Correlation of Protein Level in the Diets on Yield Grade and Rib Eye Muscle Area ofPost-Weaning Lamb

by Endang Purbowati

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APIS
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The 3rd ASEAN Regional Conference on Animal Production
3rd APIS & 3rd ARCAP – 2016

Enhancing Synergistic Roles of Stakeholders for Development of Sustainable Livestock Production

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RECTOR SPEECH

Assalamualaikum warohmatullahi wabarakatuh
Distinguished Guests and Delegates, Ladies and Gentlemen,

It gives me great previlege and pleasure to extend to you all a very warm welcome on behalf of Brawijaya University and to say how grateful we are to the organizing commitee of The Third Animal Production International Seminar (3rd APIS) and The Third ASEAN Regional Conference on Animal Production (3rd ARCAP) who made this important event happening from today onward. Your attendance in this conference will not be enough before exploring the serendipity of Batu city which has attracted so many visitors in the recent years. It offers you many attractive places to visit varying from leisure facilities to smallholder dairy farms that relevant to the topic of this conference.

The issues of livestock production and food security have been a hot topic of debates all over the world to challenge our capability to feed human population living on earth that is believed will reach 25 billion people by the middle of this millineum. The global call on quality human resources especially in developing countries may not be achieved without adequate supply of animal protein. This has urged animal scientists to make significant effort to increase animal production by inventing new technologies and approaches but have no negative impact on our natural resources because the majority of smallholder farmers face with scarcity of cultivable land to produce adequate quantity and quality fodder for their animals. The practice of uncontrolled fodder scavenging from forest and open land may provoke a serious natural disaster such as landslide, flood and loss of water resources for human beings. Through this stage I would like to extend my concern to all distinguished guests and delegates to pay more attention on sustainable development of animal production that assures our young generation lives on earth safely and happily.

As the rector of Brawijaya University, I am also delighted to welcome you in our green campus sometime in the middle of the conference to hasten mutual collaboration between Brawijaya University and either national or international partners . We are fully aware that in a modern life higher education quality should be built on the basis of collaboration for many reasons. Brawijaya University has 14 faculties that can be grouped into four science trees, that is engineering, humanity, economics, and life sciences. They have been growing significantly not only in the number of student enrollements but many prestigeous achievement on research findings, student competitions and administrative transparency are our flagships in the last ten years. Nevertheless, we also realize that first and foremost constraint for any institution is the limit of resources and thereby underpinning the importance of establishing mutual collaboration. It is our opportunities to meet delegates from varying places of origin that open initial discussion for further networking on relevant topics of interests concordance to the main topic of this conference and beyond.

To conclude my address, once again I would like to express my sincere gratitudes to all delegates, partners and conference committee who have made this important international conference occurs. I do hope that your stay and partcipation in these seminar and conference will be fruitful and unforgettable.

By the name of Almighty Allah Swt. I declare that The Third Animal Production International Seminar (3rd APIS) and The Third ASEAN Regional Conference on Animal Production (3rd ARCAP) are officially open.

Thank you very much
Wassalamualaikum warohmatullahi wabarokatuh.

Batu, 19 October 2016
Brawijaya University
Rector

Prof.Dr.Ir. Mohammad Bisri, MS.

FOREWORD DEAN THE FACULTY OF ANIMAL HUSBANDRY BRAWIJAYA UNIVERSITY

Assalaamu'alaikum wr. wb.

Praise be to Allah, that the International Seminar 3rd-APIS could be held this year. This seminar is a routine agenda of the Faculty of Animal Husbandry UB held every three years, and this time held on October 19 to 21, 2016.

For participants come from outside the city of Malang, I proudly would like to say Welcome to the city of Malang and also on the beautiful campus of the University of Brawijaya, especially in the Faculty of Animal Husbandry. I'm sure the cool atmosphere of Malang and Batu, the participants will be able to feel a distinct impression and more enthusiastic in participating in the seminar

When we viewed from a trip APIS, we note that there is significant progress in every APIS's event. It can be noted by increasing the number of participants who submit their abstract / full paper and spread of country or university / institution they came from. This shows that the APIS is increasingly recognized by the researchers or academics community, and but on the other hand might be the number of researchers who want to publish scientific work is also increased.

Now, APIS not only belong to the Faculty of Animal Husbandry University of Brawijaya, but also belong to the universities and researchers in the world who require publish their qualified scientific paper immediately.

APIS is a very effective medium to introduce each other between researchers, as well as a very efficient medium for the information and experiences exchange among the participants. Through the APIS we can know the topics of research being conducted by other researchers in different regions or countries, so that we can develop our future research directions and topic. We can also use APIS meeting as a medium for constructing the research collaboration and networking with researchers from other institutions for strengthening our research foundation. By APIS meeting, some information about new and important problems in the livestock farming and their solutions in the field can be summarized, so it is be expected to be able to overcome some of the problems of animal farming. I am sure, that the scientific information presented in APIS are very important way out of various scientific problems and in practical condition. So that by referring to the new findings of the researchers stated in their scientific works will be able to immediately increase the efficiency of farm businesses and increase in profits for farmers.

Finally, we congratulate to have nice conference and wish all participants having good days for a better future.

Thank you,
Malang, October 13, 2016

Dean of the Faculty of Animal Husbandry
University of Brawijaya

Prof. Dr.sc.agr. Ir. Suyadi, MS.

WELCOME MESSAGE

Following the success of the First and Second Animal Production International Seminar (1st and 2nd APIS) held in 2010 and 2013, respectively, and based on the proposition during the International Representatives Steering Committee Meeting, The ASEAN Regional Conference on Animal Production (ARCAP) Committee, and Malaysian Society of Animal Production (MSAP), hence, it will be held Collaborative Seminar of The Third Animal Production International Seminar (3rd APIS) and The Third ASEAN Regional Conference on Animal Production (3rd ARCAP) at Shining Batu city, 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.

Sustainable development has become globally interesting issue in the last decades, since the environmentally failure of green revolution in agriculture and in some other aspects of development. The developments have been blamed to result in environmental degradation and global climate change (global warming) that dangers for the sustainability of life. Hence, the concept of sustainable developments that are environmentally, economically, socially and finally lively friendly must be practiced in all aspects of development, and as a never ending process to result in the most promising outputs for either the present or the future sustainable lifes.

Livestock production is very well known to have very important and strategic roles for human life as well as the environment. Livestock production is as important source of high quality foods for human, where its requirement must continuously increase and cannot be stopped due to the continuous increase of the human population. Livestock production provides income for most of small farmers in the villages and industries. Livestock also functions as traction, fertilizer, investment or saving, social prides, wool, and fur. However, livestock production has recently been blamed for its contributions to the land degradation and the global climate changes. Livestock production has been blamed to degrade 70% of rain forest area in Amazon, contributes 18% of green house gas, and competing in the use of potential materials either for human food or renewable fuel.

Thus, to improve the important and strategic functions and contributions of livestock production, it is our great honors and pleasures to invite stakeholders in livestock production including scientists, practitioners, decision makers as well as farmers and industries to attend This 3rd Animal Production International Seminar (3rd APIS) and The Third ASEAN Regional Conference on Animal Production (3rd ARCAP) held in the most interesting agriculture complex and exotic tourism city of Shining Batu, East Java Province, Indonesia from 19 to 21 October 2016. The Shining Batu city that is located in the valley of nonactive volcanoes complex, is also known as the oldest dairy cattle production center in Indonesia and also as livestock production center where small, medium, and large scale of livestock production and industries present including dairy cattle, beef cattle, goat, sheep, poultry, pigs, and rabbits.

The seminar is supposed to be a chance for the participants to discuss and exchange the newest information on animal science and technology for improving the prospects and copping the challenges in animal production for its sustainable development. In addition, the seminar will be as a site in establishing and refreshing contacts among animal scientists as well as practitioners for the development of sustainable livestock production.

We strongly expect your active support and participation for the success of the seminar. Finally, we are looking forward to seeing you all in the most interesting city of Shining Batu and enjoying our wonderful traditions, cultures, cuisines, and scenery.

SPEECH FROM CHAIRMAN OF APIS 2016

Bismillahirrohmaanirrohiim
Assalamualaikum wa rohmatullahi wa barokaatuh

Our sincerely Rector of Brawijaya University, Dean of Faculty of Animal Husbandry Brawijaya University, very important invited person, keynote speakers, and all of the participants,

In this opportunity, on behalf of the Organizing Committee, I would like to express my deeply thanks and welcoming all of you to attend this Third Animal Production International Seminar and The Third ASEAN Regional Conference on Animal Production (APIS & ARCAP-2016).

The theme of this seminar is **Improving the Synergistic Roles of Stakeholders for Development of Sustainable Livestock Production**. As all of us are aware that sustainable development in all of aspects of our live are very-very important to create a better live not only for ourselves generation but also more importantly for our next-next-next generations. Especially for the development of livestock production, it is not only targeted for the production of sufficient quantity of good quality foods including meat, milk, and egg but also to minimize its contribution to the degradation of environment. As it is very well known that livestock production is not only produce many fruitful functions our live but also has been blamed to cause land degradation, water and air pollution, and to contribute to the global climate change.

For those from this seminar we would like to expect that we can give and share our knowledge, technology, and experiences to give our contribution for the development of sustainable livestock production.

As I got the data from our secretary that this seminar is attended by not less than 300 participants from many different countries including Sudan, Iran, Sri Lanka, India, Thailand, Taiwan, Malaysia, Australia, and of course from all over Indonesia from North Sumatera to West Papua; from different discipline of livestock production including livestock production systems, feeds and nutrition, genetic, breeding, and conservation reproduction, environment and waste management, products processing and food safety, socio-economic and agribusiness of livestock, and veterinary and health care; and from different types of stakeholder including scientists, practitioners, decision makers as well as farmers and industries. For those, I would like again to express my deeply thanks to all of the participants. Please, enjoy our seminar and our most interesting city of Shining Batu and enjoying our wonderful traditions, cultures, cuisines, and scenery.

And finally, last but not least, I wish to thank to all sponsors who have contributed for financial support, to our partner institutions and especially to the organizing committee member who have been working very hard to prepare and ensure the success of this international seminar.

Good Luck and Wassalamualaikum wa rohmatullahi wa barokaatuh.

Chairman
Dr.Ir. Marjuki, M.Sc.

WELCOME SPEECH FROM MSAP PRESIDENT

Welcome Speech From MSAP President

It is indeed my pleasure to welcome you to the 3rd ARCAP (Asean Regional Conference on Animal Production) to be held in the Shining City of Batu, Malang from 19th – 22th October 2016. Malaysian Society of Animal Production is proud to be a co-organizer of this conference. ARCAP was mooted by the then president of MSAP Dr Abu Hassan Muhammad Ali, in 2013 and the first ARCAP conference was held in Kuching, Sarawak in June 2014. Representatives from Malaysia, Indonesia, Thailand, The Phillipines, Vietnam, Singapore, Laos and Myanmar were among the invited speakers. Brunei and Cambodia has yet to name their representatives. ARCAP was originally planned to be held every two years in different Asean countries but initially this system was not practical as some member countries were not represented during earlier meetings. The formation of ARCAP was to develop a network within the Asean region, providing a platform where scientists and livestock stakeholders can discuss, collaborate and exchange ideas and information on animal production specific to this region. At present ARCAP is somewhat a loose organization of societies of animal production in the Asean region and therefore look forward to receiving voluntary members to be actively involved. MSAP organized the first and second ARCAP conferences, and fortunately the Faculty of Animal Husbandry, Universitas Brawijaya, has volunteered to organize the 3rd ARCAP conference in Batu, Indonesia in conjunction with their 3rd APIS. It is hoped that future ARCAP conferences will be will be hosted by other member countries.

Before I end, I would like to thank the organizing committee, and all those involved, for their hard work to make this joint conference a success. Thanks are due to Faculty of Animal Husbandry, Universitas Brawijaya, for providing all the necessary facilities and support for the success of this conference.

Last but not least, I would like to thank all participants of this conference for your support and enthusiasm and hope that you have a fruitful and enjoyable conference.

Prof Dr Abd Wahid Haron

President MSAP 2016/2017

LIST OF CONTENT

Keynote Speakers Presentation

Oral Presentation 1 Focus Session: Feed and Nutrition (1)

Oral Presentation 1 Focus Session: Feed and Nutrition (2)

Oral Presentation 1 Focus Session: Genetic Breeding and Conservation

Oral Presentation 1 Focus Session: Livestock Production Systems

Oral Presentation 1 Focus Session: Socio-Economics and Agribusiness

Oral Presentation 2 Focus Session: Feed and Nutrition (1)

Oral Presentation 2 Focus Session: Feed and Nutrition (2)

Oral Presentation 2 Focus Session: Socio-Economics and Agribusiness

Oral Presentation 2 Focus Session: Reproduction

Oral Presentation 2 Focus Session: Processing Product

Oral Presentation 03: Focus Session: Feed and Nutrition (1)

Oral Presentation 3 Focus Session: Feed and Nutrition (2)

Oral Presentation 3 Focus Session: Genetic Breeding and Conservation

Oral Presentation 3 Focus Session: Livestock Production

Oral Presentation 3 Focus Session : Veterinary and Health Care

Oral Presentation 4 Focus Session: Feed and Nutrition (1)

Oral Presentation 4 Focus Session : Feed and Nutrition (2)

Oral Presentation 4 Focus Session: Reproduction

Oral Presentation 4 Focus Session: Livestock Production System

Oral Presentation 4 Focus Session : Socio-Economic and Agribusiness

Oral Presentation 5 Focus Session : Feed and Nutrition

Oral Presentation 5 Focus Session: Feed and Nutrition (2)

Oral Presentation 5 Focus Session : Feed and Nutrition (3)

Oral Presentation 5 Focus Session: Livestock Production System

Oral Presentation 5 Focus Session : Socio-Economics & Others

Correlation of Protein Level in the Diets on Yield Grade and Rib Eye Muscle Area ofPost-Weaning Lamb

F. R. D. Prakoso[1], A. Prima[1], N. Luthfi[1], E. Purbowati[1], S. Dartosukarno[1]and A. Purnomoadi[1]

[1]Faculty of Animal and Agricultural Science, Diponegoro University, Semarang
*Corresponding author :*agung194@yahoo.com

Abstract

This study was set up to investigate the correlation between crude protein (CP) levels on yield grade and rib eye muscle area in post-weaning lamb. Twelve post-weaning lambs aged ±3 months and body weight ±25.82 kg (CV=13.71%) were used in this study. The lamb was grouped into three for the levels of CP (12, 14 and 16%) of the feed. Totaldigestible nutrients (TDN) of the feed was 60% which given *ad libitum*. The lambs were slaughtered after three months rearing period. Parameters measured were yield gradeand rib eye muscle area.Yield grade was determined by using backfat thickness at the 12th rib (surface area LD muscle) following the formula of 0.4 + (10 x backfat thicknesses in inches). Rib eye muscle area measurements was on the rack of ribs of 12nd and 13rd by using millimeter block and glass. All data were analyzed using correlation analysis. The results showed that protein levels in the diets has low correlation with the yield grade value and the rib eye muscle area, being 0.136 and 0.166, respectively. It can be concluded thatprotein levels in the feedhas low correlation on the yield grade and rib eye muscle of post-weaning lambs.

Keywords: *weaning lamb, yield grade, rib eye muscle area.*

Introduction

Thin tailed sheep had been known as the local sheep in Indonesia which has an advantage in adapting to the tropical climate conditions (Marniati, 1989). The thin tailed sheep expected to solve the problems of meat production in Indonesia. Fattening weaning lambs can be a solution to fulfill meat needed and its productivity can be expected sooner so that the meat production in carcass also can be increased.

Based on the problem, feeding management important to note that quality and quantity of meat can be produced as expected. One of the ways to increase feed quality is increasing protein content (Prakoso et al., 2009). The feed with great protein content is needed in young ruminants to grow rapidly (Soeparno, 2005).

Yield grade is indicated as meat produced on the main pieces of carcass (Soeparno, 1998). Yield grade can be measured by taking backfat thickness in the 12th of ribs or in the surface area of the muscle Longissimus Dorsi (LD). The magnitude of rib eye muscle area can describe the large of meat so that can affect the tenderness of meat, also can increase the economic value (Purbowati et al., 2013).

The purpose of this study was to determine correlation between protein levels and the yield grade and rib eye muscle of weaning lambs. The benefits of this research was to provide information of correlation between protein levels and the yield grade and rib eye muscle of weaning lambs.

Methodology

Materials used were 12 male thin-tailed weaning lambs aged ±6 months and ± 25.82 kg of slaughter weight. Materials feed were sugarcane top, soybean meal, rice bran, fish meal, cassava peel, cassava meal, molasses and minerals. The complete feed was in pellet form. Feed composition of each treatment can be seen in Table 1. The devices were an analytical scale with 1 gram of precision, cutters, saws for splitting carcass, glass, millimeter blocks and calliper.

Table 1. Composition of feed treatment

Uraian	Perlakuan		
	T1	T2	T3
	----------%----------		
DM	85,41	83,56	84,56
CP	12,00	14,00	16,00
TDN	60,00	60,00	60,00

DM= Dry Matter; CP= Crude Protein; TDN= *Total Digestible Nutrient*

Research Methods

The research has been conducted over 12 weeks. Feed was given in ad libitum. Lambs were fasted for 6 hours before slaughtered. Fasted lambs have been weighed to obtain the slaughter weight. Slaughtered lambs have been separated their head, viscera, metatarsus, tail, and dressed them to get a fresh carcass weight. Fresh carcass has been saved for aging for 10 hours at 17°C in room. Lambs was slaughtered symmetrically from the neck to tail, and weighed the left and right side. The carcass was cut into eight commercial cuts included neck, shoulder, breast, foreshank, rack, flank, loin and leg. The commercial cuts have been weighed and measured the backfat thickness to calculate the yield grade and rib eye muscle area.

Rib eye muscle area was measured at the 12th and 13th of ribs rack by using millimeter blocks and glass. The backfat thickness was measured at the 12th of rib (the surface of LD muscle area). Subcutaneous fat thickness was measured perpendicularly with fat surface and in the quarter of LD muscle by using a caliper. The backfat thickness was calculated by Romans et al. (1985) equations which was 0.4 + (10 x backfat thickness in inches). All data was analyzed using correlation analysis.

Results and Discussion

The correlation between preotein levels with yield grade and rib eye muscle area at thin-tailed weaning lambs can be seen in Figure 1 and 2.

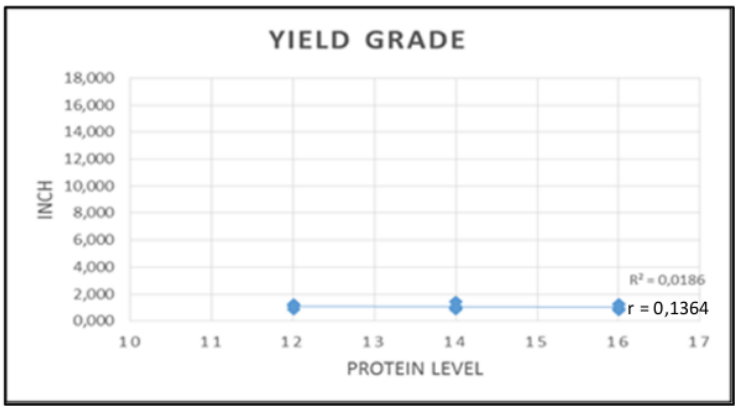

Figure 1. Correlation between protein levels and yield grade

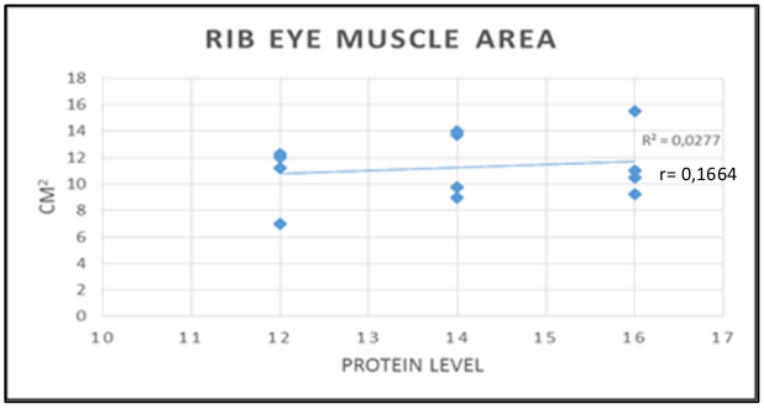

Figure 2. Correlation between protein levels and rib eye muscle area

The results showed that level of crude protein (CP) 12-16% have a low correlation to the value of the yield grade (r = 0.166433) and rib eye muscle area (r = 0.136382). The increasing of feed protein levels was slightly followed by increasing of yield grade and rib eye muscle area. Yield grade was measured by carcass backfat. The protein of feed used to growth of muscle and still haven't excess for fat. The results of this study showed that increasing of protein level could slighly increase the backfat thickness. The speed growth of head and bone lambs was higher than fat. It was caused that the lambs still in growth acceleration. According to Soeparno (1994), young age was still in organs growth acceleration as well as an increasing in the percentage of other components.

The correlation of protein levels and yield grade and rib eye muscle area was low. It could be influenced by the age of lambs so that growth has not reached the maximum point in the loin or longissimus Dorsi (LD) muscle. According to Shackelford et al. (2003), the yield grade and rib eye muscle area can be used to analyze the results of carcass produced. The growth rate of cattle has several stages of the bones, meat and fat. The young animals were estimated that they were still in acceleration growth of non-carcass parts including head and

foot bones metatarsus. According to Owens et al. (1993), the young animal was still in the low growth of muscle and fat so that gave affect lower values in the fat thickness on the back and muslce on longissimus dorsi (LD), yield grade and rib eye muscle area..

Conclusion

It can be conclude that protein level has a low correlation to the value of the yield grade and rib eye muscle area. One of the factors affecting the low correlation was the age of lambs, because age can affects the growth rate fat and muscle tissue of lambs.

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