ISBN: 978-602-96530-4-5

PROCEEDING

isai 3rd

International Seminar on Animal Industry 2015

THE THIRD INTERNATIONAL SEMINAR ON ANIMAL INDUSTRY

"Sustainable Animal Production for Better Human Welfare and Environment"

September, 17-18 2015
IPB International Convention Center
Bogor-Indonesia

Organized by:

Sponsored by:

SieradProduce

FACULTY OF ANIMAL SCIENCE
BOGOR AGRICULTURAL UNIVERSITY
2015

Bogor Agricultural University

LIST OF EDITORS

Proceeding of the 3rd International Seminar on Animal Industry, Bogor, 17-18 September 2015

Scientific Editors

Chief : Prof. Dr. Ir. I Komang G. Wiryawan
Secretary : Prof. Dr. Ir. Cece Sumantri, M.Agr.Sc
Members : Prof. Dr. Ir. Bas. Kemp. (Netherland)
Prof. Myunggi Baik (Korea)
Prof. Wayne Pitchford (Australia)
Prof. Dr. Ir. Wasmen Manalu, M.Sc
Prof. Dr. Ir. Iman Rahayu H.S., MS
Prof. Dr. Ir. Nahrowi Ramli, M.Sc
Prof. Dr. Ir. Muladno, MSA
Prof. (R)Dr. Ir. Bess Tiesnamurti
Prof. Dr. Ir. Dewi Apri Astuti, MS
Dr. Jean Pierre Bidanel (France)
Dr. Anjas Asmara Samsudin (Malaysia)
Dr. Kai J. Kuehlmann (Germany)
Dr. Ir. Idat Galih Permana, M.Sc.Agr
Dr. Tuti Suryati, SPt, MSi
Dr. Indah Wijayanti, S.Tp, M.Si
Ir. Anita Tjakradidjaja S., M.Rur.Sc

Technical Editors

Windi Al Zahra, S.Pt, M.Sc.Agr
Irma Nuranthy Purnama, SPt, MSi
Fitri M. Manihuruk, S.Pt
Himmatul Khasanah, S.Pt
Reikha Rahmasari, S.Pt, M.Si
Rika Zahera, S.Pt, M.Si

List of Reviewers

Prof. Dr. Ir. Sumiati, M.Sc
Prof. Dr. Ir. Dewi Apri Astuti, MS
Prof. Dr. Ir. I Komang G. Wiryawan
Prof. Dr. Ir. Bas. Kemp. (Netherland)
Prof. Myunggi Baik (Korea)
Prof. Dr. Ir. Erika B. Laconi, MS
Prof. Dr. Ir. Cece Sumantri, M.Agr.Sc
Prof. Dr. Ir. Iman Rahayu H.S., MS
Prof. Dr. Ir. Yuli Retnani, M.Sc
Prof. Dr. Ir. Wasmen Manalu, M.Sc
Prof. Dr. Ir. Panca Dewi M.H.K, MS
Prof. Dr. Ir. Luki Abdullah, M.Sc.Agr
Prof. Dr. Ir. Yuli Retnani, MSc
Dr. Jean Pierre Bidanel (France)
Dr. Anjas Asmara Samsudin (Malaysia)
Dr. Kai J. Kuehlmann (Germany)
Dr. Ir. Asnath M. Fuah
Dr. Indah Wijayanti, S.Tp., M.Si
Dr. rer.nat. Nur Rochmah Kumalasari, S.Pt, M.Si
Dr. Ir. Lilis Khotijah, MS
Dr. Ir. Asep Sudarman, M.Sc
Dr. Ahmad Yani, S.TP, M.Si
Dr. Ir. Muhammad Ridla, M.Agr
Dr. Ir. Widya Hermana, M.Si
Dr. Ir. Afton Atabany, M.Si
Dr. Ir. Didid Diapari, MS
Ir. Burhanudin, MM
Dr.Agr Asep Gunawan, S.Pt, M.Sc
Dr. Tuti Suryati, S.Pt, M.Si
Ir. Anita Tjakradidjaja S., M.Rur.Sc
Dr. Irma Isnafia Arief, S.Pt, M.Si
Dr. Ir. Heri Ahmad Sukria, M.Sc.Agr
Dr. Ir. Rudi Afnan, M.Sc.Agr
Dr. Anuraga Jayanegara, S. Pt, M.Sc
Dr. Ir. Henny Nuraini, MS
Dr. Ir. Rudy Priyanto
Dr. Sri Suharti, SPt, M.Si
Dr. Ir. Idat Galih Permana, MSc Agr
Dr. Ir. Rita Mutia, M.Agr
Dr. Ir. Dwierra Evvyernie A, MS, M.Sc
Dr. Ir. Hotnida H. C. Siregar, M.Si
Dr. Ir. Suryahadi, DEA
Ir. Lucia Cyrilla, E.N.S, M.Si
Dr.Ir. Sri Darwati, MSi
Dr. Epi Taufik, S.Pt, MVPH, M.Si
Dr. Ir. Moh. Yamin, M.Agr.Sc
Dr. Despal, S.Pt, M.Sc.Agr
Dr. Ir. Niken Ulupi, M.Si
Dr. Jakaria, S.Pt, M.Si
Dr. Iwan Prihantoro, S.Pt, M.Si
Drh. Agus Setiono, MS, Ph.D
Dr. Ir. Sri Mulatsih, M.Sc.Agr
Maria Ulfah, SPt, MSc.Agr
Yuni Cahya E., S.Pt, M.Si

FOREWORD FROM CHAIRPERSON OF ORGANIZING COMMITTEE

Good morning,

Selamat pagi, salam sejahtera bagi kita semua

Rector of Bogor Agricultural University, Prof. Dr. Ir. Herry Suhardiyanto, M.Sc.

Director General of Livestock and Animal Health, Ministry of Agriculture, Republic of Indonesia, Prof. Dr. Ir. Muladno, MSA.

Dean of Faculty of Animal Science, Bogor Agricultural University, Prof. Dr. Ir. Luki Abdullah, M.Sc.Agr.

All participants of the International Seminar on Animal Industry 2015

Distinguished guests, ladies and gentlemen.

It is my great pleasure to welcome you all, our distinguished guests, speakers and participants, to the Third International Seminar on Animal Industry (ISAI 3rd, 2015) held at the IPB International Convention Center,Bogor Indonesia. This seminar with the theme "**Sustainable Animal Production for Better Human Welfare and Environment**" is organized by Faculty of Animal Science, Bogor Agricultural University incollaboration with Association of Indonesia Animal Scientist (HILPI).

Following the recommendations from ISAI 1 and ISAI 2, which were held in Indonesia in 2009 and 2012,the strategic issuesof ISAI 3rd is emphasized on animal production systems and technology andthe wise use ofnatural resources in relation with environmental aspects, toward a sustainable animal production. There willbe 98 papers presented during the two days seminar; 9 by invited speakers, 69 for oral and 29 for poster presentations. The speakers came from different coutries including Australia, Egypt, France, Korea, Germany, Netherland, Indonesia, Malaysia, Nigeria, Pakistan, Thailand and USA.

This is a great opportunity for scientist, researchers, private sectors and policy makers to discuss, share information and experienceson interesting topics in animal production in a broad sense, including good farming practices, recent technologies and save animal products. I believe, there is an open window for initiating and strengthening collaboration amongst scientist and institutions during and after the seminar.

On behalf of the Organizing Committee, I would like to express my sincere appreciation and thanks to IPB, and some units within, including Institute of Research and Community Empowerment, Faculty of Animal Science, Department of Animal Production and Technology, Department of Nutrition and Feed Technology, Diploma Program, Management and Bussines Program for all advice and funding support.

The success of this seminar could only be achieved with all the valuable supports and sponsorship we received from some recognized parties and institutions in this country. In this regards, I would like to address my greatful thanks to Directorate General of Livestock and Animal Health, Ministry of Agriculture Republic of Indonesia for participation and funding support, Infovet and Trobos, Green TV as promotion agency. To: PT. Sierad Produce, Tbk, PT. Kaltim Prima Coal, Tbk, PT. BRIngin Life, PT. Adaro Indonesia, Tbk, PT. Trouw Nutrition Indonesia, PT. Nutricell Pasific, PT. Sweni Transfer Indonesia, PT. Charoen Phokphand Indonesia, Tbk, PT. Wide & Pin, PT. Pupuk Kujang, Tbk, and PT. ANTAM, Tbk, thank you so much with big appreciation, for having being part of this important event and such enormous contributions.

My recognition and gratitude are also forwarded to the Steering Committee for advice and assistanship,to international and national reviewers and the Scientific Committee for hard working and such great support . Last but not least, to all my dear coleagues of the Organizing Committee members, who have been working smartly and full of dedication and passion, to make this seminar a great succesfull event.

To all participants, hopefully, the two days seminar may bring fresh ideas, and enhancing collaborations for future success toward sustainable animal production and industry. Big appologies for any incoveniences during the seminar, wish you all having friutfull discussions and good times.

During your short stay, please enjoy the surrounding of Bogor city, the Museum of Presidential Palace and Historical Botanical Garden of Bogor.

Bogor, September 17th, 2015

The Iiai 3rd 2015,

Chairperson of Oraganizing Committee

Asmath M. Fuah

REMARKS FROM DEAN OF ANIMAL SCIENCE FACULTY

Prof. Dr. Muladno, MSA
Director General of Livestock and Animal Health-Ministry of Agriculture Republic of Indonesia,

Prof. Dr. Ir. Herry Suhardiyanto, M.Sc.
Rector of IPB

Dr. Ir. Asnath Maria Fuah
Chairperson, The 3rd International Seminar on Animal Industry

Our Colleagues from Indonesian universities and research institutes,
Distinguished foreign participants and speakers,

Representative of livestock services officers of local government from all over Indonesia,

Distinguished guests, ladies and gentlemen.

Assalamu'alaikum warahmatullaahi wabarakatuh,

I am pleased to welcome you all to Bogor city for attending "The 3rd International Seminar on Animal Industry 2015" held at Faculty of Animal Science, Bogor Agricultural University (IPB). As the Dean of Faculty, I am also really honored to host this conference.

First, let me introduce briefly about Bogor city. Bogor is one of the major scientific and educational centers in Indonesia. A significant part of academic and research base was laid in the period of Dutch colonization. In particular, since the beginning of the 19th century there were established laboratories and professional schools focused primarily on improving the efficiency of the colonial agriculture. Similar to the prevailing profile of research and academic activity was retained in Bogor after gaining independence. As in the second half of 20th century, and in the 2000s strongest areas were Agricultural sciences, Biology, Animal and Veterinary Sciences. The main educational and scientific center with the utmost national importance is the Bogor Agricultural University (IPB). It is therefore the city regularly hosted various international events, such as international seminars and conferences.

I would like to express my gratitude to IPB for supporting us to hold this conference, and also to the organizing committee of the present conference for their hard work and persistence. I convey my sincere gratitude to all the parties which is supporting this event, such as Directorate General of Livestock and Animal Health-Ministry of Agriculture Republic of Indonesia, Infovet Trobos, Agrina, Green TV as promotion agency and Sierad Produce, Kaltim Prima Coal, BRIngin Life, Adaro Indonesia, Trouw Nutrition Indonesia, Nutricell Pasific, Sweni Transfer Indonesia, Charoen Phokphand, Wide & Pin, Pupuk Kujang, and ANTAM thank you so much with big appreciation, for having being part of this important event and such enormous contributions. I am very pleased to see here the delegates from various foreign countries as well as representatives from many domestic institutions.

I hope you find this conference and the city, both interesting and stimulating and that you enjoy meeting up with your professional colleagues as well as having pleasure time during your stay in Bogor.

Thank you very much and
Wassalamu'alaikum warahmatulaahi wabarakaatuhu.

Bogor, September 17, 2015
Prof. Dr. Ir. Luki Abdullah, MSc.Agr
DEAN

SEMINAR PROGRAM

Conference Program

Thursday, September 17, 2015

Time Slot	Venue : IICC Ballroom	
	Event	Speaker
08.00-09.00	Registration	Committee
09.00-09.05	Opening Ceremony	Master of Ceremony
09.05-09.15	Report from Organizing Committee	Dr. Ir. Asnath M.Fuah, MS
09.15-09.25	Welcome Address from Dean Faculty of Animal Science	Prof. Dr. Ir. Luki Abdullah, M.Sc.Agr.
09.25-09.35	Welcome Address from Rector of Bogor Agricultural University	Prof. Dr. Ir. Herry Suhardiyanto, M.Sc
09.35-10.00	Opening and Keynote Speech by Ministry of Agriculture / Directorate General of Livestock and Health Services	Prof. Dr. Ir. Muladno, MSA
10.00-10.05	Appreciation for Keynote Speakers from Dean Faculty of Animal Science	Prof. Dr. Ir. Luki Abdullah, M.Sc.Agr.
10.05-10.20	Sponsorship Appreciation from Chairman of Organizing Committee	Dr. Ir. Asnath M.Fuah, MS.
10.20-10.25	Photo session	Photographer
10.25-10.40	Coffee break	
	Plennary Session 1 *Moderator: Prof. Dr. Ir. Komang G. Wiryawan*	
10.40-11.00	Invited speaker 1	**Prof. Dr. Ir. Bas. Kemp** Preserving Health, Welfare and Productivity in a Challenging Environment
11.00-11.20	Invited speaker 2	**Dr. Jean Pierre Bidanel** Genomic Selection for More Sustainable Livestock Production
11.20-11.40	Invited speaker 3	**Ir. Yunus Triyonggo, MM** Building Human Resources Competency Model in Poultry Industry
11.40-12.00	Discussion	
12.00-12.05	Invited Speaker Appreciation from Scientific Committee	Prof. Dr. Ir. Dewi Apri Astuti, MS.
12.05-12.15	Sponsorship Appreciation from Vice Dean Faculty of Animal Science	Dr. Ir. Moh. Yamin, M.Agr.Sc.
12.15-12.25	Student Plenary	
12.25-13.20	Lunch	
13.20-13.50	Poster session	

Time	Room A (Theme D)	Room B (Theme B and C)
Session 1	***Moderator : Dr. Rajesh Jha***	***Moderator : Ummi Noorhakimah***
14.00-14.10	**Thongsuk Jetana** Rain Tree Pod in Livestock Feeds: Opportunity, Challenges and Possibility	**Yeni Widiawati** Fermentation Kinetics Of Palm Oil Plantation By-Product Based Diet
14.10-14.20	**Supriyati Kompiang** Effect of Different Protein and Energy Levels in Concentrate Diets on Performances of Anglo-Nubian Goat During Pregnancy and Lactation Periods	**Ainissya Fitri** Utilization Of Haylage Of Local Agro-Industry By product Pretreated With Afex Method
14.20-14.30	**Rusdi** Evaluation of Eleutherine (*Eleutherine americana*) as Feed Additive for Poultry	**H. A. Sukria** Physical Quality And Storage Time Pellet Indigofera Spleaves
14.30-14.40	Discussion	Discussion
Session 2	***Moderator :Thongsuk Jetana***	***Moderator : Imana Martaguri***
14.45-14.55	**Utsav Prakash Tiwari** Nutrient Profile And In Vitro Digestibility Of Fresh And Ensiled Cassava In Swine	**Moh Ali Hamdan** Potential Of Dwarf Elephant Grass (*Pennisetum Purpureum* Schum. Cv. Mott) In Dry Land Areas Of Bojonegoro As Forage-Based Feed Sustainability
14.55-15.05	**Alif Putri** Effect of Combination Silkworm Pupae Meal and Garlic Meal on Blood Profiles, Visceral Organs and Carcass Broiler	**Rido Pande Pardede** Development Of Indigofera Zoolingeriana And Pueraria Javanica On Dry Land Integrated With Teak Forest In Bojonegoro
15.05-15.15	**Burhanudin Sundu** The effect of NaOH Concentrations and Polysaccharides Extract of Palm Kernel Meal on Performance of 4 Weeks Old-Broiler Chickens	**Malcky Telleng** Growth and Productivity of Different Sorghum Varieties Cultivated with Indigofera in Intercropping System
15.15-15.25	Discussion	Discussion
15.25-15.40	Coffee break	
Session 3	***Moderator : Anis Muktiani***	***Moderator : Lisa T. Praharani***
15.40-15.50	**Muhamad Nasir Rofiq** Combination Effect of Nutritech Feed Additive Containing Saponin, Tanin and Eugenol Essential oils on In Vivo Rumen Methane Production in Dairy Cattle Using Open Circuit Respiration Chamber Technique	**Imana Martaguri** Carbon Storage Capacity of Forage Native Grasses Growing in Palm Plantation at Transformation Forest Ecosystem in Jambi
15.50-16.00	**Dwi Yulistiani** Nitrogen Utilization and Ruminal Fermentation of Five Breed of Sheep Fed Concentrate Containing Different Levels of Rumen Undegradable Protein	**I Gusti Ngurah Jelantik** Herbage Production and Nutritive Value of Some Forage Legumes as Calf Feed Supplement
16.00-16.10	**Sutresniwati** A Willingness to Pay Evaluation for Silage Implementation for Small Dairy Farmers	**Riesi Sriagtula** Evaluation of Growth and Production of Sorghum Lines (Sorghum Brown Midrib) at Different of Harvest Time as Feed
16.10-16.20	Discussion	Discussion
Session 4	***Moderator : Rusdi***	***Moderator: Veronica***
16.25-16.35	**Anita S. Tjakradidjaja** Fermentability and Digestibility of Rice Straw - Concentrate Base Ration Added with Probiotic	**Nur Rochmah Kumalasari** Modelling of Forage Availability Response to Landuse Exchange in Bogor

Time	Room A (Theme D)	Room B (Theme B and C)
16.35-16.45	**Gusti A. Gultom** Effects of Solid or Liquid Probiotic Supplementation on Rumen Microbial Population and Enzyme Activity	**Khalil** The Diversity and Quality of Forages Used for Feeding of Goat in Payakumbuh of West Sumatra
16.45-16.55	**Eissa M. M** Effect Of Ammoniated Straw On Methane Production In An In Vitro System And On Growth Performance	**P.D.M.H. Karti** The Addition of Arbuscular mycorrhizal Fungi in Enhancing Productivity and Drought Tolerance Mechanisms of Indigofera zollingeriana
16.55-17.05	Discussion	Discussion

Time	Ballroom (Theme A)
Session 1	***Moderator : Iis Arifiantini***
14.00-14.10	**Fuah A.M** Beef Cattle Production, Constraints and Opportunities for Small Farmers in South Central Timor Regency West Timor
14.10-14.20	**S.N. Sirajuddin** The Application of Tesang Sharing System at Cattle Farms in Indonesia
14.20-14.30	**Niken Ulupi** Production Performance of Laying Hen in Cage System with Different Housing Temperature
14.30-14.40	**Lucia Cyrilla** Evaluation of Good Dairy Farming Practice Implementation in Dairy Goat Farm
14.40-14.50	Discussion
Session 2	***Moderator : Prof. Cece Sumantri***
14.55-15.05	**Lindawati Doloksaribu** Constraints to, Challenges of, and Opportunities for Rearing Goats in Bali Province. A case study: Rearing Kids in Karangasem Regency
15.05-15.15	**Hearty Salatnaya** Trigona Sppropolis, Pollen, And Honey Production In Two Different Agroecosystem
15.15-15.25	**Prabowo, S** Distribution of Thermal Body Surface Ettawah Grade in Different Tropic Microclimates
15.25-15.35	**Bram Brahmantiyo** Hycole and Hyla Rabbits Performance were Raised in Indonesia
15.35-15.45	Discussion
15.45-16.00	**Coffee break**

Welcoming dinner. Venue IICC Ballroom

Time Slot	Event
18.20-19.00	Registration and Dinner (Instrument from Gentra)
19.00-19.05	Opening by Master of Ceremony
19.05-19.15	Speech from Chairman of Committee
19.15-19.25	Speech from Dean of Animal Science Faculty
19.25-20.00	Gentra Kaheman
20.00-20.20	Prof. Singer
20.20-21.20	Spontaneity from Country Representative
21.20	Closing

Friday, September 18, 2015

Time	Venue : IICC Ballroom	
	Event	**Speaker**
8.00-8.30	Registration	Committee
8.30-8.35	Opening Ceremony	Master of Ceremony
	Plennary Session 2 ***Moderator: Dr. Jean Pierre Bidanel***	
8.35-8.55	Invited speaker 1	**Prof. Wayne Pitchford** Outcomes of Selection for Residual Feed Intake in Australian Beef Cattle
8.55-9.15	Invited speaker 2	**Prof. Myunggi Baik** Molecular Mechanisms Regulating Beef Quality in Korean Cattle
9.15-9.35	Invited speaker 3	**Prof. I Wayan Teguh W.** Vaccination and Subclinical Manifestasion of Avian Influenza in Indonesia
9.35-9.50	Discussion	
9.50-10.00	Appreciation to Invited Speaker	Prof. Luki Abdullah
10.00-10.10	**Coffee Break**	
	Plennary Session 3 ***Moderator: Prof. Wayne Pitchford***	
10.10-10.30	Invited speaker 1	**Dr. Kai J. Kuehlmann** The Role of Feed Additive in Animal Industry under Tropical Condition
10.30-10.50	Invited speaker 2	**Dr. Anjas Asmara Samsudin** Recent Advances in Gut Microbiology Research in Relation to Animal Nutrition
10.50-11.10	Invited speaker 3	**Prof. Bustanul Arifin** Social Economic and Policy in Animal Industry
11.10-11.25	Discussion	
11.25-11.30	Appreciation for Invited Speaker	Prof. Dr. Ir. Sumiati, M.Sc.
11.30-13.20	Lunch and Prayer	
13.20-13.50	Poster session	

Time	Room A (Theme D and G)	Room B (Theme F and J)
Session 5	***Moderator: Sutresniwati***	***Moderator : Dr. Irma isnafia Arif***
13.50-14.00	**Sumiati** Effect of drinking gambir extract (*Uncaria gambir Roxb*) as Antioxidant on Performance of 40-43 Weeks Old of Laying Hens	**Rudi Afnan** Weight Loss And Mortality Of Broiler During Transportation From Different Distances To Slaughterhouse
14.00-14.10	**Muktiani, A** Live Weight Gain of Beef Cattle Fed on Complete Feed Silage of Water Hyacinth Suplemented with Mineral Zinc-Proteinate	**Suharyanto** Skim Milk Powder Substitution With Soymilk Powder Could Improve Physical Properties Of Beef Surimi-Based Sausage
14.10-14.20	**Putri O. N** The Effect of Adding Fermented Waste Cabbage in Calf Starter Pellets on Total Lactic Acid Bacteria And *Escherichia coli*	**Iwan Prihantoro** The Potency of *Azollapinnataas* A High Protein Forage for High Productivity Livestock
14.20-14.30	Discussion	Discussion
Session 6	***Moderator : Prof. Khalil.***	***Moderator : Salina AB***
14.35-14.45	**Ninasari Ra** Subtitution of Fish Meal by Cricket or Indigofera Shoot Leaf Meal on Japanese Quail (Coturnix japonica) Performance	**Lilis Suryaningsih** Effects Of Local Flour Types On Physical Properties And Acceptability Of Beef Sausage

Time	Room A (Theme D and G)	Room B (Theme F and J)
14.45-14.55	**Tresia G.E** Benefit of Kemuning Leaves Meal (*Murraya paniculata [l.] Jack*) Addition in Ration Containing Date Fruit Waste to Suppress Gastrointestinal Parasites Infestation of PE Goat	**Soenarno Ms** Characteristic Of Lactic Acid Bacteria Isolated From Dangke From Sinjai, South Sulawesi
14.55-15.10	**Sri Suharti** Rumen Microbe, Protein Microbial Synthesis, Celullase Activity and Nutrient Digestibility of Bali Cattle Rumen with the Addition of Calcium Soap-Soybean Oil In vitro	**M. Aman Yaman** Increase on Commercial Weight, Carcass Quality and Economic Benefit of Selected Local Meat Chicken Fed on Fermented Diet Contained Digestive Enzymes and Probiotics
15.10-15.15	Discussion	Discussion
15.15-15.30	Coffee break	
Session 7	***Moderator : Dr. Lindawati Doloksaribu***	***Moderator : Dr. Asnath Maria Fuah***
15.30-15.40	**G. F. Bira** Incremental Level Of Chromolaena Odorata In Complete Diet Does Not Impair Intake, Rumen Fermentation And Microbial Protein Synthesis Efficiency In Cattle	**Salina A.B** An Analysis Of Cattle Traders Practices On Animal Traceability In Malaysia
15.40-15.50	**Arini NMJ** Subtitution Of Fish Meal By Cricket Or Indigoferasp Shoot Leaf Meal To Evaluate Protein Balance Of Japanese Quail (Coturnix Japonica)	**Hotnida C H Siregar** Effect Of Moisture Reduction Method, Storage Period And Temperature On Honey Quality
15.50-16.00	**Mokhamad Faesal R. Hakim** Feeding Ecology of Sumatran Orangutan (Pongo abelii, Lesson 1827) in West Batang Toru Forest Block, North Sumatra	**Iman Rahayu** Biodiversity Based On Fatty Acid And Amino Acid Profile Of Indonesian Local Chickens
16.00-16.10	Discussion	Discussion
Session 8	***Moderator : Mokhamad Faesal Rakhman Khakim***	***Moderator : Dr. Burhanudin Sundu***
16.15-16.25	**D. Latipudin** Level Of Malondialdehyde (Mda), Uric Acid And Lymphocyte: Neutrphyl Ratio Of Laying Hen In The Different Temperature Humidity Index (Thi)	**I M. A. Sudarma** Weight Loss Of Inter-Island Transported Cattle From Kupang Is Reduced By Feeding High Protein-Mineral Mix Block During Quarantine And Sea Transportation
16.25-16.35	**Windi Al Zahra** The Using Of Thermograph As Non-Invasive Method To Observe Subclinical Mastitis In Tropical Dairy Cattle	**Ummi Noorhakimah Abdullah** Cattle Importation And The Trend Of Fmd Occurrence In Peninsular Malaysia From 2000-2010
16.35-16.45	**A. Sudarman** Physiological Responses And Blood Profiles Of Sheep Fed Cassava Leaves Silage (*Manihot Esculenta* Sp.) Reared Traditionally In Petir Village	**Moh Yamin** Harmony Between Livestock Behaviors: Birth Time and Sites Selection Behaviors in Sheep and Goats
16.45-17.00	Discussion	**Erika B Laconi** Strategy of Beef Cattle Development Based on Agricultural Product in Kuningan District, West Java
17.00-17.10		Discussion

Time	Ballroom (Theme E and J)
Session 5	*Moderator : Anneke Anggraeni*
13.50-14.00	**Surya Nur Rahmatullah** Phenotypic Variation In Male Local Chicken At Tapin Regency Using Significant Analysis
14.00-14.10	**Parsaoran Silalahi** Effects Of Selection On The Efficiency And Variability Of Sow Reproduction And Maternal Abilities
14.10-14.20	**Oktora Dwi Putranti** Effect Of Caffeine On Morfology Of Epididymis Spermatozoa Of Bali Bull
14.20-14.30	Discussion
Season 6	*Moderator : Ir Anita S.T. MRur.Sc*
14.30-14.45	**Lisa Praharani** Comparisson of Anglo Nubian X Etawah Grade Goats And Saanen X Etawah Grade Goats For Some Reproductive Traits
14.45-15.00	**Maria Haryulin Astuti** Service Per Conception In Beef Cattle With Artificial Insemination In Kapuas Basarang District of Central Kalimantan
15.00-15.10	**Anneke Anggraeni** Association Of Growth Hormone (Gh|Mspi) And Growth Hormone Releasing Hormone (Ghrh Haeiii) Genes With Milk Components Of Hf Cows Under Small Farmers In Lembang, West Java
15.10-15.20	Discussion
15.20-15.30	Coffee break
Season 7	*Moderator : Dr. Epi Taufik*
15.30-15.40	**R.Iis Arifiantini** Hypoosmotic Test In Rabbit Spermatozoa
15.40-15.50	**Nalley Wmm** Effect Of Freezing On Bovine Sperm Morphology
15.50-16.00	**Tuty L Yusuf** Determination of Soy Extract Concentration In Tris Buffer of Frisian Holstein Chilled Semen
16.00-16.10	Discussion
Season 8	Moderator : Surya Nur Rahmatullah
16.15-16.25	**S. Rusdiana** Estimated Value of Live Buffalo Prices In The Economic Analysis Of The Income of Farmers In The Village
16.25-16.35	**Aslina Asnawi** Financing Preferences For Cattle Farmers In Bone Regency South Sulawesi
16.35-16.45	**Sumarti T** Women, Gender Equality In Livestock Development: Case Study From Papua and Central Java
16.45-16.55	Discussion

Closing Ceremony, Venue IICC Ballroom

Time Slot	Event
17.10-17.15	Opening
17.15-17.25	The Best Presenter (Oral and Poster) Announcement
17.25-17.35	Presence of Presents
17.35-17.45	Speech from Representative Invited Speaker: Prof. Wayne Pitchford
17.45-17.55	Speech from Representative Invited Speaker: Thongsuk Jetana
17.55-18.05	Closing Speech from Dean of Animal Science Faculty

LIST OF CONTENTS

Theme E. Animal Genetic, Breeding, and Reproduction

INVITED SPEAKER

Proceeding of the 3rd International Seminar on Animal Industry, Bogor, 17-18 September 2015
Indonesia

Potential of Dwarf Elephant Grass (*Pennisetum purpureum*Schum. cv. Mott) in Dry Land Areas of Bojonegoro as Forage-Based Feed Sustainability

M. A. Hamdan[1], P. D. M. H. Karti[2] & I. Prihantoro[2]
[1]Students of Faculty of Animal Science, Bogor Agricultural University,Bogor 16680 Indonesia,
e-mail: mohalihamdan@gmail.com
[2]Faculty of Animal Science, Bogor Agricultural University,Bogor 16680 Indonesia

Abstract

Animal industry especially stockers needs forage as their fibre and protein resource to maintain its quality and productivity. However, in several dry climate area, forage production is still low when it is dry season. So, the study about forage is very urgently and importantly needed. This study was conducted to evaluate the potency of dwarf elephant grass (Pennisetum purpureum Schum. cv. Mott) that has been planted on dry land areas of Bojonegoro. This research consists of two phase. The first phase of this research carried out on green house to evaluate the impact of drought stress by using 16 dwarf elephant grass, four water level of treatment (P1=100% KL; P2=75% KL; P3=50% KL; P4=25% KL) in completely randomized experimental design. The result showed that Pennisetum purpureum Schum. cv. Mott survived in thoose treatment without decreasing their dry matter (DM) productivity (P<0.01). It means that Pennisetum purpureum Schum. cv. Mott can be planted on drought areas of Bojonegoro. The second phase of this research carried out on dry land areas of Bojonegoro by using 320 dwarf elephant grass. Grasses were panted by using 2 x 5 completely randomised design. The first factor was the location (opened area and teak forest) and the second factor was the five fertilizer level (LEISA model). The result showed that both of two factor affected the DM production (P<0.01). The correlation between two factors also affected the DM production (P<0.01). The best result of planting the Pennisetum purpureum Schum. cv. Mott using 100 % anorganic fertilizer (Urea, SP36, and KCl) (P<0.01). This research conclude that Pennisetum purpureum Schum cv. Mott has capability to be planted on dry land areas as forage-based feed sustainability.

***Keywords**: dry matter, drought stress, forage-based feed sustainability, LEISA, Pennisetum purpureum Schum. cv. Mott*

Introduction

Feed is one of main factor for livestock. One of ruminant feed is forage in a good quality contained protein, energy, vitamin and mineral (Herlina, 2003). However, Indonesia as a tropical country, has varied climates that affect forage production. Quantity, quality, and continuity of forage affects the ruminant productivity (Widiati, 2003). Dwarf elephant grass (DEG) (*Pennisetum purpureum* Schum. cv. Mott) has high productivity level. On rainy season, it has 2-2.5 tons/ha and 1.6 tons/ha on dry season (Olivo *et al*., 1992 and Coser *et al*., 1997). It means that DEG has a potency as drought resistant plant.

Bojonegoro is one of regency on east java that has high amount of ruminant population. On 2013, it has 160 037 cows, 19 dairy, 1 026 buffalo, 105 013 goats, 129 990 sheeps (BPS Bojonegoro, 2013). However, Bojonegoro has a long drought season. It has monthly average rain interval of 142 mm that classified as drought areas (Goenadi, 2003). Therefore Bojonegoro needs drought resistant forage to fulfill the ruminant needs. This research aimed to get several informations about the potency of DEG as drought resistant forage. Furthermore, it has purpose to get information about DEG as a part of integrated planting system between forage and teak forest.

Materials and Methods

This research consists of two stages. The first stage take place on green house of agrostology unit, IPB, starting on October to December 2014. And the second stage take place on Sambeng, Bojonegoro, starting on December 2014 to January 2015.

First stage

This study was carried out to evaluate the drought respon of DEG with four water level treatments (25%, 50%, 75%, and 100% field capacity). The treatments used completely randomized design and four replication. Each of them planted on 5 kg polybag that contained 10% of manure. The field capacity determined by using freely drainage model (Jury *et al*., 2001). The first stage observed the morphological respons (height of plant, diameter of plant, root weigth and amount of leaves), physiological respons (water consumption, level of relative water content, and dissolved sugar level), and nutrientcontent (crude fibre and crude protein).

Second stage

This study was carried out to evaluate the productivity of DEGthat planted in Bojonegoro. The treatments used competely randomized design. The location consist of opened area and integrated area (teak). There were five fertilizer level and composisiton. They were 100% organic, 75% organic and 25% anorganic, 50% organic and 50% anorganic, 25% organic and 75% anorganic, 100% anorganic. Anorganic fertilizer consist of Urea, SP36, and KCl. The fertilizing method using LEISA model (Low Eksternal Input Sustainable Agriculture) to get the lowest fertilizer input but earn the highest productivity (Giovannucci, 2007). After harvesting, the biomass were analyzed to get nutrient information by Proximate (AOAC, 2005) and Van Soest (1991).

Results and Discussion

First stage (drought respons of Pennisetum purpureum Schum. Cv. Mott)

Morphological responses

Morphological response of *Pennisetum purpureum* Schum. Cv. Mott observed height, diameter, root weight, and number of leaves. Drought stress treatment significantly affected (P <0.05) on plant height and number of leaves of the plant, excepted the plant diameter. Plant height of P1 treatment showed the best response. Water used by the plant for cell metabolism process (Liu and Stutzel, 2008). The number of leaves P1, P2, and P3 showed the best response. However, the quantity of leaves P1 was less than P3 due to the adaptation todefend themselves from the drought. Liu and Stutzel (2002) stated that in orderto response drought stress, the lower the rate of growth to reduce the rate of water loss. Weight roots influenced (P <0.05) by treatment of water stress. Root weight at P1, P2, and P3 showed a greater response than P4. However, at average, P1 showed greater results than P2, and P2 was greater than P3. This was caused by the growth of roots in drought stress tends to be greater to find the source of water. On the condition of drought stress, plants tend to decrease the production of biomass and increase the production of roots to find water sources (Yin *et al*., 2005). In P4 treatment showed that no growth of roots due to the water concentration in soil was sufficient so water coming into the plant tissues by diffusion.

Table 1. Morphological respons of *Pennisetum purpureum* Schum. cv. Mott

Parameter	Treatment			
	P1	P2	P3	P4
Plant height (cm)	106.00±5.00c	83.37±17.81b	107.00±7.21bc	4.70±0.81a
Stem diameter (cm)	2.00±0.26	1.86±0.32	1.89±0.24	1.79±0.09
Amount of leaves	4.00±1.71b	4.00±2.40b	5.00±1.73b	1.00±0.50a
Root weight (gram)	0.38±0.13b	0.35±0.09b	0.30±0.19b	0.00±0.00a

Values with different letters differ significantly within column (upper case) or within line (lower case) at P<0.05. P1:25% field capacity; P2:50% field capacity; P3:75% field capacity; P4:100% field capacity.

Physiological responses

Drought stress affects plant physiology mechanism to maintaining itself. Table 2 shows that the drought stress on *Pennisetum purpureum* Schum. cv. Mott significantly different (P<0.05). The increasing of water capacityin soil media would increasedthe leaf relative water content. Drought stress treatment has no significant effect (P>0.05) on water consumption. Drought stress affected on total production of sugar dissolved on stem. Nofyangtri (2011) stated that the physiological response of stressed plants showeda

decline in value of relative water content of leaves. Otherwise, total dissolved sugar would increased when drought stress level increased.

Table 2. Physiological respons of *Pennisetum purpureum* Schum. cv. Mott

Parameter	Treatment			
	P1	P2	P3	P4
Relative water content	13.30±2.66a	79.88±27.24b	84.89±6.46b	91.73±6.76b
Dissolved sugar level	2.25±1.5b	1.75±1.92ab	1.65±0.3ab	0.00±0.00a

Values with different letters differ significantly within column (upper case) or within line (lower case) at P<0.05.
P1:25% field capacity; P2:50% field capacity; P3:75% field capacity; P4:100% field capacity.

Nutrient contents

Range of crude protein of *Pennisetum purpureum* Schum. cv. Mott is 15.40% to 21.94%. At the same time crude fiber content ranging from 22.51% to 25.77%. Crude protein content in P1 to P4 decreased respectively but the crude fibre in P1 to P4 increased respectively. Lutfi (2000) stated that nitrogen intake from the soil would increased the protein content of plant and phohibit the celulose and hemi-celulose on plant cell wall.

Table 3. Nutrient content of *Pennisetum purpureum* Schum. cv. Mott

Parameter	Treatment			
	P1	P2	P3	P4
Crude protein %	21.94	19.94	16.06	15.40
Crude fibre %	23.24	24.99	22.51	25.77

Analyzed by Pusat Antar Universitas (PAU) laboratory (IPB 2015)
P1:25% field capacity; P2:50% field capacity; P3:75% field capacity; P4:100% field capacity.

Second stage (forage integrating system of Pennisetum purpureum Schum. cv. Mott)

The planting of *Pennisetum purpureum* Schum. cv. Mott along 40 days on Bojonegoro showed different result between opened field and integrated field.

Morphology responses

Pennisetum purpureum Schum. cv. Mottthat planted by integrated model with teak forests (Table 4) showed the greatest response rates to treatment with 100% inorganic fertilizers (N5) in the production of dry weight. Whitehead (2000) stated that nitrogen was essensial element for plant growth.

Table 4. Morphology of *Pennisetum purpureum* Schum. cv. Mott planted by integrated system with teak

Parameter	N1	N2	N3	N4	N5
Plant height (cm)	95.50	98.88	99.38	92.00	86.88
Dry matter production (cm)	31.43a	30.13a	44.40ab	83.88b	117.00c

Values with different letters differ significantly within column (upper case) or within line (lower case) at P<0.05.
N1:100% organic fertilizer; N2:75% organic and 25% inorganic fertilizer; N3:50% organic and 50% inorganic fertilizer; N4:25% organic and 75% inorganic fertilizer; N5:100% inorganic fertilizer.

Pennisetum purpureum Schum. cv. Mottplanted in open fields (Table 5) showed the greatest response rates to treatment with a combination of 75% fertilizer organic + 25% inorganic (T4). However, for the production represented by the largest of dry weight in the treatment of 100% inorganic fertilizers (T5). Whitehead (2000) fertilizer that content nitrogen would increased the plant produktivity.

Table 5. Morphology of *Pennisetum purpureum* Schum. cv. Mott planted on opened field

Parameter	T1	T2	T3	T4	T5
Plant height(cm)	62.00	61.13	62.13	76.00	73.38
Dry matter production (cm)	172.93a	234.30b	379.63c	185.15a	369.98c

Values with different letters differ significantly within column (upper case) or within line (lower case) at P<0.05.
T1:100% organic fertilizer; T2:75% organic and 25% anorganic fertilizer; T3:50% organic and 50% anorganic fertilizer; T4:25% organic and 75% anorganic fertilizer; T5:100% anorganic fertilizer.

Nutrient contents

Nutritient analyzed only occured on highest response of morphology of*Pennisetum purpureum* Schum. cv. Mott.The highest result of morphology showed on 100% inorganic fertilizer treatmenton integrated field and open field. The analyzed to fulfill the nutrient information of the highest productivity level of DEG. Dry matter and crude fibre at N5 treatment in the integrated fieldhas lower value than open fields. However, the value crude protein of N5 in the integrated field has higher value than open fields. Quality of fibre fraction (Van Soest, 1991) in N5 treatment on integrated field has lower value of ADF, NDF and cellulose than open field. However, lignin value on integrated field was higher than on open field.

Table 2. Nutrientcontent of *Pennisetum purpureum* Schum. cv. Mott

Paramater	Integrated field (N5)	Open field (T5)
Proximate (%)		
Water content	90.53±0.16	93.22±0.16
Ash	16.53±0.69	24.80±2.07
Crude protein	5.20±0.03	3.86±0.13
Crude fat	1.91±0.45	0.64±0.13
Crude fibre	27.09±0.87	29.69±1.33
Van Soest (%)		
ADF	36.64±2.01	47.67±2.06
NDF	58.15±0.36	61.87±0.25
Celulose	16.96±2.56	30.91±0.70
Lignin	19.78±2.50	16.76±1.40

Analyzed by Feed Biotechnology Laboratory of LIPI (2015)

Conclusion

Pennisetum purpureum Schum. cv. Mott has potency to be planted on drought area to fulfll the ruminant forage need. *Pennisetum purpureum* Schum. cv. Mott also has a good morphologic and physiological responses to drought stress. By using LEISA model, *Pennisetum purpureum* Schum. cv. Mott gave the best growth respond on integrated fields.

References

AOAC. 2005. Official Methods of Analyses 17th ed. Association of Official Analythical Chemists, Washington, DC.

Badan Pusat Statistik. 2013.Daerah Dalam Angka. Diakses 28 Januari 2015. http://bojonegorokab.bps.go.id.

Boser AC, Martins CE, Alvim MJ. 1997. Influence of different grazing periods in elephant-grass (Pennisetum purpureum Schum.) pasture upon milk production. Braz. J. Agric. Res., in press.

Giovannucci D. 2007. Organik Farming As A Tool For Productivity And Poverty Reduction In Asia. Prepared For The International Fund For Agricultural Development /Nacf Conference Seoul, 13-16 March 2007.

Hoenadi. 2003. Konservasi Lahan Terpadu Daerah Rawan Bencana Longsoran di Kabupaten Kulonprogo Daerah Istimewa Yogyakarta, Laporan Penelitian, Yogyakarta: Lembaga Penelitian UGM.

Herlina E. 2003. Evaluasi Nilai Nutrisi dan Potensi Hijauan Asli Lahan Gambut Pedalaman di Kalimantan Tengah sebagai Pakan Ternak. Tesis. Sekolah Pascasarjana Institut Pertanian Bogor, Bogor.

Hury WA, Gardner WR, Gardner WH. 2001. Soil Physics 5th Edition. John Wiley and Sons, Inc. New York-Chichester-Brisbane.

Liu F, Stutzel H. 2002. Leaf water relations of vegetable amaranth (*Amaranthus* spp.) in response to soil drying. *Eur J Agron*16:137–50.

Nutfi PW. 2000. Pupuk Organik Pelestarian Pertanian. Majalah Trubus No. 153 Tahun XII. Edisi Agustus. Jakarta.

Rofyangtri S. 2011. Pengaruh cekaman kekeringan dan aplikasi mikoriza terhadap morfo-fisiologis dan kualitas bahan organik rumput dan legum pakan. Tesis. Institut Pertanian Bogor.

Olivo CJ, Moreira JC, Barreto IL, Diefenbach J, Ruviaro CF, Sanchez LMB. 1992. Use of elephant grass and setaria grass pasture as a feeding base for dairy cows during summer. *Braz. J. Anim. Sci*. 21:347-352.

Van Soest PJ, Robertson JB, Lewis BA. 1991. Methods for dietary fiber, neutral-detergent fiber and nonstarch polysaccharides in relation to animal nutrition. *J Dairy Sci*. 74: 3583-3597.

Whitehead DC. 2000. Nutrient Element in Grassland: Soil Plant-Animal Relationships. CAB International. United Kingdom.

Widiati R. 2003. Analisis Linier Programming Usaha Ternak Sapi Potong dalam Sistem Rumah Tangga Tani Berdasarkan Tipologi Wilayah di Daerah Istimewa Yogyakarta. Disertasi S3. Program Pasca Sarjana UGM. Yogyakarta.

Yin CY, Wang X, Duan BL, Luo JX , Li CY. 2005. Early growth, dry matter allocation and water use efficiency of two sympatric Populus species as affected by water stress. *J. Environ. Exp*. Bot. 53:315–22.

LIST OF PARTICIPANT

Abdullah, U. N. A.

Department Of Veterinary Services, Ministry of Agriculture and Agro-Based Industry, WismaTani, Lot 4G1, Precint 4, Federal Government Administration Centre, Putrajaya, 62630, Malaysia
Email: latiffah@upm.edu.my

Afnan, R.

Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: rudiafnan@yahoo.com

Al Zahra, W.

Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: windialzahra@gmail.com

Anggraeni, A.

Research Institute for Animal Production (RIAP), Bogor, Indonesia
Email: ria.anneke@yahoo.co.id

Arifiantini, I.

Faculty of Veterinary Medicine, Bogor Agricultural University, Dramaga, Bogor 16680, Indonesia
Email: iis.arifiantinipurna@gmail.com

Arini, N. M. J.

Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: dewiapriastuti86@gmail.com

Atabany, A.

Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: afton.atabany@yahoo.co.id

Asnawi, A.

Teaching Staff of Socio Economic in Animal Science Faculty in Hasanuddin University, Indonesia
Email : aslinaasnawi@yahoo.com

Astuti, M. H

Faculty of Agriculture, Palangka Raya University, palangkaraya, 73111, Indonesia
Email: maria.astuti18@gmail.com

Baihaqi, M.

Faculty of Animal Science, Bogor Agricultural University, Indonesia
Email: baihaqi@ipb.ac.id

Bira, G. F.

Nusa Cendana University, NTT, 85001, Indonesia
Email: martin_kpg@yahoo.com.au

Brahmantiyo, B.

Indonesian Research Institute for Animal production,Ciawi, Bogor, 16002, Indonesia
Email: brahmantiyo@litbang.pertanian.go.id

Cyrilla, L.

Faculty of Animal Science, Bogor Agricultural University, Indonesia
luci.wanto@gmail.com

Dharma, A.

Muhammadiyah Prof Dr HAMKA University, Jakarta, Indonesia
Email:Agus_imp87@yahoo.com

Dharmawan, A.

Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: adityadharmawan75@gmail.com

Doloksaribu, L.

The University of Queensland, Gatton Campus, Queensland, 4343, Autralia
Email: lindawati.doloksaribu@uq.net.au

Fuah, A. M.

Faculty of Animal Science, Bogor Agricultural University, Bogor, 16680, Indonesia
Email: asnath_95@yahoo.com

Gultom, G. A.

Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: gusti.gultom44@gmail.com

Hajrawati
Hasanuddin University, Makasar, 90243, Indonesia
Email: hajrahamsah@gmail.com

Hamdan, M. A.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia Email: mohalihamdan@gmail.com

Hanizar, D. S.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: permana@ipb.ac.id

Jakaria
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: Jakaria_karman@yahoo.co.id

Jha, R.
Department of Human Nutrition, Food and Animal Sciences, College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa, HI, United States
Email: rjha@hawaii.edu

Jelantik, I G. N.
Nusa Cendana University, NTT, 85001, Indonesia
Email: jelantikgustingurah@yahoo.com

Jetana, T.
Research and Development Center for Livestock Production Technology, Faculty of Veterinary Science, Chulalongkorn University, Henri Dunant street, Phathumwan, Bangkok 10330, Thailand
Email: thongsuk.J@chula.ac.th

Karti, P. D. M. H.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: pancadewi_fapetipb@yahoo.com

Keintjem, J. R. M.
Faculty of Animal Husbandary, Samratulangi University, Manado, 95115, Indonesia
Email: jameskeintjem@gmail.com

Khaerunnisa, I.
Graduate School, IPB, Animal Production and Technology Study Program, Indonesia
Email: isyanakhaerunnisa@gmail.com

Khakim, M.F. R.
Magister Student of Primatology, Multidicipline Programme, Institut Pertanian Bogor
Email: mfr.khakim@gmail.com

Khalil
Faculty of Animal Science, Andalas University, Padang, 25163, Indonesia
Email: khalil@faterna.unand.ac.id

Khotijah, L
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: lilis.khotijah@gmail.com

Kompiang, S.
Indonesian Research Institute for Animal production,Ciawi, Bogor, 16002, Indonesia
EEmail: skompiang@yahoo.co.id

Kosim, A.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: tutisuryati16@yahoo.co.id

Kumalasari, N.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: nurrkumala@gmail.com

Kurniawan, W.
Agricultural and Animal Livestock Services of Southeast Sulawesi, Indonesia
Email: kurniawan.widhi@yahoo.com

Laconi, E.B.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: elaconi@yahoo.com

Lestari, V. S.
Animal Science Program Study, Faculty of Animal Science, University of Hasanuddin, Makasar, 90245, Indonesia
Email: veronicasrilestari@yahoo.co.id

Malelak, G. E. M.
Nusa Cendana University, NTT, 85001, Indonesia
Email: geminimalelak@yahoo.com.au

Maulana, L.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: erniedea8492@gmail.com

Marlene, N. W. M.
Faculty of Animal Science, Nusa Cendana University, Kupang, NTT, 85148, Indonesia
Email: iis.arifiantinipurna@gmail.com

Martaguri, I.
Student at Graduate School of Bogor Agricultural University,Indonesia
Email: imana.martaguri@gmail.com

Margawati, E. T.
Research Center for Biotechnology of The Indonesian Institute of Sciences, Indonesia
enda032@lipi.go.id

Metawi, H.
Animal Production Research Institute, Agriculture Research Center, Egypt
Email: hrmmetawi@hotmail.com

Muhsinin, M.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: muhsinin33@gmail.com

Muktiani, A.
Faculty of Animal and Agricultural Sciences, Diponegoro University, Tembalang, Semarang, 50275, Indonesia
Email: anismuktiani@gmail.com

Mulyono, R. H.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: rinimulyono@yahoo.co.id

Ninasari, R. A.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: dewiapriastuti86@gmail.com

Nuraini, H.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: hennynuraini@ymail.com

Putri, A.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: dewiapriastuti86@gmail.com

Putri, O. N.
Faculty of Animal and Agricultural Sciences, Diponegoro University, Tembalang, Semarang, 50275, Indonesia
Email: oktavianirmalaputri@gmail.com

Putranti, O. D.
Faculty of Agriculture, Khairun University, Ternate, 97719, Indonesia
Email: oktoradwiputranti@gmail.com

Pardede, R. P.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: ridopandepardede@gmail.com

Permana, R.
Faculty of Animal Scince, Padjajaran University, Jatinangor, Sumedang, 40132, Indonesia
Email: ronnie_permana@yahoo.com

Prabowo, S.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: sigidprabowo@yahoo.com

Praharani, L.
Indonesian Research Institute for Animal production,Ciawi, Bogor, 16002, Indonesia
Email: lisa_praharani@yahoo.com

Priyanto, R.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: rd.priyanto@gmail.com

Rahayu, I.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: rahayu21@hotmail.com

Rahmatullah, S. N.
Mulawarman University
Email: surya_pato@yahoo.co.id

Rahmawati, A.
Faculty of Veterinary Medicine, University of Airlangga, Malang, 60286 , Indonesia
Email: rahmawatianggun611@yahoo.co.id

Retnani, Y.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: yuli.retnani@yahoo.com

Rofiq, M. N.
Agency for the Assessment and Application of Technology, Indonesia
Email: nasir.rofiq@bppt.go.id

Rusdi
Faculty of Animal Husbandry and Fishery, Tadulako University, Palu, 94118, Indonesia
Email: rusdiuntad@yahoo.com

Rusdiana, S.
Indonesian Research Institute for Animal Production, Bogor, Indonesia
Email: s.rusdiana20@gmail.com

Salatnaya, H.
Agroecotechnology Major, BanauTertiery Institute for Agricultural Enterprise, West Halmahera, Maluku, Indonesia
Email: hearty_salatnaya@yahoo.com

Salina, A. B.
Faculty of Veterinary Medicine, University Putra Malaysia, 43400 Serdang, Selangor, Malaysia
Email: salina_alin4280@yahoo.com

Sianturi, S. J.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email:asnath_95@yahoo.com

Silalahi, P.
AgroParisTech, INRA, IPB
Email: parsaoran.silalahi@jouy.inra.fr

Simamora, T.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: asnath_95@yahoo.com

Sirajuddin, S. N.
Department of Social Economic, Faculty of Animal Husbandry, Universitas Hasanuddin, Makasar, 90245, Indonesia
Email: sitti_nurani@yahoo.co.id

Siregar, H. C. H.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: hotnidachsiregar@gmail.com

Soenarno, M. S.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: msriduresta23@gmail.com

Sriagtula, R.
Post Graduate School, Bogor Agricultural University, Indonesia
riesi_faterna@yahoo.co.id

Suci, D. M.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: dwi.margi2@gmail.com

Sudarman, A.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: chairussyuhur.arman@yahoo.com

Sudarma, I. M. A
Nusa Cendana University, NTT, 85001, Indonesia
Email: martin_kpg@yahoo.com.au

Sukria, H. A.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: heriahmadhas@gmail.com

Sumarti, T.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: asnath_95@yahoo.com

Sumiati
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email:y_sumiati@yahoo.com

Sundu, B.
Faculty of Animal Husbandry and Fishery, Tadulako University, Palu,94118, Indonesia
Email: b_sundu@yahoo.com

Suharyanto
Faculty of Animal Science, Bengkulu University, Bengkulu, 38371, Indonesia
Email: suharyantounib@gmail.com

Suharti, S.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: harti_ss@yahoo.com

Suryaningsih, L.
Faculty of Animal Scince, Padjajaran University, Jatinangor, Sumedang, 40132, Indonesia
Email: lsnelwan@yahoo.com

Suryati, T.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia Email: tutisuryati16@yahoo.co.id

Sutresniwati
SNV Indonesia
Email: ssutresniwati@snvworld.org

Tasee, A. M.
Faculty of Animal Science, Halu Oleo University, Kendari, South Sulawesi, 93132,Indonesia.
Email: andimurlinatasse@gmail.com

Telleng, M. M.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: adetelleng@gmail.com

Tjakradidjaja, A. S.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: 1atj.yanuar@gmail.com

Tresia, G. E.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia Email: erniedea8492@gmail.com

Ulupi, N.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: niken.ulupi@gmail.com

Wijaya, I.
Faculty of Animal Science, Bogor Agricultural University, Dramaga, Bogor, 16680, Indonesia
Email: indah_wjynt@yahoo.com.sg

Widiawati, Y.
Research Institute for Animal Production
Email: yeni_widiawati14@yahoo.com

Yaman, M. A.
School of Sustainable Agriculture, Universiti Malaysia Sabah (Sandakan Campus), Malaysia.
Email: msrahman@ums.edu.my

Yamin, M.
Faculty of Animal Science, Bogor Agricultural University (IPB), Indonesia.
Email: mohamadyamin@yahoo.com

Yulistiani, D.
Indonesian Research Institute for Animal production,Ciawi, Bogor, 16002, Indonesia
Email: Dwiyulistiani@yahoo.com

Yusuf, T. L.
Faculty of Animal Science, University of Nusa Cendana Kupang 85148, Indonesia
Email: iis.arifi antinipurna@gmail.com

LIST OF ISAI COMMITTEE

Steering Committee

Chairman	Prof. Dr. Ir. I Komang G. Wiryawan
Secretary	Prof. Dr. Ir. Cece Sumantri, M.Agr.Sc
Members	Prof. Dr. Ir. Wasmen Manalu, M.Sc
	Prof. Dr. Ir. Iman Rahayu H.S., MS
	Prof. Dr. Ir. Nahrowi Ramli, M.Sc
	Prof. Dr. Ir. Muladno, MSA
	Prof. (R)Dr. Ir. Bess Tiesnamurti
	Prof. Dr. Ir. Panca Dewi, M.H.K, MS
	Dr. Ir. Moh. Yamin, M.Agr.Sc
	Dr. Ir. Idat Galih Permana, M.Sc.Agr

Organizing Committee

Chairman	Dr. Ir. Asnath M. Fuah, MS
Vice Chairman	Dr. Ir. Moh. Yamin, M.Agr.Sc
Executive Secretary	Dr. Indah Wijayanti, S.Tp., M.Si (PIC and External Affairs)
	Sigid Prabowo, S.Pt, M.Sc (Internal Affairs)
Secretariat	Dr. rer.nat. Nur Rochmah Kumalasari, S.Pt, M.Si (PIC)
	Dilla Mareistia Fassah, S.Pt, M.Sc
	Windi Al Zahra, S.Pt, M.Sc.Agr
	Winarno, S.P
	Aulia Irhamni Fajri, S.Pt
	Putut Suryo Negoro
Treasurer	Prof. Dr. Ir. Sumiati, M.Sc (PIC)
	Yuni Cahya E., S.Pt, M.Si
	Triyati
	Vivin Hadiningrum, S.Pt
Scientific & Proceeding	Prof. Dr. Ir. Dewi Apri Astuti, MS (PIC)
	Prof. Dr. Ir. I Komang G. Wiryawan
	Prof. Dr. Ir. Yuli Retnani, M.Sc
	Dr. Ir. Rudy Priyanto
	Dr. Epi Taufik, S.Pt. MVPH, M.Si
	Dr.Agr Asep Gunawan, S.Pt, M.Sc
	Dr. Anuraga Jayanegara, S.Pt, M.Sc
	Dr. Cahyo Budiman, S.Pt, M.Eng
	Dr. Sri Suharti, S.Pt. M.Si
	Dr. Ir. Asep Sudarman, M.Sc
	Dr. Tuti Suryati, S.Pt, M.Si
	Dr. Ir. Bagus Priyo Purwanto, M.Agr
	Dr. Irma Isnafia Arief, S.Pt, M.Si
	Dr. Ir. Rita Mutia, M.Sc
	Dr. Ir. Dwierra Evvyernie, MS, M.Sc
	Dr. Ir. Heri Ahmad Sukria, M.Sc.Agr
	Ir. Anita Tjakradidjaja S., M.Rur.Sc
Seminar Program	Dr. Ir. Afton Atabany, M.Si (PIC)
	Ir. Lucia Cyrilla, E.N.S, M.Si
	Dr. Despal, S.Pt, M.Sc.Agr
	Dr. Ir. Salundik, M.Si
	Dr. Ir. Widya Hermana, M.Si
	Dr. Ir. Sri Darwati, M.Si
	Dr. Ir. Didid Diapari, MS
	Dr. Ir. Lilis Khotijah, MS

Fund raising/Finance	Prof. Dr. Ir. Sumiati, M.Sc (PIC)
	Prof. Dr. Ir. Erika B. Laconi, MS
	Prof. Dr. Panca Dewi M.H.K., MS
	Prof. Dr. Ir. Muladno, MSA
	Dr. Ahmad Yani, S.TP, M.Si
Logistic and Accommodation	Dr. Jakaria, S.Pt, M.Si (PIC)
	M. Baihaqi, S.Pt, M.Sc
	Dr. Iwan Prihantoro, S.Pt, M.Si
	Edit L. Aditia, S.Pt, M.Sc
	Iyep Komala, S.Pt
	M. Sriduresta S., S.Pt, M.Sc
	Supriyono, SP
	Eka Koswara, S.Pt
	Cucu Diana, S.Pt
	Adang Undiana, SE
Documentation/Publication	Dr. Rudi Afnan, S.Pt, M.Sc.Agr (PIC)
	Bramada Winiar P., S.Pt, MSi
	Maria Ulfah, S.Pt, M.Sc.Agr
	Sugeng Tri Wahyono, S.Kom
	Susi Heryati, SE
	Supriyadi, S.Pt
	Mad Haris
Refreshments	Ir. Sri Rahayu, MSi (PIC)
	Dr. Ir. Niken Ulupi, M.Si
	Dr. Ir. Henny Nuraini, MSi
	Ir. Dwi Margi Suci, MS
Student Committee	Reikha Rahmasari
	Fitry M. Manihuruk
	Himmatul Khasanah
	Rika Zahera
	Elisabeth Diona Hutagaol
	Devi Kumala Sari
	Ainissya Fitri
	Astari Wibiayu Putri
	Heru Dwi Nugroho
	Hilda Susany
	Rini Yuniarty
	Saprilian Stya Hapsari
	Any Anggraeny
	Dea Justia Nurjana
	Rahayu Ambarwati Ninasari
	Cintia Agustin Patria
	Dedi Ramdani
	Hamzah Nata Siswara
	Shania Zaradina
	Sherly Wijayanti
	Singgih Aditya Saputro
	Sugih Satrio Wibowo
	Tekad Urip P
	Weny Dwi Ningtyas
	Yuni Nur Rafiah
	Zulhijariyanto
	Ardiansyah
	Anggia Martiana
	Dewi Ayu Lestari
	Fakhriansyah
	Lilis Riyanti

INDEX OF AUTHOR

ACKNOWLEDGEMENT

Bogor Agricultural University

Faculty of Animal Science
Bogor Agricultural University

Primary Sponsor

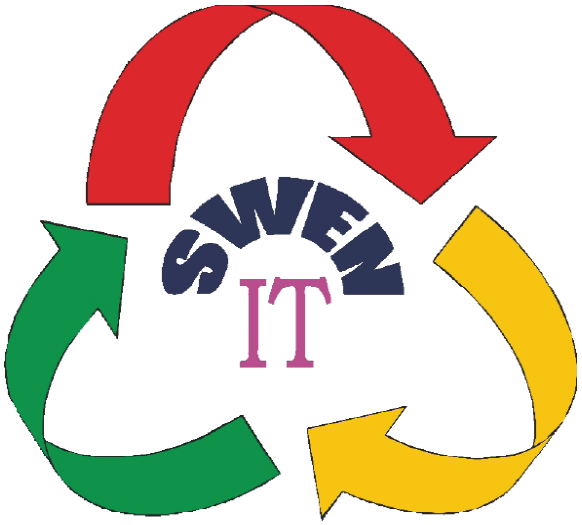
Supported by

adaro

KPC
COAL FROM INDONESIA

PT KALTIM PRIMA COAL

program diploma ipb



Supported by:

KPC COAL FROM INDONESIA
PT KALTIM PRIMA COAL

adaro

BRINGIN LIFE
ASURANSI JIWA - KESEHATAN - PENSIUN

nutricell the science of life

program diploma ipb

trouw nutrition a Nutreco company

MB-IPB

lppm ipb

POKPHAND

TROBOS

Infovet
MAJALAH PETERNAKAN DAN KESEHATAN HEWAN

PT WIDE & PIN
ENGINEERING & INSPECTION

SIWEN IT

TABLOID AGRIBISNIS DWIMINGGUAN
AGRINA

antam

PUDUK KUJANG CIKAMPEK

green TV
Inovasi Peradaban Baru

Bogor Agricultural University