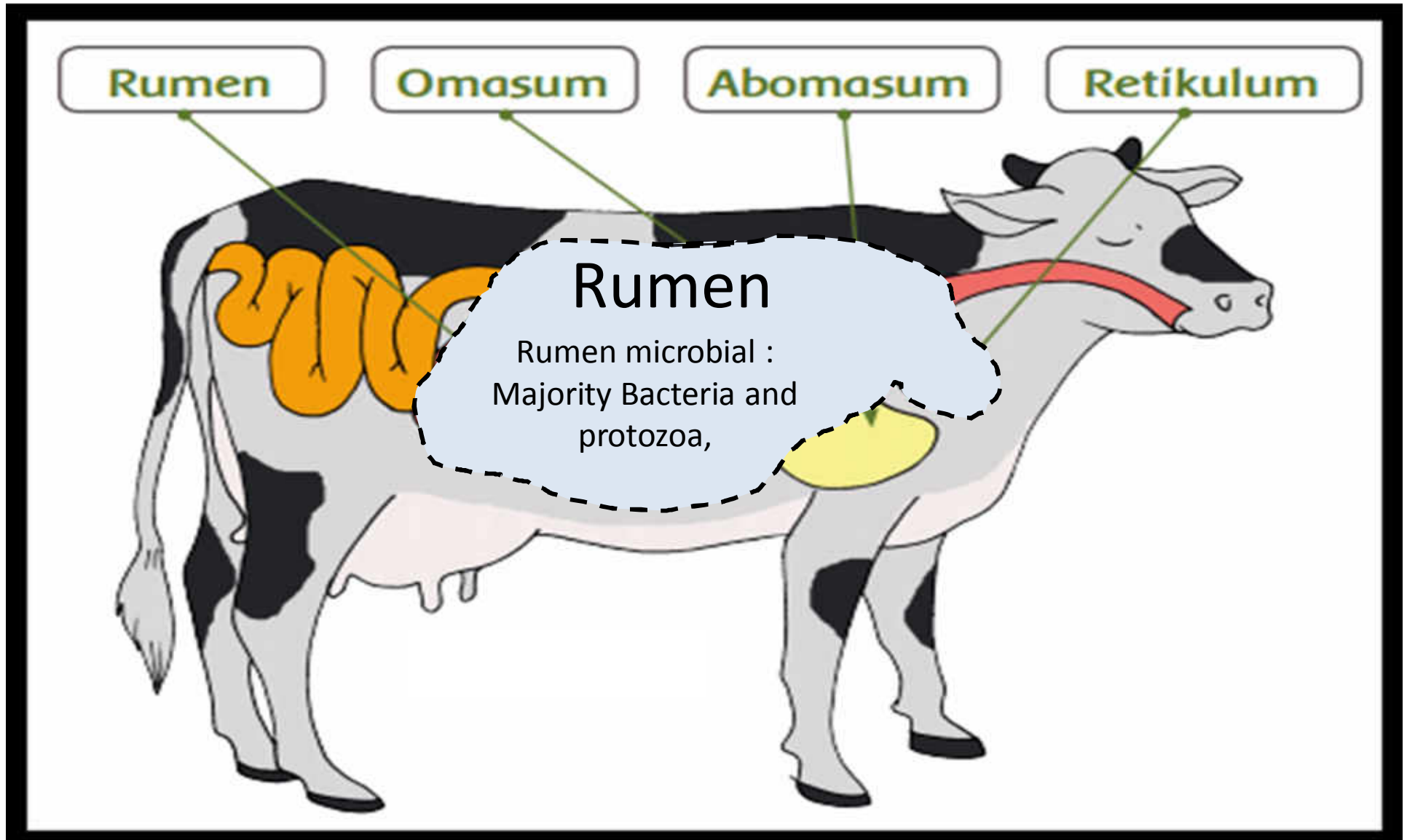


The Addition of Gambier Leaf Residue to Protect Protein in Cattle Feed Supplement from Rumen Degradation

Ramaiyulis

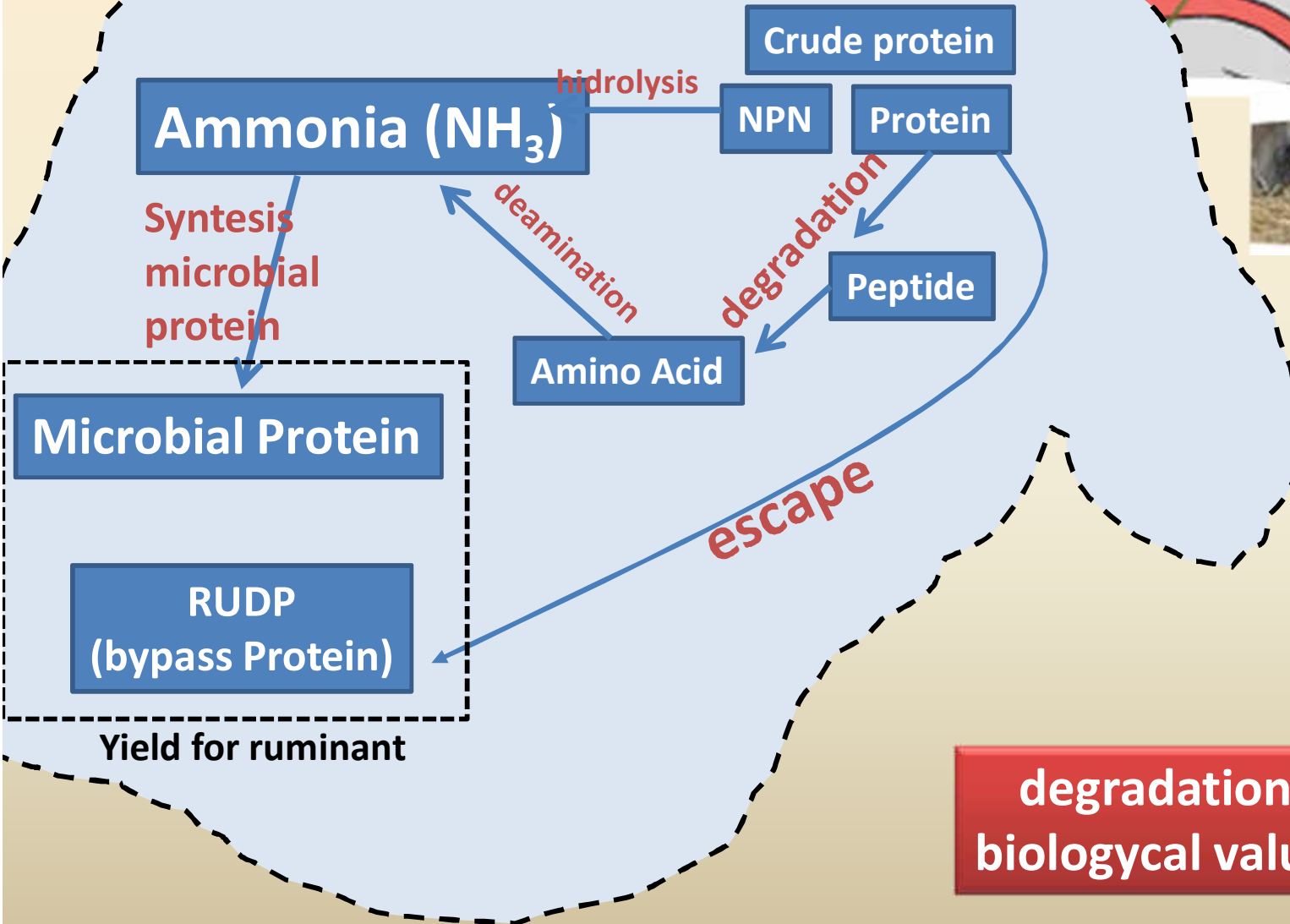
Doctoral Program of Animal Husbandry Faculty
Andalas University, Limau Manis Padang 25163
Indonesia

Why proteins need to be protected from rumen degradation in ruminants ?





Protein digestion by rumen microbial



degradation decreases biological value of protein

- Protection of proteins is essential for productive ruminants
- Protein deficiency can inhibit ruminant productivity and even reduce weight, especially in animals that are growing, pregnant and lactating
- Provision of protein in ruminant rations is very crucial given the low protein content in tropical forages

Beef cattle ration

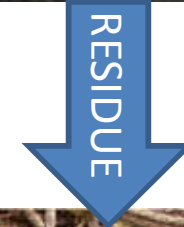
Forage

Konsentrate

Feed supplement



What is gambier leaf residue (GLR) ?



Containt
Condensed
tannin 9.96%
to protect
protein



Materials and methods

Table 1. Cattle feed supplement composition with the addition of gambier leaf residue

Ingredient	Gambier leaf residue, %DM			
	0	2.5	5.0	7.5
Brown sugar	15	15	15	15
Bran	29	28	27	26
Coconut meal	15	14	12	11
Soybean meal	15	15	15	15
Tapioca	15	15	15	15
Urea	5	5	5	5
Salt	3	2.5	3	2.5
Mineral	3	3	3	3
Gambier leaf residue	0	2.5	5	7.5
Chemical composition				
Organic matter, %	84.32	84.51	85.95	85.96
Crude protein (CP), %	29.30	29.36	29.64	29.90
Tannin, %	0	0.68	1.17	1.60
Tannin: CP non-urea	0	62,42	31,21	20,81

Rumen in vitro digestion

Rumen fluid

McDougall Buffer saliva :

$\text{NaHCO}_3 = 9,8 \text{ g}$

$\text{Na}_2\text{HPO}_4 = 4,62 \text{ g}$

$\text{KCl} = 0,57 \text{ g}$

$\text{MgSO}_4 = 0.12 \text{ g}$

$\text{NaCl} = 0,47 \text{ g}$

$\text{CaCl}_2 = 0,05\text{g}$

1 liter

Rumen Fluid
(RF)

1:4

mix



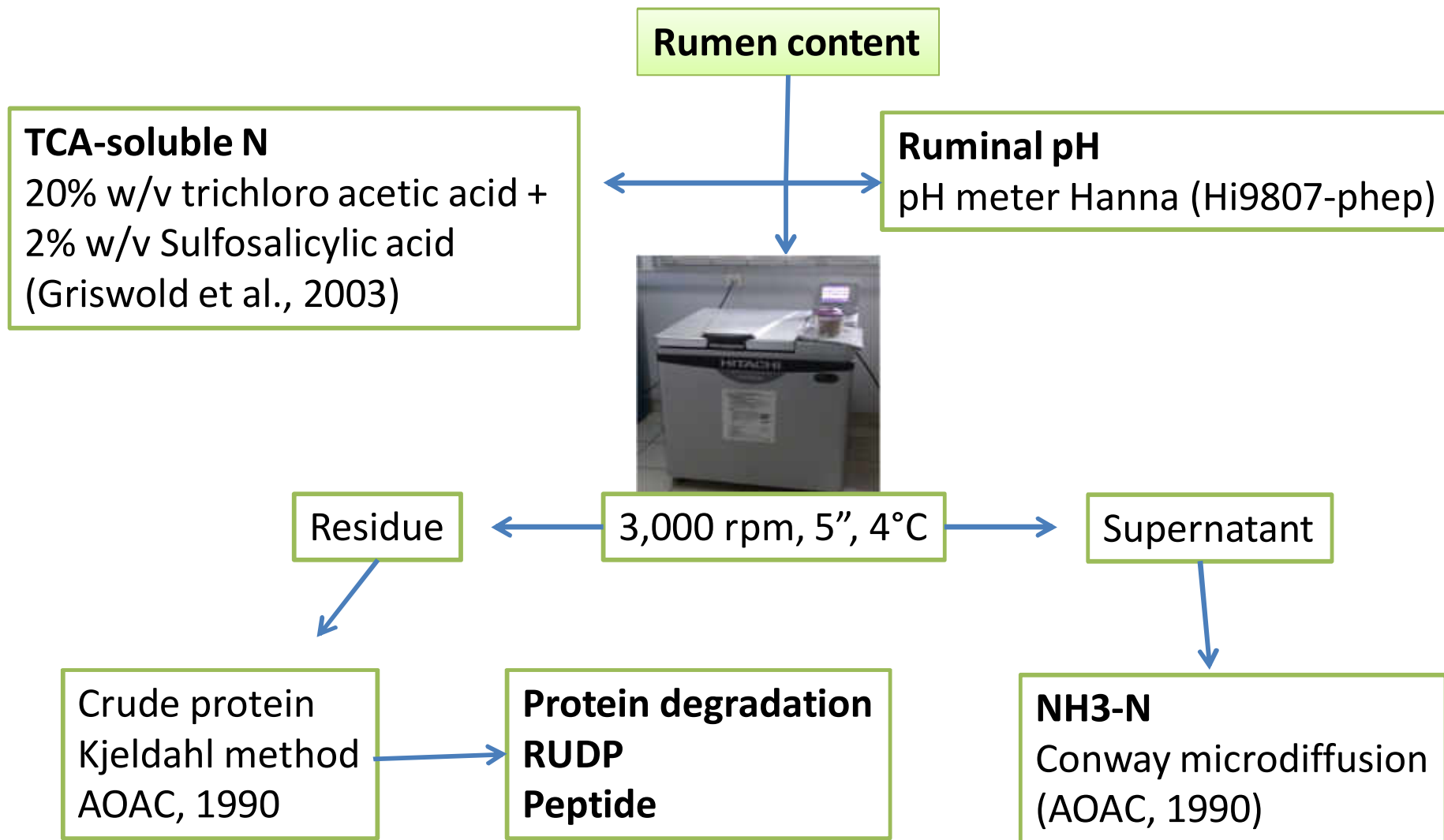
0,5 g sample + 50 ml RF in fermenter bottle

CO_2 Gas = anaerob

Incubation 39°C for 3, 6, 12, 24 and 48 hours
in shaker water bath

Stop fermentation with soaking in cool water

Sample analysis



RESULTS AND DISCUSSION

Table 2. In vitro rumen digestibility of cattle feed supplement with addition gambier leaf residue.

Parameters	Gambier leaf residue, %DM				SEM	P-value
	0	2.5	5.0	7.5		
Sample protein, mg / 100 ml	165.66	168.14	169.75	170.96		
Crude protein degradation, %	69.87 ^a	58.18 ^b	56.37 ^b	59.76 ^b	2.96	0.046
RUDP, mg/100 ml	49.91 ^b	70.31 ^a	74.07 ^a	68.80 ^a	2.34	<0.01
TCA-soluble N, mg/100 ml	319.14 ^b	345.46 ^b	465.20 ^a	433.16 ^a	26.01	0.010
NH ₃ -N, mg/100 ml	15.17 ^a	14.75 ^b	13.95 ^b	13.11 ^b	0.33	0.049
Peptide N, mg/100 ml	304.40 ^b	330.29 ^b	451.25 ^a	420.75 ^a	25.82	0.026
pH	6.85	6.95	6.93	6.95	0.03	0.088

Different superscripts on the same line significantly different (P <0.05)

RUDP = rumen undegraded dietary protein; TCA = trichloroacetic acid

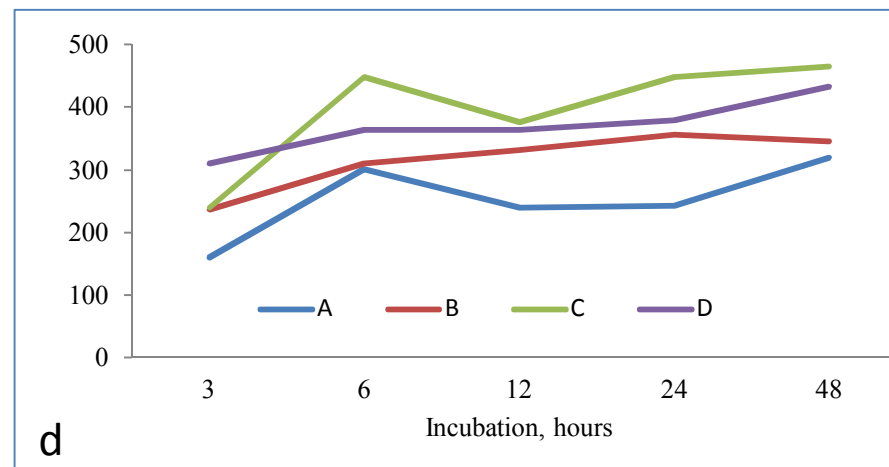
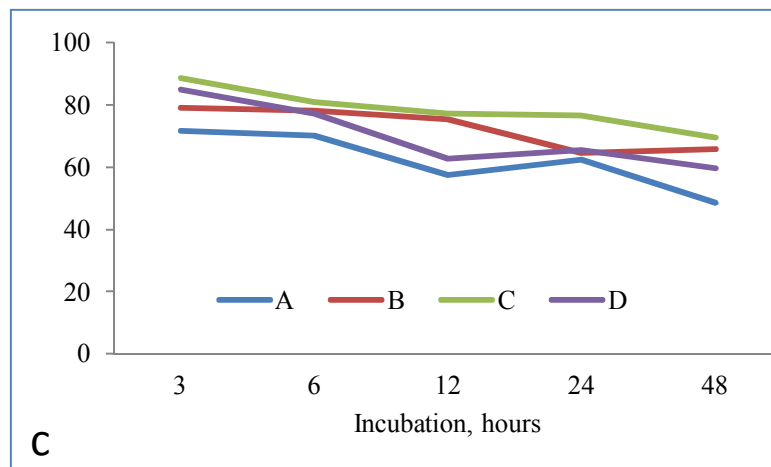
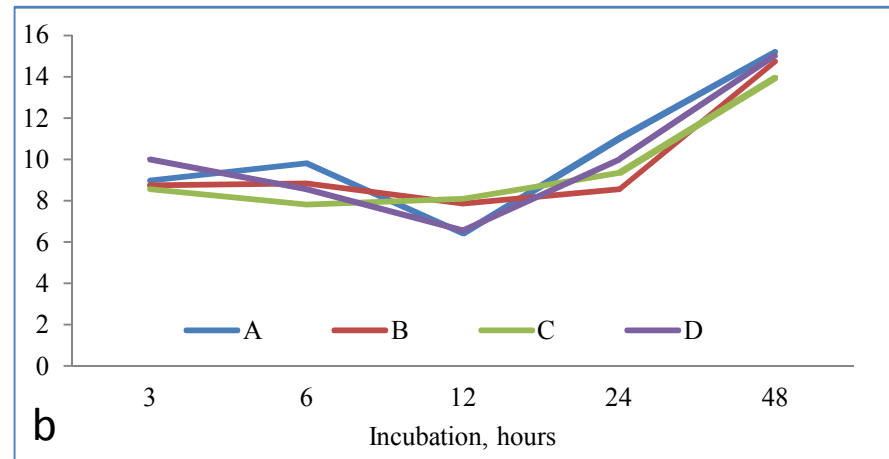
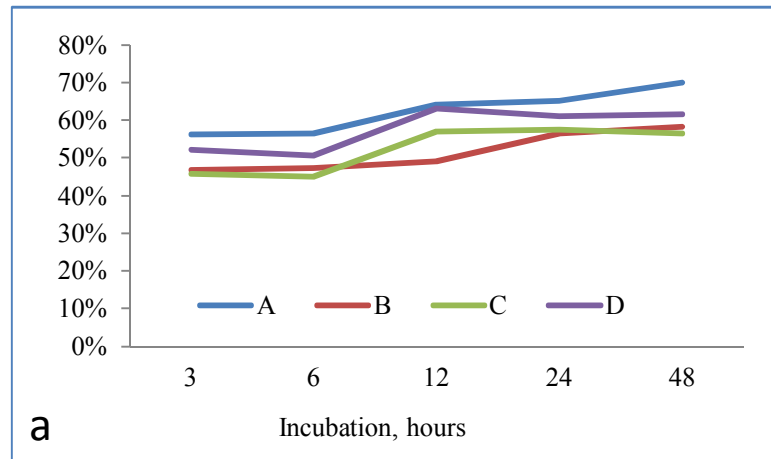


Figure 1. Effect of gambier leaf residue addition (A = 0%; B = 2.5%; C = 5.0%; D = 7.5%) to cattle feed supplement against kinetics of: a. protein degradation (%), b. NH₃-N concentration (mg/100 ml of rumen fluid), c. Rumen undegraded dietary protein (mg/100 ml rumen fluid) and d. TCA-soluble N (mg /100 ml of rumen fluid).

Table 3. The estimated value of the optimum GLR level in CFS to obtain the minimum protein degradation rate in the incubation period.

Incubation (hours)	b_1	b_2	a	R^2	P	GLR Optimum (%)	Deg.min. (%/jam)
3	0.0021	-0.0178	0.1873	0.991	<0.01	4.64	14.99
6	0.001	-0.0086	0.094	0.994	<0.01	4.71	7.57
12	0.0007	-0.0051	0.0524	0.782	0.091	4.89	4.42
24	0.0002	-0.0017	0.027	0.947	0.032	5.02	2.35
48	0.0001	-0.0013	0.0145	0.961	0.021	5.12	1.05

D = estimated value of protein degradation based on quadratic equation

$$D = b_1x^2 + b_2x + a$$

b_1 & b_2 = regression coefficient

a = intercept

x = level of GLR

R^2 = coefficient of determination

P = the significance of the regression equation

Deg.min. = the minimum degradation rate of protein

Conclusion

- The addition of GLR can reduce the degradation of protein, increase RUDP, increase TCA-soluble N and higher Peptide will be available for post-rumen digestion.
- The optimum level of addition of GLR is 4.64 to 5.12%



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AGRIFOOD SYSTEM TOWARDS AGRICULTURE 4.0 AND DELIVERY OF SUSTAINABLE DEVELOPMENTS GOALS (SDGS)

Kyriad Hotel Bumi Minang, Padang, West Sumatera, Indonesia
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Conference Programme & Abstract

ASIC 2018

AGRIFOOD SYSTEM INTERNATIONAL CONFERENCE

“Agrifood system towards Agriculture 4.0 and delivery of Sustainable Developments Goals (SDGs)”

Padang, West Sumatra, Indonesia, 4-6 September 2018



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AGRIFOOD SYSTEM INTERNATIONAL CONFERENCE 2018
FACULTY OF AGRICULTURE
UNIVERSITAS ANDALAS

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Phone :082285700843, 085263099502

Conference Website : <http://conference.faperta.unand.ac.id> e-mail :

seminarfpa18@gmail.com, seminarfpa18@agr.unand.ac.id

SCHEDULE

Agrifood System International Conference (ASIC)
Faculty of Agriculture, Universitas Andalas
Kyriad Hotel Bumi Minang, 4 – 6 September 2018

First day agenda

Tuesday, September 4th 2018

Time	Session	Venue/ Person in charge
08.00 – 08.30	Registration	
	Opening ceremony	Ball room
08.30 – 08.35	Opening by MC	2 MCs (English and Indonesian)
08.35 – 08.50	National Anthem: 'Indonesia Raya'	UKS - FPUA
08.50 – 09.00	Do'a	Forstudi - FPUA
09.00 – 09.10	Report from organizing committee	Prof. Ir. Yonariza, M.Sc, Ph.D
09.00 – 09.20	Welcoming remarks 1. Dean 2. Rector 3. Governor	Dr. Ir. Munzir Busniah, M.Si Prof. Tafdil Husni, SE, MBA, Ph.D Prof. Dr. IrwanPrayitno, S.Psi, M.Sc (Gong striking)
09.20 – 09.35	Minangkabau Dance Performance	UKS - FPUA
09.35 – 09.50	Coffee break	Dwi Evaliza
	Keynote speech (1 st session)	Conventional Room
09.50 – 10.15	1. Prof. Kouichi Ikegami (Digital agrifood system in era 4.0)	Moderator : Prof. Dr. Helmi
10.35 – 11.20	2. Prof. Iin Handayani (Education to support agrifood system in era 4.0)	Moderator : Dr. Agustian
11.20 – 12.05	3. Dr. Daniel Ruiz de Garibay Ponce (Family farming in era 4.0)	Moderator : Prof. Dr. Dian Fiantis
12.05 – 12.20	Appreciation and photo session	Afraningsih
12.20 – 13.30	Lunch Break	Dwi Evaliza

13.30 – 14.30	Parallel session I	Venue	Moderator
	1. Crop breeding and production 1 CPPB-01 to CPPB-07	1	Dr. Nunun Barunawati
	2. Soil management 1 SM-01 to SM-07	2	Prof. Dr. Yulnafatmawita
	3. Plant protection & food safety 1 PPFS-01 to PPFS-08	3	Dr. Eka Candra Lina
	4. Sustainable Rural Economy 1 SRE-01 to SRE-05	4	Dr. Sharon B. Singzon
	5. Agribusiness & family farming 1 AFF-01 to AFF-05	5	Dr. Yuerlita
14.30 – 15.30	Parallel session II	Venue	Moderator
	1. Crop breeding and production 2 CPPB-08 to CPPB-14	1	Prof. Dr. Jamsari
	2. Soil management 2 SM-08 to SM-14	2	Prof. Dr. Dian Fiantis
	3. Plant protection & food safety 2 PPFS-09 to PPFS-15	3	Dr. Hidrayani
	4. Sustainable Rural Economy 2 SRE-06 to SRE-10	4	Dr. Vonny Indah Mutiara
	5. Agribusiness & family farming 2 AFF-06 to AFF 10	5	Dr. Hasnah

15.30 – 16.30	Parallel session III	Venue	Moderator
	1. Crop breeding and production 3 CPPB-15 to CPPB-20	1	Dr. Irawati
	2. Crop breeding and production 4 CPPB-21 to CPPB-28	2	Dr. P.K. Dewi Hayati
	3. Plant protection & food safety 3 PPFS-16 to PPFS-23	3	Dr. Nur Ain Izzati
	4. Other topics related Agricultural System 1 OTR-01 to OTR-07	4	Dr. Darnetty
	5. Agribusiness & family farming 3 AFF-11 to AFF-16	5	Dr. Ifdal

16.30 – 18.00	Preparation for gala dinner	-	
18.00 – 19.00	Fetch participants	Dr. Ujang Khairul	
19.00 – 20.00	Gala dinner ceremony	Household affairs of Governor	
	Welcome speech		
	1. Steering Committee 2. Rector 3. Governor	Prof. Ir. Helmi, M.Sc, Ph.D Prof. Tafdil Husni, SE, MBA, Ph.D Prof. Dr. Irwan Prayitno, S.Psi, M.Sc	
	Traditional Dances	Household affairs of Governor	
20.00 – 20.30	Dinner		
20.30 – 21.00	Closing		

Second day agenda

Wednesday, September 5th 2018

Time	Session	Venue/Person in charge
08.00 – 08.30	Registration for field trip	Conventional room entrance
	Keynote speech (2nd Session)	Ball room
08.30 – 09.15	3. Prof. Dr. Rudi Febriamansyah (Education of agriculture toward Indonesia 4.0)	Moderator : Dr. Irawati
09.15 – 10.00	1. Dr. Ravi Khetarpal (Capacity building to support agrifood system)	Moderator : Dr. Hidrayani
	2. Prof. Dr. S. Teki (Emergence of Agriculture 4.0 challenges and strategies: select case studies from India)	
10.00 – 10.15	Coffee break	Dwi Evaliza
10.15 – 11.15	Panel Speech	Moderator : Prof. Dr. Yonariza
	- Dr. Gusmini (Land management)	
	- Dr. P.K. Dewi Hayati (Crop production and plant breeding)	
	- Dr. My Syahrawati (Plant protection and food safety)	
	- Dr. Vonni Indah Mutiara (Sustainable rural economics)	
	- Dr. Mahdi (Family farming)	
11.15 – 11.30	Appreciation & photo session	Afrianingsih
11.30 - 12.15	Poster Session CPPB 41 to CPPB-55 SM-23 to SM-25 PPFS-31 to PPFS 35 SRE-29 to SRE-32 AFF-28 to AFF-36 OTR 15 to OTR-16	Prof. Dr. Trizelia
12.15 – 13.30	Lunch break	Dwi Evaliza

13.30 – 14.30	Parallel session IV	Venue	Moderator
	1. Crop breeding and production 5 CPPB-29 to CPPB-34	1	Dr. Dwi Susanto
	2. Soil management 3 SM-15 to SM-22	2	Dr. Adrinal
	3. Plant protection & food safety 4 PPFS-24 to PPFS-30	3	Prof. Dr. Trimurti Habazar
	4. Sustainable Rural Economy 3 SRE-11 to SRE-16	4	Dr. Teki Surayya
	5. Agribusiness & family farming 4 AFF-17 to AFF 22	5	Dr. Osmet

14.30 – 15.30	Parallel session V	Venue	Moderator
	1. Crop breeding and production 6 CPPB-35 to CPPB-40	1	Prof. Ardi
	2. Sustainable Rural Economy 4 SRE-17 to SRE-22	2	Dr. Yuerlita
	3. Other topics related Agricultural System 2 OTR-08 to OTR-14	3	Dr. Muhammad Makky
	4. Sustainable Rural Economy 5 SRE-23 to SRE-28	4	Dr. Hasnah
	5. Agribusiness & family farming 5 AFF-23 to AFF-27	5	Dr. Mahdi

Closing ceremony		
15.30 – 15.35	Opening by MC	
15.35 – 15.55	Remark by : 1. Organizing committee 2. Dean	Prof. Ir. Yonariza, M.Sc, Ph.D Dr. Ir. Munzir Busniah, M.Si
15.55 – 16.15	Announcement of best presenter and best poster	Dr. Eka Candra Lina
16.15 – 16.30	Announcement of field trip	Dr. Gusmini
16.30 – 17.30	Certificate distribution	Dr. Hasmiandy Hamid

Third day : Field trip day
Thursday , September 6th 2018

LIST OF PARTICIPANTS

CODE	NAME	INSTITUTION	TITLE	ORAL / POSTER
CPPB-01	Muhammad Muryono	Plant Ecology- Departement of Biology ITS Universitas Andalas	System of Rice Intensification: Characteristics of Dry Matter Production in Rice (<i>Oryza sativa</i> L.) Cultivar Chering in the Use of Organic Compared with Inorganic Fertilizers	Oral
CPPB-02	Sannaida Simbolon, Irawati Chenilago, Irfan Sulaimiyah	Universitas Andalas	Tofu Liquid Waste and Organic-Household-Waste Compost Affecting The Yield of Cucumber (<i>Cucumis sativus</i> L.)	Oral
CPPB-03	P.K. Dewi Hayati dan Lutfiyah Rahmi	Universitas Andalas	EFFECT OF BIO-PRIMING ON DETEIORATED SEED VIABILITY AND VIGOR, GROWTH AND YIELD OF SOYBEAN (<i>Glycine max</i> (L.) Merrill) IN ACIDIC SOIL	Oral
CPPB-04	Steven M. Sidi, Anmar Muttalib, Iin Handayani	Murray State University	The Effect of Three Different Mulches on Weed Presence and Zinnia Growth	Oral
CPPB-05	Warmita, Andi, Yopi Zulfia	Universitas Andalas	THE EFFECT OF ISOLATE OF INDIGENOUS RHIZOBAKTERI AND SILVER BLACK PLASTIC MULCH ON GROWTH AND YIELD OF POTATOES (<i>Solanum tuberosum</i> L.)	Oral
CPPB-06	Ratna Rubiana, Yandha	BPTP Jambi	Technology Of Soybean's Seed Management Unit In Jambi Province	Oral
CPPB-07	Metty Rasmiasari, Indra Dwiipa, Irawati	Universitas Andalas	Response of Edamame Soybean (<i>Glycine max</i> (L.) Merr.) and Sorghum (<i>Sorghum bicolor</i> (L.) Moench) on various spacing of Soybean and NPK dose in intercropping pattern	Oral
CPPB-08	Rahman Hairuddin	Universitas Cokroaminoto Palopo	Character Components the Onion (<i>Allium oleronicum</i> L.) and Selection of Callus Using NaCl and PEG In Vitro	Oral
CPPB-09	IP Handayani, H Widiajanti, MS Coynis, S Widawati	Murray State University	Soil Organic Carbon Fractions in Oil Palm Management Systems	Oral
CPPB-10	Ngatiman	Riau University	Exploration of Local Rice Germplasm from Rokan Hilir Regency Based on Morphology and Agronomy Character	Oral
CPPB-11	Maythesya Oktaviani	Universitas Andalas	Isolation the Distal Promoter of NPK1 Gene from Chili Pepper (<i>Capsicum annuum</i> L.)	Oral

CPPB-12	I Gede Putu Wirawan, Vederis Leunardus, Ni Made Ayuratih Utami, I G.K. Susrama, and Nyoman Wijaya	Universitas Udayana	Primers Construction from DNA Sequence of CVPD' DNA Fragment that Amplified Specific Region which Distinct the Resistant Fragment from <i>Triphacacia trifolia</i> and the Susceptibel Fragment from <i>Citrus nobilis</i>	Oral
CPPB-13	Lissa Herliana, Jefri Maldoni, Siti Nur Aisyah, Jamsari	Universitas Andalas	Evaluation of antifungal activity and IAA production of <i>Pseudomonas lurida</i> strain UBCR_36 under various culture durations	Oral
CPPB-14	Reni Mayerni, Auzar Syarif, Nazres Akhbir, Patrisno and Ismu Hadi Nurmawan	Universitas Andalas	APPLICATION OF RHIZOBAKTERIA INDEGINUS AND ENDOFIT BACTERIA ORIGIN PEAT SOIL IN WEST PASAMAN AGENCY TO INCREASE GROWTH OF PALM OIL SEEDS (<i>Elais guineensis</i> Jacq.) IN PRE-NURSERY	Oral
CPPB 15	Nunun Barunawati, Dina Wahyu, and Sumardi	Universitas Brawijaya	NUTRITION DISTRIBUTION ON ORYZA SATIVA AS RESPONSE TO APPLICATION OF N-ENCAPSULATION TOWARD BIOTIC STRESS	Oral
CPPB-16	Nguyen Thi Thu Hau	Kien Giang University	Improving the propagation of in vitro and ex vitro candyleaf (<i>Stevia rebaudiana</i> Bertoni)	Oral
CPPB-17	Andika Aulia, Teguh Prasetyo, Andri Panca Setiawan and Heriansyah	PT. Triputra Agro Persada Group	PRELIMINARY STUDY OF CONVENTIONAL PROPAGATION OF <i>Cordyceps militaris</i> ON SOLID MEDIA	Oral
CPPB-18	Dwi Susanto, Zeti Ermiena Surya Mat Hussin	Universiti Malaysia Kelantan	In Vitro Direct Organogenesis of Kenaf (<i>Hibiscus cannabinus</i> L.) Using Different Types of Explants	Oral
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OTR-01

The addition of Gambier leaf residue to protect protein in the feed supplement from rumen degradation

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Protection of proteins is essential for productive ruminants, this study aimed to obtain optimal gambier leaf residue (GLR) that can protect the protein of cattle feed supplement (CFS) from rumen microbial degradation. Gambier (*Uncaria gambir* Roxb.) leaf residue containing 9.96% condensed tannin was added to CFS containing 29% crude protein with a mixture of brown sugar, soybean meal, coconut cake, tapioca, urea, and minerals at level 0 (control), 2.5%, 5.0%, and 7.5%, so obtained condensed tannin content in CFS: 0%, 0.68%, 1.17% and 1.60% then which were tested in rumen digestion *in vitro*. Degradation of crude protein in the rumen decreased linearly with an increase in tannin level and ratio of tannin: protein in CFS ($R^2 = 0.905$; $P < 0.05$) with degradation of 58.18%-69.87% so that rumen undegraded dietary protein (RUDP), TCA-soluble N and peptide N was obtained respectively in the range (49.91-74.07; 319.14-465.20; 304.40-451.25) mg / 100 ml rumen fluid, the lowest at control and highest at level 5% GLR. NH_3-N concentration decreased linearly with an increase in GLR level while the rumen pH was neutral and not significant with GLR level. The estimated value of optimum GLR addition was obtained at the range of 4.64%-5.12% with the rate of protein degradation 1.05-14.99% / hour with the lowest rate at 3 hours and the highest at 48 hours of incubation.

Keywords: cattle feed supplement; gambier leaf residue; tannin; protein degradation

OTR-02

Effect Of Waretha® Probiotic On Total Colonies Of Bacillus Amyloliquefaciens, Lactobacillus sp, Ph And Cellulose Enzyme Activity In The Small Intestine Of Domestic Chickens

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This study aims to determine the effect of the addition of Waretha® probiotic in drinking water on the total colonies of bacteria Bacillus amyloliquefaciens, Lactobacillus sp, pH, and cellulase enzyme activity in the small intestine of domestic chickens in starter period. This study was used 200 day-old-chicks of domestic chickens CP 808 kept for 8 weeks. Type of cage used 20 units cage box measuring 85 cm x 70cm x 30 cm which each unit contains 10 chickens. This study used the Completely Randomized Design (CRD) experimental method with 4 treatments and 5 replications. Treatment is the addition of Waretha® probiotic in drinking water which is W0 (no addition of Waretha® probiotic), W1 (45 x 10⁹ CFU/ml), W2(65 x 10¹⁰ CFU /ml), and W3 (43 x 10¹² CFU /ml). The parameters measured were total bacterial colonies of Bacillus amyloliquefaciens, Lactobacillus sp, pH, and cellulase enzyme activity in the small intestine of domestic chickens. The results showed that the use of Waretha® probiotic in drinking water had significantly different effect ($P < 0.01$) on the total colonies of bacillus amyloliquefaciens, Lactobacillus sp, and cellulase enzyme activity, but not significantly different ($P > 0.05$) on pH in the small intestine of domestic chickens. The DMRT test showed that the total colonies of Bacillus amyloliquefaciens, Lactobacillus sp, and cellulase enzyme activity up to 43 x 10¹² CFU/ml (W3) were very significant ($P < 0.01$) higher than the treatment of W0. The conclusion of Waretha® probiotics were added to 43 x 10¹²CFU/ml in drinking water increased total colonies of Bacillus amyloliquefaciens, Lactobacillus sp, and cellulase enzyme activity in the small intestine, but did



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CERTIFICATION OF PARTICIPATION



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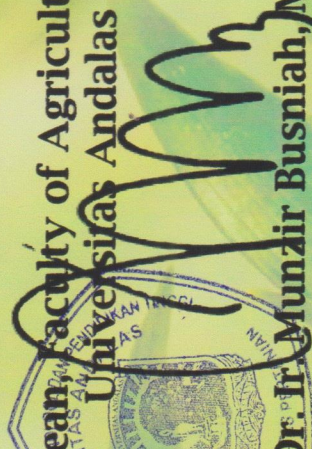
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