

PROCEEDINGS



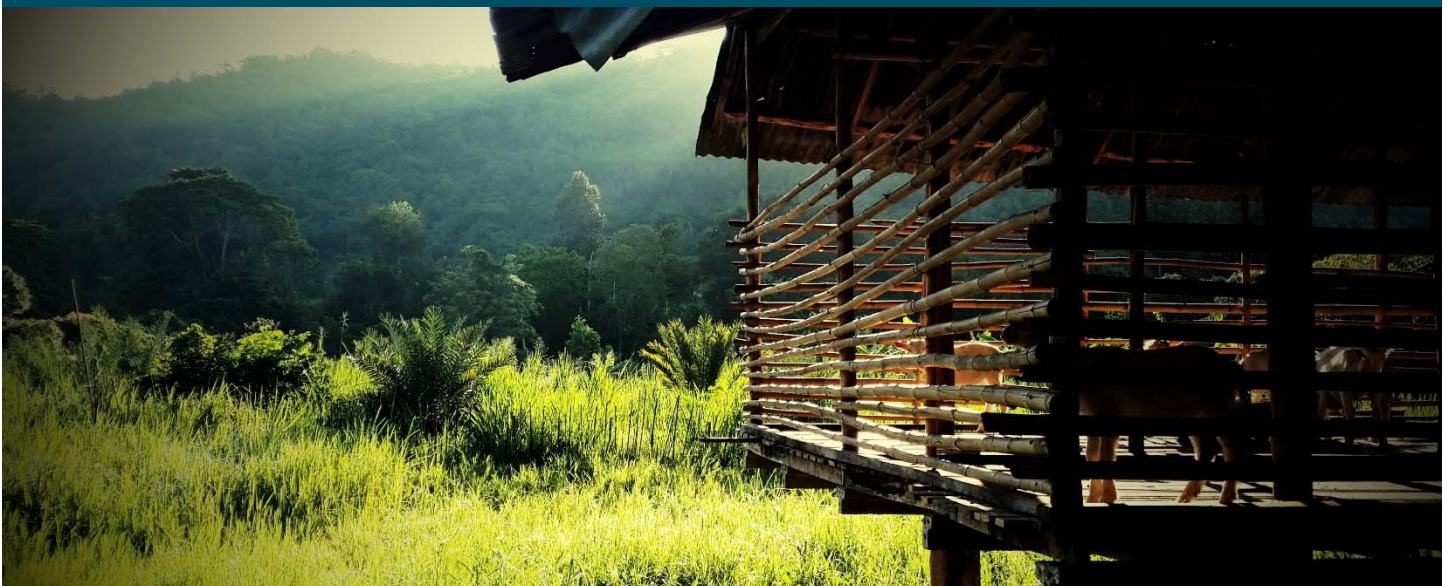
5th

SAADC 2015

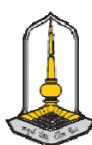
The 5th International Conference on
Sustainable Animal Agriculture for Developing Countries

**“CLIMATE SMART SUSTAINABLE ANIMAL AGRICULTURE FOR FOOD SECURITY
AND LIVELIHOOD IMPROVEMENT IN THE DEVELOPING COUNTRIES”**

October 27-30, 2015, Dusit Thani Pattaya Hotel, THAILAND



Jointly organized by



PROCEEDINGS
of
The 5th International Conference on
Sustainable Animal Agriculture for Developing Countries
(SAADC 2015)
October 27-30, 2015
Dusit Thani Pattaya Hotel, Thailand

Jointly Organized by:



Faculty of Sciences and Liberal Arts, Rajamangala University of Technology Isan



Institute of Agricultural Technology, Suranaree University of Technology



Faculty of Technology, Mahasarakham University



Faculty of Veterinary Medicine, Mahanakorn University of Technology



Faculty of Animal Sciences and Agricultural Technology, Silpakorn University Phetchaburi IT Campus



Faculty of Science and Technology, Nakhon Ratchasima Rajabhat University



Faculty of Technology, Udon Thani Rajabhat University



Tropical Feed Resources Research and Development Center (TROPREC)



Department of Livestock Development
Thailand



The Animal Husbandry Association of Thailand under the Royal Patronage of
H.R.H. Princess Maha Chakri Sirindhorn

Message from the President of RMUTI

Dear Participants,

It is my great honor to welcome all of participants to attend the 5th Sustainable Animal Agriculture for Developing Countries (SAADC) conference which held at the Dusit Pattaya Hotel, Chonburi, Thailand during 27-30 October 2015. It is also 10 years Anniversary of Rajamangala University of Technology Isan (RMUTI), which established depending on Rajamangala University of Technology Act B.E. 2548 (2005). On behalf of RMUTI, I would like to welcome about 350 participants from 40 countries to participate at the conference. The principal objective of SAADC is to provide a venue for animal scientist, agriculturist, farmers and private sectors to build up the relationship and to exchange their experiences.



The 5th SAADC 2015 is organized by seven institutes such as Rajamangala University of Technology Isan (RMUTI); Suranaree University of Technology (SUT); Mahasarakham University (MSU); Silpakorn University (SPU); Mahanakorn University of Technology (MUT); Nakhon Ratchasima Rajabhat University (NRRU) and Udon Thani Rajabhat University (UDRU).

All sponsors are highly appreciated to make the conference more successful. Last but not least, all partners who contributed to this conference are deeply thanks without your fully supports this conference would never be accomplished.

With best wishes,

A handwritten signature in black ink, appearing to be 'V. Limkaisang', written in a cursive style.

Assistant Professor Dr. Viroj Limkaisang

President of RMUTI

27 October 2015

Message from President SAADC International Advisory Committee

Ladies and Gentlemen,

First and foremost, I would like to thank the Organising Committee of the 5th International Conference on Sustainable Animal Agriculture for Developing Countries (SAADC2015) for inviting me to pen a few words in this Souvenir Programme.



I would like to take this opportunity to share with you, especially those who are attending the SAADC series of conferences for the first time that SAADC has grown steadily since the inaugural SAADC2007 organised by Yunnan Agricultural University in Kunming, China. The numbers of participants and countries involved have increased from less than 200 from seven countries in the inaugural conference to more than 300 from 40 countries in this conference. This reflects the relevance of SAADC in providing a platform for animal scientists and producers especially from the developing countries to share experience and network to promote sustainable animal agriculture in our respective countries.

This week we are here again to present our research findings and ideas for promotion of sustainable animal agriculture. I congratulate the Organising Committee for their hard work throughout the last two years to make it possible for us to meet in one of the world renowned beach resorts in Thailand. I would like to thank members of the SAADC2015 International Advisory Committee and the SAADC2015 in-house editors for their input and hard work to support the local organising committee of this conference. Special thank goes to Dr Chris Anderson of the CSIRO Publishing for his help to create the SAADC2015 special issue in the journal of *Animal Production Science* for publication of selected papers presented by the participants of this conference.

Most of all, I thank each and every one of you for your participation in making this conference a great success. I would like to encourage all participants, particularly the younger ones to take this opportunity to make new friends and to create new opportunities to foster cooperation towards promotion and enhancement of sustainable animal agriculture in our respective countries.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Juan Boo Liang', written in a cursive style.

Professor Dr. Juan Boo Liang

President
SAADC2015 International Advisory Committee
27 October 2015

Message from the Chairman of the 5th SAADC Conference

On behalf of Rajamangala University of Technology Isan (RMUTI), I would like to express my deeply thanks to the SAADC International Advisory Board (IAB) for their agreement to permit RMUTI to organize the 5th SAADC conference together with our co-hosts institutes, these are Suranaree University of Technology (SUT), Mahasarakham University (MSU), Silpakorn University (SPU), Mahanakorn University of Technology (MUT), Nakhon Ratchasima Rajabhat University (NRRU) and Udontani Rajabhat University (UDRU).



The 5th SAADC 2015 consists of scientific session, private sector demonstration, social and cultural activities. The scientific session offers plenary session, invited session, symposium and graduate course. The symposium is an entitled on “Understanding of Biological Product: The role for sustainable Animal Production” by Associate Professor Dr. Kriengsak Poonsuk (K.M.P. BIOTECH CO., LTD). The workshop is an established on “Publishing Your Research Findings in International Journals” by Dr. Thomas J. Schonewille (Utrecht University, The Netherlands). The cultural activities are Thai regional dancing (Fon Ram) with the contributing of Rajamanagala University of Technology Tawan-ook. Field trips are based on two routes: Route I is a “Dairy Buffalo Farm: Runjaun Farm” and Route II is a tropical garden so called “Saun Nongnooch”.

I would like to express my sincerely thanks for the keynote, plenary, invited speakers and participants who had been fully supported to make the conference more success and fruitful.

I deeply appreciate to the International Advisory Board (IAB) and the local organizing committee for their great effort and dedication to make the proceeding in time.

Last but not least, I would like to sincerely thanks to President of RMUTI for his fully supports to make this conference successful.

Wish best wishes.

A handwritten signature in blue ink, appearing to be 'Chalermpon Yuangklang'.

Assistant Professor Dr. Chalermpon Yuangklang

Chairman of the 5th SAADC 2015
Dusit Thani Hotel, Pattaya, Chonburi, THAILAND

Message from Academic Committee Chairman

As the host of the 5th International Conference on Sustainable Animal Agriculture for Developing Countries (SAADC2015), Rajamangala University of Technology Isan do realize the significance of research, innovation and application in terms of international development of economics and society. The SAADC 2015 conference has its objectives to provide a chance for researchers in field of animal science, agriculture and related fields including academicians, researchers, administrators and private sectors both in developing and developed countries to share their own experiences, to develop collaborative networks among institutions and to strengthen research quality of staff and students for sustainable animal agriculture production.



From the number of oral and poster presentations submitted in this conference in Pattaya, I do impress your participation and have confidence that you all are the scientists with very great enthusiasm to solve problems as well as to share valuable information and knowledge for people prosperity.

I would like to particularly thank all guest speakers and participants who make this conference such a valuable collaborative and successful forum. My sincere thanks go to our co-organizing committee form Suranaree University of Technology, Nakhon Ratchasima Rajabhat University, Mahasarakham University, Mahanakorn University of Technology, Silpakorn University, and Udon Thani Rajabhat University. Special thanks to the scientific committee, reviewers and editorial boards for their great contribution to make the conference successfully organized.

I believe all delegates will benefit substantially from the conference through the presentations of expert speakers and exchanges of ideas with one another. I wish you all have most pleasant and most wonderful time in the conference in Pattaya, Thailand and a safe journey home.

A handwritten signature in blue ink, which appears to read "Kraisit Vasupen".

Assistant Professor Dr. Kraisit Vasupen

Chairman of Academic Committee
SAADC 2015

INTERNATIONAL ADVISORY COMMITTEE:

Chairman:

Prof. Dr. Liang Juan Boo (Malaysia)

Committee Members:

Prof. Dr. Peter Wynn (Australia)

Dr. Hiroyuki Konuma (FAORAP)

Prof. Dr. Harinder Makkar (FAO)

Prof. Dr. Long Ruijin (China)

Assist. Prof. Dr. Chalermpon Yuangklang (Thailand)

Prof. Dr. Liang Chou Hsia (Taiwan, ROC)

Prof. Dr. Pietro Celi (Australia)

Prof. Dr. Junichi Takahashi (Japan)

Dr. Vo Thi Lam Thanh (Vietnam)

Assoc. Prof. Dr. Pramote Paengkoum (Thailand)

Dr. Elizabeth Wina (Indonesia)

ORGANIZING COMMITTEE:

Advisors:

Assist. Prof. Dr. Viroj Limkaisang (President of RMUTI)

Prof. Dr. Charan Chantalakhana

Prof. Dr. Metha Wanapat

President of the Animal Husbandry Association of Thailand under the Royal Patronage of H.R.H. Princess Maha Chakri Sirindhorn

Chairperson:

Assist. Prof. Dr. Chalermpon Yuangklang

Vice chairperson:

Assoc. Prof. Dr. Pramote Paengkoum

Secretary:

Dr. Benya Saenmahayak

Fund raising committee:

Chairperson: Assist. Prof. Dr. Sasiphan Wongsuthavas

Secretary: Dr. Siwaporn Paengkoum

Public Relations:

Dr. Weerawat Namanusart

Social Culture:

Assoc. Prof. Dr. Opart Pimpa

Dr. Siwaporn Paengkoum

International Scientific Committee:

Chairman: Assist. Prof. Dr. Kraisit Vasupen (Thailand)

Co-Chairman: Dr. Vincenzo Tufarelli (Italy)

Secretary: Assist. Prof. Dr. Smerjai Bureenok (Thailand)

Members:

Publishing Advisor: Dr. Chris Anderson (Australia)

Assoc. Prof. Dr. Songsak Chumpawadee (Thailand)

Prof. Dr. Pietro Celi (Australia)

Prof. Dr. Ermias Kebreab (USA)

Prof. Dr. Mohd Ariff Omar (Malaysia)

Prof. Dr. Norhani Abdullah (Malaysia)

Prof. Dr. Ariff Omar (Malaysia)

Prof. Dr. Christopher McSweeney (Australia)

Prof. Dr. Peter Daniels (Australia)

Dr. Elizabeth Wina (Indonesia)

Prof. Joaquim Balcells (Spain)

Dr. James Chin (Australia)

Prof. Dr. Thomas J. Schonewille (The Netherlands)

Registration:

Dr. Siwaporn Paengkoum

Dr. Nittaya Pitiwittayakul

Dr. Totsapron Srisaphoomi

Financial/Treasurer:

Mrs. Ekarat Vasupen

Website:

Mr. Ekkachai Sae-jueng

Mr. Ekkalak Chimjarn

Mr. Thanin Rabiabpho

Mrs. Chonlada Chimjarn

Mr. Soravit T.Siriwattana

List of Reviewers:

Prof. Dr. Yangqing Lu
Prof. Dr. Kazuaki Takehara
Prof. Dr. Anton C. Beynen
Prof. Dr. Kawamoto Yasuhiro
Prof. Dr. Wahid Haron
Dr. Jothi Panandam
Dr. Chen Wei Li
Dr. Tomoyuki Suzuki
Dr. Eko Widodo
Dr. Abdoreza Soleimani
Dr. Awis Q. Sazili
Assoc. Prof. Dr. Boonlom Cheva-Isarakul
Assoc. Prof. Dr. Chalong Wachirapakorn
Assoc. Prof. Dr. Songsak Chumpawadee
Assoc. Prof. Dr. Jatuporn Kajaysri
Assist. Prof. Dr. Araya Seubkhamphet
Assist. Prof. Dr. Jamlong Mitchaothai
Assist. Prof. Dr. Sakchai Reunphet
Assist. Prof. Dr. Walaiporn Tonpitak
Assist. Prof. Rachakris Lertpatarakomol
Assist. Prof. Dr. Pattaraporn Poommarin
Assist. Prof. Dr. Skorn Koonawootrittriron
Dr. Wittawat Molee
Dr. Danai Sangthong
Dr. Darsaniya Punyadarsaniya
Dr. Grisada Khumpool
Dr. Pannigan Chaichanasak
Dr. Sunisa Sirimongkolvorakul
Dr. Sunpetch Sophon
Dr. Thuchadaporn Chaikhun-Marcou
Dr. Umaporn Rungroekrit
Mr. Patipan Jaipeng
Mr. Pichai Jirawatthanapong
Mrs. Kornkamon Padiporn
Dr. Khanitta Ruangwittayanusorn
Dr. Atra Chaimongkol
Dr. Daranee Sookying
Dr. Chatchawan Singhapol
Dr. Narin Preyavichyapugdee
Dr. Nittaya Pitiwittayakul
Mr. Pichet Sriboonyoung
Dr. Juan Boo Liang
Prof. Dr. Thomas J. Schonewille
Prof. Dr. Eric A. Decker
Prof. Dr. Pietro Celi
Prof. Dr. Peter Wynn
Dr. Hassan Sadri
Dr. Devika Saddul
Dr. Tan Hui Yin
Dr. Irfan H. Djunaidi
Dr. Mohd Ariff Omar
Dr. Elizabeth Wina
Assoc. Prof. Dr. Surintorn Boonanuntanasarn
Assoc. Prof. Dr. Anut Chantiratikul
Assoc. Prof. Dr. Opart Pimpa
Assoc. Prof. Dr. Pantipa Na Chiangmai
Assoc. Prof. Dr. Pramote Paengkoum
Assist. Prof. Dr. Chalermpon Yuangklang
Assist. Prof. Dr. Kraisit Vasupen
Assist. Prof. Dr. Smerjai Bureenok
Assist. Prof. Dr. Sasiphan Wongsuthavas
Assist. Prof. Dr. Charunee Kasornpikul
Assist. Prof. Dr. Sutisa Khampaka
Assist. Prof. Dr. Chaweng Sarnklong
Dr. Chakrapong Chaikong
Dr. Seksan Wongsiri
Dr. Kanok-on Nugboon
Dr. Benya Saenmahayak
Dr. Totsapron Srisaphoomi
Dr. Weerawat Namanusart
Miss Sirinun Lasrichan
Dr. Pornpan Saenphoom
Dr. Chaowadee Laosutthipong
Dr. Wantanee Polviset
Dr. Peerapot Nitipot
Dr. Huang Xiaodam
Dr. Anan Chaokaur
Dr. Suphavadee Chimtong
Dr. Janjira Sittiya
Dr. Nattiya Chumnanka
Dr. Chomphoonuch Khongla
Dr. Saowaluck Yammeun-art

CONTENTS

Aquaculture		
A-338	Aquaculture in a protected gulf: The case of Amvrakikos (Greece)	1
A-369	Meat and bone meal as an alternative for fish meal in diets for black carp (<i>Mylopharyngodon piceus</i>)	4
A-524	Growth performance of carrageenan-producing seaweeds of <i>Kappaphycus</i> and <i>Eucheuma</i> in Sumbawa	11
A-531	Advantages of environmentally sound poly-eco-aquaculture in fish farms	15
Animal Biotechnology		
AB-125	Study of humoral immune response using IBD Blen® and Vaxxitek HVT-IBD® vaccines even high maternal derived antibody in broiler chickens	17
AB-169	Fertility status of local PO cattle and its crosses with Limousin and Simental bull in Situbondo Regency, East Java, Indonesia	20
AB-319	Reliable monoclonal antibodies for immunodiagnosis of fasciolosis in both animal and human	23
AB-342	Vitrification of mouse embryos: comparison of Cryotop and hemi straw closed system methods	26
AB-343	Impact of complete feed silage from sugar cane waste product on Bali beef cattle performance	29
AB-437	Development of a rapid immunochromatography test for detecting antibodies after anthrax vaccination in cattle: A preliminary study	32
AB-481	The effect of <i>Cinnamomum burmannii</i> extract as an immunomodulator on the increase of GR-1 expressing IFN γ and macrophage	36
AB-555	Genetic variation of MHC Class II DRB3 gene in local goat from South Sulawesi Indonesia	39
Animal Genetic/Breeding		
AG-080	The relationship between longevity and reproductive efficiency in Lori-Bakhtiari ewes	43
AG-095	The Interleukin-8 gene polymorphism and its association with milk production traits in Holstein Cows	46
AG-100	Genetic improvement of production performance for Yorkshire	49
AG-104	Genetic parameters and trends for growth and carcass traits of Landrace in Korea	52
AG-105	Effect of sex and carcass weight on pork belly characteristics of Large White	55
AG-107	Influence of sex and carcass weight on pork belly muscle of Large White	58
AG-130	Production and reproduction characteristics of tegal and magelang ducks	61
AG-149	Breeding potency of Bali cattle as indigenous beef cattle breed in Sumbawa Island Indonesia	64
AG-161	Institutional development on conservation of Madura cattle	67
AG-164	Annual trend of genetic improvement for production performance of three swine breeds	70
AG-182	Phenotypic and chromosome band intensity characters of swamp buffalo in very isolated area of East Java, Indonesia	73
AG-211	The study of reproductive efficiency over the lifetime of Lori-Bakhtiari ewes	76
AG-263	Performance testing of Kamphaeng Saen bulls	80
AG-356	Modelling genomic selection strategies to improve genetic gain in swine breeding programs using ZPLAN+	84
AG-431	Effects of different mating methods on hatchability and embryonic mortality of indigenous chicken eggs	87
AG-530	Proximity of genetic cross Boer goat with Local goat to parent based on gene DNA <i>Capra hircus</i> growth hormone (ChGH)	91

AG-535	Effect of numbers of day of progesterone intra-vaginal device insertion on oestrus rate pregnancy rate and litter size in Thai-native cross breed goats	94
AG-560	Genetic parameter estimation for prolificacy trait of local Ettawah crossbreed goat	97
Animal Nutrition		
AN-007	Effect of microbial mixture on survival of fermented juice of epiphytic lactic acid bacteria (FJLB)	100
AN-012	Effects of storage time on external and internal characteristics of lutein eggs	102
AN-014	Efficacy of probiotic <i>Enterococcus mundtii</i> in dried form in broilers	106
AN-021	Truly absorbed protein in the small intestine content of alfalfa hay harvested at various blooming	110
AN-026	Growth response of purebred Merino and crossbred prime lambs from feed supplemented with canola and flaxseed oils	113
AN-033	Vitamin E and C effect on meat of Muscovy duck	117
AN-036	<i>In vitro</i> nutrients digestibility and fermentation characteristics of king grass combined with concentrate containing mixed microbes	121
AN-037	Periodic changes in chemical composition and <i>in vitro</i> digestibility of Gramineae feed resources in the Philippines	125
AN-038	Chemical composition of forages and browses offered to stall fed goats on smallholder farms in Mauritius	128
AN-047	Feed intake and serum metabolite of goats fed crude glycerin from waste vegetable oil	131
AN-056	Nutritive value of oil palm fronds treated with white rot fungi	135
AN-057	Effect of chemical treated shrimp meal on growth performances of broilers	139
AN-068	Effect of bee pollen as a natural antioxidant on the performance, carcass and antioxidant status of V-line rabbits	142
AN-073	Nutritive value of grower pig ration using local feeds in West Manokwari District, Manokwari	145
AN-078	The effect of chemical processing of soybean meal on <i>in vitro</i> ruminant intestinal available protein	149
AN-086	The effect of Mao pomace supplementation in diets on blood parameters of meat ducks	152
AN-116	Effects of cassava treated lactic acid supplementation on dry matter degradability and rumen fermentation in beef cattle	155
AN-121	Feeding value of dried cashew nut testa in finishing pigs: effects on growth performance, economic return and carcass characteristics	158
AN-124	Effect of oral administration of red ginger extract on performances of hybrid ducks	164
AN-143	The inclusion effect of mangosteen (<i>Garcinia Mangostana</i> L.) peel as feed additive on blood profile and testosterone level of Mojosari male duck	167
AN-144	The effects of quantitative restricted feeding on performances and internal organ weight broiler	170
AN-146	Evaluation of mulberry leave as a functional feed additive of laying hens	174
AN-147	Effects of performance and intestinal morphology by supplementation with a functional feed additive in poultry diet	177
AN-151	Nitrogen balance and carcass quality in broilers given a low-protein diet in the grower period and higher-protein diets in the finisher period	180
AN-153	Effect of a heat stress reducing additive on meat production and quality in Hanwoo heifers	183
AN-154	Effect of fermented plant extracts on enteric methane production in the rumen	186
AN-171	Enhancement of rice straw nutrient value by solid state fermentation with <i>Trichoderma</i>	189
AN-174	Allometric productivity forage and goat foraging behaviour in rangeland at Ebelo Amboasary in Southern of Madagascar	191

AN-177	Supplementation of recombinant lycopene on egg quality and blood characteristics in quail diet	198
AN-184	Effect waste of cabbage on rabbit meat	201
AN-187	Effect of propolis as a natural antioxidant on the performance, carcass and antioxidant status of V-line rabbits	206
AN-193	The effects of phenological stages on forage quality of four rangeland species for the sheep nutrition in Sari plain, Iran	210
AN-202	Effect of ginger root powder supplementation on growth performances and carcass characteristics of broiler chickens as rearing in hot climate	214
AN-205	Fermentation patterns of alfalfa hay and <i>Ulva Fasciata</i> using gas production technique	218
AN-206	To compare intestinal available protein of <i>Ulva Fasciata</i> with alfalfa hay using a new gas technique	221
AN-213	Effect of <i>Curcuma domestica</i> stock solution on layer performance, egg quality, and antioxidant activity	224
AN-215	Effect of yeast fermented fresh cassava root fed beef cattle on digestibility	228
AN-229	Changes in metabolic hydrogen flow on bovine rumen fermentation in response to cashew nut shell liquid	231
AN-231	Utilization of cassava pulp and corncob fermented with <i>Aspergillus niger</i> for animal feed: effect on protein levels	234
AN-256	Nutrient composition and in vitro ruminal degradability of selected local plants used as goat feed in Malaysia	236
AN-269	Effect of crude glycerin supplementation on performance of dairy heifers	240
AN-271	Utilization of fresh cassava with ruzi grass fermented by microbes from Pangkhaomark as diets in swine	244
AN-284	Evaluation of urea-yeast fermented fresh cassava root as protein source by using <i>in vitro</i> gas production technique	247
AN-291	The effects of soybean meal treated with green tea marc crude extract on oxidative status and milk production of dairy cows	251
AN-294	Utilization of <i>Samanea saman</i> pod meal as protein source in diet on voluntary feed intake and digestibility of goats	255
AN-301	Digestibility and nitrogen balance of growing goats fed different <i>Mimosa pigra</i> (L.) meal levels	258
AN-303	Effects of banana stem supplemented on productive performance of finishing pigs	261
AN-305	Effect of cultivation time on populations of yeast and lactic acid bacteria co-cultures in fermented milk	264
AN-309	Effect of dietary supplementation of bioceramic powders on production performance of broiler chickens	268
AN-314	Effect of cutting age and ensilage on chemical composition of Pak Chok1 and King giant napier grasses	272
AN-324	Effects of levels of dried leucaena (<i>Leucaena leucocephala</i>) supplementation on nutritive value of milk in organic dairy cows	276
AN-348	Potential of seaweed as feed to make a healthy broiler meat chicken	280
AN-354	Metabolic imprinting improves rumen development via modulation of epigenetic gene expression including histone modification	283
AN-357	Effect of rumen content on the performance and external body measurement of Sudanese desert kids	287
AN-358	Potassium iodate supplementation in layer drinking water for iodine enriched egg and laying performance	291
AN-367	Efficacy of dry powdered <i>Enterococcus italicus</i> on immune responses to <i>Mycoplasma hyopneumoniae</i> vaccination	294
AN-370	Effect dietary energy concentrate on birth weight and weaning weight of Sudanese Taggar goat kid's	297
AN-398	Feeding standard for Hanwoo cattle: past, present and future	300
AN-400	Estimation of the TDN of spent mushroom substrates used as Hanwoo feed	303

AN-402	Feed intake, nutrient digestibility and rumen parameters in goats as affected by mao (<i>Antidesma thwaitesianum</i> Muell. Arg.) seed meal supplementation	306
AN-410	Effects of spineless cactus feeding on milk production, milk quality and antioxidant capacity in dairy goat	309
AN-416	Effects of wet soya milk waste supplementation on feed intake and growth performance of goats fed corn stubble silage	316
AN-421	Effect of high choline levels supplementation on phosphatidylcholine concentration in egg yolk of laying hen	319
AN-429	Effect of coconut oil supplementation on meal pattern, feed intake, and milk yield in early lactating crossbred dairy goat	324
AN-432	The effect of the use of cassava leaves silage in concentrate on goat performance	331
AN-434	Effects of CNCPS fraction-enriched protein feeds on ruminal fermentation in Holstein Steers fed TMR containing low protein as a basal	334
AN-440	Effects of dietary pomegranate by-products on performance, immunity, intestinal microbiology and odorous gas emissions from excreta in broilers	338
AN-442	Effects of synbiotic supplemented in broiler diet on carcass and meat quality	341
AN-444	Feed intake, digestibility, nitrogen retention and daily weight gain of steers fed on sugarcane stalk based complete diet silage	344
AN-445	Effect of nitrate addition to cassava chip on In vitro gas production	348
AN-447	Effects of TDN value in TMR on ruminal fermentation characteristics and effective dry matter degradability by rumen microbes	351
AN-451	Utilization of Paprika (<i>Capcicum annum</i>) by product for ruminants feeding	354
AN-452	Performance of Lohi sheep and Beetal goats fed various fodders	357
AN-453	Intake digestibility of summer fodders fed sheep and goats	360
AN-458	Feed intake and nutrient digestibility in goats of silages prepared from Stylo legume (<i>Stylosanthes guianensis</i> CIAT184) treated with dried mao pomaces (DMP) and lactic acid bacteria	363
AN-461	Effect of combination acidifiers-garlic-Phyllanthus niruri L. powder and encapsulated form in feed on production performance and egg quality of laying hens	366
AN-464	Characteristics of fermentation kinetics and digestibility of PUFA saponification and aldehyd protected as cattle feed supplement by in-vivo	371
AN-470	Effect of usage probiotics powder as feed additive on the eggs quality of laying hens	374
AN-475	Supplementation of different sources of nitrogen and its effects on rumen microbial biomass and <i>in vitro</i> feed degradability parameters	379
AN-480	Rumen adaptation for urea on feed intake, nutrient digestibility and microbial protein syntheses of swamp buffaloes	383
AN-484	Study on rumen ecology of swamp buffaloes as affected by urea as protein source in concentrate mixture fed on rice straw based	387
AN-485	Effect of <i>Flemingia macrophylla</i> (FLM) as a protein source on rumen fermentation and microbial population in dairy steers	391
AN-486	Effect of rice straw treat menton feed intake and nutrient digestibility in swamp buffaloes	394
AN-491	Efficacy of endogenous emulsifier in broilers diets on growth performance	398
AN-494	Effects of fattening length and energy levels on meat characteristics of Iranian native lamb	402
AN-496	Comparative efficacy of herbal methionine and synthetic DL-Methionine on performance in laying hen	405
AN-498	In Situ evaluation of heat treated vegetable protein sources	409
AN-499	Efficacy of probiotics (Sanizyme) on performance in broiler diets	413
AN-501	Efficacy of probiotics (Sanizyme) on performance and digestibility in weaning piglets diets	417

AN-504	Effects of condensed tannins of some tropical plants on ruminal gas production in vitro	421
AN-505	Dietary fat sources on growth performance and body composition in broiler chickens	425
AN-506	Influence of rice straw treated on rumen fermentation and microbial population in swamp buffaloes	428
AN-512	A study on nutrient intake and digestibility, rumen environment and nitrogen retention of sheep fed different levels of ensiled water hyacinth in diets	431
AN-513	Effect of dried cassava chips in growing rabbit diets on meat performance and economic returns	434
AN-517	Effects of wet soya milk waste supplementation on feed intake and growth performance of goats fed corn stubble silage	438
AN-519	Productive performance and production cost of different cross bred meat goats fed high levels of OPL fermented TMR	441
AN-522	The effect of <i>S. rarak</i> microparticles on blood profile and productivity of broiler chickens raised on litter system inoculated with <i>E. tenella</i>	445
AN-532	Effect of different Chinese herbs on antioxidant capacity and immune function in Sansui laying duck	448
AN-534	Enhancing the nutritional value of soybean through supplementation with new-generation feed enzymes for poultry –Review	452
AN-539	The effects of feed fermented by Azotobacter microbes culture on milk production and its feed efficiency at dairy cattle	456
AN-552	Evaluation of nutrient digestibility of mixed cassava pulp and Napier Pakchong grass for use as an alternative feedstuff in laying hens	459
AN-564	Effect of extraction methods for krabok oil on milk production, compositions and fatty acids in milk of dairy cows	462
AN-569	Supplementation of different sources of nitrogen and its effects on rumen microbial biomass and <i>in vitro</i> feed degradability parameters	466
Animal Physiology		
AP-008	Effects of lycopene on hepatic metabolic and immune-related gene expressions in chickens	467
AP-173	The effect of different altitude to adaptability, feed consumption and weight gain's lactating ettawa's cross bred	470
AP-435	Differential level of plasma nesfatin-1, ghrelin and leptin for onset of puberty in Murrah buffalo heifers	473
AP-472	The effect of teat seal on milk microorganism number in postpartum cows	477
AP-526	Growth performances of PO cattle and its crossbred with European cattle (POE) maintained in different environmental conditions	480
AP-536	Morphological studies of thyroid gland of Saidi rams fed mannan oligosaccharide supplemented diet	483
AP-538	The study of extracellular hsp70 & physiological parameters, the effect of feeding improvement of the Ongole crossbred & it's crossing breed	486
Animal Reproduction		
AR-023	Breeding soundness evaluation in Garut ram	489
AR-024	Individual variation on the success of garut ram frozen semen production	492
AR-066	Efficiency of difference doses of pregnant mare's serum gonadotropin on superovulations in meat goats	496
AR-082	Noni effect on goat sperm motility after cooling	499
AR-119	Productive and reproductive performance of indigenous Lime and Parkote buffaloes in the Western hills of Nepal	502
AR-120	The Oocyte parthenogenesis stimulation by protein extract of goat spermatozoa	505
AR-131	Supplementation of vascular endothelial growth factor (VEGF) increases the maturation of porcine COCs derived from small follicles	508
AR-194	Supplementation of L-Carnitine on matured goat oocyte <i>in vitro</i>	511
AR-254	The acceptability of reduced sperm concentration in frozen buffalo semen	514

AR-255	Reproductive performance of cattle and buffaloes treated with prostaglandin F2 α and gonadotropin releasing hormone in Thailand and Philippines	518
AR-310	Morphometric dimensions of the spermatozoa in Thai native boar depend on the ejaculates	522
AR-383	Effects of addition juice date palm to the extender on the percentage of live and motility of frozen thawed bull spermatozoa	526
Basic Veterinary Science		
BVS-148	Antibacterial activity of wood vinegar against <i>Salmonella</i> Enteritidis and <i>Salmonella</i> Typhimurium	529
BVS-207	Virucidal efficacy of <i>Clinacanthus nutans</i> and <i>Houttuynia cordata</i> extract against virulent Newcastle Disease Virus	532
BVS-313	Ciliary activity and life span of swine precision-cut lung slices: Comparison between changed and unchanged medium	536
BVS-331	Factors influencing the incidence of Babesiosis in sheep of district Toba Tek Singh, Pakistan	541
BVS-340	The <i>in vitro</i> antibacterial activity of <i>Muntingia calabura</i> against <i>Staphylococcus aureus</i> and <i>Streptococcus agalactiae</i>	546
BVS-399	Study of the optimal condition of RNA in situ hybridization for HER-2/neu in canine mammary gland	549
Food Science and Technology		
FST-267	Process development of cooking wine from whey of buffalo milk	553
FST-302	Study of differential protein composition of raw milk and processed milk by using SDS-PAGE and Native-PAGE	556
FST-476	Development and production of Shrikh and by utilization of pomegranate fruit	559
FST-483	Physico-chemical quality of kefir of etawah crossbred goat milk	563
FST-551	Histological liver of mice (<i>Mus musculus</i>) consumption collagen extract of broiler's bone in South Sulawesi, Indonesia	566
FST-578	Effect of jelly addition on kefir quality	574
Feed Technology		
FT-099	Crude triterpenoid, phenolic compounds and enzyme activities of fermented soybean hull by <i>Antrodia cinnamomea</i>	577
FT-111	Effect of performance and intestinal characteristics on supplemented with protease in the broiler diet	579
FT-299	The levels of TBARs in pellet fish feed mixed with different astaxanthin levels and packaging methods	582
FT-355	Standardized total tract digestibility of phosphorus of various meal diets as protein source in growing-finishing pigs	587
FT-406	Application of feed technology of quail (<i>Coturnix-coturnix Japonica</i>) using waste of Skipjack (<i>Katsuwonus pelamis</i>)	592
FT-430	Quality of protein concentrate from <i>Jatropha curcas</i> seed cake produced by chemical and biological processing	595
FT-544	Serum testosterone, testes size and semen quality of rams fed sugarcane bagasse treated with urea or pronifer	600
Livestock and Environment		
LE-375	Effects of storage on pathogenic bacteria content of layer manure extract	604
LE-408	Effect of heat stress environment on the blood parameters and behavior pattern in Korean native calves	608
LE-460	Study of local feeds potency for pig farming development in Manokwari, West Papua, Indonesia	612
LE-510	A response of <i>in vitro</i> and <i>in vivo</i> methane production, nutrient digestibility and rumen parameters of sheep by Cat fish oil (CFO) supplementation	615
LE-548	Water footprint of milk production in Thailand	618
LE-550	Biogas unit, an alternative solution for reducing green house gas effect of animal waste	621

Livestock Farming System		
LF-022	Development of farmer champions and their role in progressing smallholder beef production in Vietnam	624
LF-072	The assessment of cattle and palm oil plant integration system in West Sumatera, Indonesia	628
LF-162	Characterization of native pig raisers and their current production systems in the integrated sweet potato –native pig production system in Baliem valley, Jayawijaya regency, Papua province, Indonesia	634
LF-218	Smallholder identified constraints to adoption of new forage options in South Central Coast Vietnam	638
LF-220	Studies on socio-economical profile of the dairy farmers in Latur district of Maharashtra state	645
LF-234	Economic impact of spatial development on goat farming in Banjarnegara district Indonesia	644
LF-349	Pasture management and supplemented feed enhanced the performance of farmed buffaloes in Sabah, Malaysia	649
LF-361	Developing technology and husbandry skills required for efficient animal production in villages in the highlands of Papua Indonesia	654
LF-378	Partnership in broiler farm closed house system (case study at Tuban, East Java, Indonesia)	657
LF-381	Moving families from subsistence animal production to small commercial production using a participatory approach with a multidisciplinary team	660
LF-389	Development of local cattle with sustainable in North Sulawesi	663
LF-393	Analysis of the resource potential of the coconut crop-cattle in the district of East Likupang	667
LF-404	Utilization of cattle waste as compost fertilizer	671
LF-465	The Study of nutritive value of plant for goat in Pattani province of Thailand	674
Livestock Management		
LM-044	Production performance of laying hen housing on litter system with different temperature	677
LM-046	Use of agricultural by-product in pig ration to reduce feed cost in Manokwari Regency, West Papua Province, Indonesia	680
LM-079	Evaluation of goat milk quality to support dairy goat development	683
LM-155	Insight into broiler development in East Java	687
LM-203	Association among fat, protein, lactose and total solid of milk produced by farmers in central part of Thailand	690
LM-215	Conventional and deep - litter pig production system: income over feed cost of three breed cross fattening pigs	693
LM-306	Application of PCR technique to detect <i>Staphylococcus aureus</i> that causes mastitis in dairy cows	696
LM-345	Enhancing goat farm performance thru the farmer livestock school –goat enterprise management modality	699
LM-443	Constraints to improved productivity of smallholder cow-calf systems in South Central Coast Vietnam – insights from recent surveys	703
LM-553	Efforts to increase production of cow's milk through the cooperation empowerment in Sinjai Regency	707
LM-589	Why poultry welfare in Kuwait is an obstacle to trade?	711
Meat Science		
M-045	Nutrition, fatty acid and cholesterol content of Garut lamb meat at different ages fed with diet containing mungbean sprouts waste	715
M-163	Some functional properties of beef liver protein concentrates	718
M-245	Meat quality assessment in goats subjected to conscious halal slaughter and slaughter following minimal anaesthesia	722
M-270	Effects of dietary blend of canola oil and palm oil on fatty acid composition, color and antioxidant profile of <i>biceps femoris</i> muscle in goats	726

M-298	Meat quality of crossbred fattening pigs sired by Pakchong 5 boars and commercial boars	733
M-412	Comparison muscle fiber size, sarcomere length and tenderness between chicken and duck meat	737
M-413	Effect of immunocastration on myosin heavy chain isoform expression	741
M-441	Meat composition, fatty acid profile and oxidative stability of meat from broilers supplemented with pomegranate (<i>Punica granatum</i> L.) by-products	744
M-448	Effect of dried fermented juice of epiphytic lactic acid bacteria on broiler meat quality	747
M-459	Prediction of meat and carcass quality traits by real-time Ultrasound in swine	751
M-489	Drip and cooking loss of longissimus dorsi muscle under different levels of energy and protein in Iranian kid native breed	754
Others		
O-084	Microbiological and chemical characteristics of probiotic goat cheese with mixed cultures of <i>L. rhamnosus</i> and <i>L. plantarum</i>	758
O-092	Production elasticity of broiler farming in blitar regency, East Java, Indonesia	762
O-141	The differences of milk density and fat content in Tawang Argo Village compared with Indonesian National Standard	766
O-196	Marketing analysis of broiler farming system on partnership scheme in Ponorogo Regency, East Java Province, Indonesia	769
O-204	Physical properties and microstructure of dangke pipening, a traditional cheese of Enrekang Sulawesi Indonesia	772
O-221	Studies in urban geography of latur city of maharashtra state of India with special reference to demographic features	777
O-252	Body growth of Thai wild boar (<i>Sus scrofa jubatus</i>) within a yearling age in a deep litter pig production system	780
O-266	Consumer attitude toward meat consumption in Ghana	783
O-352	Effect of herbal immunostimulant formulation with Newcastle disease oral pellet vaccine on immune response in native chicken	787
O-377	Effects of probiotics supplementation on nutrient digestability in captive asiatic elephants in temples of Tamilnadu in India	790
O-384	A retrospective investigation of co-endoparasitism of dog and cat patients in Nongchok subprovince, Thailand	795
O-463	Quality of chicken eggs in the flea market, KamphaengSaen district, NakhonPathom province, Thailand	780
O-477	Effect of carbon and nitrogen sources on growth of <i>Alternaria solani</i> (Ell. & Mart.) Causing early blight of Tomato	803
Veterinary Public Health		
VPH-249	Prevalence of parasite infection of puppy dogs to 2 months under animal hospital institute, Udon Thani Rajabhat University	806
INVITED PAPERS		
Invited speaker	Is small animal farming system of low technology?	809
Invited speaker	Family poultry farming system and their characteristics in developing countries	813
Invited speaker	Two types of grazing system under tropical pasture in South western islands of Japan	819
Invited speaker	Value added technology for cattle hide quality improvement in sustainable animal production	824
Invited speaker	Human behaviours as determinants of animal disease: meeting the challenge of a complex mix of changing production systems	845
Invited speaker	Challenges for sustainability of beef cattle production in Thailand	848
Invited speaker	Capacity building and services to assist local farmers to improve aquaculture management in Vietnam	852

Use of agricultural by-product in pig ration to reduce feed cost in Manokwari Regency, West Papua Province, Indonesia

Widayati T.W., M.N. Lekitoo, D.J.Rahardjo, S.Y. Randa, S. Lumatauw, S.Hartini & B.Santoso

Department of Animal Science, University of Papua, Manokwari, Indonesia

Abstract

The paradigm of modern animal husbandry is based on zero waste concept. The use of agricultural and food industry by-products into valuable materials is an important issue that needs to be done. Pigs are the favorite animals for the Papuan because they are valuable in social, cultural and economical aspects. However, pig farm in Papua is constrained by providing concentrate ration because there is competition between pig ration and human food. The aim of this study was to know the potential of agricultural and food industry by-products as constituents of pig ration; and its possibility to reduce feed cost. This study was conducted at Manokwari regency, West Papua Province, Indonesia. The agricultural and food industry by-products used as pig ration constituents were collected from 2 traditional market, 5 restaurant and 15 small-scale food industries. The ingredients of ration comprised fish waste, soybean curd, taro skin, soybean skin, restaurant waste and commercial broiler ration. All materials used as ration were proximate analyzed to determine nutrition content. Feed cost was estimated using local market prices. Tabulation was used to analyse the data. Results of this study showed that crude protein and gross energy contents of agricultural and food industry by-products varied 4.26 to 31.21% and 3432.94 to 4950.57 kcal/kg, respectively. Use of agricultural and food industry by-products in pig ration reduced ration cost for phases of pre-starter, starter, grower, non lactation pig, gestation pig and lactation pig by 36.65, 38.58, 46.92, 55.00, 40.59 and 65.52%, respectively. It was concluded that agricultural and food industry by-products could be used as an alternative ration in order to reduce cost of ration in Manokwari Regency, West Papua.

Keywords: agricultural by-product, pig, concentrate ration, ration cost, protein, gross energy

Corresponding author: trieswd4@gmail.com

Introduction

Pigs are the favorite animals for the Papuan because they are valuable in social, cultural and economical aspects of their lives. The market demand of this commodity is quite high and become a primary saving for the households. Selling price of this animal is sufficiently high, weaning period price ranged from IDR 1.000.000 to 1.500.000 and that of at the age of cut (8-12 months) varied from IDR 3.000.000 to 5.000.000. So far, pig in Papua has not been intensively raised. The animal are mostly taken as the home consumption, so that aspects of feeding, reproduction and health are not cared properly (Randa, 1994). In general, farmers fed their animals as single feed such as tubers which is of low quality. The minimum amount of feed with low quality are factors that affect the growth of pig to be slow and easy to be infected by diseases (Iyai, 2008). Pig is a monogastric animal, favors concentrate ration and hence compete with human food. This condition caused a problem in feed availability during intensive pig raising. In addition, the commercial feed is not always available and its price is expensive. Based on BPS Papua Barat Province (2005) that West Papua has abundant forages and agricultural by-product and

potentially for the development of animal husbandry that is 42.442.750 tons produced from the area of 4.244.274 ha.

A good livestock development is adjusted to the availability of feed, socio-cultural conditions and local climate. In fact, the potency market of pig is high, but on the other hand there is still problems in the continuous feed availability, quality and economic, thus it is necessary to use ingredients from agriculture and food industry by-products as an alternative of pig ration. Based on above reasons, a study was conducted to evaluate potency of agriculture and food industry by products in Manokwari Regency as nutrient source to pig and its ability to substitute commercial ration in order to reduce ration cost.

Materials and Methods

This study was conducted at Manokwari regency, West Papua Province, Indonesia. The agricultural and food industry by-products used as pig ration constituents were collected from 2 traditional markets, 5 restaurants and 15 food industries. Ingredients used as pig ration were fish waste, soybean curd, taro skin, soybean skin, vegetables waste, waste of restaurant and broiler commercial ration. All ingredients used as ration were proximate analyzed to determine nutritional content. Ration cost was estimated by local market prices. Tabulation was used to analyze the data.

Results and Discussion

Proximate analysis of agricultural and food industry-by products as pig ration constituent presented in Table 1.

Table 1. The Potency and nutrients content of ingredients in pig ration.

No.	Ingredients	Potency (kg/day)	Nutrients Content			
			DM (%)	CP (%)*	GE (kcal/kg)*	ME (kcal/kg)*
1.	Fish waste	1000.00	29.41	31.21	3432.94	2709
2.	Soybean curd	2400.00	14.31	23.85	4950.57	3906
3.	Soybean skin	55.50	15.96	15.1	4022.23	3174
4.	Taro skin	11.40	26.45	4.26	3648.96	2879
5.	Vegetables waste	546.00	9.84	15.8	3683.99	2907
6.	Waste of restaurant	2056.56	35.84	13.72	4202	3315
7.	Commercial broiler ration (CP 11)		87	19.5	-	3100

*Dry matter basis

Two kind of ingredients such as fish waste and soybean curd used in this study were included as protein sources. Skin taro had the lowest CP content (4.6%), whereas the highest CP content obtained in fish waste (31.21%). The agricultural and food industry by-product are abundantly available in Manokwari Regency, however those by-products have not been used efficiently. Verkan (2011) stated that the lost of economic value of food such as vegetables, fish, legumes which caused by inefficiency in retail and consumer in America as much as US\$ 197.68 billion per year. Moreover, Kariasa&Suryana (2012) revealed that food availability could be increased by preventing food wastes.

Table 2 shows that the use of agricultural and food industry by-product as pig ration at different stage of production could meet nutrients requirement of pig and provides economical benefit by reducing the cost of the ration.

Table2. Formulation of pig ration using agriculture and food industry by-products at different stages of production.

No	Items	Stages of Production					
		Prestarter	Starter	Grower	Boar and Non Lactation	Gestation	Lactation
1	CP requirement (%)	23.7	20.9	18	13	12.9	16.3
2	ME requirement (Kcal/kg)	3265	3265	3265	3265	3265	3265
3	Dry matter requirement (kg)	0.5	1	1.86	2	1.96	4.31
4	Ration formulation (kg fresh weight)						
	a Soybean curd	1.07	1.95	2.45	1.43	1.79	0.86
	b Soybean skin			0.64	1.82	2.73	0.29
	c Taro skin		0.13	0.37	1.38	1.64	2.29
	d Fish waste	0.19	0.14	0.28			0.13
	e Vegetables waste		1.22	2.69	2.66	3.35	6.26
	f Restaurant waste		0.18	1.29	1.96	0.93	2.59
	g Broiler ration (CP 551)	0.28	0.42	0.38			0.56
5	Total ration as fed (kg)	1.53	4.03	8.09	9.25	10.45	12.98
6	Cost of commercial ration (IDR)	6000	12000	22260	24000	23520	51720
7	Ration cost using agricultural by-product (IDR)	3801.18	7370.1	11816.49	10798.29	13972.62	17831.94
8	Reduction of ration cost (%)	36.65	38.58	46.92	55.01	40.59	65.52

The lowest economic profit was obtained in the use of agricultural and industry by-product as pig ration at prestarter phase where the ration cost was reduced by 36%. Meanwhile, the highest profit was obtained at lactation phase where ration cost was reduced by 65.52% as compared to the use of commercial ration.

Conclusion

Agricultural and food industry by-products could be used as the alternative feeds which are not only favorable in nutrition quality but also help to reduce feed cost of pig in Manokwari Regency, West Papua.

References

- BPS Papua Barat, 2005. Papua Barat dalam Angka. BadanPusatStatistik, Provinsi Papua Barat.
- Iyai, D.A., 2008. Innovation of pig keeping system in pig farmers at Manokwari, West Papua Province, Indonesia. Thesis. Wageningen University, The Netherlands.
- Randa, S.Y., 1994. Performance of indigenous pigs of upland and lowland Irian Jaya. MSc Thesis. Department of Animal Science. Los Baños, The Philippines.
- Venkat, K., 2011. The Climate Change and Economic Impact of Food Waste in The United States. Kvenkat@celanmetrics.com.



Oral Presentation

Trisiwi Wahyu Widayati

The 5th International Conference on Sustainable Animal Agriculture for Developing Countries

"Climate smart sustainable animal agriculture for food security and livelihood improvement in the developing countries"

October 27-30, 2015

Dusit Thani Pattaya Hotel, Chonburi Thailand

Handwritten signature of Professor Dr. Juan Boo Liang.

Professor Dr. Juan Boo Liang
President SAADC2015 International Advisory Committee

Handwritten signature of Assistant Professor Dr. Chalermpon Yuangklang.

Assistant Professor Dr. Chalermpon Yuangklang
Chairman of the 5th SAADC 2015