



Sustainable Livestock Production in the Perspective of
Food Security, Policy, Genetic Resources, and Climate Change

Proceedings Full Papers

10-14 November 2014, Yogyakarta, INDONESIA



The 16th AAAP Congress



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Ministry of Agriculture



Indonesian Society of Animal Sciences



Gadjah Mada University

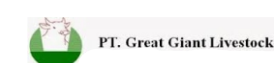
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**SUSTAINABLE LIVESTOCK PRODUCTION IN THE
PRESPECTIVE OF FOOD SECURITY, POLICY, GENETIC
RESOURCES, AND CLIMATE CHANGE**

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FULL PAPERS

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Asian-Australasian Association of Animal Production Societies

✧ **Scope of AAAP:** AAAP is established to devote for the efficient animal production in the Asian-Australasian region through national, regional, international cooperation and academic conferences.

✧ **Brief History of AAAP:** AAAP was founded in 1980 with 8 charter members representing 8 countries-those are Australia, Indonesia, Japan, Korea, Malaysia, New Zealand, Philippines and Thailand. Then, the society representing Taiwan joined AAAP in 1982 followed by Bangladesh in 1987, Papua New Guinea in 1990, India and Vietnam in 1992, Mongolia, Nepal and Pakistan in 1994, Iran in 2002, Sri Lanka and China in 2006 , thereafter currently 19 members.

✧ **Major Activities of AAAP:** Biennial AAAP Animal Science Congress, Publications of the Asian-Australasian Journal of Animal Sciences and proceedings of the AAAP congress and symposia and Acknowledgement awards for the contribution of AAAP scientists.

✧ **Organization of AAAP:**

- President: Recommended by the national society hosting the next biennial AAAP Animal Science Congress and approved by Council meeting and serve 2 years.
- Two Vice Presidents: One represents the present host society and the other represents next host society of the very next AAAP Animal Science Congress.
- Secretary General: All managerial works for AAAP with 6 years term by approval by the council
- Council Members: AAAP president, vice presidents, secretary general and each presidents or representative of each member society are members of the council. The council decides congress venue and many important agenda of AAAP

✧ **Office of AAAP:** Decided by the council to have the permanent office of AAAP in Korea. Currently # 909 Korea Sci &Tech Center Seoul 135-703, Korea

✧ **Official Journal of AAAP:** Asian-Australasian Journal of Animal Sciences (Asian-Aust. J. Anim. Sci. ISSN 1011-2367. <http://www.ajas.info>) is published monthly with its main office in Korea

✧ **Current 19 Member Societies of AAAP:**

ASAP(Australia), BAHA(Bangladesh), CAASVM(China), IAAP(India), ISAS(Indonesia), IAAS(Iran), JSAS(Japan), KSAST(Korea), MSAP(Malaysia), MLSBA(Mongolia), NASA(Nepal), NZSAP(New Zealand), PAHA(Pakistan), PNGSA(Papua New Guinea), PSAS(Philippines), SLAAP(Sri Lanka), CSAS(Taiwan), AHAT(Thailand), AHAV(Vietnam).

✧ **Previous Venues of AAAP Animal Science Congress and AAAP Presidents**

I	1980	Malaysia	S. Jalaludin	II	1982	Philippines	V. G. Arganosa
III	1985	Korea	In Kyu Han	IV	1987	New Zealand	A. R. Sykes
V	1990	Taiwan	T. P. Yeh	VI	1992	Thailand	C. Chantalakhana
VII	1994	Indonesia	E. Soetirto	VIII	1996	Japan	T. Morichi
IX	2000	Australia	J. Ternouth	X	2002	India	P. N. Bhat
XI	2004	Malaysia	Z. A. Jelani	XII	2006	Korea	I. K. Paik
XIII	2008	Vietnam	N.V. Thien	XIV	2010	Taiwan	L.C. Hsia
XV	2012	Thailand	C.Kittayachaweng	XVI	2014	Indonesia	Yudi.Guntara.Noor

Remark from Chairman of the 16th AAAP Congress

Dear all of the scientists, delegates, participants, ladies and gentlemen,

As the host of the 16th AAAP Animal Science Congress, we do impress, thankful, and present a high appreciation for your participation in joining the 16th AAAP Conference in Yogyakarta, Indonesia. We can see the very great enthusiasm of all the scientists to solve livestock problems as well as to share valuable information and knowledge for human prosperity all over the world.

A large numbers of representatives are participating in this conference, which indicates that the interest in the field of animal science is continuously increasing among member countries. We have invited some Plenary Speakers and Invited Papers who are qualified as scientists and bureaucrats in animal science field to share their valuable information and knowledge. Other participants can deliver their precious research through oral and poster presentations. This congress is also paralleled to symposium held by livestock organization and institution as well as some academic meetings.

The theme of the 16th AAAP Congress is “Sustainable Livestock Production in the perspective of Food security, Policy, Genetic Resources and Climate Change”. We believe that animal production in Asia and Australasia has become important and strategic sector to provide high quality food, opening up job opportunities, as well as improving farmer’s welfare. Animal science societies, therefore, have to support this growing interest by providing more appropriate and relevant technologies to improve efficiency of resources utilization to produce more animal protein food by member countries. Long term sustainable livestock production will, therefore, be significantly influenced by the national food policy, climate change issues, as well as conserved environments and genetic resources.

On behalf of 16th AAAP Committee and all associates, we wish all of the participants having a great achievement of success and fulfill the expectation as well as enjoying the interaction with all scientists participating the Congress.

High appreciation we may acknowledge to all of sectors, especially for His Majesty of Royal Palace of Yogyakarta, Sri Sultan Hamengku Buwono X, and Rector of Universitas Gadjah Mada, who have concerned to facilitate the Congress site host. Special thank to the Steering Committee, Scientific Committee, Reviewers and Editorial Boards for their great contribution to make the Congress successfully organized.

To you, your excellencies, invited guests and delegates, thank you for choosing to come to this conference and to Indonesia. We hope the arrangements we have put in place meet with your requirements. We wish you fruitful deliberations and an intellectually and socially rewarding stay in Yogyakarta.

We are looking forward to meeting you all in the future congress to continue.

Terimakasih (Thank you)



Budi Guntoro

Chairman of the 16th AAAP Congress

16th AAAP PRESIDENT'S REPORT

Selamat pagi!

Dear Ladies and Gentleman

Attendants of 16 AAAP congress:

It is my great pleasure and honor to welcome all of you at The 16th AAAP Congress on November 10 – 14, 2014 at Grha Sabha Pramana, Universitas Gadjah Mada, Yogyakarta Indonesia. This Congress is jointly organized by The Indonesian Society of Animal Science (ISAS), Indonesian Agency for Agricultural Research and Development, Indonesian Directorate General of Livestock and Animal Health Services-Ministry of Agriculture and Faculty of Animal Science Universitas Gadjah Mada. Universitas Gadjah Mada Campus is located in Yogyakarta, one of the Special Region in Indonesia where culture and tradition live in harmony with the modern nuance and educational spirit makes it a beautiful venue of this Congress.

The 16th AAAP Program consists of scientific and technical programs as well as social and cultural activities. The scientific and technical programs offer five plenary sessions, two satellite symposia, field trip, and many scientific sessions, both oral and poster presentations.

During this event distinguished scientists from all over the world will present plenary papers ranging from livestock policy, food security, local genetic resources, climate change, animal welfare, international trade, as well as global research agenda. I believe that around 1,200 scientists as well as livestock producers, companies, graduate and postgraduate students from 40 countries are attending the Congress and more than 770 research papers will be presented. The Congress also provides not only opportunities to discuss and exchange information and experience with scientists from different regions of the world, but also a good environment to build up friendship between nations is our ultimate goals for the Congress outcome. Moreover, this congress also keeps its tradition to be a forum of communication among researchers, academician, industries and related stakeholders among Asian-Australasian countries.

The social and cultural programs are specially designed to be very important for the congress participants since the promotion of friendship and future scientific cooperation are also central to this AAAP Congress. The Opening Ceremony will offer you the Congress Program at a glance. In addition, participants will also join at a warm Welcome Dinner gathering at Keraton Yogyakarta. Sri Sultan Hamengku Buwono X, His Majesty of The Royal Palace of Yogyakarta will give you the most memorable moment during this event.


Moreover, cultural night offers us an opportunity to introduce significant culture from participants' countries and gives a spectacular performance to enjoy in order to strengthen our friendship and future cooperation. Field trip, on the other hand, provides a wonderful sightseeing to the most valuable ancient heritage around Yogyakarta, such as Borobudur and Prambanan Temples, and more other interesting places to visit. I do hope that you enjoy your stay in Yogyakarta and not miss all of these spectacular opportunities.

Closing Ceremony will be held on November 14, 2014 immediately after the last session of presentation. During this great moment we will welcome the next host of the 17th AAAP Congress to deliver a brief message. The AAAP Congress Award will provide and announce some participant who receive appreciation for their valuable research.

With all of our hospitality, we will try our best to make your brief visit to Yogyakarta and our beautiful country Indonesia, become a wonderful experience and memorable moments.

I wish you all a very pleasant and most enjoyable stay in Yogyakarta, Indonesia.

Terima kasih (Thank you).

A handwritten signature in black ink, appearing to read 'Y. Guntara Noor', written over a diagonal line that extends from the bottom left towards the right.

Sincerely Yours
Mr. Yudi Guntara Noor
President
The 16th AAAP Congress

PREFACE

The proceedings of the 16th Congress of the Asian-Australasian Association of Animal Production Societies (AAAP) held on 10-14 November 2014 at Grha Sabha Pramana, Universitas Gadjah Mada, Yogyakarta, Indonesia, consist of two volumes. Those are Volume I of Plenary and Invited Papers and Volume II of Abstracts Contributed Papers. This is the second volume of the proceedings that contains a total of 754 abstracts, consist of 368 papers for oral presentation and 386 papers for poster. Papers were categorized into various disciplines, such as Nutrition and Feed Technology; Genetics and Reproduction; Physiology, Animal Welfare and Health Management; Product Technology and Food Safety; Waste and Environmental issues; Forage Agrostology; as well as Agribusiness, Marketing, Extension and Community Development. The scientific committee has initially received a total of 1,028 abstracts from 42 countries. After reviews have been made, 60 of them were rejected and 74 were cancelled by the authors. The reviewers consist of 4 international and 71 internal reviewers from 6 universities and 1 research institute in Indonesia. In the interest of time limitation for proceedings publication, we apologize for not including 140 submitted abstracts in the proceedings since they were not being followed up with full manuscripts until the extended due date we offered.

The scientific committee would like to thank all the reviewers and appreciate their effort to make significant contribution in reviewing the full manuscripts. Similarly, we would also like to thank supporting staffs at the secretariat office of the Faculty of Animal Science, Universitas Gadjah Mada as well as of the Indonesian Center for Animal Research and Development who have helped in the preparation of the proceedings. Finally, we would like to thank all the authors for their valuable contribution to the congress and make it useful for our societies.

Editorial Team

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B 412 DZ	Effects of Marl and Kaolin on Growth Performances, Digestive Efficiency and Wet Droppings of Broiler Chickens <i>D. Ouachem, A. Meredef, A. Kalli, N. Kaboul, A. Mehdaoui, and Z. Ahmed Gaid</i>	1958

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B 788 TW	Effects of Dietary Supplementation of Sorghum Distillery Residue and Its Solid Fermented Product on Growth Performance and Immune Response in Broilers <i>P. H. Lin, Y. T. Chen, F. C. Tsai, S. M. Lee, and I. H. Chen</i>	1987
B 853 NG	Growth Performance and Organoleptic Properties of Broilers Fed Rumen Filtrate Fermented Shea Nut (<i>Vitellaria paradoxa</i>) Meal <i>D. N. Tsado and J. Akinwolere</i>	1991
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B 872 KR	Effects of Gromax [®] Supplementation on Growth Performance, Carcass Traits, Blood Profiles and Secretion of IGF-1 in Broiler Chickens <i>J. S. Hong, G. I. Lee, J. M. Kim, H. S. Choi and Y. Y. Kim</i>	1999

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B 957 LK	Effect of Phytase Enzyme on Phosphorous Availability of Broiler and Breeder Rations <i>M. A. J. P. Munasinghe, R. M. A. S. Bandara, B.C. Gallawattage and G. Weerakkody</i>	2005
B 1018 TW	Effect of Pelleting of Two Stage Fermented Process on Feed Composition, Broiler Growth Performance and Nutrition Digestibility <i>R. H. Yeh and K. L. Chen</i>	2008
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Production and Revenue of Pigs to Reduce Poverty and to Support Food Security of Papuan Farmers in Manokwari

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ABSTRACT

Pigs are a favorite animal for the Papuan because they are very valuable in social, cultural and economic status of the community. In order to support food security and poverty alleviation for the people of Papua, the relationship among pig production, revenues, poverty reduction and food security were analyzed. The study aimed at determining the factors that influence production and pig revenue to reduce poverty and to support food security of famers in Manokwari . Data were taken from 36 farmers in Manokwari. Pig production, pig revenues, poverty gap and food security were analyzed simultaneously by Two Stage Least Squares regression. The results showed that feeding of pigs (source of protein), land area, and body weight of sows had significant and positive impact on the pig production (CI 95%). Price of rice bran, banana, stall waste, and costs of transportation were negatively significant effect on revenue of pigs. The revenues of pig and farmer education had positive effect on poverty gap (CI 90% and 95%). Farmer education had positively significant effect on food security while kerosene prices had negatively significant effect on food security. However revenue of pigs did not have yet any effect on food security.

Key Words: Pig, Production, Revenue, Food security, Poverty

INTRODUCTION

Poverty in Indonesia and other some developing countries in Asia are still being a leading issue that need creative and strategic solution. Papua and West Papua are areas in Indonesia with high number of poor people. Data showed that the number of poor households in Papua was 391,767 from the total of 480,578 households or approximately 81.52% (Suebu,2007), while for West Papua was 128,156 from the total of 170,049 households or approximately 75.36% (BPS West Papua 2005). Information on the spread of poor people was is not only exist either in the city areas or in urban areas.

Generally, Papua is believed to be an area with huge potential for the development of animal husbandry due to its abundance natural resources. According to statistics of the province of West Papua (2005) and the Monitoring and Evaluation Team of livestock of West Papua Province (2007), the production of forage and agricultural waste/estate plantation in West Papua was about 42,442,750 tons readily accessed from the total area of 4,244,275 ha as a source of animal feeds. In general, the kind of livestock kept by the Papuan were beef cattle, chickens, goats and pigs. But pigs are the most popular livestock for the Papuan, whose population currently was about 546,696, it ranked as the sixth of the national pigs population (BPS, 2010).

Development of livestock sector became strategic if it is based on local demand and needs. Although the national programs on beef self-sufficiency through P2SDS was done, ~~but~~ local strategic commodities such as pigs continued to be a regional priority to support local markets and demand for food in Papua.

MATERIALS AND METHODS

The study was carried out using data which were taken from 36 farmers in Manokwari. Pig production, household revenues from pig keeping, poverty gap and food security status were analyzed simultaneously by Two Stage Least Squares regression (Widarjono. 2007)

Regression equation of production, pigs revenue, poverty gap and food security were described in Table 1.

Table 1. Regression Equation of Production, Pigs Revenue, Poverty Gap and Food Security

Item	Equation
1. Production	$\text{Ln PROD} = \text{Ln } a_0 + a_1 \text{ Ln Feed Energi} + a_2 \text{ Ln Feed Protein} + a_3 \text{ Ln Land} + a_4 \text{ Ln Sow} + a_5 \text{ Ln Labour} + a_6 \text{ Ln labour times} + a_7 \text{ Ln Age of Farmer} + a_8 \text{ Ln Experience} + a_9 \text{ Ln Body size} + a_{10} \text{ Ln Farmers Education} + \epsilon_1$
2. Revenue of Pigs	$\text{Ln PUPB}^* = \text{Ln } b_0 + b_1 \text{ Ln Rice price}^* + b_2 \text{ Ln Cassava price}^* + b_3 \text{ Ln taro}^* + b_4 \text{ Ln rice bran price}^* + b_5 \text{ Ln banana price}^* + b_6 \text{ Ln sweet potato}^* + b_7 \text{ Ln waste of restaurant}^* + b_8 \text{ Ln soy curd byproduct}^* + b_9 \text{ Ln sow price}^* + b_{10} \text{ Ln Transportation}^* + \epsilon_2$
3. Poverty Gap	$\text{Ln POV} = \text{Ln } c_0 + c_1 \text{ Ln Family Dependency} + c_2 \text{ Ln Education cost} + c_3 \text{ Ln Pigs revenue} + c_4 \text{ Ln Source of income} + c_5 \text{ Ln Member of Family} + c_6 \text{ Ln Market accessibility} + c_7 \text{ Ln Farmers Education} + c_8 \text{ Ln Transportation} + c_9 \text{ Ln Pigs revenue} + \epsilon_3$
4. Food Security	$\text{Ln FC} = \text{Ln } d_0 + d_1 \text{ Ln Rice price} + d_2 \text{ Ln Fish price} + d_3 \text{ Ln Kerosene price} + d_4 \text{ Ln Oil price} + d_5 \text{ Ln Revenue of pigs} + d_6 \text{ Ln Other income} + d_7 \text{ Ln Farmer Education} + \epsilon_4$

Poverty Gap was measured by the distance between family income per capita and poor line (Prayitno and Arsyad. 1997)

Food security was calculated by ratio of total family expense for food and total family expenses (Ilham and Sinaga. 2007)

*) normalized price. Each price was normalized by sales pig price.

RESULT AND DISCUSSION

The results of the analysis of the relationship between production, income, poverties and food security were presented in Table 2. Production was measured by summing up the total body weight of weaning piglets produced by pigs breeding livestock. By the regression on factors that influence the production, it was found that the protein source of feed, land and body size of dam affected the production. Therefore, it is important to improve knowledge on the feed availability as source of protein categories to the Papuan. Land which was utilized for crops has positively impact on the household production. Therefore, improvement in the knowledge of efficient land management will help the papuan to contribute to the availability of feeds for their pigs. The body size of sow described the genetic merit of the next generation (Lasley, 1978).

Pig revenues were obtained from sales of weaned pigs. Factors that significantly influenced to the revenues were feed prices which include the price of rice bran, potato kitchen and restaurant refusals. In Manokwari fluctuation was closely related to the scarcity and competition of feed utilization. Rice bran prices were more expensive when as more businessmen looking for the especially during the period of festivity. Moreover, the cost of transportation also affected household revenue. This included the cost for routine feed purchasing as well as marketing of the product. As expected, those farmers who already have regular customers in the markets were enjoying advantages from this relation than the other who have to fight for their their market opportunity.

Table 2. Determinan Factor of Production, Pigs Revenue, Poverty gap and Food Security of Farmer Household in Manokwari District

PRODUCTION							
Variable	Coefficient	Prob.	Sig.	Variable	Coefficient	Prob.	Sig.
Feed Source of Energy	-0.387759	0.3956	NS	labor times	3.367951	0.2554	NS
Feed Source of Protein	1.464118	0.0002	***	Age of Farmer	-0.144102	0.6586	NS
Land	0.000915	0.0165	**	Experience	-0.282513	0.7445	NS
Sow	3.476383	0.5901	NS	Body weight	1.27065	0.0136	**
Labor	4.881758	0.2549	NS	Farmers Education	-0.901217	0.4027	NS
				C	-64.58726	0.1171	
R-squared	0.890956			Adjusted R-squared	0.845521		
REVENUE OF PIGS							
Variable	Coefficient	Prob.	Sig.	Variable	Coefficient	Prob.	Sig.
Rice price	-963.8321	0.4439	NS	Sweet potato	-589.3484	0.0984	*
Cassava price	-86.45931	0.7339	NS	Waste of restaurant	-419.4725	0.0984	*
Taro	0.526219	0.9988	NS	Soy curd byproduct	-81.27912	0.8505	NS
Rice bran price	-3850.676	0.0933	*	Sow price	0.763905	0.1597	NS
Banana price	-760.1221	0.0457	NS	Transportation	-1875.646	0.0001	***
				C	74957861	0.0001	
R-squared	0.744707	0.638335		Adjusted R-squared	0.63834		
POVERTY GAP							
Variable	Coefficient	Prob.	Sig.	Variable	Coefficient	Prob.	Sig.
Family Dependency	-11434428	0.2148	NS	Market accessibility	-616619.2	0.8205	NS
Education cost	-2.173996	0.6743	NS	Farmers Education	1506849	0.0160	**
Source of income	2263031	0.7546	NS	Transportation	1330.283	0.2931	NS
Member of Family	11985824	0.1875	NS	Revenue of pigs	1.250501	0.0217	**
				C	-35503613	0.0825	
R-squared	0.509199			Adjusted R-squared	0.35818		
FOOD SECURITY							
Variable	Coefficient	Prob.	Sig.	Variable	Coefficient	Prob.	Sig.
Rice price	-7.76E-06	0.6906	NS	Revenue of pigs	-1.85E-09	0.3534	NS
Fish price	1.75E-07	0.9422	NS	Other income	1.91E-09	0.1658	NS
Kerosene price	-0.000164	0.0119	**	Farmer Education	0.007723	0.0926	*
Oil price	0.0000168	0.3364	NS	C	1.331689	0.0030	
R-squared	0.4632			Adjusted R-squared	0.32403		

*: significant in Confident Interval 90%, **: significant in Confident Interval 95%, ***: significant in Confident Interval 99%, NS: Non Significant.

The poverty level was measured by the difference between income per capita of farmer and the poverty line. The results of the regression analysis of poverty in relation to pigs keeping by the households showed that pig revenues were significantly influenced to the level of poverty. It can therefore be concluded that pigs business can be used as an optional solution to solve poverty problems in Papua, although the revenue did not influence their status of food security.

Food security was calculated by the ratio between the total household expenditure on food and the total expenses of family farmer. The result indicated that pig revenue could alleviate

poverty level of the Papuan, even it did not yet have an impact on the society food security status. The high price of food in Papua was suspected to be the cause of the difficulty of the community to enter the food secure status.

CONCLUSION

1. Household's pig production was positively influenced by the source of protein feed, land, and sow body size.
2. Pigs Revenue was significantly influenced by the prices of rice bran, sweet potatoes, the restaurant refusal as well as transportation costs.
3. Revenue pigs had positive effect on narrowing the poverty gap (PG), although it had no effect as yet on the food security status.

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CERTIFICATE



This is to certify that

TRISIWI WAHYU WIDAYATI

has participated as a

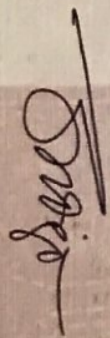
ORAL PRESENTER

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