

**BUKTI KORESPONDENSI  
ARTIKEL DI PROSIDING INTERNASIONAL**

Judul Artikel : Carcass commercial cuts percentage of Ram raised under different energy-protein ratio feeding and different slaughtered weight  
Prosiding : Proceedings The 17th Asian-Australasian Association of Animal Production Societies Animal Science Congress. Fukuoka Japan 22-25 August 2016  
Penulis : Endang Purbowati, Rega Dianzha Yudha, Edy Rianto

No	Perihal	Tanggal
1.	Abstrak dan Bukti kirim abstrak telah diterima	21 April 2016
2.	Invitation letter	10 Mei 2016
3.	Pengumuman tentang Prosiding	22 Juni 2016
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9.	Daftar Isi Prosiding	25 Agustus 2016
10.	Prosiding AAAP 2016	25 Agustus 2016

**Abstrak yang Dikirim**  
**(21 April 2016)**

# **Carcass Commercial Cuts Percentage of Ram Raised Under Different Energy-Protein Ratio Feeding and Different Slaughtered Weight**

By

**Endang Purbowati, Rega Dianzha Yudha, and Edy Rianto**

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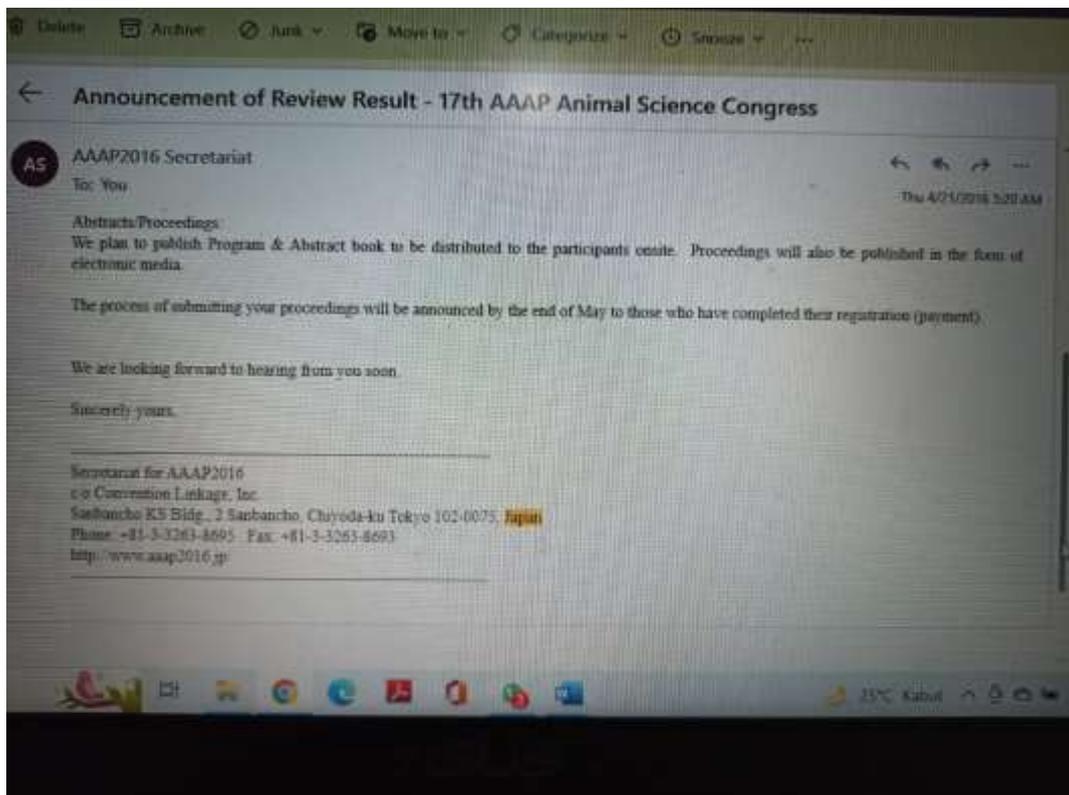
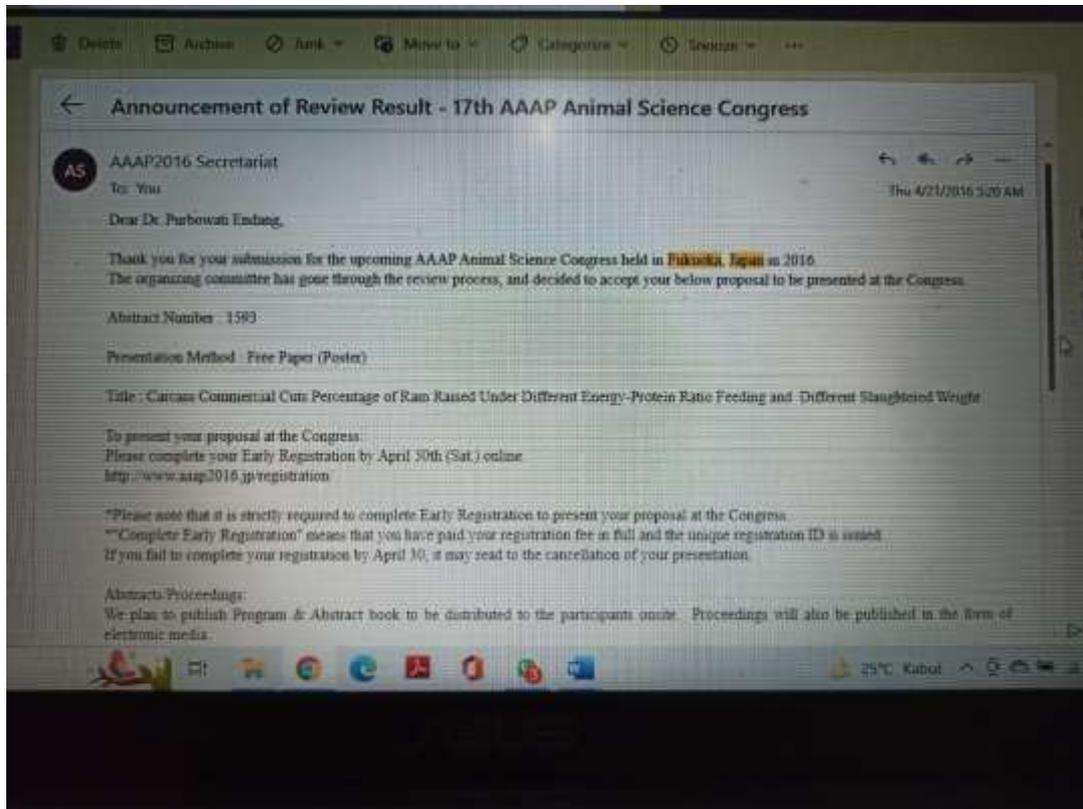
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## **ABSTRACT**

The study aimed to determine the effect of dietary energy-protein ratio of complete feed on the carcass commercial cuts percentage (flank, leg, loin, rib, breast, shoulder-neck and shank) of ram at different slaughtered weight. Twenty four heads of thin tailed rams with 3-5 months of age and initial body weight (BW) of 8.7 to 15.5 kg (CV = 15.01%) were used in this experiment using A Generalized Randomized (Complete) Block Design for four feeding treatments. The treatments were R1 (14.48% crude protein (CP) and 50.46% total digestible nutrients (TDN), R2 (17.35% CP and 52.61% TDN), R3 (15.09% CP and 58.60% TDN), and R4 (17.42% CP and 57.46% TDN). Rams were grouped based on the initial BW, i.e. Light/B1 (= 10.73±1.37 kg; slaughtered at 15 kg), Moderate/B2 (= 12.76±0.54 kg; slaughtered at 20 kg) and Heavy/B3 (= 14.91±0.36 kg; slaughtered at 25 kg). Analysis of variance and Duncan's Multiple Range Test were used to analyze data, respectively. The results showed that slaughter weight, carcass weight, carcass percentage, and carcass commercial cuts percentage (except flank) of rams raised at different feeding treatments were similar ( $P>0.05$ ). The different feeding resulted in an average of 20 kg slaughter weight, 8.909 kg carcass weight and 44.18% carcass percentage, while the percentage of shoulder-neck, leg, loin, rack, breast and shank were 32.05, 34.23, 9.32, 8.70, 9.14 and 4.05%, respectively. The highest percentage of flank was observed at R1 (2.70%), followed by R3 (2.56%), R2 (2.40%) and R4 (2.26%), respectively. Carcass percentage was increased ( $P<0.05$ ) with increasing slaughter weight. Percentage leg and shank were decreased ( $P<0.05$ ) with increasing slaughter weight, while the percentage of other commercial cuts were not different ( $P>0.05$ ). Conclusion of this study was dietary energy-protein ratio of feeds influenced the percentage of flank, while slaughtered weight influenced carcass, leg, and shank percentages.

Keywords: Sheep, energy-protein ratio, slaughter weight, carcass commercial cuts

# Bukti kirim abstrak telah diterima (21 April 2016)



# **ARTIKEL YANG DIKIRIM**

# **Carcass Commercial Cuts Percentage of Rams Raised Under Different Energy-Protein Ratio Feeding and Different Slaughter Weight**

By

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## **ABSTRACT**

A study was carried out to determine the effect of dietary energy-protein ratio on the carcass commercial cuts percentage (flank, leg, loin, rib, breast, shoulder-neck and shank) of rams at different slaughter weight. The study used 24 thin tail rams aged 3-5 months and weighed 8.7 to 15.5 kg (CV = 15.01%). A Generalized Randomized (Complete) Block Design was used in this study with 4 different feeding treatments, i.e. R1 = 14.48% crude protein (CP) and 50.46% *total digestible nutrients* (TDN), R2 = 17.35% CP and 52.61% TDN, R3 = 15.09% CP and 58.60% TDN, and R4 = 17.42% CP and 57.46% TDN. Rams were grouped based on the initial body weight, i.e. B1 = 10,73±1,37 kg (slaughtered at 15 kg), B2 = 12,76±0,54 kg (slaughtered at 20 kg) and B3 = 14,91±0,36 kg (slaughtered at 25 kg). The results showed that slaughter weight, cold carcass weight, cold carcass percentage, and carcass commercial cuts percentage (except flank) were not significantly different ( $P>0.05$ ) among feeding treatments. In average, the animals had 20 kg slaughter weight, 8909.58 g cold carcass weight, 44.18% cold carcass percentage. Whilst, the average of percentage of shoulder-neck, leg, loin, rack, breast and shank were 32.05; 34.23; 9.32; 8.70; 9.14; and 4.05%, respectively. On the other hand, the highest percentage flank was found in R1 (2.70%), followed by R3 (2.56%), R2 (2.40%) and R4 (2.26%). Cold carcass percentage increased ( $P<0.05$ ) with increasing slaughter weight. The percentage of leg and shank decreased ( $P<0.05$ ) with increasing slaughter weight, while the percentage of other commercial cuts are not significantly different ( $P>0.05$ ) among slaughter weights. The conclusion of this study is that energy-protein ratio of the feed does not affect the percentage of commercial cuts (except flank), while the slaughtered weight affects the percentage of carcass, leg, and shank.

Keywords: Sheep, dietary energy-protein ratio, slaughter weight, carcass commercial cuts

## **INTRODUCTION**

The carcass is the main yield expected from the sheep. The carcass yield measurements, both relative and actual weights are important as these are the criteria used to evaluate animal productivity. The carcass is the result of a biological process affected by genetic, environmental and management factors (Cardoso et al., 2013).

Carcass weight of sheep is affected by slaughter weight, which in turn is affected by feed intake. Protein and energy are the main nutrients required by the animal. Protein is found in all living cells, where they are intimately with all phases of activity that constitute the life of cell. Dietary energy is used for production after satisfying the requirement of maintenance. A young

growing animal stores protein in new tissues, while an adult stores relatively more energy in fat (McDonald et al., 1991). Energy and protein interact because dietary protein is a source of dietary energy, because dietary energy is needed for protein turnover and deposition and because deposited protein represents part of the body's energy store (Boorman, 1980).

Carcass traits are greatly modified by slaughter weight (Galvani et al., 2008). Hot carcass weight of Barki lambs increased significantly ( $P < 0.01$ ) with increasing slaughter weight from 30 to 60 kg (Shehata, 2013). Similar results were reported by Galvani et al. (2008), that dressing percentage of Texel x Ile de France crossbred feedlot lambs increased linearly with increased slaughter weight ( $P \leq 0.01$ ).

The proportions of the carcass cuts are an important index for the commercial evaluation of the carcass and have different economic value. Factors such as genetics, diet, slaughter weight, sex among others, are responsible for differences in cuts between carcasses (Cardoso et al., 2013). This study was carried out to determine the effect of feed energy-protein ratio of complete feed on the carcass commercial cuts percentage (flank, leg, loin, rib, breast, shoulder-neck and shank) of ram at different slaughtered weight.

## MATERIALS AND METHODS

This study used 24 thin-tailed rams, aged 3-5 months and weighed 8.7 to 15.5 kg (CV = 15.01%). The rams were kept in individual pens and fed a diet composed of rice straw (25%), and a concentrate mix 75% (fish meal, soybean meal, *Leucaena leucocephala* leaf meal, rice bran, cassava meal, molasses, and mineral), and formulated according to treatments.

A Generalized Randomized (Complete) Block Design was used in this experiment with 4 different feeding treatments, i.e. R1 = 90.73% dry matter (DM), 14.48% crude protein (CP) and 50.46% *total digestible nutrients* (TDN), R2 = 90.82% DM, 17.35% CP and 52.61% TDN, R3 = 89.01% DM, 15.09% CP and 58.60% TDN, and R4 = 90.11% DM, 17.42% CP and 57.46% TDN. Rams were grouped based on the initial body weight, i.e. B1 = 10,73±1,37 kg (slaughtered at 15 kg), B2 = 12,76±0,54 kg (slaughtered at 20 kg) and B3 = 14,91±0,36 kg (slaughtered at 25 kg). Dry matter intake (DMI), CP intake, and TDN intake were recorded.

The rams were slaughtered after a 24 hour fasting period. Before being slaughtered, the animals was weighed individually. The animals were killed by cutting their jugular vena, throat and esophagus removing. The carcass was obtained after removal of the head, feet, skin, digestive tract and internal organs, except kidneys and kidney fat. The carcass was weighed (hot weight), then two hours later the carcass was reweighed (cold weight). The carcass was then halved longitudinally by a band saw, after the removal of tail, kidneys and kidney fat. Right carcass half was then cut into seven joints: flank, leg, loin, rack, breast, shoulder with neck, and shank (Figure 1). The percentage of each cut was calculate. Analysis of variance and Duncan's Multiple Range Test were used to analyze the data (Steel and Torrie, 1980).

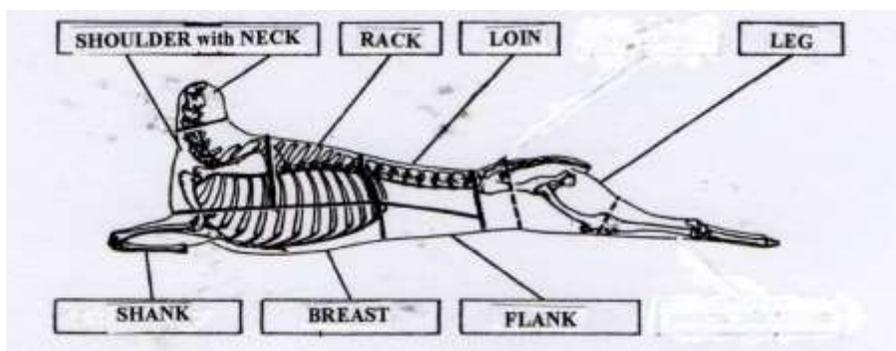


Figure 1. Carcass commercial cuts (Soeparno, 2005)

## RESULTS AND DISCUSSION

The main characteristics of sheep carcasses from different energy-protein ratio feeding are presented in Table 1. The results showed that slaughter weight, cold carcass weight, cold carcass percentage, and carcass commercial cuts percentage (except flank) were not significantly different ( $P>0.05$ ) among treatments.

Table 1. Slaughter weight, cold carcass weight, dressing percentage, carcass commercial cuts percentage, and dry matter intake, crude protein intake, and TDN intake of ram raised under different dietary energy-protein ratio

Variables	R1	R2	R3	R4
Slaughter weight (kg)	20.42 <sup>a</sup>	19.58 <sup>a</sup>	20.05 <sup>a</sup>	19.97 <sup>a</sup>
Cold carcass weight (g)	8,966 <sup>a</sup>	8,631 <sup>a</sup>	8,898 <sup>a</sup>	9,142 <sup>a</sup>
Dressing percentage (%)	43.91 <sup>a</sup>	44.08 <sup>a</sup>	44.38 <sup>a</sup>	45.78 <sup>a</sup>
Percentage of carcass commercial cuts (%)				
- Shoulder with neck	33.09 <sup>a</sup>	31.90 <sup>a</sup>	31.24 <sup>a</sup>	32.46 <sup>a</sup>
- Leg	33.83 <sup>a</sup>	34.12 <sup>a</sup>	34.72 <sup>a</sup>	34.03 <sup>a</sup>
- Loin	9.30 <sup>a</sup>	9.22 <sup>a</sup>	9.08 <sup>a</sup>	9.80 <sup>a</sup>
- Rack	8.31 <sup>a</sup>	8.71 <sup>a</sup>	8.73 <sup>a</sup>	9.22 <sup>a</sup>
- Breast	8.80 <sup>a</sup>	9.62 <sup>a</sup>	9.63 <sup>a</sup>	8.37 <sup>a</sup>
- Flank	2.70 <sup>c</sup>	2.40 <sup>ab</sup>	2.56 <sup>bc</sup>	2.26 <sup>a</sup>
- Shank	4.00 <sup>a</sup>	4.05 <sup>a</sup>	4.05 <sup>a</sup>	3.87 <sup>a</sup>
DMI (g/day)	956.35 <sup>b</sup>	966.94 <sup>b</sup>	827.94 <sup>a</sup>	850.55 <sup>a</sup>
CP intake (g/day)	138.51 <sup>b</sup>	140.04 <sup>b</sup>	119.91 <sup>a</sup>	123.18 <sup>a</sup>
TDN intake (g/day)	480.24 <sup>a</sup>	535.09 <sup>a</sup>	499.99 <sup>a</sup>	345.48 <sup>a</sup>

<sup>a, b, c</sup> Different letters in the same raw are significantly different ( $P<0,05$ ), using Duncan test

The non-significant difference in carcass percentage and carcass commercial cuts percentage in this study occurred because of the fact that the slaughter weight and cold carcass

weight no significant differences ( $P>0.05$ ). This was in accordance with the opinion of Soeparno (2005), that the weight of carcass weight affects carcass commercial cuts. Slaughter weights, carcass weights and dressing percentages in this study were not significantly different ( $P>0.05$ ) among the treatments, because the energy intake was not significantly different ( $P>0.05$ ) either. According to Blakely and Bade (1985), the main nutrients needed for fattening animals is energy. Rianto et al. (2006) stated that an increase in dietary energy intake will be followed by an increase in energy deposition in the body, increasing energy deposition will be used to accelerate the rate of metabolism and establish fat deposition. The dietary energy intake of sheep in this study were similar, so that the energy deposited was also relatively the same.

The percentage of flank of R4 was the lowest ( $P < 0.05$ ), followed by R2, R3 and R1. This was so because the weights of flank in R4 was the lowest, but the carcass weight was the highest. Hasnudi (2004) reported that while the empty body weight increased, the flank weight was relatively stable, so the flank percentage was getting lower as the body weight increased.

Table2. Slaughter weight, cold carcass weight, dressing percentage, carcass commercial cuts percentage, and dry matter intake, crude protein intake, and TDN intake of ram at different slaughter weight

Variables	B1	B2	B3
Slaughter weight (kg)	15.09 <sup>a</sup>	19.86 <sup>b</sup>	25.06 <sup>c</sup>
Cold carcass weight (g)	6,266.75 <sup>a</sup>	8,918.75 <sup>b</sup>	11,543.25 <sup>c</sup>
Dressing percentage (%)	41.52 <sup>a</sup>	44.93 <sup>b</sup>	46.07 <sup>b</sup>
Percentage of carcass commercial cuts(%)			
- Shoulder with neck	31.92 <sup>a</sup>	31.98 <sup>a</sup>	32.62 <sup>a</sup>
- Leg	34.94 <sup>b</sup>	34.25 <sup>ab</sup>	33.33 <sup>a</sup>
- Loin	9.11 <sup>a</sup>	9.52 <sup>a</sup>	9.42 <sup>a</sup>
- Rack	8.76 <sup>a</sup>	8.63 <sup>a</sup>	8.84 <sup>a</sup>
- Breast	8.34 <sup>a</sup>	9.37 <sup>a</sup>	9.60 <sup>a</sup>
- Flank	2.45 <sup>a</sup>	2.45 <sup>a</sup>	2.54 <sup>a</sup>
- Shank	4.49 <sup>b</sup>	3.83 <sup>ab</sup>	3.65 <sup>a</sup>
DMI (g/day)	711.91 <sup>a</sup>	913.87 <sup>b</sup>	1,075.56 <sup>c</sup>
CP intake (g/day)	103.10 <sup>a</sup>	132.36 <sup>b</sup>	155.77 <sup>c</sup>
TDNintake (g/day)	381.95 <sup>a</sup>	396.94 <sup>a</sup>	616.71 <sup>a</sup>

<sup>a, b, c</sup> Different letters in the same raw are significantly different ( $P<0,05$ ), using Duncan test

Data in Table 2 show that carcass weight and percentage increased with slaughter weight. These findings were in agreement with the statement of Cardoso et al. (2013), that animal carcass production is influenced by slaughter weight, which in turn is affected by the feed intake. An increase in feed intake will result in higher slaughter weight.

The percentage of leg and shank were significantly different ( $P < 0.05$ ) among slaughter weights. The percentage of leg and shank of B3 were the lowest, followed by B2 and B1. These findings indicated that leg and shank were early mature compared with other parts of the body. This was in agreement with the statement of Tillman et al. (1991), that head and leg bones reach maturity faster than bones of shoulder, pin bones and muscles. Thus while the other parts of the

grow, leg and shank stop growing at certain stage of growth, so that the percentage of leg and shank are lower than the other parts of carcass. This results is also confirmed by the results obtained by Tobing et al. (2004), that the weight of head, feet and viscera decline their growth rate at the beginning of life, while the other parts still continue to grow. Consequently, the weight of leg and shank did not increase with the increasing slaughter weight, resulting in low percentage of leg and shank in higher slaughter weight as occurred in animals of B3.

## CONCLUSIONS

The conclusion of this study is that dietary energy-protein ratio does not affect the percentage of commercial cuts (except flank) of rams, while rams slaughter at higher body weight had higher carcass percentage, but lower leg and shank percentage.

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# BUKTI KIRIM ARTIKEL DITERIMA

Dear Purbowati

Thank you for your paper submission.

We confirm receiving the registration of your abstract for the 17th AAAP Animal Science Congress.

Your Abstract Number is: [1593]

Your Abstract Number and the Password that you created are necessary in case you want to make changes to your abstract, so please have both pieces of information readily when making any such changes.

Thank you for your patience and kind co-operation.

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Secretariat for the 17th AAAP Animal Science Congress

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(10:00 am to 5:30 pm (JST), except on Saturday, Sunday and Public Holidays)

FAX: +81-(0)3-3263-8693

E-mail: [aaap2016@c-linkage.co.jp](mailto:aaap2016@c-linkage.co.jp)

Dear Dr. Purbowati Endang,

Thank you for your submission for the upcoming AAAP Animal Science Congress held in Fukuoka, Japan in 2016.

The organizing committee has gone through the review process, and decided to accept your below proposal to be presented at the Congress.

Abstract Number : 1593

Presentation Method : Free Paper (Poster)

Title : Carcass Commercial Cuts Percentage of Ram Raised Under Different Energy-Protein Ratio Feeding and Different Slaughtered Weight

To present your proposal at the Congress:

Please complete your Early Registration by April 30th (Sat.) online.

<http://www.aaap2016.jp/registration/>

\*Please note that it is strictly required to complete Early Registration to present your proposal at the Congress.

\*\*"Complete Early Registration" means that you have paid your registration fee in full and the unique registration ID is issued.

If you fail to complete your registration by April 30, it may read to the cancellation of your presentation.

Abstracts/Proceedings:

We plan to publish Program & Abstract book to be distributed to the participants onsite. Proceedings will also be published in the form of electronic media.

The process of submitting your proceedings will be announced by the end of May to those who have completed their registration (payment).

We are looking forward to hearing from you soon.

Sincerely yours,

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Secretariat for AAAP2016

c/o Convention Linkage, Inc.

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<http://www.aaap2016.jp/>

Dear Dr. Purbowati Endang,

Thank you very much for your registration for the Congress.  
We are herein informing you of the Proceeding Registration.

[Proceeding]

Registration page to submit Proceeding will open on AAAP2016 website.  
Submission Period: June 24 (Fri) - July 15 (Fri)

ID and Password are required to login.

- \* Word count of Proceeding up to around 2,400 words
- \* Charts and/or diagrams up to 5 items

We highly appreciate the warm messages of concern and encouragement from many of you for the suffering of major earthquakes which took place in Kumamoto on April 14 and 16.

Nevertheless, we'd like to ask you not to worry too much to come to Fukuoka, since the venues of AAAP2016 are reasonably away from the epicenter.

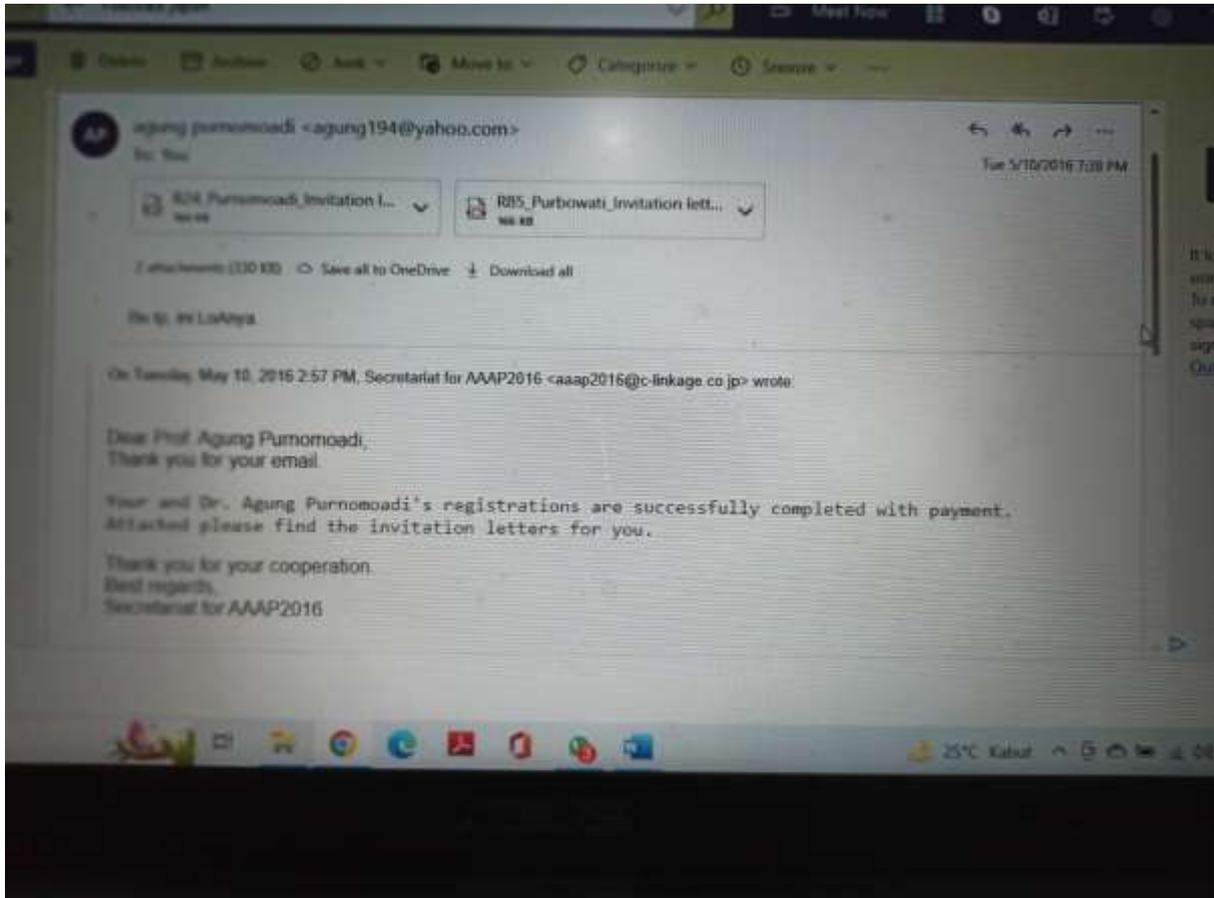
We look forward to meeting you soon in August

Should you have any question, please feel free to contact us.  
Sincerely yours,

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Secretariat for AAAP2016  
c/o Convention Linkage, Inc.  
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Phone: +81-3-3263-8695 Fax: +81-3-3263-8693  
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# Invitation Letter

## (10 Mei 2016)





**17<sup>th</sup> Asia Australasian Association of Animal Production Society (17<sup>th</sup> AAAP)**

Dates: 22-25 August 2016

Venue: Kyushu Sangyo University, Fukuoka, Japan

Website: <http://www.aaap2016.jp/>

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May 10, 2016

Dear Dr. Purbowati Endang (S000085),  
Fac. Animal and Agric. Sci., Diponegoro University

We would like to extend to you our warm invitation to participate in the 17th Animal Science Congress of AAAP to be held in Fukuoka, Japan from 22nd to 25th August 2016.

We are glad to announce that your paper 1593 entitled “Carcass Commercial Cuts Percentage of Ram Raised Under Different Energy-Protein Ratio Feeding and Different Slaughtered Weight” has been accepted and that your registration has been confirmed for the 17th Animal Science Congress of AAAP.

It is our sincere hope that you will be able to attend the Congress and present your study. Through the Congress you will find out the latest findings and practices in the field of Animal Science. We believe that your participation with your valuable knowledge will greatly contribute to the success of the Congress.

Please kindly be reminded that the funds to participate in 17th Animal Science Congress of AAAP are not provided by the organizers. Therefore, this invitation does not include any financial support for your travel, registration fees or local expenses once you arrive in Japan. We appreciate your kind understanding and consensus on this matter.

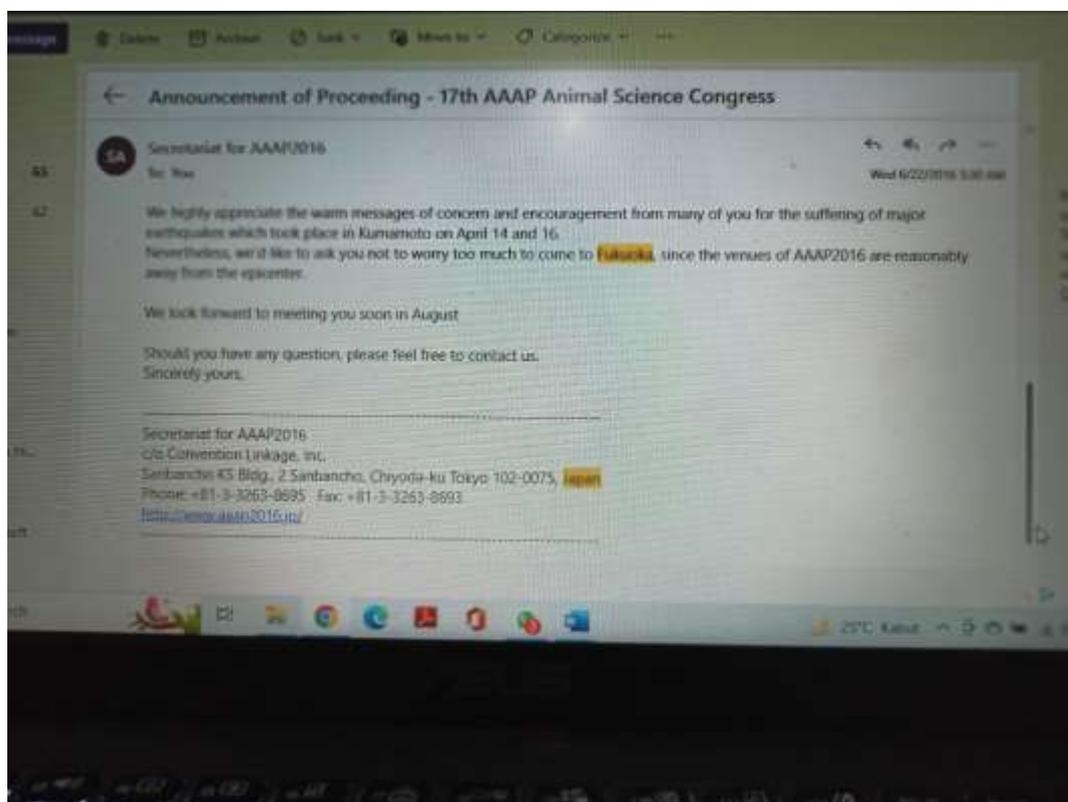
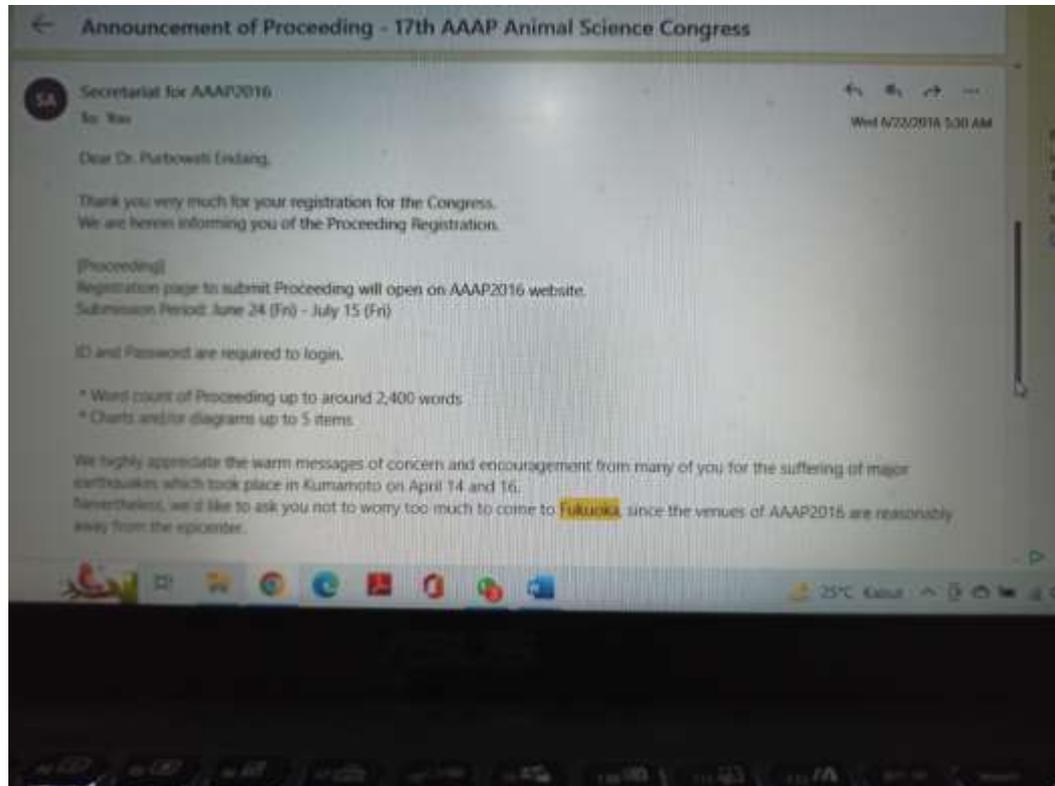
We look forward to your attendance at 17th Animal Science Congress of AAAP.

Sincerely yours,

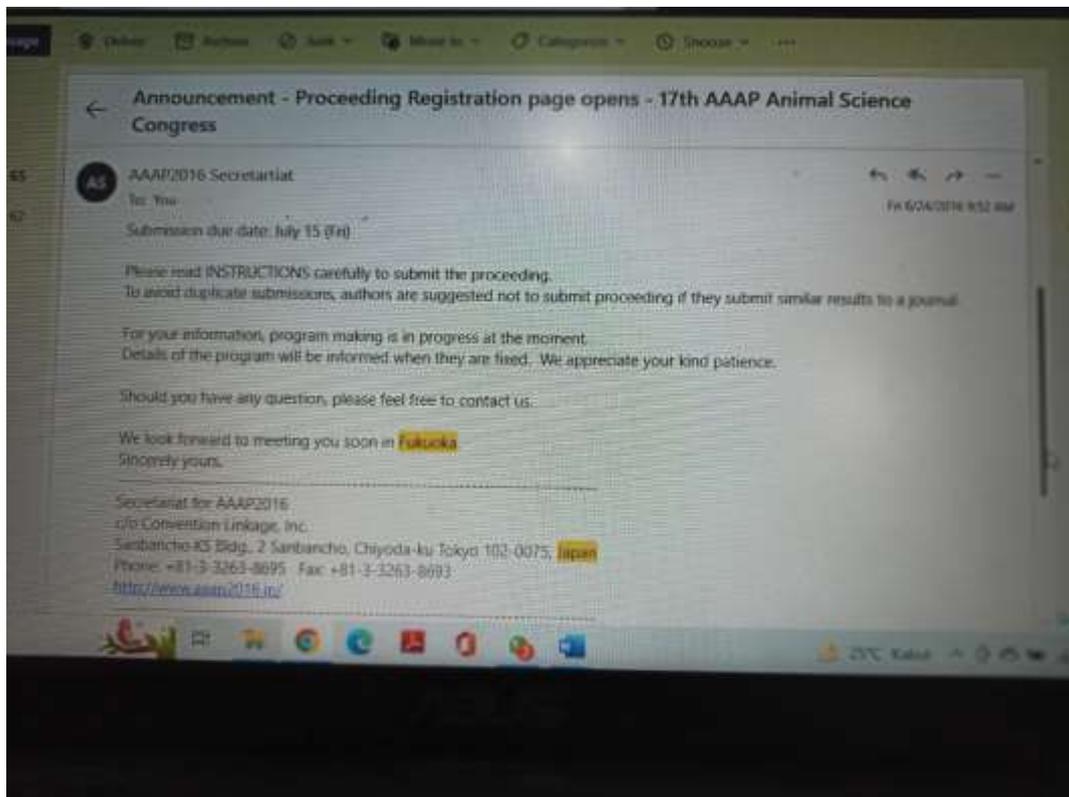
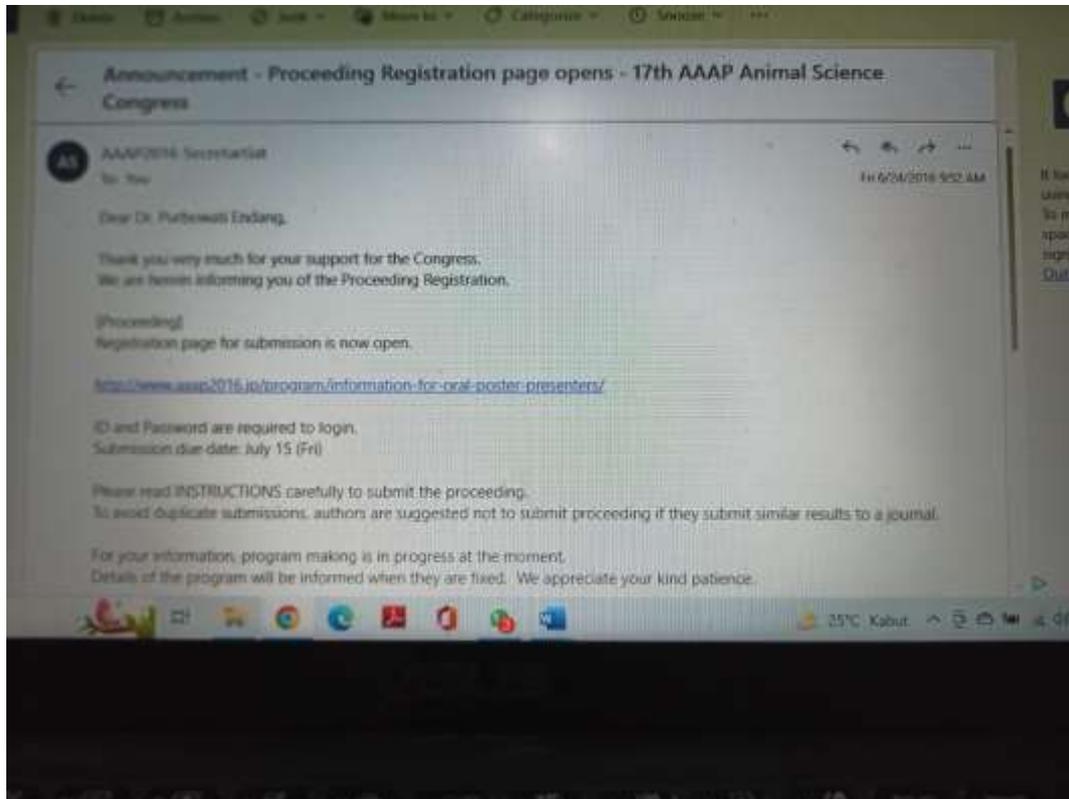
Mitsuhiro Furuse  
President of 17th AAAP

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E-mail: [aaap2016@c-linkage.co.jp](mailto:aaap2016@c-linkage.co.jp)

# Pengumuman tentang Prosiding (22 Juni 2016)

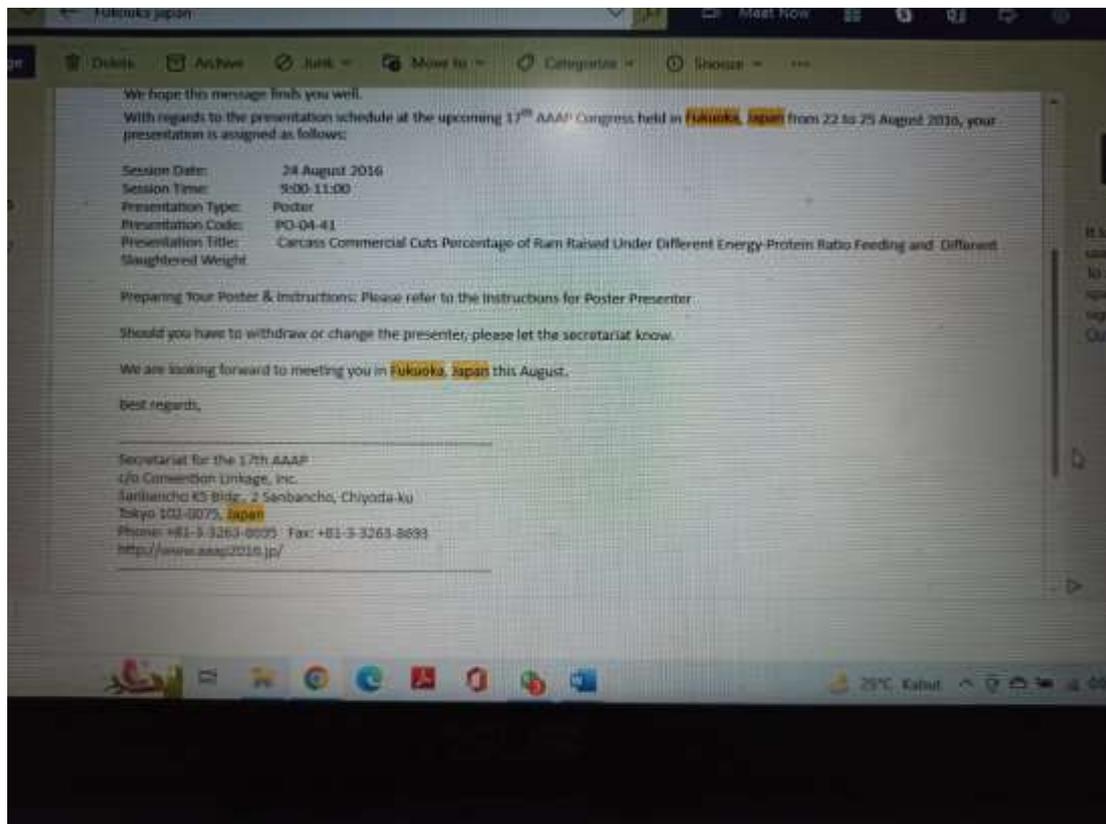
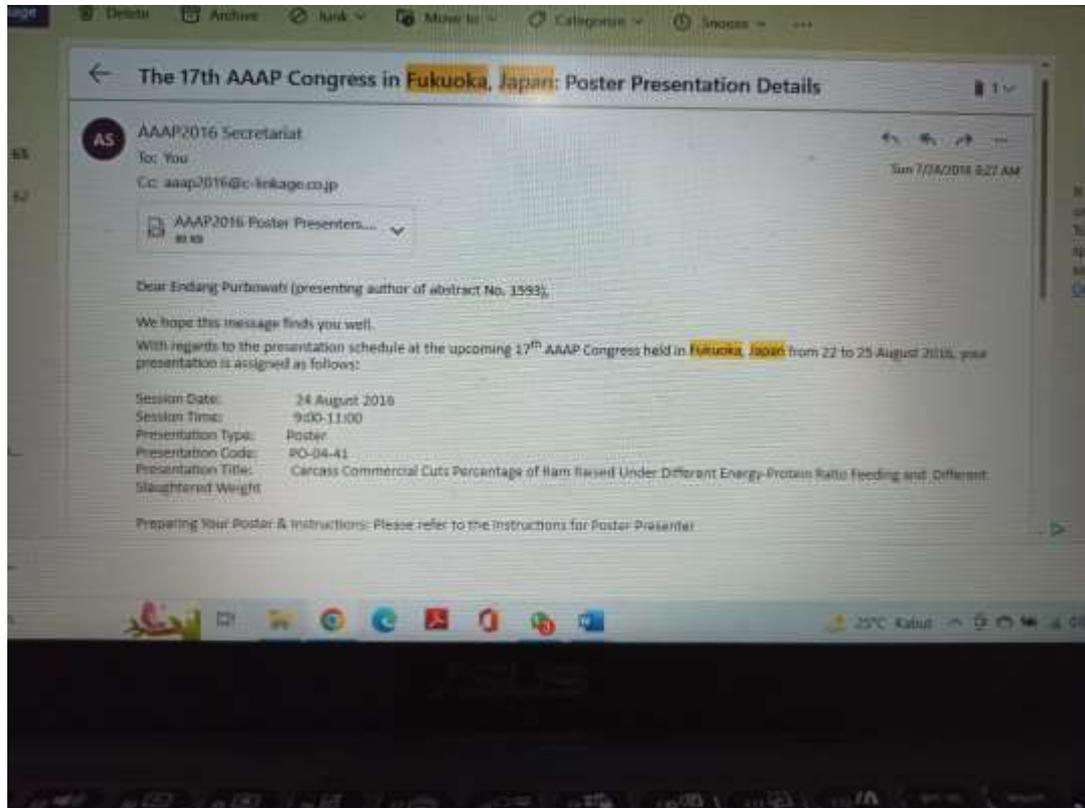


# Pengumuman tentang Regristrasi Prosiding (24 Juni 2016)



# Poster Presentation Details

## (24 Juli 2016)



## [Poster Presenters]

### (1) Poster Panel

- The secretariat will prepare a panel with your poster number. Pins will be provided along with the board. Placing your poster with any other materials (i.e. adhesive tapes) is prohibited.

### (2) Poster size

- The size of the poster panel is W115 x H175 cm (see right image). Please prepare your posters to fit in this size. Each presenter is responsible for preparing their posters with the title, name(s) of author(s) and institution(s).

### (3) Poster Title

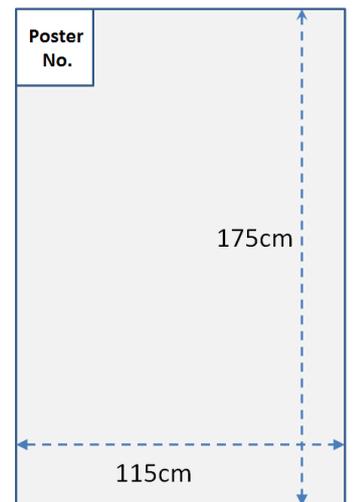
- Please prepare a slip with title, name(s) of author(s), and institution(s), if not included in their posters.

### (4) Poster Discussion

- The first half of each session will be allocated to presentations for odd-numbered posters. During this time, presenters should be ready in front of their panel to make a presentation and answer questions. The second half of each session will be allocated to presentations for even-numbered posters.

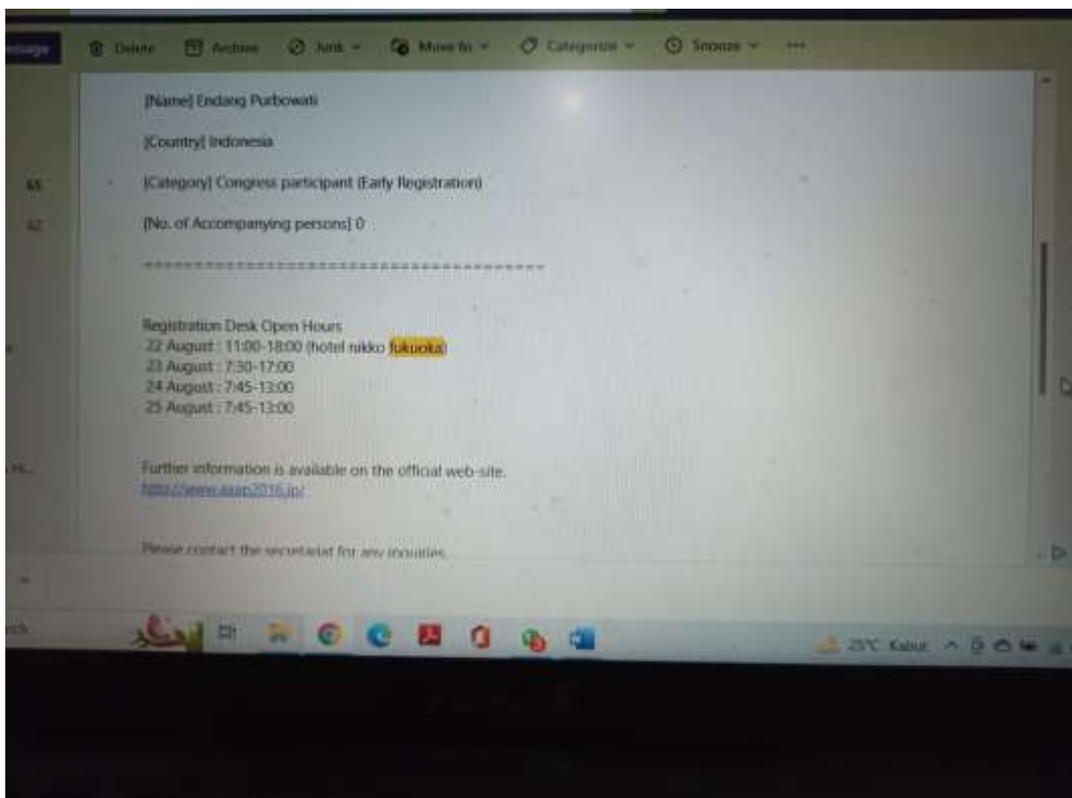
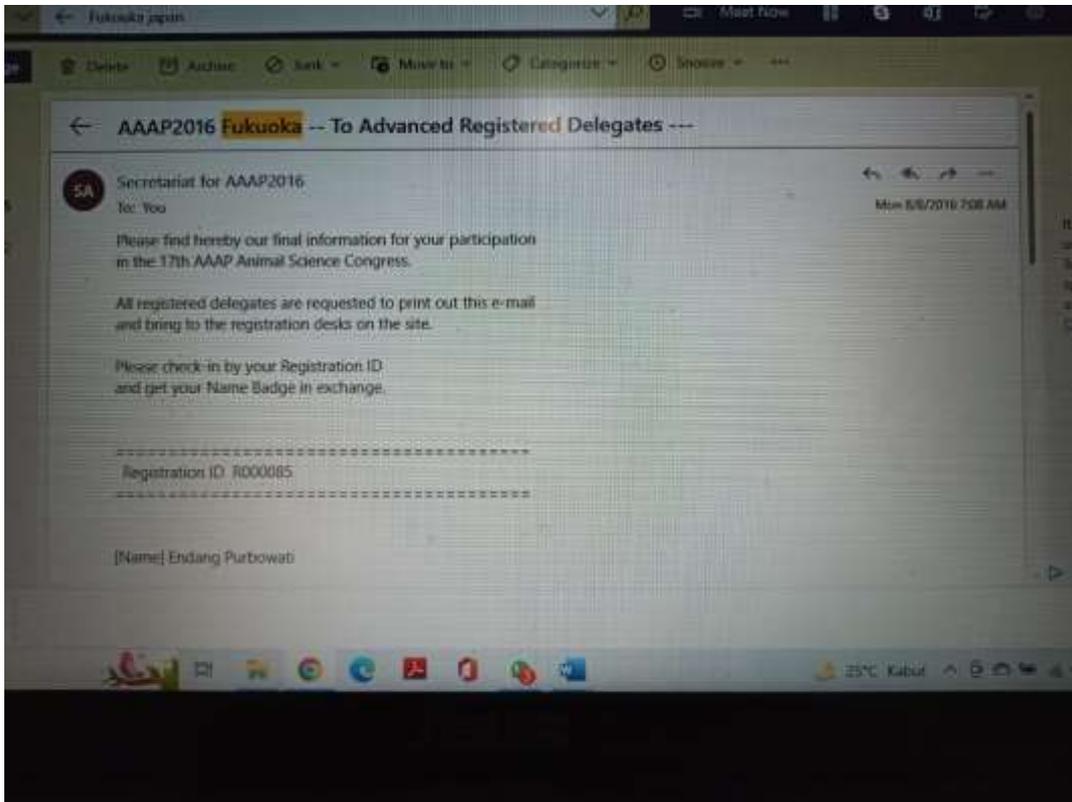
### (5) Schedule for Display & Mounting/Removing

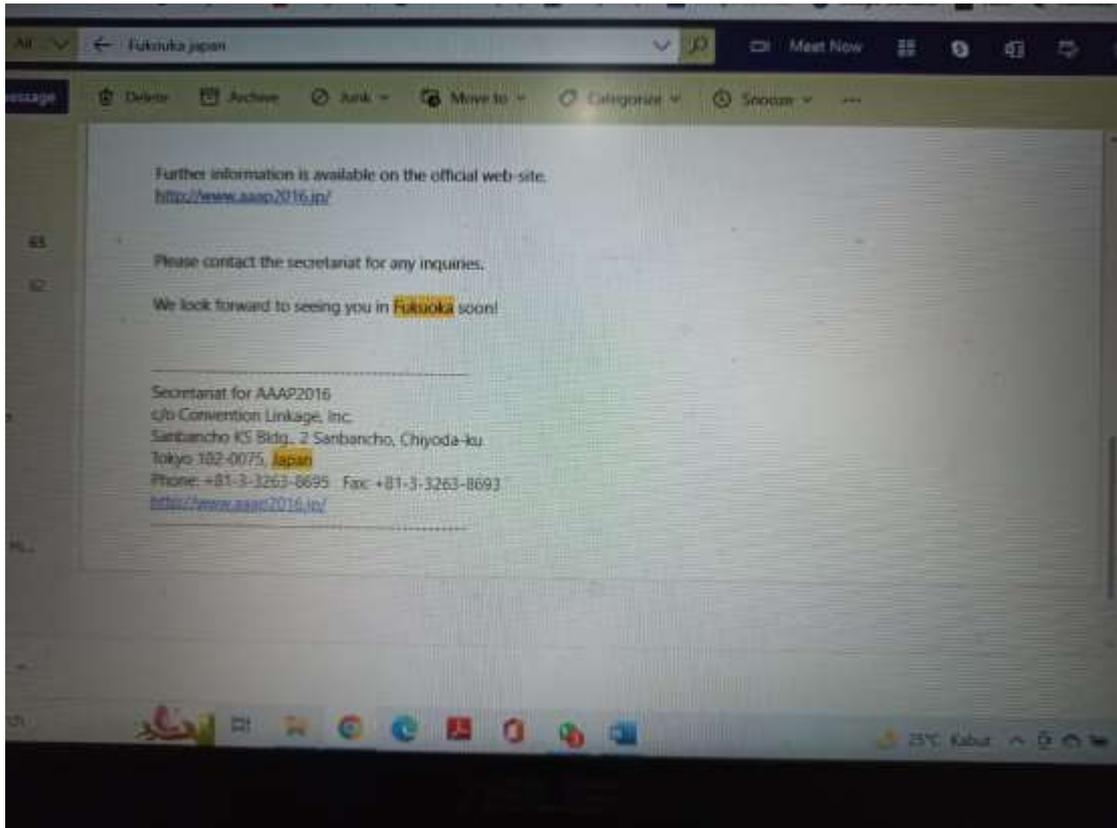
- Poster Presenters are asked to place their posters at the designated space and to follow the schedule below.
- Any posters or handouts left behind after the removal time shall be destroyed by the Secretariat.



	Display time	Discussion		Mounting	Removing
		Odd-numbered posters	Even-numbered posters		
23 August (Tue)	Poster 1 (PO-01): 9:00-11:00	9:00-10:00	10:00-11:00	8:30-9:00	11:00-11:30
	Poster 2 (PO-02): 13:00-15:00	13:00-14:00	14:00-15:00	12:30-13:00	15:00-15:30
	Poster 3 (PO-03): 17:00-19:00	17:00-18:00	18:00-19:00	16:30-17:00	19:00-19:30
24 August (Wed)	Poster 4 (PO-04): 9:00-11:00	9:00-10:00	10:00-11:00	8:30-9:00	11:00-11:30
25 August (Thu)	Poster 5 (PO-05): 9:00-11:00	9:00-10:00	10:00-11:00	8:30-9:00	11:00-11:30
	Poster 6 (PO-06): 14:00-16:00	14:00-15:00	15:00-16:00	13:30-14:00	16:00-16:30

# To Advanced Delegates (8 Agustus 2016)





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## AAAP2016 Fukuoka -- To Advanced Registered Delegates ---



Secretariat for AAAP2016

Mon 8/8

You 

Please find hereby our final information for your participation in the 17th AAAP Animal Science Congress.

All registered delegates are requested to print out this e-mail and bring to the registration desks on the site.

Please check-in by your Registration ID and get your Name Badge in exchange.

=====  
Registration ID R000085  
=====

[Name] Endang Purbowati

[Country] Indonesia

[Category] Congress participant (Early Registration)

[No. of Accompanying persons] 0

=====

Registration Desk Open Hours  
22 August : 11:00-18:00 (hotel nikko fukuoka)  
23 August : 7:30-17:00  
24 August : 7:45-13:00  
25 August : 7:45-13:00

Further information is available on the official web-site.  
<http://www.aaap2016.jp/>

Please contact the secretariat for any inquiries.

We look forward to seeing you in Fukuoka soon!

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Secretariat for AAAP2016  
c/o Convention Linkage, Inc.  
Sanbancho KS Bldg., 2 Sanbancho, Chiyoda-ku  
Tokyo 102-0075, Japan  
Phone: +81-3-3263-8695 Fax: +81-3-3263-8693  
<http://www.aaap2016.jp/>  
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**Poster AAAP 2016**  
**(22 Agustus 2016)**

# CARCASS COMMERCIAL CUTS PERCENTAGE OF RAMS RAISED UNDER DIFFERENT ENERGY-PROTEIN RATIO FEEDING AND DIFFERENT SLAUGHTER WEIGHT

**E. Purbowati, R.D. Yudha, and E. Rianto**

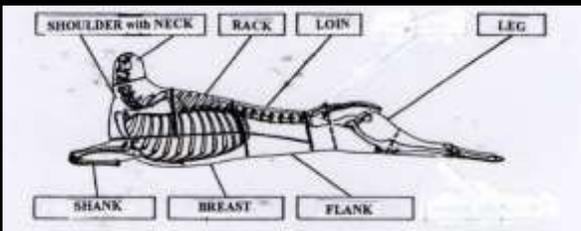
Faculty of Animal and Agricultural Science,  
Diponegoro University, Semarang, Indonesia

## INTRODUCTION

The proportions of the carcass cuts are an important index for the commercial evaluation of the carcass and have different economic value. Factors such as genetics, diet, slaughter weight, sex among others, are responsible for differences in cuts between carcasses (Cardoso et al., 2013). This study was carried out to determine the effect of feed energy-protein ratio of complete feed on the carcass commercial cuts percentage (flank, leg, loin, rib, breast, shoulder-neck and shank) of ram at different slaughtered weight.

## MATERIALS AND METHODS

This study used 24 thin-tailed rams, aged 3-5 months and weighed 8.7 to 15.5 kg (CV = 15.01%). The rams were kept in individual pens and fed a diet composed of rice straw (25%), and a concentrate mix 75% (fish meal, soybean meal, *Leucaena leucocephala* leaf meal, rice bran, cassava meal, molasses, and mineral), and formulated according to treatments. A Generalized Randomized (Complete) Block Design was used in this experiment with 4 different feeding treatments, i.e. R1 = 90.73% dry matter (DM), 14.48% crude protein (CP) and 50.46% total digestible nutrients (TDN), R2 = 90.82% DM, 17.35% CP and 52.61% TDN, R3 = 89.01% DM, 15.09% CP and 58.60% TDN, and R4 = 90.11% DM, 17.42% CP and 57.46% TDN. Rams were grouped based on the initial body weight, i.e. B1 = 10,73±1,37 kg (slaughtered at 15 kg), B2 = 12,76±0,54 kg (slaughtered at 20 kg) and B3 = 14,91±0,36 kg (slaughtered at 25 kg). Dry matter intake (DMI), CP intake, TDN intake, and weight and percentage of flank, leg, loin, rack, breast, shoulder with neck, and shank were recorded. Analysis of variance and Duncan's Multiple Range Test were used to analyze the data (Steel and Torrie, 1980).



## RESULT

The results showed that slaughter weight, cold carcass weight, cold carcass percentage, and carcass commercial cuts percentage (except flank) were not significantly different ( $P>0.05$ ) among treatments. Cold carcass weight and dressing percentage increased with increasing slaughter weight.

Variables	R1	R2	R3	R4
Slaughter weight (kg)	20.42 <sup>a</sup>	19.58 <sup>a</sup>	20.05 <sup>a</sup>	19.97 <sup>a</sup>
Cold carcass weight (g)	8,966 <sup>a</sup>	8,631 <sup>a</sup>	8,898 <sup>a</sup>	9,142 <sup>a</sup>
Dressing percentage (%)	43.91 <sup>a</sup>	44.08 <sup>a</sup>	44.38 <sup>a</sup>	45.78 <sup>a</sup>
Percentage of carcass commercial cuts (%)				
- Shoulder with neck	33.09 <sup>a</sup>	31.90 <sup>a</sup>	31.24 <sup>a</sup>	32.46 <sup>a</sup>
- Leg	33.83 <sup>a</sup>	34.12 <sup>a</sup>	34.72 <sup>a</sup>	34.03 <sup>a</sup>
- Loin	9.30 <sup>a</sup>	9.22 <sup>a</sup>	9.08 <sup>a</sup>	9.80 <sup>a</sup>
- Rack	8.31 <sup>a</sup>	8.71 <sup>a</sup>	8.73 <sup>a</sup>	9.22 <sup>a</sup>
- Breast	8.80 <sup>a</sup>	9.62 <sup>a</sup>	9.63 <sup>a</sup>	8.37 <sup>a</sup>
- Flank	2.70 <sup>c</sup>	2.40 <sup>ab</sup>	2.56 <sup>bc</sup>	2.26 <sup>a</sup>
- Shank	4.00 <sup>a</sup>	4.05 <sup>a</sup>	4.05 <sup>a</sup>	3.87 <sup>a</sup>
DMI (g/day)	956.35 <sup>b</sup>	966.94 <sup>b</sup>	827.94 <sup>a</sup>	850.55 <sup>a</sup>
CP intake (g/day)	138.51 <sup>b</sup>	140.04 <sup>b</sup>	119.91 <sup>a</sup>	123.18 <sup>a</sup>
TDN intake (g/day)	480.24 <sup>a</sup>	535.09 <sup>a</sup>	499.99 <sup>a</sup>	345.48 <sup>a</sup>

Variables	B1	B2	B3
Slaughter weight (kg)	15.09 <sup>a</sup>	19.86 <sup>b</sup>	25.06 <sup>c</sup>
Cold carcass weight (g)	6,266.75 <sup>a</sup>	8,918.75 <sup>b</sup>	11,543.25 <sup>c</sup>
Dressing percentage (%)	41.52 <sup>a</sup>	44.93 <sup>b</sup>	46.07 <sup>b</sup>
Percentage of carcass commercial cuts (%)			
- Shoulder with neck	31.92 <sup>a</sup>	31.98 <sup>a</sup>	32.62 <sup>a</sup>
- Leg	34.94 <sup>b</sup>	34.25 <sup>ab</sup>	33.33 <sup>a</sup>
- Loin	9.11 <sup>a</sup>	9.52 <sup>a</sup>	9.42 <sup>a</sup>
- Rack	8.76 <sup>a</sup>	8.63 <sup>a</sup>	8.84 <sup>a</sup>
- Breast	8.34 <sup>a</sup>	9.37 <sup>a</sup>	9.60 <sup>a</sup>
- Flank	2.45 <sup>a</sup>	2.45 <sup>a</sup>	2.54 <sup>a</sup>
- Shank	4.49 <sup>b</sup>	3.83 <sup>ab</sup>	3.65 <sup>a</sup>
DMI (g/day)	711.91 <sup>a</sup>	913.87 <sup>b</sup>	1,075.56 <sup>c</sup>
CP intake (g/day)	103.10 <sup>a</sup>	132.36 <sup>b</sup>	155.77 <sup>c</sup>
TDN intake (g/day)	381.95 <sup>a</sup>	396.94 <sup>a</sup>	616.71 <sup>a</sup>

## CONCLUSION

The conclusion of this study is that dietary energy-protein ratio does not affect the percentage of commercial cuts (except flank) of rams, while rams slaughter at higher body weight had higher carcass percentage, but lower leg and shank percentage.

**Summary of 17<sup>th</sup> AAAP  
(25 Agustus 2016)**

# Summary of the 17<sup>th</sup> AAAP Animal Science Congress

## 1. Congress Outline:

Date : 22-25 August, 2016

Venues: Hotel Nikko Fukuoka(Aug 22)

Kyushu Sangyo University(Aug 23~25)

Fukuoka, Japan

Homepage: <http://www.aaap2016.jp>

Theme: 『Strive toward Progress on Sustainable Animal production Contribute to Environmental and Welfare for Human and Livestock』



(Opening ceremony, Seiichi KOIZUMI(left), Mitsuhiro FURUSE(right))

## 2. AAAP Officers:

AAAP President: Seiichi KOIZUMI (Japan)

Vice Presidents: Naomi KASHIWAZAKI (Japan), Loh Teck CHWEN(Malaysia)

Secretary-General: Sang Jip OHH (Korea)

## 3. Members of the 17<sup>th</sup> AAAP Animal Science Congress Organizing Committee:

Mitsuhiro FURUSE	Congress President of the 17 <sup>th</sup> AAAP Animal Science Congress	
Seiichi KOIZUMI	Chair of Committee and Finance	
Kei HANZAWA	Chair of Fund Raising, Public Relations, and Registration	
Naomi KASHIWAZAKI	Chair of Accommodations & Tour	
Masahiro SATOH	Chair of Program, Scientific Section and Publications	
Koichi ANDO	Chair of Venue, Social Culture & Protocol, and Exhibition	
Keitaro YAMANOUCHI	Secretary General	
Naoshige ABE	Yoshikazu ADACHI	Ryozo AKUZAWA
Narito ASANUMA	Hisashi ASO	Takashi BUNGO
Hiroshi DOHI	Osamu DOI	Takafumi GOTOH
Tsutomu HASHIZUME	Satoshi HIDAKA	Kohzy HIRAMATSU
Hiroyuki HIROOKA	Toshiyoshi ICHINOHE	Masakazu IRIE
Yasuhiro KAWAMOTO	Tomoyuki KAWASHIMA	Kazuhiro KIKUCHI
Shinichi KOBAYASHI	Yasuo KOBAYASHI	Tetsuo KUNIEDA
Hiroki MATSUI	Takashi MIYANO	Tetsuo MORITA
Takashi NAGAI	Kunihiko NAITO	Yoshitaka NAKANISHI
Sueo NIIMURA	Takahiro NIKKI	Shotaro NISHIMURA
Takeyuki OZAWA	Hiroshi SASADA	Eimei SATO
Kazuhiro SHIMADA	Shigeru SHIOYA	Kunio SUGAHARA
Koji SUGIURA	Madoka SUTOH	Kenichi TAKEDA
Kumiko TAKEDA	Ryuichi TATSUMI	Yoshinori TERAWAKI
Atsushi TOYODA	Hiroko TSUKAMURA	Hitoshi USHIJIMA
Akira WATANABE	Nobuhiko YAMAUCHI	Tatsuyuki YOSHIDA

(Alphabetical order / titles omitted unless specified)

## 4. Scientific Programs

The scientific and technical programs offer 3 plenary sessions, 9 symposia, 6 workshop, 2 meetings, 41 oral presentation sessions, and 6 poster sessions for three days (23,24, and 25 August). Two special satellite symposia were held by:

1. CADIC (Center for Animal Disease Control) International Symposium entitled “ Livestock revolution in Asia - Risk and opportunity-”
2. FFTC (Food and Fertilizer Technology Center ) entitled “Mitigation of greenhouse gases and adaptation to climate change in livestock production systems”

Total numbers of scientific papers presented in the 17<sup>th</sup> AAAP Animal Science Congress were 834. Those include 3 plenary papers, 15 lead papers, and 816 contributed papers, of which were 377 oral presentations from 41 concurrent sessions and 439 poster presentations on 19 categories. The highest number of papers (276 papers) were presented by delegation from Japan, then followed by Thailand (140 papers).

In addition, there were two managerial meeting for AAAP organization. Those were 17<sup>th</sup> AAAP Council Meeting (Aug. 24, 2016) and AJAS Editorial Board Meeting (Aug. 22, 2016).

One program booklet and one proceeding of 17<sup>th</sup> AAAP Congress were published as:

1. Program and Abstract: Booklet (411 pages)
2. Proceeding: USB storage (1,688 pages )

**Table 1. Summary of the papers presented at the 16<sup>th</sup> AAAP Animal Science Congress**

Country	Plenary Session	Lead Papers	Contributed Papers	Total
<b>AAAP Countries</b>				
Australia	1	0	7	8
Bangladesh	0	0	4	4
China	0	1	30	31
India	0	0	2	2
Indonesia	0	4	131	135
Iran	0	0	0	0
Japan	1	9	266	276
Korea, Republic	0	0	77	77
Malaysia	0	0	13	13
Nepal	0	0	1	1
Pakistan	0	0	0	0
Philippines	0	0	20	20
Sri Lanka	0	0	5	5
Taiwan, Republic of China	1	0	96	97
Thailand	0	0	140	140
Vietnam	0	1	10	11
<b>Non-AAAP Countries</b>				
Afghanistan	0	0	2	2
Cambodia	0	0	1	1
Egypt	0	0	2	2
Mexico	0	0	1	1
Nigeria	0	0	1	1
Turkey	0	0	1	1
United States of America	0	0	5	5
Zimbabwe	0	0	1	1
<b>Total number of papers</b>	<b>3</b>	<b>15</b>	<b>816</b>	<b>834</b>

## 5. Summary of the congress and activities

A total of 1,160 participants from 27 countries had participated in the 17<sup>th</sup> AAAP Congress, of which were 1,131 participants from 15 member countries and 29 participants from non-AAAP member countries (refer Table 2).

The social and cultural programs of the 17<sup>th</sup> AAAP Congress were organized to develop friendship and cooperation between the participants of the 17<sup>th</sup> AAAP Congress and also to introduce Japanese cultural inheritance. Opening ceremony and welcome dinner were specially arranged on 22 August 2016 to show various Japanese cultural performances. Half a day field trip was held on 24 August 2016. There were 3 alternative routes: (1) Factory Tour (2) Saga Karatsu, and (3) Dazaifu

**Table 2. Number of participants of the 17<sup>th</sup> AAAP Animal Science Congress**

Country	Number	Country	Number
<b>AAAP Member Countries</b>			
Japan	418	Sri Lanka	8
Indonesia	174	Bangladesh	5
Taiwan, Rep. of China	167	India	2
Korea, Republic	127	New Zealand	2
Thailand	126	Nepal	1
China	38	Iran	None
Philippines	26	Mongolia	None
Malaysia	18	Pakistan	None
Vietnam	10	Papua New Guinea	None
Australia	9	<b>Sub-total</b>	1,131
<b>Non-AAAP Member Countries</b>			
United States of America	12	France	1
Afganistan	3	Italy	1
Egypt	3	Laos	1
Germany	2	Macau	1
Nigeria	2	Mexico	1
Cambodia	1	Turkey	1
		<b>Sub-total</b>	29
<b>Total number of participants</b>		<b>1,160</b>	

Closing ceremony was held on 25 August 2016. The Young scientist award was conferred to 30 best oral presenters, 15 best poster presenters and the youngest presenter. The 17<sup>th</sup> AAAP Animal Science was closed with the invitation presentation by the newly elected AAAP president from Malaysian Society of Animal Science, who will host the 18<sup>th</sup> AAAP Animal Science Congress in 2018 in Sarawak, Malaysia.

*(This summary report was prepared by the 17<sup>th</sup> AAAP Animal Science Congress President, Prof. Mitsuhiro Furuse, on Dec. 26, 2016, then confirmed by the AAAP Secretary General, Prof. Sang Jip Ohh on Jan. 6, 2017)*

**Daftar Isi Prosiding**  
**(25 Agustus 2016)**

- PO-04-39 Effects of providing fatty acid-calcium soap with high oleic acid content on fatty acid composition in Japanese Black steers  
Nobutada Sakagami, Hiroyuki Tsuji, Shinji Hashimura, Kiyoshi Akiyama, Kentaro Orihara  
Kanagawa Prefectural Livestock Industry Technology Center
- PO-04-41 **Carcass Commercial Cuts Percentage of Ram Raised Under Different Energy-Protein Ratio Feeding and Different Slaughtered Weight**  
Endang Purbowati, Rega Dianzha Yudha, Edy Rianto  
Diponegoro University, Faculty of Animal Agricultural Sciences
- PO-04-45 Breeding of Napiergrass (*Pennisetum purpureum*) Talsu no.6  
Jeng-Bin-Li<sup>1</sup>, Tzu-Rung Li<sup>1</sup>, Shy-Rong Chang<sup>1</sup>, Chi-Hsin Lu<sup>1</sup>, Churng\_Faung Lee<sup>1</sup>, Yih-Min Shy<sup>1</sup>, Shu-Fen Yan<sup>1</sup>, His-Hsun Wu<sup>2</sup>, Yu-Kule Cheng<sup>1</sup>  
<sup>1</sup>Livestock Research Institute, Council of Agricultural, Taiwan  
<sup>2</sup>Department of Animal Science, National Pingtung University of Science and Technology, Taiwan
- PO-04-46 Physical and Growth Characteristics of Japanese 'Kuchinoshima Feral Cattle', a Native Cattle Breed  
Ichiro Oshima<sup>1</sup>, Yuki Chikara<sup>2</sup>, Akira Tominaga<sup>1</sup>, Daiki Yanagita<sup>1</sup>, Daisuke Ishii<sup>1</sup>, Satoshi Matsumoto<sup>1</sup>, Kiyomi Katahira<sup>1</sup>, Koji Takayama<sup>1</sup>, Yoshitaka Nakanishi<sup>1</sup>  
<sup>1</sup>Faculty of Agriculture, Kagoshima University  
<sup>2</sup>The United Graduate School of Agricultural Sciences, Kagoshima University
- PO-04-48 Fermentation quality of Tropical Grasses Silage treated with Lactic acid bacteria and Cellulase  
Waroon Khota<sup>1</sup>, Suradej Pholsen<sup>1</sup>, Yimin Cai<sup>2</sup>  
<sup>1</sup>Faculty of Agriculture, Khon Kaen University, Thailand  
<sup>2</sup>Institute of Livestock and Grassland Science (NILGS), NARO, Japan
- PO-04-49 Silage fermentation of natural grasses in meadow steppe and typical steppe  
Melling Hou<sup>1</sup>, Gentu Ge<sup>1</sup>, Tingyu Liu<sup>2</sup>, Yushan Jia<sup>1</sup>, Yimin Cai<sup>3</sup>  
<sup>1</sup>Inner Mongolia Agricultural University  
<sup>2</sup>Inner Mongolia University of Nationalities  
<sup>3</sup>National Institute of Livestock and Grassland Science
- PO-04-50 Effect of molasses and cellulase on the silage fermentation of kudzu, sugarcane top and their mixture  
Xinzhu Chen<sup>1</sup>, Wenyang Li<sup>1</sup>, Yifen Zhuang<sup>2</sup>, Boqi Weng<sup>1</sup>, Yimin Cai<sup>3</sup>  
<sup>1</sup>Fujian Academy of Agricultural Sciences  
<sup>2</sup>Fujian Agriculture and Forest University  
<sup>3</sup>National Institute of Livestock and Grassland Science
- PO-04-54 Evaluation of Protein Utilization from Broken Job's tears and Job's tears bran in Weanling Pigs  
Chaiyapruerk Hongladdaporn, Sawang Kullawong, Suthasinee Kruttaga  
Loel Rajabhat University



**Prosiding AAAP 2016**  
**(25 Agustus 2016)**

# The 17th Asian-Australasian Association of Animal Production Societies Animal Science Congress

**Proceedings**

22-25 AUGUST 2016

CONGRESS VENUE: FUKUOKA JAPAN

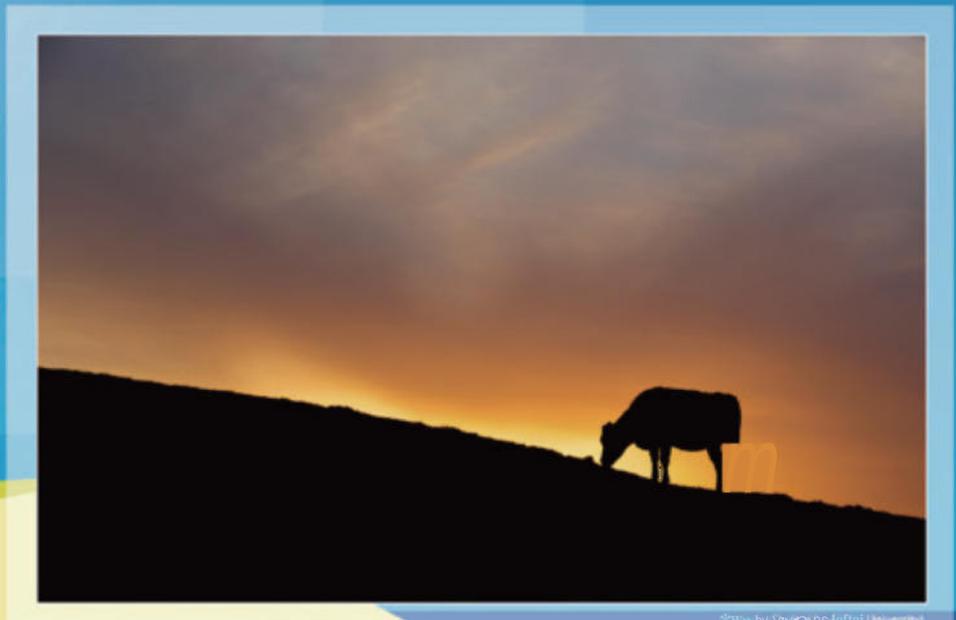
FUKUOKA

**n**

*Osaka*

*Nagoya*

*Tokyo*





## 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 (AsianAustralas. J. Anim. Sci. ISSN 1011-2367. <http://www.ajas.info>) is published monthly

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

ASAP(Australia), BAHA(Bangladesh), CAAV(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	GKittayachaweng	XVI	2014	Indonesia	Yudi Guntara
XVII	2016	Japan	Seiichi Koizumi	XVIII	2018	Malaysia	Loh Teck Chwen

## *Welcome Message*

The 17th Animal Science Congress of AAAP will be held at Kyushu Sangyo University, Fukuoka, Kyusyu Area in Japan, from 22 to 25 August 2016. The aim of this congress is to provide a forum for the exchange of new information on animal sciences and technology, with a focus on successful strategies for the sustainable promotion of livestock considering the environment and welfare of livestock and human beings. At the same time, the congress will provide a venue for people from both inside and outside of the Asian Australasian region to make new contacts and renew friendships. Japanese Society of Animal Science is organizing the 17th AAAP Congress and is pleased to welcome everyone in this congress who is interested in animal science and production.

The venue of the congress, Fukuoka City, where tradition meets modernity, with delicious dishes and an excellent geographic location close to the Asian countries.

*Qfl JfuruuZ*

Prof. Mitsuhiro FURUSE

President of 17th AAAP

## Committee Members

Mitsuhiro FURUSE	President
Seiichi KOIZUMI	Chair of Committee and Finance
Kei HANZAWA	Chair of Fund Raising, Public Relations, and Registration
Naomi KASHIWAZAKI	Chair of Accommodations & Tour
Masahiro SATOH	Chair of Program, Scientific Section and Publications
Koichi ANDO	Chair of Venue, Social Culture & Protocol, and Exhibition
Keitaro YAMANOUCHI	Secretary General

Naoshige ABE	Takashi NAGAI
Yoshikazu ADACHI	Kunihiko NAITO
Ryozo AKUZAWA	Yoshitaka NAKANISHI
Narito ASANUMA	Sueo NIIMURA
Hisashi ASO	Takahiro NIKKI
Takashi BUNCO	Shotaro NISHIMURA
Hiroshi DOHI	Takeyuki OZAWA
Osamu DOI	Hiroshi SASADA
Takafumi GOTOH	Eimei SATO
Tsutomu HASHIZUME	Kazuhiro SHIMADA
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## Outline of the congress

### Congress Name

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The 17th Asian-Australasian Association of Animal Production Societies Animal Science Congress

### Theme

---

Strive toward Progress on Sustainable Animal Production Contribute to Environment and Welfare for Human and Livestock

### President

---

Mitsuhiro FURUSE (Professor, Animal & Marine Bioresource Sciences, Kyushu University)

### Date

---

22-25 August, 2016

### Venue

---

Kyushu Sangyo University  
hotel nikko fukuoka

### Official Website

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- PO-04-39 Effects of providing fatty acid-calcium soap with high oleic acid content on fatty acid composition in Japanese Black steers  
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Kanagawa Prefectural Livestock Industry Technology Center
- PO-04-41 **Carcass Commercial Cuts Percentage of Ram Raised Under Different Energy-Protein Ratio Feeding and Different Slaughtered Weight**  
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- PO-04-45 Breeding of Napiergrass (*Pennisetum purpureum*) Talsu no.6  
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<sup>1</sup>Livestock Research Institute, Council of Agricultural, Taiwan  
<sup>2</sup>Department of Animal Science, National Pingtung University of Science and Technology, Taiwan
- PO-04-46 Physical and Growth Characteristics of Japanese 'Kuchinoshima Feral Cattle', a Native Cattle Breed  
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- PO-04-48 Fermentation quality of Tropical Grasses Silage treated with Lactic acid bacteria and Cellulase  
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<sup>1</sup>Faculty of Agriculture, Khon Kaen University, Thailand  
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- PO-04-49 Silage fermentation of natural grasses in meadow steppe and typical steppe  
Melling Hou<sup>1</sup>, Gentu Ge<sup>1</sup>, Tingyu Liu<sup>2</sup>, Yushan Jia<sup>1</sup>, Yimin Cai<sup>3</sup>  
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- PO-04-50 Effect of molasses and cellulase on the silage fermentation of kudzu, sugarcane top and their mixture  
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<sup>1</sup>Fujian Academy of Agricultural Sciences  
<sup>2</sup>Fujian Agriculture and Forest University  
<sup>3</sup>National Institute of Livestock and Grassland Science
- PO-04-54 Evaluation of Protein Utilization from Broken Job's tears and Job's tears bran in Weanling Pigs  
Chaiyapruerk Hongladdaporn, Sawang Kullawong, Suthasinee Kruttaga  
Loel Rajabhat University

PO-04-41

## Carcass Commercial Cuts Percentage of Ram Raised Under Different Energy-Protein Ratio Feeding and Different Slaughtered Weight

Endang Purbowati, Rega Dianzha Yudha, Edy Rianto

Diponegoro University, Faculty of Animal and Agricultural Sciences

### ABSTRACT

A study was carried out to determine the effect of dietary energy-protein ratio on the carcass commercial cuts percentage (flank, leg, loin, rib, breast, shoulder-neck and shank) of rams at different slaughter weight. The study used 24 thin tail rams aged 3-5 months and weighed 8.7 to 15.5 kg (CV = 15.01%). A Generalized Randomized (Complete) Block Design was used in this study with 4 different feeding treatments, i.e. R1 = 14.48% crude protein (CP) and 50.46% *total digestible nutrients* (TDN), R2 = 17.35% CP and 52.61% TDN, R3 = 15.09% CP and 58.60% TDN, and R4 = 17.42% CP and 57.46% TDN. Rams were grouped based on the initial body weight, i.e. B1 = 10,73 + 1,37 kg (slaughtered at 15 kg), B2 = 12,76 + 0,54 kg (slaughtered at 20 kg) and B3 = 14,91 + 0,36 kg (slaughtered at 25 kg). The results showed that slaughter weight, cold carcass weight, cold carcass percentage, and carcass commercial cuts percentage (except flank) were not significantly different ( $P > 0.05$ ) among feeding treatments. In average, the animals had 20 kg slaughter weight, 8909.58 g cold carcass weight, 44.18% cold carcass percentage. Whilst, the average of percentage of shoulder-neck, leg, loin, rack, breast and shank were 32.05; 34.23; 9.32; 8.70; 9.14; and 4.05%, respectively. On the other hand, the highest percentage flank was found in R1 (2.70%), followed by R3 (2.56%), R2 (2.40%) and R4 (2.26%). Cold carcass percentage increased ( $P < 0.05$ ) with increasing slaughter weight. The percentage of leg and shank decreased ( $P < 0.05$ ) with increasing slaughter weight, while the percentage of other commercial cuts are not significantly different ( $P > 0.05$ ) among slaughter weights. The conclusion of this study is that energy-protein ratio of the feed does not affect the percentage of commercial cuts (except flank), while the slaughtered weight affects the percentage of carcass, leg, and shank.

### INTRODUCTION

The carcass is the main yield expected from the sheep. The carcass yield measurements, both relative and actual weights are important as these are the criteria used to evaluate animal productivity. The carcass is the result of a biological process affected by genetic, environmental and management factors (Cardoso et al., 2013).

Carcass weight of sheep is affected by slaughter weight, which in turn is affected by feed intake. Protein and energy are the main nutrients required by the animal. Protein is found in all living cells, where they are intimately with all phases of activity that constitute the life of cell. Dietary energy is used for production after satisfying the requirement of maintenance. A young growing animal stores protein in new tissues, while an adult stores relatively more energy in fat (McDonald et al., 1991). Energy and protein interact because dietary protein is a source of dietary energy, because dietary energy is needed for protein turnover and deposition and because deposited protein represents part of the body's energy store (Boorman, 1980).

Carcass traits are greatly modified by slaughter weight (Galvani et al., 2008). Hot carcass weight of Barki lambs increased significantly ( $P < 0.01$ ) with increasing slaughter weight from 30 to 60 kg (Shehata, 2013). Similar results were reported by Galvani et al. (2008), that dressing percentage of Texel x Ile de France crossbred feedlot lambs increased linearly with increased slaughter weight ( $P < 0.01$ ).

The proportions of the carcass cuts are an important index for the commercial evaluation of the carcass and have different economic value. Factors such as genetics, diet, slaughter weight, sex among others, are responsible for differences in cuts between carcasses (Cardoso et al., 2013). This study was carried out to determine the effect of feed energy-protein ratio of complete feed on the carcass commercial cuts percentage (flank, leg, loin, rib, breast, shoulder-neck and shank) of ram at different slaughtered weight.

### MATERIALS AND METHODS

This study used 24 thin-tailed rams, aged 3-5 months and weighed 8.7 to 15.5 kg (CV = 15.01%). The rams were kept in individual pens and fed a diet composed of rice straw (25%), and a concentrate mix 75% (fish meal, soybean meal, *Leucaena leucocephala* leaf meal, rice bran, cassava meal, molasses, and mineral), and formulated according to treatments.

A Generalized Randomized (Complete) Block Design was used in this experiment with 4 different feeding treatments, i.e. R1 = 90.73% dry matter (DM), 14.48% crude protein (CP) and 50.46% *total digestible nutrients* (TDN), R2 = 90.82% DM, 17.35% CP and 52.61% TDN, R3 = 89.01% DM, 15.09% CP and 58.60% TDN, and R4 = 90.11% DM, 17.42% CP and 57.46% TDN. Rams were grouped based on the initial body weight, i.e. B1 = 10,73 + 1,37 kg (slaughtered at 15 kg), B2 = 12,76 + 0,54 kg (slaughtered at 20 kg) and B3 = 14,91 + 0,36 kg (slaughtered at 25 kg). Dry matter intake (DMI), CP intake, and TDN intake were recorded.

The rams were slaughtered after a 24 hour fasting period. Before being slaughtered, the animals was weighed individually. The animals were killed by cutting their jugular vena, throat and esophagus removing . The carcass was obtained after removal of the head, feet, skin, digestive tract and internal organs, except kidneys and kidney fat. The carcass was weighed (hot weight), then two hours later the carcass was reweighed (cold weight). The carcass was then halved longitudinally by a band saw, after the removal of tail, kidneys and kidney fat. Right carcass half was then cut into seven joints: flank, leg, loin, rack, breast, shoulder with neck, and shank (Figure 1). The percentage of each cut was calculate. Analysis of variance and Duncan's Multiple Range Test were used to analyze the data (Steel and Torrie, 1980).

## RESULTS AND DISCUSSION

The main characteristics of sheep carcasses from different energy-protein ratio feeding are presented in Table 1. The results showed that slaughter weight, cold carcass weight, cold carcass percentage, and carcass commercial cuts percentage (except flank) were not significantly different ( $P>0.05$ ) among treatments.

The non-significant difference in carcass percentage and carcass commercial cuts percentage in this study occurred because of the fact that the slaughter weight and cold carcass weight no significant differences ( $P>0.05$ ). This was in accordance with the opinion of Soeparno (2005), that the weight of carcass weight affects carcass commercial cuts. Slaughter weights, carcass weights and dressing percentages in this study were not significantly different ( $P>0.05$ ) among the treatments, because the energy intake was not significantly different ( $P>0.05$ ) either. According to Blakely and Bade (1985), the main nutrients needed for fattening animals is energy. Rianto et al. (2006) stated that an increase in dietary energy intake will be followed by an increase in energy deposition in the body, increasing energy deposition will be used to accelerate the rate of metabolism and establish fat deposition. The dietary energy intake of sheep in this study were similar, so that the energy deposited was also relatively the same.

The percentage of flank of R4 was the lowest ( $P <0.05$ ), followed by R2, R3 and R1. This was so because the weights of flank in R4was the lowest, but the carcass weight was the highest. Hasnudi (2004) reported that while the empty body weight increased, the flank weight was relatively stable, so the flank percentage was getting lower as the body weight increased.

Data in Table 2 show that carcass weight and percentage increased with slaughter weight. These findings were in agreement with the statement of Cardoso et al. (2013), that animal carcass production is influenced by slaughter weight, which in turn is affected by the feed intake. An increase in feed intake will result in higher slaughter weight.

The percentage of leg and shank were significantly different ( $P <0.05$ ) among slaughter weights. The percentage of leg and shank of B3 were the lowest, followed by B2 and B1. These findings indicated that leg and shank were early mature compared with other parts of the body. This was in agreement with the statement of Tillman et al. (1991), that head and leg bones reach maturity faster than bones of shoulder, pin bones and muscles. Thus while the other parts of the grow, leg and shank stop growing at certain stage of growth, so that the percentage of leg and shank are lower than the other parts of carcass. This results is also confirmed by the results obtained by Tobing et al. (2004), that the weight of head, feet and viscera decline their growth rate at the beginning of life, while the other parts still continue to grow. Consequently, the weight of leg and shank did not increase with the increasing slaughter weight, resulting in low percentage of leg and shank in higher slaughter weight as occurred in animals of B3.

## CONCLUSIONS

The conclusion of this study is that dietary energy-protein ratio does not affect the percentage of commercial cuts (except flank) of rams, while rams slaughter at higher body weight had higher carcass percentage, but lower leg and shank percentage.

**Keywords:** Sheep, dietary energy-protein ratio, slaughter weight, carcass commercial cuts

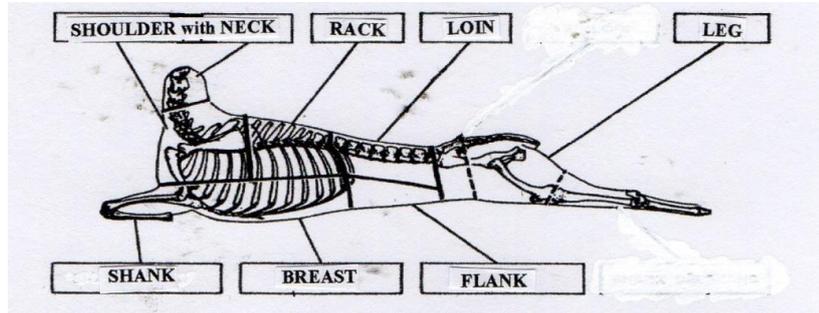


Figure 1. Carcass commercial cuts (Soeparno, 2005)

Table1. Slaughter weight, cold carcass weight, dressing percentage, carcass commercial cuts percentage, and dry matter intake, crude protein intake, and TDN intake of ram raised under different dietary energy-protein ratio

Variables	R1	R2	R3	R4
Slaughter weight (kg)	20.42 <sup>a</sup>	19.58 <sup>a</sup>	20.05 <sup>a</sup>	19.97 <sup>a</sup>
Cold carcass weight (g)	8,966 <sup>a</sup>	8,631 <sup>a</sup>	8,898 <sup>a</sup>	9,142 <sup>a</sup>
Dressing percentage (%)	43.91 <sup>a</sup>	44.08 <sup>a</sup>	44.38 <sup>a</sup>	45.78 <sup>a</sup>
Percentage of carcass commercial cuts (%)				
- Shoulder with neck	33.09 <sup>a</sup>	31.90 <sup>a</sup>	31.24 <sup>a</sup>	32.46 <sup>a</sup>
- Leg	33.83 <sup>a</sup>	34.12 <sup>a</sup>	34.72 <sup>a</sup>	34.03 <sup>a</sup>
- Loin	9.30 <sup>a</sup>	9.22 <sup>a</sup>	9.08 <sup>a</sup>	9.80 <sup>a</sup>
- Rack	8.31 <sup>a</sup>	8.71 <sup>a</sup>	8.73 <sup>a</sup>	9.22 <sup>a</sup>
- Breast	8.80 <sup>a</sup>	9.62 <sup>a</sup>	9.63 <sup>a</sup>	8.37 <sup>a</sup>
- Flank	2.70 <sup>c</sup>	2.40 <sup>ab</sup>	2.56 <sup>bc</sup>	2.26 <sup>a</sup>
- Shank	4.00 <sup>a</sup>	4.05 <sup>a</sup>	4.05 <sup>a</sup>	3.87 <sup>a</sup>
DMI (g/day)	956.35 <sup>b</sup>	966.94 <sup>b</sup>	827.94 <sup>a</sup>	850.55 <sup>a</sup>
CP intake (g/day)	138.51 <sup>b</sup>	140.04 <sup>b</sup>	119.91 <sup>a</sup>	123.18 <sup>a</sup>
TDN intake (g/day)	480.24 <sup>a</sup>	535.09 <sup>a</sup>	499.99 <sup>a</sup>	345.48 <sup>a</sup>

<sup>a, b, c</sup> Different letters in the same raw are significantly different ( $P < 0.05$ ), using Duncan test

Table2. Slaughter weight, cold carcass weight, dressing percentage, carcass commercial cuts percentage, and dry matter intake, crude protein intake, and TDN intake of ram at different slaughter weight

Variables	B1	B2	B3
Slaughter weight (kg)	15.09 <sup>a</sup>	19.86 <sup>b</sup>	25.06 <sup>c</sup>
Cold carcass weight (g)	6,266.75 <sup>a</sup>	8,918.75 <sup>b</sup>	11,543.25 <sup>c</sup>
Dressing percentage (%)	41.52 <sup>a</sup>	44.93 <sup>b</sup>	46.07 <sup>b</sup>
Percentage of carcass commercial cuts(%)			
- Shoulder with neck	31.92 <sup>a</sup>	31.98 <sup>a</sup>	32.62 <sup>a</sup>
- Leg	34.94 <sup>b</sup>	34.25 <sup>ab</sup>	33.33 <sup>a</sup>
- Loin	9.11 <sup>a</sup>	9.52 <sup>a</sup>	9.42 <sup>a</sup>
- Rack	8.76 <sup>a</sup>	8.63 <sup>a</sup>	8.84 <sup>a</sup>
- Breast	8.34 <sup>a</sup>	9.37 <sup>a</sup>	9.60 <sup>a</sup>
- Flank	2.45 <sup>a</sup>	2.45 <sup>a</sup>	2.54 <sup>a</sup>
- Shank	4.49 <sup>b</sup>	3.83 <sup>ab</sup>	3.65 <sup>a</sup>
DMI (g/day)	711.91 <sup>a</sup>	913.87 <sup>b</sup>	1,075.56 <sup>c</sup>
CP intake (g/day)	103.10 <sup>a</sup>	132.36 <sup>b</sup>	155.77 <sup>c</sup>
TDN intake (g/day)	381.95 <sup>a</sup>	396.94 <sup>a</sup>	616.71 <sup>a</sup>

<sup>a, b, c</sup> Different letters in the same raw are significantly different (P<0,05), using Duncan test

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# Summary of the 17<sup>th</sup> AAAP Animal Science Congress

## 1. Congress Outline:

Date : 22-25 August, 2016

Venues: Hotel Nikko Fukuoka(Aug 22)

Kyushu Sangyo University(Aug 23~25)

Fukuoka, Japan

Homepage: <http://www.aaap2016.jp>

Theme: 『Strive toward Progress on Sustainable Animal production Contribute to Environmental and Welfare for Human and Livestock』



(Opening ceremony, Seiichi KOIZUMI(left), Mitsuhiro FURUSE(right))

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Vice Presidents: Naomi KASHIWAZAKI (Japan), Loh Teck CHWEN(Malaysia)

Secretary-General: Sang Jip OHH (Korea)

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## 4. Scientific Programs

The scientific and technical programs offer 3 plenary sessions, 9 symposia, 6 workshop, 2 meetings, 41 oral presentation sessions, and 6 poster sessions for three days (23,24, and 25 August). Two special satellite symposia were held by:

1. CADIC (Center for Animal Disease Control) International Symposium entitled “ Livestock revolution in Asia - Risk and opportunity-”
2. FFTC (Food and Fertilizer Technology Center ) entitled “Mitigation of greenhouse gases and adaptation to climate change in livestock production systems”

Total numbers of scientific papers presented in the 17<sup>th</sup> AAAP Animal Science Congress were 834. Those include 3 plenary papers, 15 lead papers, and 816 contributed papers, of which were 377 oral presentations from 41 concurrent sessions and 439 poster presentations on 19 categories. The highest number of papers (276 papers) were presented by delegation from Japan, then followed by Thailand (140 papers).

In addition, there were two managerial meeting for AAAP organization. Those were 17<sup>th</sup> AAAP Council Meeting (Aug. 24, 2016) and AJAS Editorial Board Meeting (Aug. 22, 2016).

One program booklet and one proceeding of 17<sup>th</sup> AAAP Congress were published as:

1. Program and Abstract: Booklet (411 pages)
2. Proceeding: USB storage (1,688 pages )

**Table 1. Summary of the papers presented at the 16<sup>th</sup> AAAP Animal Science Congress**

Country	Plenary Session	Lead Papers	Contributed Papers	Total
<b>AAAP Countries</b>				
Australia	1	0	7	8
Bangladesh	0	0	4	4
China	0	1	30	31
India	0	0	2	2
Indonesia	0	4	131	135
Iran	0	0	0	0
Japan	1	9	266	276
Korea, Republic	0	0	77	77
Malaysia	0	0	13	13
Nepal	0	0	1	1
Pakistan	0	0	0	0
Philippines	0	0	20	20
Sri Lanka	0	0	5	5
Taiwan, Republic of China	1	0	96	97
Thailand	0	0	140	140
Vietnam	0	1	10	11
<b>Non-AAAP Countries</b>				
Afghanistan	0	0	2	2
Cambodia	0	0	1	1
Egypt	0	0	2	2
Mexico	0	0	1	1
Nigeria	0	0	1	1
Turkey	0	0	1	1
United States of America	0	0	5	5
Zimbabwe	0	0	1	1
<b>Total number of papers</b>	<b>3</b>	<b>15</b>	<b>816</b>	<b>834</b>

## 5. Summary of the congress and activities

A total of 1,160 participants from 27 countries had participated in the 17<sup>th</sup> AAAP Congress, of which were 1,131 participants from 15 member countries and 29 participants from non-AAAP member countries (refer Table 2).

The social and cultural programs of the 17<sup>th</sup> AAAP Congress were organized to develop friendship and cooperation between the participants of the 17<sup>th</sup> AAAP Congress and also to introduce Japanese cultural inheritance. Opening ceremony and welcome dinner were specially arranged on 22 August 2016 to show various Japanese cultural performances. Half a day field trip was held on 24 August 2016. There were 3 alternative routes: (1) Factory Tour (2) Saga Karatsu, and (3) Dazaifu

**Table 2. Number of participants of the 17<sup>th</sup> AAAP Animal Science Congress**

Country	Number	Country	Number
<b>AAAP Member Countries</b>			
Japan	418	Sri Lanka	8
Indonesia	174	Bangladesh	5
Taiwan, Rep. of China	167	India	2
Korea, Republic	127	New Zealand	2
Thailand	126	Nepal	1
China	38	Iran	None
Philippines	26	Mongolia	None
Malaysia	18	Pakistan	None
Vietnam	10	Papua New Guinea	None
Australia	9	<b>Sub-total</b>	1,131
<b>Non-AAAP Member Countries</b>			
United States of America	12	France	1
Afganistan	3	Italy	1
Egypt	3	Laos	1
Germany	2	Macau	1
Nigeria	2	Mexico	1
Cambodia	1	Turkey	1
		<b>Sub-total</b>	29
<b>Total number of participants</b>		<b>1,160</b>	

Closing ceremony was held on 25 August 2016. The Young scientist award was conferred to 30 best oral presenters, 15 best poster presenters and the youngest presenter. The 17<sup>th</sup> AAAP Animal Science was closed with the invitation presentation by the newly elected AAAP president from Malaysian Society of Animal Science, who will host the 18<sup>th</sup> AAAP Animal Science Congress in 2018 in Sarawak, Malaysia.

*(This summary report was prepared by the 17<sup>th</sup> AAAP Animal Science Congress President, Prof. Mitsuhiro Furuse, on Dec. 26, 2016, then confirmed by the AAAP Secretary General, Prof. Sang Jip Ohh on Jan. 6, 2017)*