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

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The 16th AAAP Congress

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Ministry of Agriculture

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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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AAAP

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. Jelan	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 socities, 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 desgined 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.

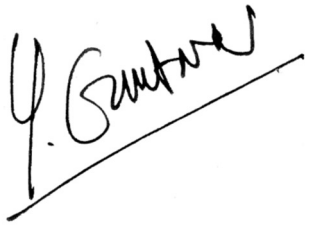
Moreover, cultural night offers us an opportunity to introduce significant culture from participants' countries and gives a spectacular performance to enjoy in order to strengthen our friendship and future cooperation. Field trip, on the other hand, provides a wonderful sightseeing to the most valuable 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 hospitability, 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).



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

CONTENTS

ORAL PRESENTATION

POSTER PRESENTATION

Rearing Dairy Goats for Reducing Malnutrition and Increasing Farmers' Income: A Case Study in Kerta Village, North Lombok, Indonesia

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ABSTRACT

Currently, goats' milk is starting to be known as a nutritious food and used to accelerate recovery of several diseases and malnutrition. Since early 2010, local government (North Lombok District) has given "rotated assistance of cross-breed goats" to farmers who potentially suffer from malnutrition in Kerta village. The study was aimed to describe the management of crossbred Etawah goats for milk production, reducing malnutrition and as an income generating activity in Kerta village, North Lombok, NTB, Indonesia. A survey was conducted on 20 respondents' (farmers who starting rearing the goats for milk production since 2010) using a census sampling technique. Primary data were obtained by a way of observations and interview based on the questionnaires, and the secondary data were gathered from government institutions. The data related to cross-breed Ettawah goats' management and their productivity were analyzed using descriptive method, and the level of farmers' income were analyzed using output-input method. The results show that the goats were reared in a semi-intensive system as a secondary job. Roughages were provided by way of cut and carry system, given *ad-libitum*, and supplemented with rice bran. The goats were milked for the average of 48 day/lactation with the daily milk production of 0.8 liter. The excess of milk produced over families' needs is a sourse income. No malnutrition is found and the farmers' monthly net incomes were increasing gradually from 2010 up to 2013 (IDR 109.456; IDR 588.939; IDR 825.161; IDR 1.218.548 respectively). The lack of farmers' knowledge in feeding of dairy goats, result in relatively low milk production. However, development of this goat's agribusiness is still feasible, and the strategy to develop this business is to invest back the does produced

Key Words: Goats agribusiness, Farmer's income, Malnutrition.

INTRODUCTION

In developing countries, commonly poverty occurs in the rural villages represent the poverty of farmers' family. In September 2012, the category of poor society in West Nusa Tenggara Province (NTB) is people who are spending of money below IDR 250.000/month/capita (Harjanto, 2013). Statistically, Anonym (2010) shows that the number of poor population in North Lombok District was the highest (21.6%) among nine Districts in NTB. It was about 13.3% nationally.

In North Lombok District, there are many villages which are having high number of poor people; one of them is "Kerta village". This village has a high number of poor people; it is about 43.1% of North Lombok's population. This data is supported by arising number infants' malnutrition up to 6.19% in that District (BPS, 2012). This problem might be solved by introducing dairy goats such as cross-breed Ettawah goats (dual purposes) which have been familiar and adaptive in Indonesia. Goats' milk has been recognized as a nutritious food and used to accelerate recovery of several diseases and malnutrition. Therefore, in early 2010 North Lombok's government has assisted the village people who have potentially suffering from malnutrition by letting them to look after cross-breed Ettawah goats to produce milk, for their family, even for sell, if there is an excess for increasing farmers' income. The system of

the assistance is "rotated assistance" which it has a role that each farmer in the first group must give the two offspring of does to other farmer in the second group and to be continued to the next groups, so both the goats'population and the number of famers involvement in this system increased. It is expected that it would be continued to be developed as home industry businesses, since this "rotated assistance" has been developed for four years at the end of 2013.

The study was aimed to describe the management of cross-breed Ettawah goats for milk production in Kerta village, North Lombok NTB, to reduce malnutrition, and to analyze the income of farmers who rearing those goats from 2010 to 2013.

MATERIALS AND METHODS

This study was conducted in Kerta Village, situated in North Lombok District, NTB. A survey was conducted on 20 respondents (farmers who started rearing the goats for milk production since 2010 or the group of farmers who received the goats at the first rotation) using a census sampling technique. Primary data related to goats' performances; management practices of dairy goats; milk production; identification of farmers; income generating of farmers and marketing strategies. The data were obtained by a way of observations and interview based on the questionnaires. While the secondary data such as the population; number of farm animals and the size of the region were gathered from government institutions. The data related to cross-breed Ettawah goats' management and their productivity; farmers' identification and marketing strategies were analyzed using descriptive method, and the level of farmers' income were analyzed using output-input method (Soekardono, 2009).

RESULTS AND DISCUSSION

Topography and climate of North Lombok District. North Lombok was originally a part of West Lombok district, but for the purpose of better service to the community because of the extension of territory and sufficient resources for generating income, on July 21, 2008, it is separated into a new district. North Lombok has a high potential in agriculture and animal husbandry because most of the North Lombok areas is land with an altitude of 500 meters above sea level and at115.46°-116.28° East longitude and 8.12°-8.55° South latitude, with total area of 809.53km². Moreover, the support of adequate air temperatures, in the range of 23 - 32^0C. The highest temperatures occur in July and the lowest in May (BPS, 2012). Rainfall (range 10 – 895 mm during the year) is sufficient to support the availability of roughages for livestock. However, most population and their livelihood is still in poor condition due to lack of natural resource management. This study found that introducing cross-breed Ettawah goat (PE) can be developed in this District because most people work in the agricultural sector and those goats adapted quickly to the environment.

The farmers identities. Related to the age aspect, the farmers could be categorized as productive employees, with an average age of 40 years, in detail about 60% (30-39 years old) and 40% (40-49 years old). However, from education point of view most farmers finished secondary school (40%) and elementary school level (35%); only 20% finished high school, and only 5% (1 person) be university graduate who is the leader of the group. Therefore, it still needs counseling from related institutions to implement such technology. This is also suggests that an opportunity to develop dairy goats in this village by involving the female family members who have not involved much yet, since the female population (51%) is higher than men population (49%). The involvement of all household members in the management will increase the net income of farmers.

Dairy goats management

Breeding Stock. In early 2010, farmers in Kerta village started rearing cross-breed Ettawah goat (for producing meat and milk) which is initiated with 40 females and 4 males for 20 farmers who recieved "rotated assistance" from local government. Those good quality goats are obtained from Kali Gesing, Central Java. The strategy to develop the population by investing back the does produced could be feasible suggestion.

The cages. Goats' cages are built near settlements in one location with the average size of 100 cm x 125 cm per head and the height about 60 cm from the ground level. At the beginning, each farmer is already preparing the goat cage size to maintain 7 to 9 goats. Mostly, the goats are kept in the cages, except when the goats are given exercise.

Source of Feeds. Carrying capacity of the land as a source of feed supply is sufficient even when dry season. The farmer utilize forages as the main feeds for their goats such as: elephant grass, field grass and foliage such as leucaena, sesbania grandiflora, gliricidia, and calliandra which are harvested from their gardens and given to goats *ad-libitum*. Drinking water was always available. Moreover, rice bran is given as additional feed. When it's price is increase they start thinking more economical way in feeding and use the waste as a feed supplement such as fermented cocoa by-product. However, they never considered to feed their goats high nutritious concentrate for high milk production. This means that the goats were reared in a semi-intensive system as a secondary job.

Mating. The offspring of both male and female goats are placed in different cages.When the female are in estrus period, they were placed in the same cage with good buck to maintain the quality of the next offspring. The first mating was done when the female goat reach 1 to 1.5 years old. The female goats were mated back one to two months after getting birth, while the length of the pregnancy is about 152 – 155 days. The litter size is about 1.5 kids with the birth weight 2.8 – 3.2 kg and 10 – 30% mortality. Most farmers did not help the goats giving birth. This is the most caution of kid death. Therefore, they need special course to have more attention to their late pregnancy does and help them when getting birth.

Milking and milk production. After getting birth, the does and kids were kept in one cage until kids reach 15 days to 30 days oldso that the kids have fully milking time, especially for colostrums consumption. After that, the does were milked by farmers for their family, particularly for their infants and kids. This helps farmers to increase their family nutrient status, so at the end 2013, no malnutrition is found. The excess of milk is sold to other people who need for accelerating recovery of several diseases (IDR 30.000/liter). Most farmers milked their does for 30 – 60 days per lactation with the average of 48 days/lactation and milk production of 0.8 liter/day. This milk production could be elevated by extending the length of milked days/lactation.

Hearth. In early 2010, when the farmers started to build dairy goat farm, the farmers could not handle their goats suffering from kinds of diseases, even to prevent them from the diseases. Consequently, the kids' mortality was the highest (31.8%) in 2010 and it was decreasing gradually to be 15.3%; 8.8%; and 8.2% in 2011; 2012; and in 2013 respectively. These results were caused by involvement of related institutions through dairy goat extension agents. Therefore, the number of dairy goat farmers was increased from 20 farmers to 100 farmers at the end 2013. While goats' population of 20 respondents are developing from 40 does and 4 males in early 2010 to be 101 does and 215 heads offspring (from 3 weeks to 10 months old) at the end 2013. The total of sold out goats from 2010 to 2013 was 451 heads, mostly for breeding stock.

Farmers' income. Farmers' income was increased gradually from year 2010 to 2013 as shown in Table 1.

Table 1. Net farm income of farmers rearing cross-breed Ettawah goat (2010 – 2013).

Item	Years			
	2010 (IDR)	2011 (IDR)	2012 (IDR)	2013* (IDR)
Total revenue	2.038.800	13.084.275	21.110.250	23.844.987
Variable cost	2.558.979	5.223.703	10.415.013	12.283.080
Fixed cost	793.300	793.300	793.300	594.975
Total cost	3.352.279	6.017.003	11.208.313	12.878.055
Net farm income	-1.313.479	7.067.272	9.901.936	10.966.932
Monthly net farm income	-109.456	588.939	825.161	1.218.548
Minimum monthly salary **	890.775	950.000	1.000.000	1.100.000

*In 2013: The activities were only nine months.
**BPS (2012).

It is interestingly to note that, for the first year (2010) the net income was negative, caused by in that time the does had not produced offspring for sale. The farmers only got money from selling the excess milk of family needs, while farmers continued spending money for variable and fixed costs (Table 1). After 2010, the net income was gradually increased up to IDR 1.218.548 in 2013. It was possibly higher than that value, because in 2013 the activities calculated only for nine months. This net income reached above the minimum monthly salary in the fourth year (2013) which was initially rearing only two does. Even this net income is an addition income because their main job is as farm worker.

IMPLICATIONS

Development of cross-breed Ettawah goats as dairy goats could reduce malnutrition in rural village and increase farmers' income. To keep the farmers rearing these goats continuously, it needs special attention and guidance from related institution.

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CERTIFICATE

16th AAAP CONGRESS

This is to certify that

A. RAI SOMANING ASIH

has participated as a

POSTER PRESENTER

at the 16th Asian-Australasian Association of Animal Production Societies Congress
"Sustainable Livestock Production in the Perspective of Food Security, Policy, Genetic Resources and Climate Change"
Universitas Gadjah Mada, Yogyakarta – Indonesia
10th -14th November 2014

President
Asian-Australasian Association
of Animal Production Societies

Mr. Yudi Guntara Noor

Chairman
Organizing Committee

Budi Guntoro, Ph.D.