



PROCEEDING

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Enhancing Synergistic Roles of Stakeholders for Development of Sustainable Livestock Production

Batu, Indonesia, October 19-21, 2016

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Preface

Following the success of the First and Second Animal Production International Seminar (1st and 2nd APIS) held in 2010 and 2013, respectively, it has been held successfully a Collaborative Seminar of The 3rd Animal Production International Seminar and The Third ASEAN Regional Conference on Animal Production (3rd APIS & ARCAP 2016 Conference) in the Shining City of Batu, East Java Province, Indonesia from 19 to 21 October 2016 with the theme of Improving the Synergistic Roles of Stakeholders for Development of Sustainable Livestock Production. More than 150 Abstract and papers have been presented and discussed during the seminar by either keynote speakers or participants from different countries. The papers cover animal production and nutrition, animal reproduction and breeding, animal health and veterinarian, animal products technology, as well as social, economy, and animal production systems.

Full papers of this seminar are published in this proceeding. It is hoped that this proceeding would provide valuable information and contribution for readers in improving the productivity and sustainability of livestock production.

To follow up the seminar and for regular and continuous discussion on the related aspects of sustainable livestock production development, it is the committee's great honours and pleasures to inform that The Fourth Animal Production International Seminar (4th APIS) will be held in 2019 and to invite again the participants (academics, scientist, practitioners, decision maker on livestock production as well as industries and government) to attend and actively support for the next success of the next APIS seminar.

Malang, October 22, 2016

Editors

Physical Carcass Characteristics from Body Composition of Timor Pigs Boar Kept Extensively in the Province of East Nusa Tenggara - Indonesia <i>R. Wea , Y.L. Henuk, T. Barus, S. Sembiring, U.Ginting-Moenthe</i>	45
The Effect of Cherry Leaf (<i>Muntingia Calabura</i>) Extract on Hatchability and Embryo Mortality Hybrid Duck Egg <i>Muhammad Ngalaul Huda , Fatikhatul Huda Alkhakim, Galuh Dianita Fitri, Dewi Ambarwati and Heli Tistiana</i>	49
Correlation between Crude Protein Levels in the Diets and Carcass Weight and Carcass Percentage in Thin Tailed Lambs <i>R. Choirunnisa, A. Prima, N. Luthfi, M. Arifin, Sutaryo and A. Purnomoadi</i>	53
Phenotypic Characteristics of Aceh Cattle on Different Sex and Age in Smallholder Farmers <i>Tri Satya Mastuti Widi, Endang Baliarti, Alek Ibrahim, Hendra Koesmara, and I Gede Suparta Budisatria</i>	56
Prospects of Broiler Industry in Indonesia <i>V.J. Ballo, M. Sinlae, J.F. Theedens, S.T. Temu, and Y. L. Henuk</i>	60
Physiological Responses and Milk Qualities of Holstein Friesian During Long Dry Season at High Altitude <i>E. Mariana, C. Sumantri, D. A . A.Astuti, A. Anggraeni, A. Gunawan, N. Q. Agustin</i>	64
Estimating Yield Grade by Using Body Measurements and Body Condition Score in Thin-Tailed Sheep <i>Ulia Renfelia Baysi, Agung Purnomoadi and Endang Purbowati</i>	68
Exploration of Fecal Physical Test to Estimate Weaning Age of Kids <i>L. P. Lestari, R. N. Andrian, S. Dartosukarno and A. Purnomoadi</i>	73
Physiological Responses and Milk Qualities of Holstein Friesian During Dry Season at High Altitude <i>E. Mariana, C. Sumantri, D. A . A.Astuti, A. Anggraeni, A. Gunawan, N. Q. Agustin</i>	77
Correlation between Body Weight, Body Condition Score and Vital Statistics of Madura Cattle in Pamekasan, Madura <i>Maylinda, S., M. Nasich and I. R. Pertiwi</i>	81

Milk Production of Holstein Friesian Cows Related to Heat Stress in Responding to Climate Change <i>A. Anggraeni and F. Hadiyawan</i>	93
 <i>Oral Presentation - Ruminant Nutrition</i>	
Smallholder Dairy Cattle Farmer Capacity in Providing Feeds and Nutrient in Several Population Densities of Villages of Sleman Regency, DIY Province - Indonesia <i>Permana IG, Zahera R, Toharmat T and Despal</i>	97
Nutritional Properties of Several Seaweeds Species for Dairy Cattle <i>Despal, Hasri N and Permana IG</i>	101
Development of Beef Cattle by Using Agricultural By-Product in West Java <i>Laconi, E. B. L, Mulatsih, S., and Martin, R.S.H</i>	105
Changes in Nutrition and Fibre Silage Water Hyacinth (<i>Eichornia crassipes</i>) as Ruminant Feed Fermented with Some Fermentative Materials <i>Muhammad Mukhtar</i>	110
Production and Milk Composition of Crossbred Etawah Goats Fed on Basal Diet Containing Different Levels of <i>Sesbania</i> (<i>Sesbania Grandiflora</i>) Leaves <i>A R. S. Asih, K G. Wiryawan, I. N. Sadia, and Kertanegara</i>	116
The Fermentation of Bagasse with Fungi <i>Ganoderma lucidum</i> and Its Ligninolytic Enzyme Activity <i>Fauzia Agustin, Elihasridas</i>	120
Encapsulated Biomineral Supplementation in Dairy Cattle Ration on In Vitro Fermentability and Digestibility <i>Anita S. Tjakradidjaja, Ajeng Puspendari, Suryahadi, B. Bakrie and Dewi A. Astuti</i>	124
Effect of Packaging Medium on Survival of Napier Grass Stem Cutting <i>Jusoh, S., H. Yaakub and N. H. Hussein</i>	129
Effects of Rumen Mechanical Stimulating Brush Administration on Eating Behavior and Dry Matter Digestibility of Brahman Cross Steers Fed with Low Forage Diet <i>S. Nurmeiliasari, R. Priyanto, D.A. Astuti, Salundik, J. Takahashi</i>	133

Biological Status and Conservation of Anoa (<i>Bubalus depressicornis</i>) in Tropical Forest of North Sulawesi <i>B. Tulung, J.F. Umboh, K. Maaruf, A.F. Pendong, and Y.L.R. Tulung</i>	138
The Nutritional Value Evaluation of Ammoniated Rice Straw and Fermented Sago Dregs in Complete Feed on Performances of Ongole Cross Breed Cattle <i>R.A.V. Tuturoong , Y.L.R. Tulung dan A.F. Pendong</i>	142
Potential Source of Feedstuffs from Oil Palm Plantation Areas for Development of Cattle Production in Indonesia <i>D. Bakti, Y. L. Henuk, Rosmayati, E. Purba, D. Siahaan</i>	147
Methane Reduction Strategy With Fat Supplementation for Development of Sustainable Ruminant Livestock Production <i>Nur Hidayah</i>	151
Nutritional Responses on The Hypothalamic-Pituitary-Ovarian Axis on Female Goats <i>Mashitah Shikh Maidin</i>	156
In Vitro Dry Matter Degradation Kinetics of Some Ruminant Feeds <i>Rudi, Suryahadi and Anuraga Jayanegara</i>	160
The Effects of Phenolic Compounds in Brown Propolis Extracts on Rumen Methane Production (in vitro) <i>Sh. Ehtesham, A.R. Vakili, M. Danesh Mesgaran</i>	165
Prediction of feed metabolizable energy and metabolizable protein contents from their chemical constituents <i>Anuraga Jayanegara, Sari P. Dewi, Muhammad Ridla, Erika B. Laconi, Nahrowi</i>	170
Effects of Long Transportation Preceded by Short Periods of Deprivation on the Intake and Nutrient Digestibility of <i>Bos sondaicus</i> bulls <i>C.L.O. Leo-Penu, W. Ndaumanu, J. Widu, D.R. Tulle, J.A. Jermias, U.R. Raya, I.G.N. Jelantik, G. Maranatha, Y. Manggol, T. Lapenangga, A.Ch. Tabun, A.J. Parker</i>	174
Addition of different species of forages legumes on physical, chemical characteristics and in vitro digestibility of dairy cattle feed pellet <i>Iin Susilawati and Lizah Khairani</i>	178

Effect of Supplementation Multi-Nutrient Feed Supplement or Urea Multi-Nutrient Molasses Block in Diet on Performance of Dairy Cattle. <i>Suharyono, Y. Widiawati and A. Kurniawati</i>	181
Feed Consumption and Dry Matter Digestibility of Feed Containing Different Protein Levels in Thin Tailed Lambs Fattened After Weaning <i>Ari Prima, Edy Rianto and Agung Purnomoadi</i>	186
Calcium And Phosporous Absorption Of Field Grass During The Dry Season At Medium Altitude In Garut <i>Ana Rochana, Iin Susilawati, Herryawan Kemal Mustafa, Nyimas Popi Indriani, Budi Ayuningsih.</i>	191
Correlations between Crude Protein/Total Digestible Nutrients Ratio and Commercial Cuts Weight and Percentage of Thin Tailed Lambs <i>F. Nabila, A. Prima, N. Luthfi, E. Purbowati, Sutaryo, and A. Purnomoadi</i>	195
Eating Time and Ruminating of Lambs Fed at Different Total Digestible Nutrients Content of Feed <i>F. D. Nugroho, A. Prima, N. Luthfi, S. Dartosukarno, and A. Purnomoadi</i>	200
The Study on The Use of Rough Fecal Particle Proportion to Estimate Feed Digestibility on Post-Weaned Lambs <i>T. F. Zahari, A. Prima, N. Luthfi, S. Dartosukarno and A. Purnomoadi</i>	204
Introduction of Feed Technology for Development of Cattle, in North Bolaang Mongondow <i>M. L. Rundengan, S.P. Pangemanan, J.O. Rawis and F.H. Elly</i>	208
Correlation of Protein Level in the Diets on Yield Grade and Rib Eye Muscle Area of Post-Weaning Lamb <i>F. R. D. Prakoso, A. Prima, N. Luthfi, E. Purbowati, S. Dartosukarno and A. Purnomoadi</i>	212
Effects of Probiotics Supplementation on Milk Quality of Etawa Crossbred Dairy Goat Fed by Product of Palm Oil Industry <i>Arief. N Jamarun, B Satria</i>	216
Measurement of Reactive Oxygen Species (ROS) in High and Low Residual Feed Intake Cattle <i>Zulkifli, N. A , Pitchford, W.S , and Bottema, C.D.K</i>	226

Correlations between Crude Protein/Total Digestible Nutrients Ratio and Commercial Cuts Weight and Percentage of Thin Tailed Lambs

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Abstract

This study was conducted to study the relationship between crude protein and total digestible nutrients (CP/TDN) ratio and shoulder, leg, and loin weight and percentage of thin tailed lambs. Twenty four heads of three months old male thin tailed lambs with initial body weight (BW) 14.19 ± 0.17 kg were fattened by feda complete feed contained three levels of crude protein (CP; 12, 14 and 16%) and two levels of total digestible nutrients (TDN; 60, 70%) to give six ratios of CP/TDN. After 3 months fattening period, the lamb was slaughtered and commercially cut into 8 parts including shoulder, leg, and loin, and then weighed. The data was analyzed by correlation regression to determine the correlation between CP/TDN ratio and shoulder, leg, and loin weight and percentage of weaning lambs carcass. The results showed that the CP/TDN ratio in feed has a medium correlation value with the shoulder weight ($r=0.57$), shoulder percentage ($r = 0.42$), and leg weight ($r = 0.43$), while low correlation was found in loin weight ($r = 0.25$), and negatively low correlated with leg and loin percentage, being -0.28 and -0.15 , respectively. Based on the results of this study, it can be concluded that the weight and percentage of shoulder, and leg and loin weight could be influenced by CP/TDN ratio in feed, but has no effect on the percentage of leg and loin.

Keywords: *thin tailed lamb, CP and TDN ratio, weight and percentage commercial cuts*

Introduction

The effort to improve lambs production in Indonesia is taking by increasing nutrient content in the diet, mainly based on the content of crude protein (CP) and total digestible nutrients (TDN). These CP and TDN as well as CP/TDN ratios required for the muscle formation and growth rate. Purbowati *et al.* (2013) reported that the increasing protein levels up to 11.7% and TDN 58.6% could increase meat production of goat. The balance of CP/TDN ratio will effect to optimum the rumen fermentation efficiency as well as feed utilization (Ginting, 2005).

The big portion of meat in carcass is contained mainly in leg, shoulder, and loin which are different in their growth rate. The leg and shoulder are earlier developed than of the loin (Owens *et al.*, 1993). This different of growth rate of these carcass portions may lead to vary the amount of the leg, shoulder, and loin portions as well as in the percentage. Therefore, to evaluate the suitable level of CP and TDN as well as CP/TDN ratio in feed, this study was carried out.

Methodology

Experimental animals, feed, and equipments

Twenty four heads of male thin tailed lambs (\pm 3 months old) with initial body weight (BW) 14.17 ± 0.17 kg (CV= 2.41%) were used in this study. They were grouped into six, each consisted of 4 lambs and fed a complete feed contained three levels of crude protein (CP; 12, 14 and 16%) and two levels of total digestible nutrients (TDN; 60, 70%) to give six ratios of CP/TDN, i.e. 12/60; 12/70; 14/60; 14/70; 16/60 and 16/70, respectively. The complete feed was composed of rice bran, cassava meal, sugar cane top, cassava peel, soybean meal, fish meal, molasses and mineral and was given in pelleted form. All lambs were housed in individual pen and given freely access to feed and water throughout the experimental period.

Slaughter procedure

All lambs were slaughtered randomly after 3 months of feeding. Lambs were fasted for 6 hours before slaughtered. The slaughter method was done follow halal and standard slaughtering methods. The carcass was kept in a cold room at 18°C for 10 hours. Carcass were cut into 8 parts as described by Forrest *et al.* (1975) after removing the kidney fat. Each part of shoulder, leg, and loin were weighed.

Parameters

Parameters measured were CP/TDN ratio of feed given to the lamb and weight and percentage of shoulder, leg, and loin. The CP and TDN ratio was calculated by dividing percentage of CP and TDN of the feed given and was expressed in decimal.

Data analysis

The relationship between CP/TDN ratio with weight and percentage of shoulder, leg, and loin were analyzed by correlation regression analysis. The strength of correlation coefficient was evaluated by the value described by Sugiyono (2008), i.e. 0.00 - 0.19 (very low), 0.20 - 0.39 (low), 0.40 - 0.59 (medium), 0.60 - 0.79 (strong), and 0.80 - 1.00 (very strong).

Results and Discussions

The relationship between CP/TDN ratio on the weight and percentage of leg, shoulder, and loin

The correlation between CP/TDN ratio and weight and percentage of leg, shoulder and loin are shown in Figure 1 and 2. The correlation of CP/TDN ratio was found positive on weight of leg, shoulder and loin, but on percentage, there were weak and negative correlation found on leg and loin, but medium and positive was found on shoulder.

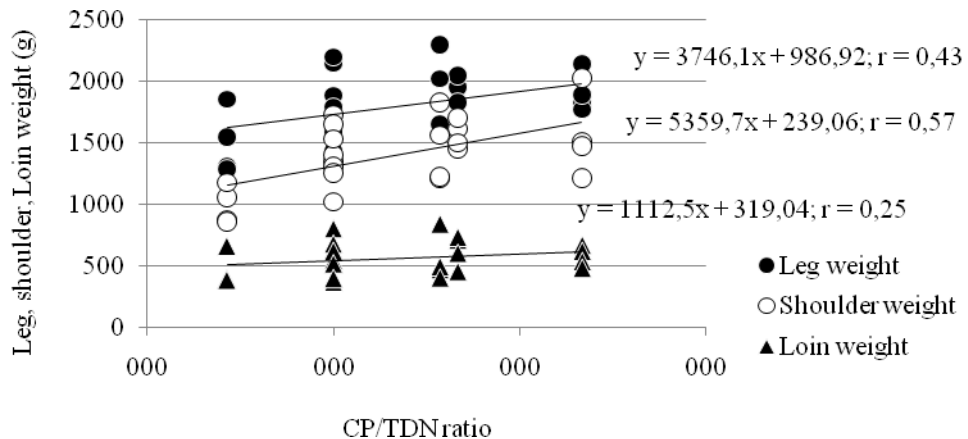
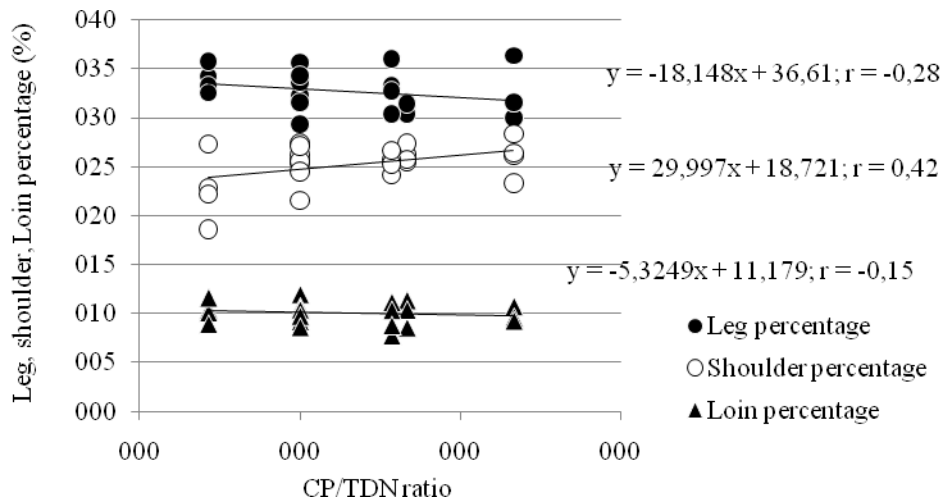


Figure 1. The relations between CP/TDN ratio on weight of leg, shoulder and loin



negative (-0.28 and -0.15, respectively) while for shoulder 0.42. These results indicated the CP/TDN ratio is able to accelerate the growth of muscle tissues in lambs, but at this stage the acceleration only reach shoulder as the earlier develop than leg and loin agreed to body components growth rate described by Owens *et al.* (1993) that ingeneral muscle development start from head and backward to tail and from extremities to the core towards the loin. The higher CP/TDN ratio resulted a considerable increasing in the amount of weight and percentage of shoulder. Shoulder is one of the moving parts, it has faster growth rate than other part does. The amount of deposition of protein and energy intake will speed up the tissues growth, and leg grows after the shoulder. According to Mawati *et al.* (2004) legs needed to walk and move, so it has fast growth rate in life and loin is more extensive later in life. Therefore, the correlation between loin and CP and TDN ratio is lower than the other. Forrest *et al.* (1975) reported that rack and loin have slow growth rate and late maturity.

There is a negative correlation between the percentages of leg and loin with CP and TDN ratio. Protein in the diet has a corresponding formation of lamb's tissues, so that the higher protein levels can increase the carcass weight. According to Rianto *etal.* (2006) the amount of protein deposition will be used for growth that will improve the carcass weight. Energy also has a function in the synthesis of fat, so the higher energy in feed, the more fat is formed. This is confirmed the results of study by Prakoso *etal.* (2009), that the higer TDN levels of feeding deposited more fat in carcass production. Therefore, the balance of protein and energy should be appropriated to produce optimal growth.

Conclusion

It can be inferred that there is a strong relations between the ratio of CP and TDN with the weight and percentage of leg, shoulder, and loin. CP and TDN ratio in the feed is able to optimize the growth rate of animals.

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