



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 16<sup>th</sup> AAAP Congress



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**Proceedings  
Full Papers**  
10-14 November 2014, Yogyakarta, INDONESIA  
**The 16<sup>th</sup> AAAP Congress**



Ministry of Agriculture



Indonesian Society of Animal Sciences



Gadjah Mada University

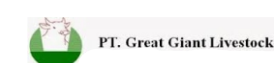
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**SUSTAINABLE LIVESTOCK PRODUCTION IN THE  
PRESPECTIVE OF FOOD SECURITY, POLICY, GENETIC  
RESOURCES, AND CLIMATE CHANGE**

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## **Cataloguing-in-Publication Data**

The 16<sup>th</sup> Asian-Australasian Associations of Animal Production Societies

Proceedings Full Papers

Sustainable Livestock Production in the Perspective of

Food Security, Policy, Genetic Resources, and Climate Change

10-14 November 2014, Yogyakarta, Indonesia / editors Subandriyo *et al*;

2825 p: ill.; 21 x 29,7 cm

Organized by Indonesian Society of Animal Sciences

In Collaboration with Ministry of Agriculture

Faculty of Animal Sciences Universitas Gadjah Mada

ISBN 978-602-8475-87-7

1. Livestock

2. Food Security

3. Policy

4. Genetic Resources

5. Climate Change

I. Title

II. Subandriyo



## 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 16<sup>th</sup> AAAP Congress**

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

As the host of the 16<sup>th</sup> AAAP Animal Science Congress, we do impress, thankful, and present a high appreciation for your participation in joining the 16<sup>th</sup> 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 16<sup>th</sup> 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 16<sup>th</sup> 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 16<sup>th</sup> AAAP Congress

## 16<sup>th</sup> 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 16<sup>th</sup> 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 16<sup>th</sup> 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 17<sup>th</sup> 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 middle right.

Sincerely Yours  
Mr. Yudi Guntara Noor  
President  
The 16<sup>th</sup> AAAP Congress

## PREFACE

The proceedings of the 16<sup>th</sup> 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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## **Carcass Characteristics of Shorn Javanese Fat-Tailed Sheep Fed By Soybean Tofu Waste**

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### **ABSTRACT**

Sheep fattening using soybean tofu waste as energy resource is commonly applied by local farmers. On the contrary, people believe that the carcass produced by sheep fed by tofu waste have more fat, so that will decrease consumers palatability. Twelve Javanese fat-tailed rams fed by soybeans tofu waste and shorn treated were fattened for twelve weeks in order to identify the differences of its carcass characteristic. The research was designed by complete random design with two factorial (2x2). First treatment was diet type (P1 = grass and concentrate and P2 = grass and concentrate and soybean tofu waste). The diets were formulated as iso-energy (TDN = 69%). The second treatment was wool shearing (C1= shorn and C2= unshorn). The daily weight gain of animals was analyzed by analyses of variance (Anova), while carcass characteristics were analyzed by analyses of covariance (Ancova), whereas half of carcass was used as covariable. The result showed that the interaction between addition 30 % of tofu waste and wool shearing was significantly affected on average daily gain of fat-tailed rams ( $P < 0.05$ ). The addition of tofu waste as feed energy resource was not affected on fat percentage of carcass ( $P > 0.05$ ) that produce fat ranged 15-20% of carcass. In could be concluded that the addition of tofu waste was not increase fat production of carcass. The Javanese fat-tailed sheep that been slaughtered at 23 kg produce 42-47% of carcass consist of 57% muscle, 20% fat and 23% bone.

**Key Words:** Javanese fat-tailed sheep, carcass characteristic, fat, soybean tofu waste

### **INTRODUCTION**

Sheep is one of the important livestock commodities in Indonesia, playing an important role in the context of agriculture. DGLHA (2013) noted that sheep population in Indonesia in 2010 reached 10.7 mio. heads and in 2011 to 11.3 mio heads. One of local sheep in Indonesia is Javanese fat-tailed. This breed is suitable to be maintained because it has a higher level of productivity than any other local sheep (Khasanah, 2007). Tofu byproduct is a waste produced from tofu production and well knows as ruminant feed which has a high nutritional value (Sugana and Duldjaman, 1983). Rianto *et al.* (2004) mentioned that the higher the amount of tofu byproduct consumed the higher of body weight gain of sheep and eventually gained the slaughter weight. However, the disadvantage of using tofu byproduct as feed for sheep is that this feed containing high water content so that the dry matter intake of sheep is low (Wahyuni, 2003). In addition, according to sheep farmers who have applied tofu byproduct for feed, the carcass of sheep has high fat and it does not meet market preference.

Shearing wool on sheep is one of management that often recommended for sheep farmers. Wool is as a protective covering of the body to environmental temperature stress. Tomazweska *et al.* (1993) stated that shearing wool will increase sheep comfort and decrease invasion of ecto-parasites. Nevertheless, the study that focused on carcass characteristics of sheep that feed by tofu byproduct is rarely found. The objective of this research was to evaluate the different characteristic of carcass components of Javanese Fat-Tailed sheep that fattened by different type of diets and shorn treatment.

## MATERIALS AND METHODS

This research was conducted in the laboratory of Small Ruminants, Department of Animal Production and Technology, Faculty of Animal Science, Bogor Agricultural University. This study used 12 heads of Javanese fat-tailed lambs with initial weight  $17.40 \pm 1.10$  kg. Each of animals remained in individual indoors cage for fattening process raised in individual cages for three months. The rations consisted of forage, concentrates and soybean byproduct. The tofu byproduct was mixed with the concentrate. The comparison of forage to concentrate is 30: 70 based on dry matter. Nutritional value of rations consist of crude protein 13% and TDN 69%. Substitution of 30% tofu byproduct was conducted in feed trial. Slaughtering was done according to standard halal methods at a slaughter house plant in Laboratory of Small Ruminant, Department of Animal Production and Technology, Faculty of Animal Science, Bogor Agricultural University. After the animal was skinned, the other parts of the body were weighed in hot condition before was chilled. Carcass was weighed and recorded as hot carcass weights. Carcass percentage was calculated from slaughter weight. After carcasses were chilled at 4 °C for 12 h, carcass was split along vertebral column in two half. The left side was dissected and recorded for carcass tissue (muscle, fat and bone). Empty body weight was calculated by subtracting the weight of gastro-intestinal contents from slaughter weight. Data of carcass was expressed in average values and standard error (SE) in weight (kg) and percent (%) of slaughter weight. In order to determine the differences of carcass and non carcass components between breeds (Priangan and Javanese Fat-tailed Sheep), the data were statistically analyzed. The daily weight gain of animals was analyzed by analyses of variance (Anova), while carcass characteristics were analyzed by analyses of covariance (Ancova), whereas half of carcass was used as covariable.

## RESULTS AND DISCUSSION

### Carcass characteristics

There were significant differences of slaughter weight between type of feed ( $P < 0.01$ ) (Table 2.).

Table 2. Carcass characteristic of Javanese fat-tailed sheep

Variable	Shearing	Feed (tofu waste)		Average
		Without	With	
Slaughter weight (kg)	Unshorn	$17.40 \pm 0.88$	$22.05 \pm 0.83$	$19.72 \pm 0.57$
	Shorn	$16.94 \pm 0.88$	$23.09 \pm 0.95$	$20.02 \pm 0.57$
	Average	$17.17 \pm 0.66A$	$22.57 \pm 0.66B$	
Empty body weight (kg)	Unshorn	$14.38 \pm 0.54$	$19.22 \pm 0.50$	$16.80 \pm 0.25$
	Shorn	$13.94 \pm 0.59$	$20.23 \pm 0.63$	$17.08 \pm 0.29$
	Average	$14.16 \pm 0.51$	$19.72 \pm 0.51$	
Hot carcass (kg)	Unshorn	$7.08 \pm 0.37$	$9.61 \pm 0.34$	$8.34 \pm 0.17$
	Shorn	$6.71 \pm 0.41$	$10.47 \pm 0.44$	$8.59 \pm 0.17$
	Average	$6.90 \pm 0.35$	$10.04 \pm 0.35$	
Chilled carcass (kg)	Unshorn	$6.74 \pm 0.37$	$9.17 \pm 0.34$	$7.96 \pm 0.17$
	Shorn	$6.38 \pm 0.41$	$10.10 \pm 0.44$	$8.24 \pm 0.17$
	Average	$6.56 \pm 0.35$	$9.64 \pm 0.35$	
Carcass percentage (%)	Unshorn	$40.68 \pm 1.70$	$43.49 \pm 1.58$	$42.08 \pm 0.79$
	Shorn	$39.60 \pm 1.88$	$45.38 \pm 2.01$	$42.49 \pm 0.74$
	Average	$40.14 \pm 1.61$	$44.44 \pm 1.61$	$42.49 \pm 1.61$

Slaughter weight of sheep fed with the addition of tofu byproduct was heavier than without the addition of by product ( $22.57$  vs  $17.17$  kg). Slaughter weight of sheep fed by tofu byproduct (P2) has  $22.57$  kg. It could be caused by the dry matter consumption of sheep at P2 was higher than P1 ( $1.41$  vs  $0.63$  kg) so that daily gain of P2 was relatively higher than P1.

Hudalloh *et al.* (2007) mentioned than one factor affected of slaughter weight is dry matter intake.

Carcass percentage in this study was relatively higher compared to that reported by Sunarlim dan Setiyanto (2005) that was (42.49 vs 39.1%) of carcass. However, this value was relatively lower than study conducted by Baihaqi dan Herman (2013) who stated that carcass percentage of Javanese fat-tailed sheep reached until 55.4% and 55.6% at slaughter weight 32.5 and 40, respectively. Soeparno (1994) mentioned that carcass percentage was correlated to slaughter weight of livestock.

### **Carcass composition of Javanese fat-tailed sheep**

The percentage of carcass composition in this study can be shown in Table 3.

**Table 3.** Percentage of carcass composition of Javanese fat-tailed sheep.

Variable	Shearing	Feed (tofu waste)		Average
		Without	With	
Muscle (%)	Unshorn	56.33 ± 3.31	58.16 ± 3.31	57.25 ± 2.34
	Shorn	61.43 ± 3.31	54.91 ± 3.31	58.17 ± 2.34
	Average	58.88 ± 2.34	56.54 ± 2.34	
Fat (%)	Unshorn	13.79 ± 3.72	18.00 ± 3.72	15.90 ± 2.63
	Shorn	10.56 ± 3.72	22.28 ± 3.72	16.42 ± 2.63
	Average	12.18 ± 2.63	20.14 ± 2.63	
Bone (%)	Unshorn	27.59 ± 1.15a	21.90 ± 1.15b	24.74 ± 0.81
	Shorn	25.15 ± 1.15a	20.65 ± 1.15b	22.90 ± 0.81
	Average	6.90 ± 0.81	10.04 ± 0.81	

Table 3 shows that muscle and fat component was not affected by treatment ( $P > 0.05$ ). This result indicated that supplementation of tofu byproduct did not cause increasing of fat component in carcass. The average value of muscle, fat and bone of sheep fed by tofu waste is 56.54, 20.14 and 21.27% respectively. In general, total lean and bone decreased while total fat of carcass increased with increasing sheep weight (Abdullah & Qudsieh, 2008).

### **CONCLUSION**

The addition of tofu waste was not increase fat production of carcass. The Javanese fat-tailed sheep that been slaughtered at 23 kg produce 42-47% of carcass consist of 57% muscle, 20% fat and 23% bone.

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