3rd AINI INTERNATIONAL SEMINAR
In conjunction to 50th Anniversary Faculty of Animal Science
Andalas University
THE ROLE OF NUTRITION AND FEED IN SUPPORTING SELF SUFFICIENT
IN ANIMAL PRODUCTS, FOOD SAFETY AND HUMAN WELFARE
Padang, 24 – 25 September 2013

PROCEEDING
"The Role of Nutrition and Feed in Supporting Self Sufficient in Animal Products, Food Safety and Human Welfare"

PROCEEDING

3rd International Seminar and 9th Biennial Meeting of AINI
"The Role of Nutrition and Feed in Supporting Self Sufficiency in Animal Products, Food Safety and Human Welfare"
in conjunction with
the 50th Anniversary of the Faculty of Animal Science
University of Andalas, Padang West Sumatera
Grand Inna Muara Hotel, Padang 24-25 September 2013

THE COMMITTEE

STEERING COMMITTEE: Dr. Ir. H. Jafirinur, MSP
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Dr. Ir. Khasrad, M.Si
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Prof. Dr. Nahrowi, M.Sc
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Prof. Dr. Ir. Komang Wiryawan
Prof. Dr. Dewi Apri Astuti

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VICE CHAIRPERSON II Prof. Dr. Ir. Mirzah, MS
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Ade Sukma, S.Pt, MP
Amirdas, SE
Khairisma Fedra, S.Pt
Irwanto, A.Md
"The Role of Nutrition and Feed in Supporting Self Sufficient in Animal Products, Food Safety and Human Welfare"

**SCIENTIFIC PROGRAM**

Indry Zelita Suci, S.Kom
Dr. Ir. Irsan Ryanto H
Dr. Ir. Ade Djulardi, MS
Drh. Yuherman, M.S, Ph.D
Ir. H. Fuad madarisa, M.Sc
Ir. Harmentis, MS
Lendrawati, S.Pt., M.Si

**EXHIBITION, DOCUMENTATION AND PUBLICATION**

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Dr. Ir. Yuliati Shafan Nur, MS
Dr. Rusfidra, S.Pt, MP
Ir. Ifradi HR, MP

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Ir. Basril Basyar, MM
Dr. Evitayani, S.Pt, M.Agr

**TRANSPORTATION AND ACCOMMODATION**

Dr. Ir. Elihasidas, MS
Ir. Erpomen, MP
Ir. Rijal Zein, MS
Ir. Maramis, SE
Rahmat Mulyadi, SE

**LOGISTIC**

Dr. Ir. Suslina A. Latif, MS
Ir. Jurnida Rahman, MS
Ir. Helmi Muis, MP
Ir. Rita Herawati, SU
Fauziah
FOREWORD
President AINI

Assalamu 'alaikum Wr. Wb.,
The Honourable Rector of The University of Andalas,
The Dean Faculty of Animal Science, University of Andalas
Distinguish guests, participants, ladies and gentlemen,

First of all, on behalf of the Indonesian Animal Nutritionist and Feed Scientist Association (AINI), I would like to extend our warmest welcome, and indeed it is a great pleasure to see you all in this room, participating in the 3rd International Seminar and 9th Biennial Meeting of AINI in conjunction with the 50th anniversary of the Faculty of Animal Science University of Andalas, Padang West Sumatera. AINI that was firstly established in 1996 with the objective to gather all of the animal nutrition and feed scientists in Indonesia permitting to the exchange of knowledge and experiences under the spirit of brotherhood, to stimulate the advancement of science and technology in nutrition and feed science, thus benefiting to the competitiveness of livestock agribusiness.

Since its establishment 1996, AINI has been conducting regularly the biennial scientific meeting. From 2007, the scientific meeting was upgraded to the International level and the first International seminar was conducted at Jenderal Sudirman University, Purwokerto Central Java and then the second International seminar was held in Padjajaran University, Bandung West Java, while this third event is conducting here with the theme "THE ROLE OF NUTRITION AND FEED IN SUPPORTING SELF SUFFICIENCY IN ANIMAL PRODUCTS, FOOD SAFETY AND HUMAN WELFARE"

Distinguish guests, participants, ladies and gentleman,

The role of feed and nutrition is primordial in the livestock agribusiness, not only due to the fact that more than 70% of production cost is coming from the feed cost, but also the feed safety that affect the food safety is becoming the great issues in recent years and become a great concern by many countries in the world. Animal products such as egg, meat and milk are subjected to the government policy to reach the self sufficiency. Indonesian government has paid attention and put high priority especially in meat self sufficiency for 2014. Unfortunately, effort made by the government ie. Ministry of Agriculture since many years has facing now the difficulty to succeed, due to some raisons such as the meat price volatility, and also the low exchange rate of rupiah to the US dollar at this time being. Indeed, the demands on the animal products will be increasingly in the future as the population and income per capita are growing. We should take a part and do our best to support the government policy in fulfilling the food of animal products, quantitative and qualitatively. In this regards, role of nutrition and also Nutritionist and Feed Scientist are very important.

I would like also to take this opportunity to share the idea with all you, that AINI as the organization of scientist, to have a international scientific journal is a must. The jurnal deals with all aspects of nutrition and feed issues in tropical conditions. The Management board of AINI has taken the decision for revitalizing the AINI Journal to become the Journal of Nutrition and Feed Science, internationally recognized, by involving the International committee of lecture as the reviewers. To this end, we need
fully your support and encourage the scientists especially the young scientists to publish their work in English. The accomplishment of this task will bring the association be more respected in national and international level.

Distinguish guests, participants, ladies and gentleman,

For this opportunity, I should express my sincere thanks to the Dean of the Faculty of Animal Science, University of Andalas, the organizing committee, sponsors, and all party that cannot be listed since we are deeply in debt to all of your effort and sacrifice to the success of this seminar. Our sincere thanks must go to the Directorate General for Higher Education Department of National Education for the grant awarded. For our invited speakers, Prof. Tamo Fukamizo (Kinki University, Japan), Dr. Robert L. Payne (Evonik-US), Dr. Yuwares Ruangpanit (Thailand), Prof. Abdul Razak Alimon (UPM Malaysia), Prof. Yose Rizal (University of Andalas, Indonesia), Prof. Ali Agus (University of Gajah Mada, Indonesia), Prof. Suhubdy (Mataram University, NTB) we are indebted to your effort and your participation in this event. Your views will enlighten and inspire how to empower our local feed resources in sustaining the feed security for the future. Also, on behalf of the AINI, I must express my deepest gratitude to the Director General of Livestock Services Department of Agriculture for his willingness to give the keynote speech to this seminar.

Distinguish guests, participants, ladies and gentleman,

I hope you will have the fruitful meeting and gaining many new ideas and perspectives to be developed in the future. I do hope also, we will see you again in the 4th International seminar and Xth Biannual meeting 2015 that will be hosted by AINI member and colleagues from Sam Ratulangi University, Manado, North Sulawesi as the organizing committee.

Finally and surely, please enjoy your stay with west Sumatera culture and nature, tradition and hospitality, in addition to your scientific activities. Thank you,

Wassalamu ‘alaikum Wr. Wb.
Padang, September 24th, 2013
President AINI

Prof. Ali Agus
“The Role of Nutrition and Feed in Supporting Self Sufficient in Animal Products, Food Safety and Human Welfare”

FOREWORD
ORGANIZING COMMITTEE

Assalamu’alaikum Wr. Wb.,
The Honourable Rector of The University of Andalas,
The Dean Faculty of Animal Science, University of Andalas
Distinguish Guests, Seminar Participants, Ladies And Gentlemen,

First of all, we are very grateful for Allah the Almighty, who has allowed us to get together in the prestigious 3rd AINI International Seminar which is held by the Faculty of Animal Science, University of Andalas in conjunction to celebrate the 50th Anniversary of the Faculty of Animal Science, collaborated with Indonesian Association of Nutritionist and Feed Scientist (AINI). We would like to welcome all participants who have come from different provinces in Indonesia, and especially to our distinguished guests and participant from overseas (USA, Japan, Thailand, Malaysia, Philippine and Australia).

The animal protein consumption of the people in Indonesia and other developing countries around the world as well is still low. The Indonesian Government has performed many efforts to increase this animal protein consumption. One of them is through the launching of a program called the self sufficient in beef (program swasembada daging sapi = PSDS), that has been targeted to be achieved in 2014. Besides, other attempts are also to develop poultry and other animal industries that have contributed to the fulfillment of animal protein requirement. However, based on the animal industry condition nowadays it would be rather complicated to achieve it, due to the low in farm animal productivity in Indonesia. Among the problems of low in animal productivity are the nutrition and feed they obtain during their life cycles. Besides, the price of feed for animal industries could reach 60 to 70% of the total cost of animal production. Indonesia has very limited range land for cattle grazing and limited feed sources for poultry feeding. The cattle feeding are very dependent on the utilization of agriculture waste/by-product as the source of feed. Most of these available feedstuffs are low in quality, so that they require further processing before feeding them to cattle. Meanwhile, the poultry and other farm animal feeding are depending on imported feeds. The other problem is the concern in utilization of in-organic feedstuffs or feed additives for growing farm animals.

The theme of this seminar is very relevance to the nowadays national as well as international issues of feeding safety feed for livestock and poultry, and conserving nutritious, safety and hygienic food for human health. This nutritious, safety, hygienic and healthy food of animal origin will be obtained from the high quality of feed that is fed to animals. The feed and food processing technology will support the high quality of feed and food. This 3rd AINI International Seminar on nutrition and feed is held to collect the information and to share the ideas from nutritionists, scientist and practitioners on the nutrition, feed processing technology and its utilization for producing high quality of feed and food which are available in other part of the world to contribute to the human welfare.

Prof. Dr. Novirman Jamarun
Chairman of the Organizing Committee
WELCOME SPEECH

Rector of Andalas University

Bismillahirrahmaanirrahim,
Assalamu’alaikum wrwb, Peace be with you!
Your Excellency, Governor of West Sumatra Province.
Your Excellency, Chairman of House of Representative of West Sumatera Province
The Horable, Dr. Mursyid Ma’sum, M.Agr, Director of Animal Feed, Directorate General
of Livestock and Animal Health, Ministry of Agriculture.
The honorable, The Chairman of Indonesian Association of Nutritionist and Feed
Scientist (AINI), Prof. Dr. Ali Agus DAA, DEA, from Gajah Mada University.
Honorable guest, the Dean of The Faculty of Animal Science.
The Honorable guests all keynote speaker.
Seminar Committees, Participants, Ladies and Gentlemen,

Good evening.

First of all, let us say a merciful for Allah the Almighty who has given us a chance
to meet each other at this 3rd AINI International Seminar which is held by the Faculty of
Animal Science University of Andalas in conjunction to celebrate of 50th Anniversary
Faculty of Animal Science, Andalas University.

On this occasion, I welcome all of the seminar participants who come from
different places in the world, as well as participants from different universities and agencies
in Indonesia.

On this opportunity, I would like to introduce to all of you about the University
of Andalas. It was the oldest university in Indonesia, outside the Java Island that was
founded in 1956. This university has 15 Faculties with 38 study programs for Sarjana
degree, and 34 Graduate Study Programs for Master’s and Doctor’s degrees. The Faculty
of Animal Science is one of the faculties at the University of Andalas which was
established in 1963. I am very proud of this International seminar, which is conducted
by the Faculty of Animal Science.
It indicates that the Faculty of Animal Science, University of Andalas, has the capability
to create a link or a network with national as well as international level institutions, in
which it is a kind of initiation toward the world class university.

Ladies and Gentlemen,

From this 3rd AINI International Seminar, I hope that it will result in the fruitful
thoughts and brilliant ideas which could be implemented by the government and animal
industrial community for the development of the Animal Feed industries in Indonesia as
well as in West Sumatra. The Faculty of Animal Science University of Andalas plays a
role in the development of feed industries in cooperation with the government, and
livestock as well as animal nutritionist organizations.

Feed Industries contribute to the fulfillment of animal development in Indonesia
because Feed is one most important factors to develop animal production and animal
population and with cheap in price of feed will give high benefit could be reached by the
farmer. The development of feed and animal industries needs science and technology, and through this seminar, it is hoped that the scientists from all over the world could contribute the information and technology in disciplines in feed sciences.

**Ladies and Gentlemen,**

This seminar is in concomitant with the 57 year University of Andalas, and the 50 year Faculty of Animal Science Anniversaries. Considering the age of this institution, it is the appropriate time for this institution to play its role at the international level. The progress toward the world class university is a dream of every institution, including the University of Andalas. That is why I hope that this international seminar could be performed routinely, so that the development of science and technology in the field animal science could always be monitored and implemented by the animal community in Indonesia.

Finally, I would like to address my special thanks to the committees who have work very hard to prepare this seminar, congratulation and good luck for all of you.

**Wassalammualaikum wr.wb.**

Dr. Werry Darta Taifur, SE, MA
Rector of Andalas University
WELCOME SPEECH
Governor of West Sumatera

Assalamualaikum, w.w
Your Excellency, Chairman of House of Representative of West Sumatera Province. Ir. Yulteknil, MM
The Honorable, Dr. Mursyid Ma’sum, M.Agr, Director of Animal Feed, Directorat General of Livestock and Animal Health, Ministry of Agriculture.
The honorable, Prof. Dr. Ali Agus DAA, DEA, The Chairman of Indonesian Association of Nutritionist and Feed Scientist (AINI) from Gajah Mada University.
Honorable guest, the Rector of the University of Andalas.
The Honorable guests all keynote speaker.
Honorable guest, the Dean of The Faculty of Animal Science.
Seminar Committees, Participants, Ladies and Gentlemen,

Seminar Committees, Participants, Ladies and Gentlemen,
First of all we are very grateful for Allah the Almighty, who has allowed us to get together in the prestigious 3rd AINI International Seminar which is held by the Faculty of Animal Science University of Andalas in conjunction to celebrate of 50th Anniversary, Faculty of Animal Science, Andalas University.

I would like to say ‘welcome’ to all of participants who have come from different areas in Indonesia, and especially to the participants from several countries (USA, Malaysia, Thailand, USA and Japan).

West Sumatra is one of 33 provinces in Indonesia which is also called “Ranah Minang” or Minang Area, because this area mostly inhabited by Minangkabau ethnic. This province is well known with its beautiful scenery and culture, because it possess Sianok canyon, marvelous beach in Mentawai Island with its high wave that is suitable for surfing, gorgeous Harau Valley, four beautiful lakes (Singkarak, Maninjau, Upper and Lower Lakes), and several other places for tourism. We have two international regular events, the first is Tour de Singkarak, and the second is Padang International Dragon Boat competition. Tour de Singkarak, a bike racing event every year followed by many bicyclers from all over the world, got its name from this lake’s name ‘Singkarak’.

The population of West Sumatra province is approximately 4 million people who mostly are moslems. Besides, Ranah Minang also well known with its specific hot and spicy foods. One of the menus is RENDANG, which is the most delicious food in the world. Rendang is made of varieties of meat (beef, chicken, or egg) which is mixed up with coconut milk, chili, and other ingredients. That is why, after this seminar I suggest you to spare your time visiting some of those beautiful and marvelous places while enjoying the specific menu I mentioned.

Furthermore, I would like to address that this 3rd AINI International Seminar is an important event for us, because it is a place where the experts from all over the world get together, informing their research findings to the others and sharing the ideas in order these findings and ideas to be useful for the development of science and technology in animal nutrition. The information from this seminar will be very useful for the development of animal industry in West Sumatra, Indonesia as well as in other countries around the world.
Ladies and Gentlemen,

The target of the Indonesian Government nowadays is to achieve the self-sufficient in meat in 2014 in order to fulfill the demand for animal protein for the Indonesian people. For supporting the achievement of this target, the West Sumatra province is implementing a program called “Satu Petani Satu Sapi” or one farmer one cow which is funded by government and private. The purposes of this program are to motivate farmers to raise cattle, to accelerate the increase in the population of cattle, to accelerate the achievement of target in fulfilling the demand for animal protein, to vary the source of income for farmers, and to increase the farmers’ income.

Ladies and Gentlemen,

Finally, I hope this seminar will produce the fruitful thoughts which could be implemented in the development of animal industry around the world as well as in Indonesia. Please enjoy this seminar, congratulation to the 50th Anniversary Faculty of Animal Science, University of Andalas, and I wish it will be continued with the other international seminars in different field. Good luck for you all!!! And by saying: Bismillahirraahmaanirrahim, I officially open this seminar.
Wabillahitauifik walhidayah, Wassalamualaikum warahmatullahi wabarakaatuh.

Governor of West Sumatera Province

Prof. Dr. Irwan Prayitno, PSi, MSc
## SEMINAR PROGRAM

<table>
<thead>
<tr>
<th>TIME</th>
<th>ACTIVITIES</th>
<th>PIC</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants arrive in Padang</td>
<td>Transportatio n and Accommodation</td>
<td>Airport and Hotels</td>
<td></td>
</tr>
<tr>
<td>19:00–22:00</td>
<td><strong>Opening Ceremony and Welcome Dinner</strong></td>
<td>MC Chairman</td>
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</tr>
<tr>
<td></td>
<td>Welcome address by Chairman of the 3rd</td>
<td>President of AINI</td>
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<tr>
<td></td>
<td>AINI International Seminar (Prof. Dr.</td>
<td>Rector Unand</td>
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<td>Novirman Jamarun)</td>
<td>Governor West</td>
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<td>Welcome address by President of AINI (Prof.</td>
<td>Sumatera Province</td>
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<td></td>
<td>Dr. Ali Agus)</td>
<td>AINI</td>
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<td></td>
<td>Welcome address by Rector of Andalas University</td>
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<td>Welcome address by Governor of West</td>
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<td>Inaugural of Regional Representative of AINI</td>
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<td>Governor House, Jl.</td>
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<td>Sudirman, Padang</td>
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</tr>
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## DAY-1 (WEDNESDAY, SEPTEMBER 25, 2013)

<table>
<thead>
<tr>
<th>TIME</th>
<th>ACTIVITIES</th>
<th>PIC</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00 – 08:30</td>
<td>Re-registration</td>
<td>Secretariat</td>
<td>Assembly Hall</td>
</tr>
<tr>
<td>08:30 – 12:30</td>
<td><strong>KEYNOTE SPEAKERS</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 08:30 – 9:00   | Dr. Ir. Mursyid Ma’sum, M.Agr (Director of Animal Feed, Directorate General of Livestock and Animal Health Services, Ministry of Agriculture - Indonesia)  
Title: “Policy And National Program For Feed Development” | Moderator : Dr. Maria Endo Mahata | OMBILIN HALL    |
| 9:00 – 9:30    | Prof Dr. Tamo Fukamizo (Kinki University Japan).  
Title: “The Mode of Action of Chitinolytic Enzymes: Production of Bioactive Oligosaccharides as Animal Nutrients” | Dr. Maria Endo Mahata |                   |
| 9:30 – 10:00   | Dr. Yuwares Ruangpanit (Kasetsart University, Thailand)  
Title: “Improving Egg Nutritional Value By Dietary Marine Sources – A Current Update” | Dr. Maria Endo Mahata |                   |
| 10:00 – 10:30  | Prof. Dr. Yose Rizal (Unand, Indonesia)  
Title: “The Utilization of Juice Waste Mixtures in Poultry Diets: A Review” | Dr. Maria Endo Mahata |                   |
| 10:30 – 11:00  | Prof Dr Abdul Razak Alimon, Universiti Putra Malaysia, Malaysia)  
Title: “Utilization Of Herbs As Growth Promoters In Animal Feed” | Dr. Rusmana Ningrat |                   |
| 11:00 – 11:30  | Dr. Robert L. Payne, Ph D, PAS (Evonik – US)  
Title: “The Role Of Amino Acids In Sustainable Poultry Production” | Dr. Rusmana Ningrat |                   |
| 11:30 – 12:00  | Prof. Dr. Suhubdy Yasin (University of Mataram, Indonesia)  
Title: “Rangelands and Pastures of Indonesia for Ruminant Production: a Poor Attention and Neglected Resources” | Dr. Rusmana Ningrat |                   |
| 12:00 – 12:30  | Prof. Dr. Ali Agus, DAA, DEA (University of Gajah Mada, Indonesia).  
Title: “Food And Feed Safety Issues In Indonesia: Reducing Mycotoxins Toxicity And Its Carry Over From Feed Into Animal Products” | Dr. Rusmana Ningrat |                   |
| 12:30 – 13:00  | **LUNCH BREAK**                   |              |                   |
SESSION 1. RUMINANT NUTRITION (ROOM OMBILIN 2-3)
CHAIR: DR. IRSAN RYANTO H, UNAND, INDONESIA

<table>
<thead>
<tr>
<th>Session</th>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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</thead>
<tbody>
<tr>
<td>2</td>
<td>13:50–14:00</td>
<td>The Effect Of NDF Ratio in the Diet on the Performance of Philippine Native Goats (Caora hicus Linn),</td>
<td>Nugroho, D., C.C. Sevilla, AA. Angeles, F. Setyawat, Animal Science and Dairy Cluster, UPLB, Philippine</td>
</tr>
<tr>
<td>3</td>
<td>14:00–14:10</td>
<td>Meat Physical Properties of Local Lamb Fed Urea-Impregnated Zeolite Ration,</td>
<td>Kardaya, D., E. Dihansih, D. Wahyuni, Djuanda University, Bogor, Indonesia</td>
</tr>
<tr>
<td>4</td>
<td>14:10–14:20</td>
<td>In vitro study of sardinella lemuru oil based calcium-soap supplementation effects on the sheep’s rumen digestibility</td>
<td>Asep Sudarman</td>
</tr>
<tr>
<td>5</td>
<td>14:20–14:30</td>
<td>Milk Composition Of Etawah Crossbred Goat Fed Forage And Leaves Pellet</td>
<td>Suryanindyah, Y. Y., N. Umami, Nurliyani, Y. S. Muthoharotin, Y. P. Oktaviani, UGM, Indonesia</td>
</tr>
<tr>
<td>6</td>
<td>14:30–14:40</td>
<td>Rumen fermentability and digestibility of lingzhi (ganoderma lucidum) and organic chromium supplementation in high and low forage rations</td>
<td>Dwieira Evvyernie, Toto Toharmat, Sumiati and Dian Astriana</td>
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<td>7</td>
<td>14:40–14:50</td>
<td>Ruminal Degradation Characteristics Of Maize (Zea Mays) Leaves,</td>
<td>Rusdi, Mustaring, M. Salman, Animal Husbandry Dept, Tadulako University, Palu Indonesia</td>
</tr>
<tr>
<td>8</td>
<td>14:50–15:00</td>
<td>The Effect Of Concentrate Offered In Ratio Based On Rice Straw To The Performance Of Bali Cattle,</td>
<td>Trisnadewi, S., T. G. O. Susila, I W. Wijana, Faculty of Animal Husbandry, Udayana University, Bali</td>
</tr>
<tr>
<td>9</td>
<td>15:00–15:10</td>
<td>Enhancing Performance of Sheep by Feeding Corn Leaf Biscuit,</td>
<td>Yuli Retnani, Sobri, D. K. Putra, and T. Toharmat, IPB Bogor, Indonesia</td>
</tr>
<tr>
<td>11</td>
<td>15:20–15:30</td>
<td>Supplementation of Solid Ex-Decanter Multi-Nutrient Block on Simbrah Breed Weaned Calves Performances as Integrated Farming System with Palm Fruit Agroindustry,</td>
<td>Fariani, A. Abrar, G. Muslim, E. D. Y. Astuti and L. Warly, Srijijaya University, Palembang, Indonesia</td>
</tr>
</tbody>
</table>

16:50 – 17:00 CLOSING CEREMONY AT OMBILIN 2-3

FAREWELL DINNER AT MAJOR HOUSE OF PADANG CITY
# SESSION 2. NON-RUMINANT NUTRITION (ROOM ANAI 1-2)

**CHAIR: PROF. DR. KHALIL AND PROF. DR. YUSRIZAL, MSC, UNAND AND UNJA, INDONESIA**

<table>
<thead>
<tr>
<th>Session</th>
<th>Time</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13:30 – 13:40</td>
<td>Productivity Of Local Chicken In Growth Periods And Carcass Characteics By Inclusion Of Moringa OleiferaLeaves MealsIn The Diets</td>
<td>Hafsah, S. Sarjuni, T. Riske, I. Kumbok</td>
</tr>
<tr>
<td>2</td>
<td>13:40 – 13:50</td>
<td>The Effect Of Palm Kernel Meal Contain Probiotic To Reduce The Fecal Ammonia Emmission In The Laying House, Yusritzel, F. Manin, Yatno and Noverdiman, University of Jambi, Indonesia</td>
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<td>3</td>
<td>13:50 – 14:00</td>
<td>Contribution Of Lysin And Calcium Of Azolla Microphylla On Egg Shel Calcium Deposition In Arab Hen, Wulandari,E., C., R.H. Prawitasari, N Suthama, W. Murningsih, V.D Yunianto, I. Estiningdiatri and H.I. Wahyuni, Agriculture Diponegoro University, Semarang, Indonesia</td>
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<tr>
<td>4</td>
<td>14:00 – 14:10</td>
<td>Japanese Quail Eggs Qualtyfed Fermented Jatropha Curcas Meal, Sumiarti, R. Mutia, and R. Khalim, IPB Bogor, Indonesia</td>
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</tr>
<tr>
<td>5</td>
<td>14:10 – 14:20</td>
<td>Evaluation in the presence of black tea waste extract on different level of energy-protein rations in the performance and carcass parameters of broiler Dilla mareistia fassah¹*, supadmo² and russe³</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>14:20 – 14:30</td>
<td>Efforts for the meat quality of bali ducks through offering purple sweet potato (ipomoea batatas l) fermented aspergillus niger in diets Tjokorda geoelawa yadnya, ida bagus sudana, i gede mahardika and i m. Mastika</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>14:30 – 14:40</td>
<td>Effect of avocado seed meal andfermented of banana peel meal to laying quail Hera dwi triani, ade djular, ahadiyah yuniza</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>14:40 – 14:50</td>
<td>Layer Ducks Performances Fed Katuk Leaf Meal, Hermana, W., M. Septiana and Sumiarti, IPB Bogor, Indonesia</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>14:50 – 15:00</td>
<td>The Profile Of Corn-Cob Nutrient As Prospective Poultry Feed In Upper And Lower Land Area In West Sumatra Maria Endo Mahata, Ahadiyah Yuniza, Niraini1 and Yose Rizal</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>15:10 – 16:20</td>
<td>The dynamics of indigenous lactic acid bacteria probiotics on carcass yield, abdominal fat And intestinal morphology of broilers Sri Hartimiru , Miftahul Huda, and Anisa Dwi Kistiari</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>15:20 – 15:30</td>
<td>The effects of xylanase supplementation on meat quality, carcass recovery and blood cholesterol in broilers fed on wheat-based diets Chusnul hanim, lies mira yusiatu, ali wibowo, and muhamad nur cahyanto</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>15:30 – 15:40</td>
<td>Digestive organ’s growth of local duck fed high dietary fiber during post-hatch: effect on allometric measurement Hanny Indrat Wahyuni, Istra Mangisah, Nyoman Sutham ¹and Maulana Hamonangan Nasution</td>
<td></td>
</tr>
</tbody>
</table>

19:00 – 22:00 FAREWELL DINNER AT MAJOR HOUSE OF PADANG CITY
SESSION 3. FEED SCIENCE AND TECHNOLOGY, PASTURE AND RANGE LAND, NUTRITION AND REPRODUCTION, SOCIO-ECONOMIS OF FEED AND FOOD (ROOM OMBILIN 1)

CHAIR: PROF. DR. MARDIATI ZAIN, MS, UNAND, INDONESIA

<table>
<thead>
<tr>
<th>Session</th>
<th>Time</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13:30</td>
<td>Effect of Somatotropin Hormone on Macroscopic and Microscopic Semen Quality of Simbrah Breed Bulls</td>
</tr>
<tr>
<td>2</td>
<td>13:40</td>
<td>Effect of vegetable and animal-derived ingredients on the physical pellet properties of extruded feed</td>
</tr>
<tr>
<td>3</td>
<td>13:50</td>
<td>Isolation and identification of lactic acid bacteria from feces of young calves as a potential Candidate of probiotic</td>
</tr>
<tr>
<td>4</td>
<td>14:00</td>
<td>Effect Of Shade On Growth And Productivity Of Torbangun, Karti, IPB, Bogor, Indonesia</td>
</tr>
<tr>
<td>5</td>
<td>14:10</td>
<td>Evaluation Of Availability And Quality Of Forage At Limau Manis Campus Of Andalas University, Padang, West Sumatra, Khalil, Unand, Indonesia</td>
</tr>
<tr>
<td>6</td>
<td>14:20</td>
<td>Feed Intake And Efficiency In Mice (Mus Musculus) Given Treated – Jatropha Curcas L. Seed Meal, Tjokradijdaja, Anita S., P. H. Siagian And Hadriyanah IPB, Bogor, Indonesia</td>
</tr>
<tr>
<td>7</td>
<td>14:30</td>
<td>Effect Of The Extracted Cinnamon Stick And Ground Cinnamon Stick On The Rancidity Of Palm Oil Decanter Meal, M. Afadal, A. Kasim, Ar. Alisman and N. Abdullah, University of Jambi, Indonesia</td>
</tr>
<tr>
<td>8</td>
<td>14:40</td>
<td>Feed Intake, Nutrient Digestibility and Blood Glucose of Sheep Supplemented with Organic Chromium From Fungi Ganoderma lucidum, Agustina, F., D.Evverenie, D.Taniwiyono, S.Tarigan, T.Toharmat</td>
</tr>
<tr>
<td>9</td>
<td>14:50</td>
<td>Analysys Performances Of Egg Poultry Industries In 50 Kota Regency As A Based Sector Of West Sumatra Rahmi, E. W. Sartika, Unand, West-Sumatra</td>
</tr>
<tr>
<td>10</td>
<td>15:00</td>
<td>Comparison Of Corn Stover Nutrient Content In Lower And Upper Land Areas In West Sumatra Rusmana W. S. Ningrat1, Irsan Rayanto1, Montesgri1,land Giovani M. Turchint2</td>
</tr>
<tr>
<td>11</td>
<td>15:10</td>
<td>Nutrients intake and their relation to milk production and qualities under traditional and Small scale indonesian dairy farms enterprises Despal*, A. Lestari, Y. Destianingsih, Z. Malyadi, H. Hartono, L. Abdullah</td>
</tr>
<tr>
<td>12</td>
<td>15:20</td>
<td>Utilization Onggok Enriched With Egg Powder To Making Nutritious Instant Food Sukma, A. K. Sayuti, Novelina. UNAND West-Sumatra</td>
</tr>
<tr>
<td>13</td>
<td>15:30</td>
<td>Study On In Vitro Digestibility Of Soaked Oil Palm Fiber By Filtrated Oil Palm Fruit Bunch Ash Ari L. Darmawan, Asep Irawan, Tidi Dhalika, Ana R. Tarmidi, Mansyur, Atun Budiman, Kurnia A. Kamil and Imran Hernaman</td>
</tr>
<tr>
<td>14</td>
<td>15:40</td>
<td>Productivity Of Bali Cattle Based On Scrotum Size, Body Weight And Feed Quality Abyadul Fitriyiah1, Nurul Hilmiati 2, Lalu Muhammad Kaslap3, Sukmawati1, Totok B.Julianto2</td>
</tr>
<tr>
<td>15</td>
<td>15:50</td>
<td>Quality of rennet from rabbit stomach during cold and frozen storage Nurliyani1, Indratiningisih2, Mufti Tri Matra</td>
</tr>
<tr>
<td>16</td>
<td>16:00</td>
<td>IN VITRO CULTURE FOR THE SUPPLY OF MATERIAL GENETIC TRANSFORMATION ON DWARF NAPIER GRASS (Pennisetum purpureum cv. Schumach) Nafiatiul Umami</td>
</tr>
<tr>
<td>17</td>
<td>16:10</td>
<td>Eggs rendang characteristic by addition of gambier catechin antioxidant Deni novia, Afriani Sandra Indri Juliyarsi Anwar Kasim and Azhari Nuridinar</td>
</tr>
</tbody>
</table>

17:30 – 18:00 CLOSING CEREMONY AT OMBILIN 2-3
19:00 – 22:00 FAREWELL DINNER AT MAJOR HOUSE OF PADANG CITY
## POSTER SESSION (OMBILIN ASSEMBLY HALL)

**CHAIR: PROF. DR. IR. NURAINI, MS AND PROF. DR. IR. YETTY MARLIDA, MS, UNAND, INDONESIA**

12:00 – 14:00

| P-01 | The effect of concentrate ratio based on palm kernel cake on pH on, VFA and NH3 In-Vitro Rumen. | Arief, N. Jamarun, Elihasridas, F. Achmad |
| P-02 | Integrated Farming System With Empowerment Of Cattle Farmers Group In Village Kinomaligan. F.H. Elly, A. Makalew, F.N.S. Oroh dan D. Polakitan |
| P-03 | The Effect Bioprocess of Banana Peels With The Different of incubation length and the source of Local microorganisms (MOL) on Crude Protein, Crude fiber and lignin content. | Tri Astuti and S. Amir |
| P-04 | The content of phytochemical and antibacterial activity of cinnamon leaf (Cinnamomum burmanii) and Noni Fruit and Leaf (Morinda citrifolia L) mixture extract to Replace Antibiotic. | Yuniza, A and Yuherman |
| P-05 | The Effect of Supplementation Lamtoro (Leucaena Leucocephala) Based on Rice Straw Amoniation Ratio on In-Vitro Rumen Characteristics. | Herawati, R., N. Jamarun, M. Zein, Arnim |
| P-06 | Dry Matter And Organic Matter Digestibility Of Java Wood (Lannea Coramandelica) Leaves By Use In Sacco. | Fatmawati |
| P-07 | Improving Quality Soybean Waste by Fermentation as Poultry Ration. | Mirmawati, Ade Djulardi and Helmi Muis |
| P-08 | Effect of totaltime marketing on microorganisms in cattle Meat Marketed In Padang Great Market, West Sumatera. | Yuherman, Eva Umar, and John Farlis |
| P-10 | Performances And Hematological Profile Of Broiler Under Heat Stress Fed Diet Containing Carica Papaya L. Leaf Meal And Curcomma Domestica Val. | Dwi Margi Suci, Dewi Apri Astuti, F.Kumala, Dewi and D. Kuncoro Sakti |
| P-11 | Mix Of Lingzhi (Ganoderma Lucidum), Organic Chromium And Roasted Soybean Evaluated As Feed Supplement For Laying Hen. | Tania Perdana Putri, Dwierra Evvyernie, Dwi Margi Suci And Muhammad Lukmanulhakim |
| P-12 | Fermentability And Degradation Of Concentrate Contents Dry Carboxylate Salt Or Methyl Ester In Rumen Liquid. | A.M. Tasse, E.B. Laconi, D. Agustina |
| P-13 | Comparative Analysis Of Nutrient Composition Of Different Sorghum Varieties After Ensilage Processes. | Awistaros Angger Sakti, A. Sofoyan and H. Julendra |
| P-14 | Viability Of Lactic Acid Bacteria Isolated From Rumen Liquor On Molasses Mixture Medium. | Ema Damayanti, N. A. Hermawati, A. Pangastuti and A. Sofoyan |
| P-15 | Effect Of Formic Acids In Silage Processing From Shrimp Head Waste As Animal Feed. | Mirzah, Montesprit and Suslina A Latif |
| P-17 | Flushing With Different Sources Of Energy Quality Ration On Reproductive Performance Local Sheep, Khotijah, L., K.G. Wiryawan, K.B. Satoto, D. Diapari, N.B. Sitepu and N.E.K. Santi, IPB, Bogor, Indonesia |
| P-18 | The use of trichoderma harzianum in the fermentation of tofu waste product | Burhanudin Malik; Anggraeni; Sawarni Hasibuan; Rudiana' |
| P-19 | Indigofera Zollingeriana Adaptation To Drought Stress And Mycorrhiza Inoculation | S. Sowmena), L. Abdullahh, P.D.M.H. Kartib), D. Soepandic) |
| P-20 | Effect Of Cocoa Pod And Cocoa Leaf On In Vitro Fermentation And Nutrient Digestibility | J. Rahman, M. Zain, and Erpomen |
**INVITED SPEAKERS**

**Invited Speakers at 3rd AINI International Seminar, Padang, West Sumatera, Indonesia**

### P-21
**Effect Of Vitamin E Supplementation In The Extender On Frozen – Thawed Semen Preservation Of Pesisir Cattle**

Zaituni Udin; Ferdinal Rhim; Jaswandi and Ayu Fadillah

### P-22
**Green livestock development: the role of lactic bacteria for improvement and utilisation of total mixture forage**

Zaenal Bachruddin, Supadmo, Lies Mira Yusiati, Chusnul Hanim, Asih Kurniawati, Dimas Hand Vidya Paradhipia and Mayansari

### P-23
**The effects of roasted coriander seeds in the diet on carcass trait and cholesterol content of broiler**

Ramind, R.G. Paminda, and N.Ramli

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17:30 – 18:00  
CLOSING CEREMONY AT OMBILIN 2-3

19:00 – 22:00  
FAREWELL DINNER AT MAJOR HOUSE OF PADANG CITY

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**Dr. Mursyid Ma’sum, M.Agr**

Director of Animal Feed, Directorate General of Livestock and Animal, Health Services.

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**Prof Dr. Tamo Fukamizo (Kinki University Japan)**

graduated his Bachelor and Master course of Agricultural Chemistry of Kyushu University, Japan, in 1977 and 1980, respectively. He completed his Ph.D. in Kyushu University in 1983. Currently, he is a full professor of Enzyme Chemistry at Department of Advanced Bioscience, Kinki University, Japan. His research of interest is,

1. Crystal structure analysis of the chitinase-oligosaccharide complex
2. NMR analysis of the interaction of chitin-binding proteins
3. Calorimetric analysis of the interaction of chitin-binding proteins
4. Conversion of chitinase into a glycosynthase by protein engineering technique
5. Biomass conversion from fungal cell wall by enzymatic digestion

Recently, in collaboration with Dr. Maria Mahata, University of Andalas, he successfully produced partially N-acetylated chitooligosaccharides, which might be used as animal food ingredients, directly from fungal cell wall. In today’s his lecture, mechanism of oligosaccharide production from chitin and chitosan biomass will be presented, and the utilization of the products will be discussed.
Dr. Robert L. Payne, Ph D, PAS (Evonik - US)
Regional Director of Nutrition and Technical Services for Evonik Health & Nutrition. Rob joined Evonik-Degussa in 2004, and since that time, he has served Evonik’s Health and Nutrition group as Animal Nutrition Services Manager, Technical Services Manager for US and Canada, and Director of Nutrition and Technical Services for North America. In 2011, Rob moved to Singapore to become Director of Nutrition and Technical Services for the Asia South region. As technical director, Rob is responsible for guiding Evonik’s value-added technical services team, which provide tools and consulting for nutritional, analytical, and feed production issues. Rob has authored numerous peer-reviewed, popular press articles, and invited talks, and currently serves on the editorial boards for the Journal of Animal Science and Poultry Science.

Prof. Dr. Ali Agus, DAA, DEA (University of Gajah Mada, Indonesia)
Graduated from the Faculty of Animal Science, University of Gajah Mada in 1989, and completed his DAA, DEA (1993) and Doctorate (1996) from Ecole Nationale Supérieure Agronomique de Rennes (ENSA), Rennes, France in Nutrition and Physiology of Dairy Cattle He is also a member of National Feed Commission, Department of Agriculture, Republic of Indonesia. He published several books and articles in peer reviewed international journals, presented papers in international meeting and published in Proceedings. His research interest are in animal nutrition, feed toxicology, mycotoxins and community developments.

Dr. Yuwares Ruangpanit (Thailand)
graduated her Bachelor and Master in Animal Science from Kasetsart University, Thailand in 1992 and 1995, respectively. She completed her Ph.D. in Nutrition from North Carolina State University in 2004. Currently, she is a lecture of Mono-gastric animal nutrition at Department of Animal Science, Kasetsart University, Thailand. Her research of interest is nutritional evaluation and application of alternative energy and protein source for poultry, especially, a high fiber by-product from Agro-industry. Her responsible research also involves in the application of feed additive in mono-gastric animal under tropical conditions

Prof. Dr. Abdul Razak Alimon (Malaysia)
obtained his Bachelor of Science and Masters of Science in Agriculture from the Faculty of Rural Science, University of New England, NSW, Australia in 1971 and 1980, respectively, and completed his Ph.D degree in 1989 at University of Reading, United Kingdom. He is currently a Professor of Animal Nutrition at the Department of Animal Science, Faculty of Agriculture, Universiti Putra Malaysia. His current interest is in the utilization of herbs as growth promotants in poultry and also agricultural byproducts as animal feed.
“The Role of Nutrition and Feed in Supporting Self-Sufficient in Animal Products, Food Safety and Human Welfare”

Prof. Dr. Yose Rizal (Indonesia)
graduated from the Faculty of Animal Science, University of Andalas, Padang, West Sumatra, Indonesia with a Sarjana degree in 1981, and completed his Master and Ph.D degrees in Animal Nutrition, at the Department of Animal Science, University of Illinois, USA in 1987 and 1989. He is currently a Professor at the Faculty of Animal Science, University of Andalas, Padang, West Sumatra, Indonesia. Now, he is also responsible for the Quality Assurance at the University of Andalas. His area of interest is in the utilization of agriculture wastes/by-products for poultry feeds.

Prof. Dr. Suhubdy Yasin (Indonesia)
is highly distinguish professor in ruminant nutrition science, awarded as Ph.D. From the University of Queensland, Australia 2002. He was a fullbright visiting professor at Utah State University, USA 2008/2009. He is Director a Research Center Of Tropical Rangelands and Grazing Animal Production Systems, Indonesia.
CONTENTS
Foreword from Chairperson of Organizing Committee ........................................... v
Foreword from Rector of Andalas University .......................................................... vi
Foreword from Governor of West Sumatera Province .............................................. viii
CONTENTS .................................................................................................................. xix
KEYNOTE SPEAKERS ................................................................................................. 1

01. POLICY AND NATIONAL PROGRAM FOR FEED DEVELOPMENT”
    Mursyid Ma’sum ....................................................................................................... 2

02. THE MODE OF ACTION OF CHITINOLYTIC ENZYMES: PRODUCTION OF BIOACTIVE
    OLIGOSACCHARIDES AS ANIMAL NUTRIENTS
    Tamo Fukamizo ..................................................................................................... 3

03. IMPROVING EGG NUTRITIONAL VALUE BY DIETARY MARINE SOURCES – A CURRENT
    UPDATE
    Yuwares Ruangpanit ............................................................................................... 4

04. THE UTILIZATION OF JUICE WASTE MIXTURES IN POULTRY DIETS: A REVIEW
    Yose Rizal1, Maria Endo Mahata2 and Guoyao Wu3 .............................................. 5

05. UTILIZATION OF HERBS AS GROWTH PROMOTERS IN ANIMAL FEED
    Abdul Razak Alimon .............................................................................................. 19

06. THE ROLE OF AMINO ACIDS IN SUSTAINABLE POULTRY PRODUCTION
    Robert L. Payne and Michael Binder ..................................................................... 20

07. Rangeland and Pasture of Indonesia for Ruminant Production: a Poor Attention and
    Neglected Resources
    Suhubdy Yasin ...................................................................................................... 29

08. FOOD AND FEED SAFETY ISSUES IN INDONESIA: REDUCING MYCOTOXINS TOXICITY
    AND ITS CARRY OVER FROM FEED INTO ANIMAL PRODUCTS
    Ali Agus and Ika Sumantri .................................................................................... 30

RUMINANT NUTRITION ............................................................................................... 37

01. ESTIMATION OF RUMEN MICROBIAL NITROGEN SUPPLY BASED ON PURINE DERIVATIVES
    EXCRETED IN THE URINE OF KEJOBONG AND BLIGON GOAT FEED BY KING GRASS AND
    PEANUT STRAW
    Lies Mira Yusiati, and Chusnul Hanim ................................................................. 38

02. THE EFFECT OF NEUTRAL DETERGENT FIBER RATIO IN THE DIET ON THE
    PERFORMANCE OF PHILIPPINE NATIVE GOATS (CaprahircusLinn.)
    Nugroho, D1, C.C. Sevilla1, A.A. Angeles1, F. Setyawatie2 .................................... 43

03. MEAT PHYSICAL PROPERTIES OF LOCAL LAMB FED UREA-IMPREGNATED ZEOLITE
    RATION
    D. Kardaya2, E. Dihansih, & D. Wahyuni ............................................................. 56

04. IN VITRO STUDY OF SARDINELLA LEMURU OIL BASED CALCIUM-SOAP
    SUPPLEMENTATION EFFECTS ON THE SHEEP’S RUMEN DIGESTIBILITY
    Asep Sudarman.................................................................................................... 61

05. MILK COMPOSITION OF ETAWAH CROSSEDBRED GOAT FED FORAGE AND LEAVES
    PELLET
06. RUMEN FERMENTABILITY AND DIGESTIBILITY OF LINGZHI (Ganoderma lucidum) AND ORGANIC CHROMIUM SUPPLEMENTATION IN HIGH AND LOW FORAGE RATIONS
Dwierra Evvyernnie, Toto Toharmat, Sumiati and Dian Astriana

07. RUMINAL DEGRADATION CHARACTERISTICS OF MAIZE (Zea mays) LEAVES
Rusdi, Mustari, M. Salman

08. THE EFFECT OF CONCENTRATE OFFERED IN RATION BASED ON RICE STRAW ON THE PERFORMANCE OF BALI CATTLE
A. A. Sri Trisnadewi, T. G. O. Susila, I W. Wijana

09. ENHANCING PERFORMANCE OF SHEEP BY FEEDING CORN LEAF BISCUIT
Yuli Retnani, Sobri, Dedi Kurnia Putra, Toto Toharmat

10. EFFECT OF BLACK TEA (Camelia sinensis) WASTE ON RUMEN DEGRADATION OF FEED PROTEIN
Asih Kurniawati, Bayu Nugroho And Chusnul Hanim

11. SUPPLEMENTATION OF SOLID EX-DECANTER MULTI-NUTRIENT BLOCK ON SIMBRAH BREEDWEANED CALVES PERFORMANCES AS INTEGRATED FARMING SYSTEM WITH PALM FRUIT AGROINDUSTRY
Fariani, A., A. Abrar, G. Moeslim, E. D. A. Astuti and L. Warly

12. NON RUMINANT NUTRITION

01. PRODUCTIVITY OF LOCAL CHICKEN IN GROWTH PERIODS AND CARCASS CHARACTERS BY INCLUSION OF MORINGA OLEIFERA LEAVES MEALSF ON THE DIETS
Hafsa, Sri Sarjuni, Tri Riske, Ilyas Kumbok

02. THE EFFECT OF PALM KERNEL MEAL CONTAINING PROBIOTIC TO REDUCE THE FECAL AMMONIA EMISSION IN THE LAYING HOUSE
Yusri, Fahmida Manin, Yatno and Noverdiman

03. CONTRIBUTION OF LYSINE AND CALCIUM OF Azolla microphylla ON EGG SHELL CALCIUM DEPOSITION IN ARAB HEN

04. JAPANESE QUAIL EGGS QUALITY FED FERMENTED JATROPHA CURCAS MEAL (Jatropha curcas L.)
Sumiati, R. Mutia and I. R. Khalim

05. EVALUATION IN THE PRESENCE OF BLACK TEA WASTE EXTRACT ON DIFFERENT LEVEL OF ENERGY-PROTEIN RATIONS IN THE PERFORMANCE AND CARCASS PARAMETERS OF BROILER
Dilla Mareistia Fassah, Supadmo and Rusman

06. EFFORTS FOR THE MEAT QUALITY OF BALI DUCKS THROUGH OFFERING PURPLE SWEET POTATO (IPOMOEA BATATAS L) FERMENTED ASPERGILLUS NIGER IN DIETS
Tjokorda Gede Belawa Yadnya, Ida Bagus Sudana, I Gede Mahardika and I M. Mastika

07. EFFECT OF AVOCADO SEED MEAL AND FERMENTED OF BANANA PEEL MEAL TO LAYING QUAIL
Hera Dwi Triani¹, Ade Djulardi², Ahadiyah Yuniza³ ................................................................. 163
08. LAYER DUCKS PERFORMANCES FED KATUK LEAF MEAL(Sauropus androgynus L. Merr)
  Widya Hermana⁴, Mahareni Septyanaw⁵ and Sumiatif ....................................................... 168
09. THE PROFILE OF CORN-COB NUTRIENT AS PROSPECTIVE POULTRY FEED IN UPPER AND
  LOWER LAND AREA IN WEST SUMATRA
  Maria Endo Mahata, Ahadiyah Yuniza, Nuraini¹ and Yose Rizal ........................................... 172
10. PERFORMANCE OF BROILER CHICKS FED WASTECANNEDFISHOIL IN RATION
  Jola J.M.R. Londok, John E.G. Rompis dan Youdhie H.S. Kowel ........................................... 179
11. THE DYNAMICS OF INDIGENOUS LACTIC ACID BACTERIA PROBIOTICS ON CARCASS
  YIELD, ABDOMINAL FAT AND INTESTINAL MORPHOLOGY OF BROILERS
  Sri Harimurti¹*, Miftahul Huda², and Anisa Dwi Kistiani ² ..................................................... 185
12. THE EFFECTS OF XYLANASE SUPPLEMENTATION ON MEAT QUALITY, CARCASS RECOVERY
  AND BLOOD CHOLESTEROL IN BROILERS FED ON WHEAT-BASED DIETS
  Chusnul Hanim¹, Lies Mira Yusiati¹, Ali Wibowo¹, and Muhamad Nur Cahyanto² .............. 189
13. DIGESTIVE ORGAN’S GROWTH OF LOCAL DUCK FED HIGH DIETARY FIBER DURING POST-
  HATCH: EFFECT ON ALLOMETRIC MEASUREMENT
  Hanny Indrat Wahyuni¹, Istna Mangisah², Nyoman Suthama³ and Maulana Hamonangan
  Nasution⁴ .............................................................................................................................. 195

FEED SCIENCE AND TECHNOLOGY, PASTURE AND RANGE LAND, NUTRITION AND
REPRODUCTION, SOCIO-ECONOMIS OF FEED AND FOOD .............................................. 204
01. Effect of Somatotropin Hormone on Macroscopic and Microscopic Semen Quality of
  Simbrah Breed Bulls
  01. Gatot Muslim¹, A. Farianti¹, A. Abrar¹, E. D. Y. Astutii¹ and L. Warly² ......................... 204
02. EFFECT OF VEGETABLE AND ANIMAL-DERIVED INGREDIENTS ON THE PHYSICAL PELLET
  PROPERTIES OF EXTRUDED FEED
  Suluh Nusantoro¹, Erfan Kustiawan¹, and Nurkholis³ .......................................................... 211
03. ISOLATION AND IDENTIFICATION OF LACTIC ACID BACTERIA FROM FECES OF YOUNG
  CALVES AS A POTENTIAL CANDIDATE OF PROBIOTIC
  Ismail Jasin¹, Z. Bacrudin², H. Hartadi² ................................................................................ 222
04. EFFECT OF SHADE ON GROWTH AND PRODUCTIVITY OF TORBANGUN (Coleus
  amboinicus, Lour.)
  Karti, P.D.M.H⁵, L. Herawati⁶, L. Despiani⁶ ................................................................. 229
05. EVALUATION OF AVAILABILITY AND QUALITY OF FORAGES AT LIMAU MANIS CAMPUS
  OF ANDALAS UNIVERSITY, PADANG, WEST SUMATRA
  Khalil ..................................................................................................................................... 233
06. FEED INTAKE AND EFFICIENCY IN MICE (MUS MUSCULUS) GIVEN TREATED – JATROPHA
  CURCAS L. SEED MEAL
  Tjakradidjaja, Anita S., P. H. Siagian And Hadriyanih IPB, Bogor, Indonesia .................... 241
07. EFFECT OF THE EXTRACTED CINNAMON STICK AND GROUND CINNAMON STICK ON THE
  RANCIDITY OF PALM OIL DECANTER MEAL
  M. Afdal¹,², A Kasim¹, A. R Alimon¹, and N Abdullah² ....................................................... 253
08. FEED INTAKE, NUTRIENT DIGESTIBILITY AND BLOOD GLUCOSE OF SHEEP 
SUPPLEMENTED WITH ORGANIC CHROMIUM FROM FUNGI GANODERMA LUCIDUM 
F.Agustin*1a, D.Evvyneriebe, m. D.Taniwiryonof, S.Tarigan2, T.Toharmatbe ................. 263
09. ANALYSIS PERFORMANCES OF EGG POULTRY INDUSTRIES IN 50 KOTA REGENCY AS A 
BASED SECTOR OF WEST SUMATRA 
Rahme, E. W. Sartika. Unand, West-Sumatra .......................................................... 269
10. COMPARISON OF CORN STOVER NUTRIENT CONTENT IN LOWER AND UPPER LAND AREAS 
IN WEST SUMATRA 
Rusmana W. S. Ningrat1, Irsan Ryanto1, Montesqrit1and Giovani M. Turchini2 .............. 276
11. NUTRIENTS INTAKE AND THEIR RELATION TO MILK PRODUCTION AND QUALITIES UNDER 
TRADITIONAL AND SMALL SCALE INDONESIAN DAIRY FARMS ENTERPRISES 
Despal*, A. Lestari, Y. Destianingsih, Z. Malyadi, H. Hartono, L. Abdullah ...................... 284
12. UTILIZATION ONGGOK ENRICHED WITH EGG POWDER TO MAKING NUTRITIOUS INSTANT 
FOOD 
Ade Sukma3, Kesuma Sayuti3, Novelina2 ............................................................................ 292
13. STUDY ON IN VITRO DIGESTIBILITY OF SOAKED OIL PALM FIBER BY FILTRATED OIL PALM 
FRUIT BUNCH ASH 
Ari L. Darmawan, Asep Irawan, Tidi Dhalika, Ana R. Tarmidi, Mansyur, Atun Budiman, 
Kurnia A. Kamil and Iman Hernaman ............................................................................. 296
14. PRODUCTIVITY OF BALI CATTLE BASED ON SCROTUM SIZE, BODY WEIGHT AND FEED 
QUALITY 
Abyadul Fitriyah1, Nurul Hilmiati2, Lalu Muhammad Kasip3, Sukmawat4, Totok B. Julianto2 
........................................................................................................................................ 299
15. QUALITY OF RENNET FROM RABBIT STOMACH DURING COLD AND FROZEN STORAGE 
Nurliyani2, Indratininginsih2, Mufti Tri Matra3 ..................................................................... 304
16. IN VITRO CULTURE FOR THE SUPPLY OF MATERIAL GENETIC TRANSFORMATION ON 
DWARF NAPIERGRASS (Pennisetum purpureum cv. Schumach) 
Nafiatiul Umami*a*, Indratiningsih1, Kesuma Sayuti2, Novelina2, Novelina2, Totok. B. Julianto2 
........................................................................................................................................ 311
17. EGGS RENDANG CHARACTERISTIC BY ADDITION OF GAMBIER CATECHIN ANTIOXIDANT 
Deni Novia 3, Afriani Sandra1, Indri Juliayarsi 2, Anwar Kasim 1, Azhari Nuridinar ............... 318

POSTER SESSION ............................................................................................................ 325
P-01. THE EFFECT OF CONCENTRATE RATION BASED ON PALM KERNEL CAKE ON pH, VFA 
AND NH3 IN IN-VITRO RUMEN 
Arief,1 N. Jamarun1, Elieshidas1 and F. Achmad2 ................................................................ 326
P-02. INTEGRATED FARMING SYSTEM WITH EMPOWERMENT OF CATTLE FARMERS GROUP IN 
VILLAGE KINOMALIGAN 
F.H. Elly 3, A. Makalew 3, F. N. S. Oroh1 dan D. Polakitan2 .................................................. 333
P-03. THE EFFECT BIOPROCESS OF BANANAPPEALS WITH THE DIFFERENT OF INCUBATION 
LENGTH AND THE SOURCE OF LOCAL MICROORGANISMS (MOL) ON CRUDE PROTEIN, 
CRUDE FIBER AND LIGNIN CONTENT AS A FEEDING 
Tri Astuti dan Yurni Sari Amir2 ........................................................................................ 339
P-04. THE CONTENT OF PHYTOCHEMICAL AND ANTIBACTERIAL ACTIVITY OF CINNAMON LEAF (Cinnamomum burmanii) AND NONI FRUIT AND LEAF (Morinda citrifolia L) MIXTURE EXTRACT TO REPLACE ANTIBIOTIC
Yuniza, A and Yuherman ................................................................. 345

P-05. THE EFFECT OF SUPPLEMENTATION LAMTORO (Leucaena Leucocephala) BASED ON RICE STRAW AMONIATION RATIO ON IN-VITRO RUMEN CHARACTERISTICS
Herawati, R., N. Jamarun, M. Zein, Arnim ..................................................................................... 352

P-06. DRY MATTER AND ORGANIC MATTER DIGESTIBILITY OF JAVA WOOD (Lannea Coramandela) LEAVES BY USE IN SACCO
Fatmawati ................................................................................................................................. 357

P-07. IMPROVING THE QUALITY OF SOYBEAN MILK WASTE THROUGH FERMENTATION BY NEUROSPORA CRASSA AS POULTRY RATION
Mirnawati, Ade Djulardi, Helmi Muis ...................................................................................... 362

P-08. EFFECT OF TOTAL TIME MARKETING ON MICROORGANISMS IN CATTLE MEAT MARKETED IN PADANG GREAT MARKET, WEST SUMATERA
Yuherman1), Eva Umar 1), John Farlis3) .................................................................................... 365

P-09. THE APPLICATION OF SCIENCE AND TECHNOLOGY FOR CATTLE FARMERS GROUP FOR IMPROVING INTEGRATED FARMING SYSTEM IN VILLAGE ONGKAW

P-10. PERFORMANCES AND HEMATOLOGICAL PROFILE OF BROILER UNDER HEAT STRESS FED DIET CONTAINING Carica papaya L. LEAF MEAL AND Curcuma domestica val
Dwi Margi Suci, Dewi Apri Astuti, F.Kumala. Dewi dan D. Kuncoro Sakti .................................. 381

P-11. MIX OF LINGZHI (Ganoderma lucidum), ORGANIC CHROMIUM AND ROASTED SOYBEAN EVALUATED AS FEED SUPPLEMENT FOR LAYING HEN
Tania Perdana Putri1), Dwierra Evwernie2), Dwi Margi Suci1) and Muhammad Lukmannulhakim1) ................................................................................................................................. 379

P-12. FERMENTABILITY AND DEGRADATION OF CONCENTRATE CONTENTS DRY CARBOXYLATE SALT OR METHYL ESTER IN RUMEN LIQUID
A.M. Tasse1), E.B. Laconi2), D. Agustina3) ................................................................................... 397

P-13. COMPARATIVE ANALYSIS OF SCIENCE AND TECHNOLOGY FOR CATTLE FARMERS GROUP FOR IMPROVING INTEGRATED FARMING SYSTEM IN VILLAGE ONGKAW

P-14. VIABILITY OLFRACTIC ACID BACTERIAISOLATED FROMRUMEN LIQUOR ON MOLASSES MIXTURE MEDIUM
Ema Damayanti 1), Novita Anggun Hermawati2), Artini Pangastuti2) and Ahmad Sofyan1) ... 402

P-15. EFFECT OF FORMIC ACIDS IN SILAGE PROCESSING FROM SHRIMP HEAD WASTE AS ANIMAL FEED
Mirzah, Montesqrit and Suslina A Latif ...................................................................................... 415

P-16. EFFECTS OF SAGA LEAVES AND YELLOW LEAVES ON RUMEN MICROBES AND IN VITRO DIGESTIBILITY
Dwierra Evyernie1,2,4, Heri Ahmad Sukria1,2, Eva Harlina1,3, Eka Rachmi2, Astri Winarni2 and Uray Nurjannah2

P-17. FLUSHING WITH DIFFERENT SOURCES OF ENERGY QUALITY RATION ON REPRODUCTIVE PERFORMANCE LOCAL SHEEP
L. Khotijah, K.G. Wiryawan, K.B. Satoto, D. Diapari, N.B. Sitepu and N.E.K. Santi

P-18. THE USE OF Trichoderma harzianum IN THE FERMENTATION OF TOFU WASTE PRODUCT
Burhanudin Malik1,3; Anggraeni1; Sawarni Hasibuan2; Rudiana1

P-19. INDIGOFA ZOLLINGERIANA ADAPTATION TO DROUGHT STRESS AND MYCORRHIZA INOCULATION
Simel Sowmena, L. Abdullahb, P.D.M.H. Kartib, D. Soepandi(c)

P-20. EFFECT OF COCOA POD AND COCOA LEAF ON IN VITRO FERMENTATION AND NUTRIENT DIGESTIBILITY
Jurnida Rahman, Mardiati Zain, and Erpomen

P-21. EFFECT OF VITAMIN E SUPPLEMENTATION IN THE EXTENDER ON FROZEN – THAWED SEMEN PRESERVATION OF PESISIR CATTLE
Zaituni Udin; Ferdinal Rhim; Jaswandi and Ayu Fadillah

P-22. GREEN LIVESTOCK DEVELOPMENT: THE ROLE OF LACTIC BACTERIA FOR IMPROVEMENT AND UTILISATION OF TOTAL MIXTURE FORAGE
Zaenal Bachruddin1, Supadmo1, Lies Mira Yusiatib, Chusnul Hanim1, Asih Kurniawatib, Dimas Hand Vidya Paradhipta2 and Mayansari2

P-23. THE EFFECTS OF ROASTED CORIANDER SEEDS IN THE DIET ON CARCASS TRAIT AND CHOLESTEROL CONTENT OF BROILER
R. Mutia, R.G. Paminda, and N. Ramli
Abstract

The study aimed to investigate the effect of substitution forage with leaves pellet on goat milk composition. Calliandra and Cassava leaves pellet were used in this study. Pellet substituted 12.25% of forage dry matter in the ration. The study used 9 lactating Etawah Crossbred goats, divided into 3 groups (Control, Treatment I and Treatment II). Feed in Control group consisted of grass, Calliandra and concentrate (21:49:30) of dry matter. In Treatment I and II the goat was given the similar ration, but 25% of Calliandra was substituted with Calliandra pellets and Cassava leaf pellets. Data were collected for 60 days, consisted of feed and nutrient consumtion, milk composition (total solid, fat and protein content). The result showed there was a significant effect of substitution of forage with leave pellets on dry matter, crude protein, crude fiber and energy consumption (P< 0.05). Milk production, fat and protein was not affected by substitution. The study concluded there was no effect of feeding leaves pellets as forages substitution on the composition of goat milk.

Key words: leaves pellet, milk composition, goat

INTRODUCTION

In smallholder condition Etawah Crossbred goat was commonly depends on forages. Calliandra, Gliricidia and Cassava leaves composed the main feed. Those type of leaves are known to be nutritious for goats. The protein content is 22.29% in Calliandra (Matara, 2001) and 23.42% in Cassava leaves (Purwanti, 2005). Problem commonly occurs in the dry season, that was the condition when forages production decreased, so that the availability of good quality forage was low. In this situation there was need an effort to preserve forage in order to overcome the problem of feed shortage. The effort should be expectable to maintain the availability of high quality forages such as Calliandra, Gliricidia and Cassava leaves, therefore significance to the sustainability of goat farming systems, depending on natural vegetation.

Pelleting is one of the methods of feed preservation. The process was a combine of mixing of the raw material, forming and a thermal treatment to hard the pellet. To produce forage pellet there was need to add concentrate and filler such as gelatin and sort of flour (Anonim, 2000). According to Parakkasi (1999) there are advantages of pellets. It can be stored in small area and there is no waste. Anonimous (2013) stated that animal fed pellets is free to eat at different times or several times a day and therefore can increase milk production. Sanz Sampelayo et al. (1998) reported the advantageous of feeding alfalfa pellet in compared with alfalfa hay, such as increased casein milk protein, improved the utilization of nitrogen and metabolizable energy for milk production. It was also indicated that amount of fat and protein in the milk depended on energy intake.

Milk composition of is one of the major factors determining its nutritive value (Morand-Fehr et al. 2007). Some factors including feed have been known to determine milk production and composition. In this recent situation where goat milk being...
promoted to consume, there is need to investigate the composition. An evaluation on Calliandra and Cassava leaves pellets for forage substitution was necessary to be done, since those type of forage were majority produced by farmers.

MATERIAL AND METHODS

Materials:

Goat and feed. The study carried out with 9 lactating Etawah Crossbred goats in the village of Sukorejo, Turi, Yogyakarta. The goats were in the second lactation with body weight around 40 to 46 kg. The goats were separated from their kids 7 days after kidding. Feed consisted of grass (*Pennisetum purpureum*), *Calliandra calothyrsus*, concentrates and leaves pellets (Calliandra and Cassava leaf pellets). Concentrates composed of rice bran (30%), wheat pollard (40%) and soy bean hull (30%) of dry matter. The component of leaves pellets are Calliandra or Cassava leaves mill (80%), rice bran (20%) of dry matter and filler component (tapioka flour and mollases).

Equipment. Individual slatted goat houses completed with feed trough and bucket for water feeding. Goat scale, equipments for processing leaves pellets and chemical analyses of feed and goat milk.

Methods:

The goats were divided into 3 groups (Control, Treatment I and Treatment II). Feed of goats in the Control group consisted of grass (21%), Calliandra (49%) and concentrates (30%) of dry matter. Similar feed was given to goats in Treatment I and Treatment II, but 25% of Calliandra was substituted with Calliandra pellets or Cassava leaf pellets, respectively. The quantity of substituted pellet corresponded to 12.25% of Calliandra (DM). Total dry matter of feed given to all groups was 4% of body weight. Feed was offered twice a day in the morning and the afternoon. Pellets was given after feeding concentrates.

Feed consumption was measured by weighting feed offered subtracted by feed refused after 24 hours. Samples of feed, feed refused and milk were taken every 3 days during 60 days then dried and composited for determination of nutrient content. Milk samples were taken for analyses of specific gravity (lactodensimeter), total solid, milk fat (Babcock tests) and milk protein (Kjeldahl). Body weight of goats was measured by weighing at the begging and the end of study period. Data of feed and nutrient consumption, body weight change, milk production and composition were collected during the study and statistically analysed by SPSS Statistical Package Programme 17 followed Completed Randomised Design.

RESULT AND DISCUSSION

Feed and nutrient consumption

Composition of feed and nutrient content were presented in Table 1 and 2. Table 3 showed the average of nutrient consumption by goats. Dry matter intake (DMI) in Treatment I and Treatment was higher than that in the Control (85.78 and 96.40 g/kg BW<sup>0.75</sup> compared with 70.41 g/kg BW<sup>0.75</sup>). Those value corresponded to 3.35 and 3.74% compared with 2.77% of body weight. The data indicated an effect of substitution of Calliandra (25% DM) with Calliandra or Cassava leaves pellets.
The highest DMI found in Treatment I (substitution with Calliandra pellets). Leaves pellets in this study considered to be palatable. It was proved by no refused pellets. This condition contributed to maintain DMI. The level of DMI of goats in this study was higher than average DMI of goats fed forage in free range as 43.6 g/kg BW^{0.75} corresponded to 2% of body weight (Njoroge, 1996) and 2.8 to 4.9% of bodyweight for tropical goats (Atabany, 2002). The level of DMI in Treatment I and Treatment II was slightly under the capacity of DMI of goats as about 4 to 7% of body weight (Harris and Springer, 2013). Based on the palatability, pelleting Calliandra and Cassava leaves is expectable preservative method for forage. In the dry season it might helpfull for farmer to solve the problem of feed shortage.

There as an effect of substitution fresh Calliandra with leaves pellets on nutrient intake (P<0.05). The highest intake of crude protein (CP), crude fiber (CF) and total digestible nutrient (TDN) was found in the Treatment I where the goats received Calliandra pellets. According to Muenga et al. (1995) cited by Kato et al. (2006) and Mpairwe et al. (2003) supplementation with adequate CP to ruminants has promoted dry matter intake (DMI), rumen degradation and nutrient flow to the small intestine and culminated in higher animal performance. In this study, 20% of pellets components also concentrates (rice bran, flour and mollases) in small amount. Therefore apart from substituting fresh Calliandra, leaves pellets in this study also supplemented the ration in a small amount. Those materials took part in increasing DM and nutrient intake for goats in the Treatment groups.

In this study, the purpose of pelleting was to reduce tannin content, apart from preserve. Calliandra calothyrsus has been identified and recommended as the most suitable species feed. However, it contains antinutritional factors, which could be reduced by ensiling (Sabiiti, 2001; Bareeba and Aluma, 2000 cited by Kato et al., 2006). According to NRC (1981) high water content in forage could restrict energy availability for goat. In this study, the form of leaves pellets was solid and high density. Dry matter content (58.60% and 58.40%) was higher than fresh leaves. According to Carvalho et al. (2006) cited by Rufino et al. (2012) forages have low energy density and slow rate of degradation and passage, which limit the forage intake. In this study, the density of pellet probably increased degradation and passage in the rumen. There was not bulky in the rumen and therefore contribute to increase dry matter and nutrient intake. The increasing of CP and CF consumption as a result of pellets substitution possibly affected milk production and composition, especially on milk fat and milk protein.

**Milk composition**

Milk composition of lactating goats (presented in Table 4) was not significantly affected by treatment. Milk gravity varied between 1.026 to 1.029. Milk fat and protein were 4.40%, and 4.55% in Control goats; 4.19% and 5.16% in Treatment I; 3.69% and 4.41% in Treatment II. The concentration of fat and protein of goat milk in this study was similar to the average milk composition. According to Strzalkowska et al. (2009) the concentration of milk fat varied between 3.67 to 3.85% and milk protein 2.98 to 3.66% while other report was 3.3 to 7.7% and 3.1 to 4.5% (Pambu et al., 2011). The characteristic of breed was also reported, such as superiority in milk quantity of dairy goat and quality in indigenous breed. The data showed similarity of milk.
The increased nutrients including CP, CF and energy in the Treatment groups did not show significant effect on the main milk composition (fat and protein). Sanz Sampelayo et al. (1998) showed the advantageous of feeding alfalfa pellet, such as increased casein milk protein, improved the utilization of nitrogen and metabolizable energy for milk production in compared with alfalfa hay. It was also indicated that amount of fat and protein in the milk depended on energy intake. According to Morand-Fehr and Sauvant (1980) supplementary concentrates during midlactation increased intakes of dry matter and energy and milk production. Milk protein percentage was increased, but milk fat contents were lower. Increased intakes of energy raised percentages of palmitic acid and decreased carbon-18 acids. In this study, feeding Calliandra pellets resulted the highest energy intake (in the form TDN), however there was no improvement in milk fat and protein content. There were many reasons of those condition. Variation of breed character, which affected milk production and milk composition. There was no record of goat samples origin. Forage quality was also uncertainly and samples were not taken daily. In this study Calliandra, Cassava leaves and grass were provided by farmers, so that very depending on the place and age of plantation. This because energy potential and protein content in forages are inversely related to maturity. The cellulose in young forages is generally more digestible because rumen microbes are able to more quickly break it down and ferment it, which resulted in more volatile fatty acids. Those reason was probably determine the digestibility of feed in rumen and nutrient absorption in the intestine.

The average milk yield was 540 ml/day (Control); 400 ml/day (Treatment I) and 460 ml/day (Treatment II). The result in Table 4 showed the highest milk fat and protein yield were achieved by goats in the Control group because this group produced the most quantity of milk. The yield of fat and protein were 24.49 and 25.39 g/kg BW $^{0.75}$ (Control); 17.27 and 21.21 g/kg BW $^{0.75}$ (Treatment I); 17.43 and 20.79 g/kg BW $^{0.75}$ (Treatment II). The benefit of leaves pellets utilization in this study could be emphasis on its capability to maintain nutrient intake and milk composition. This meant no negative effect of feeding leaves pellets on consumption and the quality of milk. Since the leaves pellets were palatable, pelleting could be considered as preservative method. This point was probably helpfull for farmers to overcome shortage feed problem during the dry season.

**CONCLUSION**

The study conclusion were (1) Calliandra and Cassava leaves was palatable and good substitution for fresh forages, (2) the effect of substitution 25% of forages dry matter with Calliandra and Cassava leaves pellets increased nutrient consumption significantly, (3) the substitution was not affected goat milk composition.

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