The Growth of Indonesian Local Sheep in Rural Production Systems

by Endang Purbowati

Poster 57

The Growth of Indonesian Local Sheep in Rural Production Systems

Purbowati, E. & A. Purnomoadi

Faculty of Animal Agriculture, Diponegoro University, Undip Tembalang Campus, Semarang 50275, Indonesia

Summary

Eighteen male 0-12 months old local sheep was used in this study for determining the growth performance of Indonesian local sheep in rural are, namely growth rate, body weight and age at reaching puberty and maturity. Regression-correlation analysis was used to obtain the growth curve. The results showed that dry matter intake of the local sheep in rural area was limited, and only giving the daily body weight gain of 57.86 g. The growth curve of local sheep showed the puberty was reached at age of 6 m.o. or at body weight of 17.70 kg, while maturity was reached at 12 m.o. or at BW 31 kg.

Keyword: local sheep, growth curve, rural

Introduction

Sheep is one of dominant meat animals in rural area in Indonesia. Developing this animal for providing farmer the maximum benefit should be based on the actual performance of growth of this sheep in rural area. Many studies to improve the sheep performance were done by feeding manipulation, but the study on the basic data of the growth performance was very limited. This study was aimed to determine the growth curve of local sheep on rural rearing condition. The benefits of this growth curve are able for standardizing sheep performance, for selection and breeding.

Materials and Methods

The study was used 18 male local sheep, aged 0-12 months obtained from Pagergunung village, subdistrict Pringsurat, district Temanggung, Indonesia. The sheep were weighed on a body weight hanging scale, while the age was based on recording or farmer information and teeth condition. These data were analyzed with regression-correlation analysis for determine growth curve based on the knowledge of growth.

Results and Discussion

Indonesian local sheep is believed to be descendants from crosses of Java thin tailed and fat tailed sheep. They were characterized with white coat color, or some with black spotted, and in the top of tail deposited some little fat, and then getting smaller in the tips of tail. In the study area, the purpose of raising sheep originally for obtaining much fertilizer needed for their horticultural farms, but later it was shown to produce meat.

Sheep production systems in rural areas
Sheep production systems in rural areas have been integrated with crop production and farming systems. They are especially dependent on the agro-ecological environment and because of the ruminant digestive systems, must always depend on hight fibre vegetation or crop residu for their feed base. Feed was given twice a day consisting of forage and concentrates. Forage given was dependent on the nature and extent of the crop residues produced, while the concentrate feeding was consisted of rice bran, cassava, and by product of coffee industry.

Based on the amount of feed given, it can be calculated that the average of dry matter intake (DMI) of male local sheep at 20 kg body weight (BW) was 970.8 g, crude protein (CP) 121.0 g, respectively. These were below the Nutrients Requirements standard of Ranjhan (1981) for ram at 20 kg BW receiving 1000 g DM, 127 g CP and 560 g total digestible Nutrients (TDN) may give 130 g ADG. The high NDF and ADF were relatively high, being 56.79 and 38.30%, respectively, indicated that the utilization of feed by animal was not high.

Sheep growth curve

The growth curve and growth rate of the local sheep are presented in Figure 1. Owens et al. (1993) stated that the growth curve (mass or cumulative weight plotted against age) is sigmoid, consisting of a pre-pubertal accelerating phase plus a post-pubertal decelerating phase. Based on this curve, birth weight of local sheep was calculated about 3 kg, maturity was reached at age of 12 months and body weight at around 31 kg. The puberty as indicated by turning point of the growth curve (Owens et al., 1993) was occurred at the age of 6 months and body weight about 17.70 kg. Average daily gain (ADG) of local sheep in the rural production systems was 57.86 g with the highest ADG (87.50 g) was achieved at the age of 6 months.
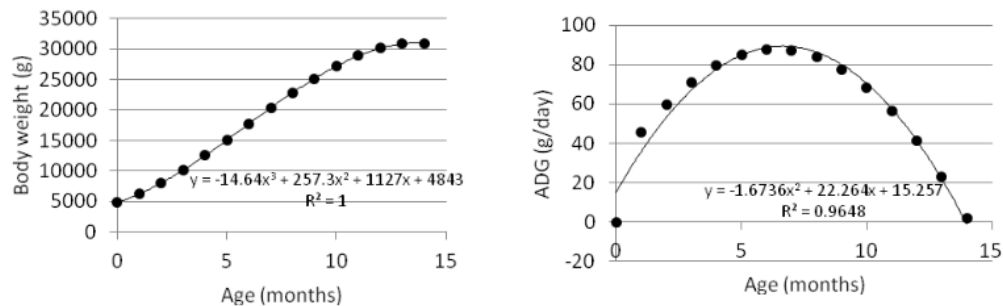
Left chart: Body weight (g) vs Age (months); $y = -14.64x^3 + 257.3x^2 + 1127x + 4843$, $R^2 = 1$

Right chart: ADG (g/day) vs Age (months); $y = -1.6736x^2 + 22.264x + 15.257$, $R^2 = 0.9648$

Figure 1. The curve and equation prediction for growth (left) and growth rate (right) of local sheep in rural production systems.

These results lead to the some recommendations for better production management, such as separation of male and female of sheep should be done before the age of 6 months, fattening lambs should be start from age 6 months and slaughtered at age of 12 months. The growth curve showed that at age of 12 months the body weight sheep is keep steady or even start to fall.

References

Owens, F.N., P. Dubeski, and C.F. Hanson. 1993. Factors that alter the growth and development of ruminants. J. Anim. Sci. 71 : 3138-3150

Ranjhan, S.K. 1981. Animal Nutrition in Tropics. Second Revised Edition. Vikas Publishing House PVT LTD, New Delhi.

Poster 58

Relationship between Live Weight and Carcass wWight in Indonesian Local Sheep

Purnomoadi, A., A. F. Nurlatifah, & R. Adiwinarti

Faculty of Animal Agriculture, Diponegoro University, Undip Tembalang Campus, Semarang 50275, Indonesia

Summary

This study was aimed to determine the correlation between the live weight and carcass weight in Indonesian local sheep. This study was used the data of live weight or slaughter weight and carcass weight of eighty sheep collected from eight feeding experimental studies on carcass quality. The results showed that the live weight averaged at 20.04 kg resulted in carcass weight of 8.18 kg, or equal to 40.82%. The correlation of live weight and carcass weight was found linear and strong as shown by high r value, being 0.94.

Keywords: slaughter weight, carcass weight, correlation, sheep

Introduction

Carcass weight is one of production parameters in meat animals. Many producers prefer larger carcasses because it will give the larger income; however, some factors are influenced the carcass size such as animal conditions (breed, weight and age), nutrition and management put to the animal prior the animals were slaughtered. Ely et al. (1979) slaughtered early-weaned lambs at 41 or 50 kg, and reported a 4% increase in dressing percents for the heavier slaughter weight lambs. The broad use of optimal slaughter weights will be common to the industry when the economic value of a carcass is related to yield grade and increased value is passed on to the producer and lamb feeder (Snowder et al., 1994). Also, Breed characterization for producing carcass also must be clearly understood before lamb producers can optimize approaches to lamb production. The purpose of this study was to determine the correlation between the live weight and carcass weight in Indonesian local sheep in order to know the live weight range of sheep that produce the maximum carcass weight.

Materials and Methods

This study used slaughtered data of eighty local male sheep at age range of 1-1.5 y.o., collected from eight feeding experimental studies. These studies mostly were done in 3 months feeding treatments after 1 month adaptation period. The feeding was set to provide enough dry matter intake (4% of live weight) and at least 12% crude protein. The data used were live weight or slaughter weight, and carcass weight. The live weight or slaughter weight was obtained by weighing sheep after 24 h fasting prior to be slaughtered. Carcass weight was obtained from sheep after being slaughtered, bled, skinned, disemboweled, and separated the head, removed the four lower legs and tail, and was then 12 h withered. The percentage of carcass weight to slaughter weight was also measured. Data were analyzed using correlation and regression analysis. The strength of relationship was determined based on the correlation value (r) between the two variables as follows: 0 to 0.199 (very weak); 0.20 to 0.399 (weak); 0.40 to 0.599 (medium); 0.60 to 0.799 (strong) and 0.80 to 1.0 (very strong).

Results and Discussion

Data used in this study was ranged at 12.5 - 32.0 kg of body weight, while the carcass weight was ranged at 4.06 – 14.97 kg. Figure 1., showed the correlation between slaughter weight and carcass weight of local sheep was the value found high, being 0.94. This was in agreement with the statement of Berg and Butterfield (1976) that the carcass weight is affected by the slaughter weight. If the data of carcass was calculated in percentage to the slaughter weight, the sheep slaughtered at 12.5 - 32 kg live weight resulting in carcass percentages ranged at 29.42 - 51.28%.
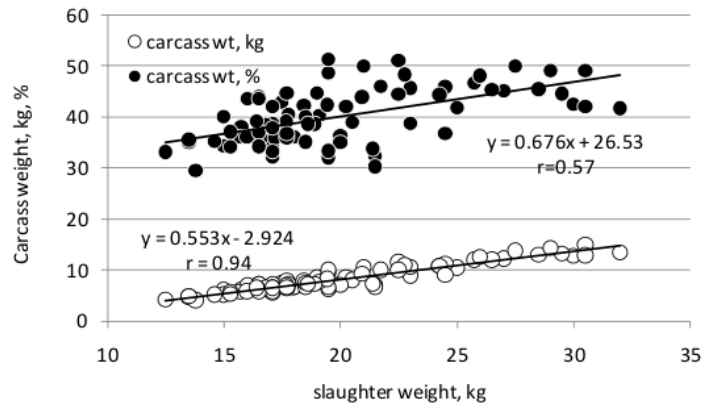

Figure 1. Correlation between slaughter weight and carcass weight and its percentage

The relationship between slaughter weights to the carcass percentage was found moderate correlation, being 0.57 indicated a greater carcass percentage will be obtained by higher slaughter weight. The percentage of carcass in Indonesian local sheep was found low if compared to other breeds, such as Targhee × Hampshire crossed lambs slaughtered at 52 - 77 kg live weight which found ranged at 52.7 – 59.0% (Borton et al., 2005), as well as to Rambouillet, Targhee, Columbia and Polyplay lambs (Snowder et al., 1994) slaughtered at 52.3 – 53.9 kg live weight were 50.4, 50.1, 49.3 and 51.5%, respectively.

The implication of this result for production management was the Indonesian local sheep should be slaughtered at higher live weight to produce higher carcass production. Moreover, the better breeding program to develop the bigger size crossbred lamb based on local sheep should be considered.

Sustainability Beef Cattle Development for Beef Supply in Central Java, Indonesia

Roessali, W., A. Setiadi, B.T. Eddy & W.Sumekar

Faculty of Animal Science and Agriculture, Diponegoro University, Tembalang Campus, Semarang, 50275 - Indonesia

Summary

The study aims were to identify farm potency to support the production sustainability and technology adoption and to support the beef self sufficiency program in Central Java. The regencies were Blora, Sragen and Wonogiri. Farmers was chosen by purposive sampling is based on scale of ownership minimal 2 animal unit (AU). 50 (fifty) farmers on every regency was chosen. So Total of 150 beef cattle farmer was chosen as respondents. Beef cattle were owned by farmers were 2.48-3.62 AU. Usually farmers raise their cattle by small scale. Farmers with high number cattle own have adoption technology tend to decrease. The result showed production pattern positively influence technology level.

Keywords: development, sustainable, beef supply, beef cattle,

Introduction

Livestock development especially to develop beef cattle in Indonesia should be done through sustainability, modern and professional efforts. Utilization of technology innovation to enhance the efficiency business is needed. Constraint to develop beef cattle especially local strain is low productivity. Reproduction disorder usually is occurred in local beef cattle due to estrus delay (Yusuf et al., 2012). Longer time of estrus cycle after birth limits reproduction efficiency in tropical area (Montiel and Ahuja, 2005). Service per conception is high (Ilham, 2006), low quality of mating management (Winugroho, 2002) and low ability of farmer to adopt the technology (Roesali et al., 2009). Effort to increase the beef cattle productivity is conducted through policies which apply to the beef cattle farmers. There were five factors which should be applied to obtain the self sufficiency program 1) depress the mortality, 2) prevent the female productive cow, 3) delay the slaughter time follow the genetic potency, 4) conduct the artificial insemination, and 5) increase the genetic quality and improve the business efficiency. The objective of the study were to identify farm potency to support the production sustainability and technology adoption and to support the beef self sufficiency program in Central Java.

Materials and Methods

Survey method was used in the study. Beef cattle farmers location were chosen as purposive in 3 (three) regency in Central Java is based on Location Quotient (LQ) > 1, the regencies were Blora, Sragen and Wonogiri. Farmers was chosen by purposive sampling is based on scale of ownership minimal 2 animal unit (AU). 50 (fifty) farmers on every regency was chosen. So Total of 150 beef cattle farmer was chosen as respondents. Descriptive analysis was used to identify the farm potency and logit analysis was used to determine the technology adoption.

Results and Discussion

Result of the study showed farm potency was based on land power supporting which was chosen on location quotient (L/Q) was good. All of regencies have (L/Q) >1. Land width was 0.52 ha on average and can support cattle feed. Number of cattle raised by farmers was 2.99 AU. Farmers profile is shown in Table 1. Implementing of Integration of plant-cattle program by government is one of policy which is socializing to the beef cattle farmers. Most of Beef cattle farmers have the knowledge on feed processing such as rice straw fermentation (61.33%). From the amount 32.61% farmers can produce for their own cattle and 16.67% of farmers can produce rice straw fermentation for cattle owned by group. Barrier and constraint to apply rice straw fermentation was time is allocated to prepare the material and labor.

Table 1. Farmers Profile in three regencies

Item	Wonogiri	Sragen	Blora
L/Q	1.8	1.9	1.7
Land width (Ha)	0.62	0.54	0.40
Number of cattle (AU)	3.62	2.86	2.48
Age (year)	41.02	44.10	45.22
Education (year)	6.74	7.34	6.55
Experience (year)	16.17	11.1	12
Number of Family (persons)	3.66	2.5	2.9
Beef cattle contribution (%)	41.24	37.85	36.58

Adoption technology of feed significantly was affected by education, experience, number of cattle. However land width and LQ not significantly influence the adoption technology. Model was fit because chi square on (0.000) significance level and level of prediction was 63.33%. Education level was relatively high (β=-1.52 sig. 0.096) and experience was relatively long (β=-0.69 sig. 0.091). Adoption technology of feed was decreased. Finding the result showed the increasing number of cattle owned by farmers (β=-0.77 sig. 0.0345) would decreased the adoption technology level even production pattern positively influence to the adoption technology level. Beef cattle were owned by farmers were 2.48-3.62 AU. Usually farmers raise their cattle by small scale. Farmers with high number cattle own have adoption technology tend to decrease. The result showed production pattern positively influence adoption technology level.

Duck Farmer Perception on Raising Pattern in Brebes Regency, Central Java, Indonesia

Sumekar, W.

Faculty of Animal Sciences and Agriculture, Diponegoro University, Undip Tembalang Campus, Semarang 50275, Indonesia

Introduction

Brebes regency in Central Java Province is center of duck development which have the highest population of duck and also is recognized as salted egg production. The duck development in this regency is supported by agroecosystem of Brebes area. Duck population in 2011 was 568,370 birds and the labour were 2,273 persons (Animal Husbandry and Animal Health Office, Central Java, 2011). Duck is an important commodity in Brebes Regency. Duck raising is very common conducted by the farmers to generate additional income for livelihood of farmers. Traditionally, duck farmers raise duck in paddy field so duck can eat from the paddy by product. The traditional raising pattern is now decreasing due to many of paddy field have been converted to estate and industrial plant. Semi intensive pattern develop because the decreasing of paddy field and the increasing of pesticide in paddy cultivate. The study was investigated the duck raising pattern was chosed by farmers in Brebes Regency.

Results and Discussion

Duck raising pattern

Rice field scarcity and trend of increasing the pesticide utilization on paddy, hence attract farmers to move to intensive raising pattern. Okabe et al. (2003) stated that duck raising in the paddy fields would cause the decreasing of land nitrogen and palatability of rice will be low.

Farmers feel that intensive raising pattern would cause the feed cost increase. Feed cost contribute the highest number in production cost so funding availability to feed duck everyday is needed to support the sustainability of duck raising. Hendayana (1991) stated that intensive pattern tend to reduce the feed availability and reduce productivity then would appear the disease. Up to present still many farmers raise duck through semi-intensive pattern although the ability to raise duck in the field just only 300 heads per farmers.

Farmers perception of duck raising pattern was chosen

Based on deep interview with Nurudin (Head of "Bebek Umbaran" duck farmers group in Negarayu Village, Tonjong Subdistrick, Brebes Regency, he stated that with intensive pattern usually duck can run and get the feed from the paddy by product, water plant, and fish will be disappear. But the semi intensive pattern would produce egg with egg yolk more sharper yellow hence would entail the egg price compared with egg produced by intensive pattern. The duck raise by semi intensive pattern can more resistant to disease and can minimize the feed cost.

The result showed, in 2012, the mortality of duck caused by avian influenza of duck raised by intensive pattern is higher than duck raised by semi intensive pattern. Almost 70% of duck raised by intensive pattern was died. Duck was raised in paddy field could fed fish, water plant, and paddy by product. The condition could increase the antibody of duck.

Duck is raise in the paddy field will feel secure, safe, not easy to become stress because of human and new view and condition (Haque et al., 2005). Rochfort et al. (2008) stated that forage contain saponine. Saponine is very useful for antiviral, increase the immune system,

increase the daily gain and increase the Feed conversion ratio (FCR) efficiency. The increasing of forage on duck raising could reduce the rice bran utilization. Based on study of Sumekar (2012) found that utilization of forage like water hyacinth could improve the duck performance. The regression coefficient has positive sign and significant (P<0.01), therefore incorporate forage in the duck feed will increase the production.

Conclusion

Duck raise in the paddy field and duck raise in semi intensive patterns would produce egg with egg yolk more sharper. Duck will more resistant to avian influenza disease and will minimize the feed cost.

References

Dinas Peternakan dan Kesehatan Hewan Propinsi Jawa Tengah. 2011. Statitik Peternakan Jawa Tengah 2011. Dinas Peternakan dan Kesehatan Hewan Propinsi Jawa Tengah, Ungaran.

Haque, M. N., S. A. Aziz, M. N. Mia, S. S. Chandra and M. R. Rahman. 2005. Evaluation of comparative bio-economic performance of duck farming in beel (low land) area of pabna. J. Anim. Vet. (2): 64-66

Hendayana, R. 1991. Pemberdayaan petani-ternak menuju kemandirian melalui wahana kelompok usaha bersama agribisnis (Kasus pada usaha ternak itik di Kabupaten Lombok Barat, NTB). Med. Pet. 1 (24): 21 – 25

Okabe , M., T. Baba, K. Yokota and K. Suyama. 2008. On ensuring sufficient yield and high-quality rice through the rice-duct farming system. J. ISSAAS 13 (2): 92-125.

Rochfort, S., A.J. Parker and F.R. Dunshea. 2008. Plant bioactives for ruminant health and productivity. J. Phitochem. 69 : 299 - 322

Sumekar, W. 2012. Strategi Pemberdayaan Peternak Itik Untuk Meningkatkan Kinerja Usahanya Di Kabupaten Brebes. Disertation. Postgraduate program, Diponegoro University, Semarang.

Poster 61

Removed Cholesterol of Lactic Acid Bacteria Isolated from Mink

Liu,H.L. C. Yang, Y. Jing, Z.P. Li, W. Zhong, G.Y. Li

Institute of Special Wild Economic Animal and Plant Science, Chinese Academy of Agricultural Sciences, Jilin 130122, China.

Corresponding author: Guangyu Li Email: tcslgy@126.com

Abstract

This study evaluated the cholesterol-lowering property of lactic acid bacteria (LAB) isolated from mink in vitro and. Two strains were investigated, Enterococcus faecium MDF1104 and Lactobacillus plantarum MDL1118. Growth curves indicated that these strains rapidly proliferated following 2 to 10 hours of incubation. Both bacteria were shown to remove cholesterol from broth natural hen yolk and skimmed milk. Both of the bacteria could could remove synthetic cholesterol from MRS broth with 2% (w/v) sodium taurocholate, (93.13% and 82.22% reduction respectively). The Experimental mice total serum cholesterol was declined (0.90mmol/L) (p<0.01) when the combination of L. plantarum and E. faecium was used. Based on these results, mink source L. plantarum MDL1118, E. faecium MDF1104 and a combination of the two may serve as promising candidates as potential cholesterol-lowering probiotics.

Keywords:Mink source, Enterococcus faecium, Lactobacillus plantarum, Cholesterol removal

Introduction

Probiotics are considered to have potential health-promoting benefits as biotherapeutic agents. Other studies have reported that some lactic acid bacteria (LAB) could lower both total cholesterol and low-density lipoprotein (LDL) cholesterol. Interestingly, these studies have also indicated that the removal of cholesterol varies depending on the source and species of LAB used (Sirilun,2010). Mink (*Mustla vison*) are small carnivores that can tolerate up to 35% of fat in their diets. Despite high fat intake, cardiovascular and cerebrovascular disease in mink has never been reported. The aims of the present study were to investigate the effect of LABs isolated from mink on cholesterol removal both in vitro, and evaluate their probiotic properties.

Materials and Methods

Lactobacillus strains
The two strains used in this study *Lactobacillus plantarum* (MDL1118) and *Enterococcus faecium* (MDF1104) were isolated from the intestines of mink. Strains were serially transferred three times in broth and incubated at 37°C for 24 h.

Method
Bacterial growth was monitored by measuring the optical density (OD) value of the culture broth at 650 nm by ultraviolet-visible spectrophotometer. The method described by Rudel and Morris (1973) was used to determine the amounts of cholesterol in the spent broth and uninoculated broth. 4% fresh hen egg yolk, or 12% skimmed milk, or 0.2% sodium thioglycollate as a cholesterol source, was measured at 4, 8, 12, 16 and 24h. Freshly prepared overnight LAB cultures were fed to mice with 0.3ml suspensions by intragastric gavage for 35days the serum total cholesterol levels were measured.

446

The Growth of Indonesian Local Sheep in Rural Production Systems

8   sinta3.ristekdikti.go.id
     Internet Source   <1%

9   Ulf Hennig, Siegfried Kuhla, Wolfgang B
     Souffrant, Armin Tuchscherer, Cornelia C
     Metges. "Effect of partial dehulling of two- and   <1%
     six-row barley varieties on precaecal digestibility
     of amino acids in pigs", Archives of Animal
     Nutrition, 2006
     Publication

10   media.neliti.com
     Internet Source   <1%

11   care.diabetesjournals.org
     Internet Source   <1%

12   Hulot, F.. "Rabbit growth, feed efficiency and
     body composition: Effects of recombinant   <1%
     porcine somatotropin", Meat Science, 1994
     Publication

13   "30TH INTERNATIONAL SYMPOSIUM ON
     THE AUTONOMIC NERVOUS SYSTEM",   <1%
     Clinical Autonomic Research, 2019
     Publication

14   Klaus Horsted, Judith Henning, John E.
     Hermansen. "Growth and sensory   <1%
     characteristics of organically reared broilers
     differing in strain, sex and age at slaughter",

Acta Agriculturae Scandinavica, Section A - Animal Science, 2005

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		