma, M, Hamana, K. 2002. Chitin and chitosan as possible novel nitrogen sources for ruminants. Can. J. Anim. Sci. Devnloaded from www.nrcresearchpress.com by 180.252.132.190 on 10/05/16.
- General Laboratory Procedures. Department of Dairy Science. University of Wisconsin, Madinson, 1966.
- Guo YQ,QX Liu, Y Lu, WY Zhu, SE Denman, CS McSweeney. 2008. Effect of tea saponin on methanogenesis, microbial community structure and expression of mcrA gene, in cultures of rumen micro-organisms. Lett Appl Microbiol. 2008 Nov.47(5):421-6. doi: 10.1111/j.1472-765X.2008.02459.x.
- Ogimoto K, Imai S. 1981. Atlas of rumen microbiology. Tokyo (JP): Japan Scientific Societes Press.

. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber:

Rahminiwati S. Sa'diah, Poeloengan M. 2010. Formulasi Anti Mastitis Berbasis Herbal: Skrining Aktivitas Anti Bakteri dan Anti Inflamasi secara In Vitro dan In Vivo untuk Menghasilkan 1 Kandidat Formulasi Probiotik dari Daun Kemuning, Daun Saga,

Menghasilkan 1 Kandidat Formulasi Probiotik dari Daun Kemuning, Daun Saga, Daun Binahong, Herba, Seledri, Rimpang Kunyit, Minyak. KKP3T. Departemen Pertanian.

Rinaudo, M. 2006. Chitin and Chitosan: Properties an Application. Prog. Polym.Sci. 31: 603-632. Elsevier.

RGD, Torrie JH.1993. Prinsip dan Prosedur Statistika (Pendekatan Biometrik) Penerjemah B. Sumantri. Jakarta (ID): Gramedia Pustaka Utama.

Prilley JMA, Terry RA. A two stage technique for the *in-vitro* digestion of forage crops. J. British Grassland Soc. 18 (1963) 104-111.

Presia, G.F., Evvyernie, D, Harlina, E, Sukria, H.A. 2015. Benefit of Kemuning Leaves Meal in Ration Containing Date Fruit Waste to Suppress Gastrointestinal Parasites Intestation of Goats. Proceeding of the 3rd International Seminar on Animal Industry. ISBN: 978-602-96530-4-5. Page: 220-223. Bogor, 17-18 September, 2015.

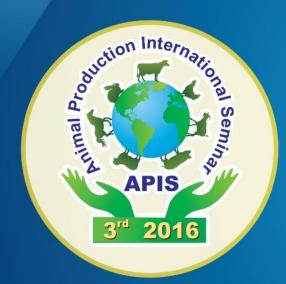
Yuniarti, E, Evvyernie, D, Astuti, D.A. 2014. In vitro evaluation of dates fruit waste as an

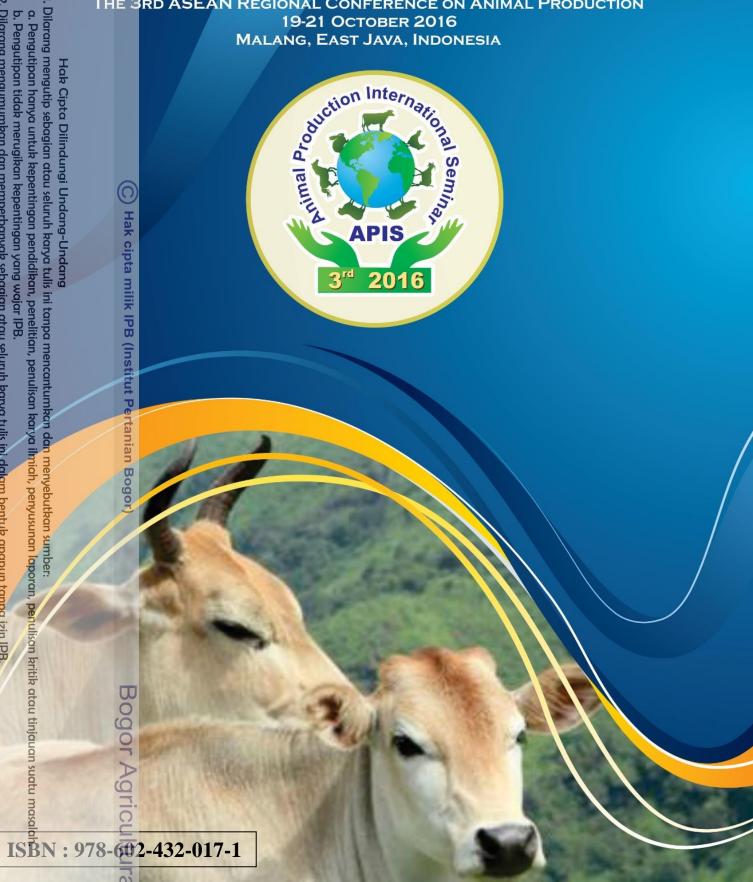
energy source in dairy goat ration. Proceeding The 2nd Asian-Australasian Dairy Goat Conference. ISBN 978-602-96530-3-8. Page: 182-184. Bogor, April 25-27th, 2014.

Bogor Agricultural Universit

(Institut Pertanian Bogor)

THE 3RD ANIMAL PRODUCTION INTERNATIONAL SEMINAR THE 3RD ASEAN REGIONAL CONFERENCE ON ANIMAL PRODUCTION 19-21 OCTOBER 2016 MALANG, EAST JAVA, INDONESIA





2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB.

1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber:

