

The Effect of Crude Protein Content on Meat and Fat Production in Sheep

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Abstract

This study was undertaken to evaluate the effect of crude protein (CP) content on meat protein and fat production in sheep. Twenty four male thin tail sheep aged 6-7 months with average body weight of 13±1.56 kg were used in this study. The sheep were fed 10-14% CP. Sheep with the average body weight amount 16.75 kg were slaughter after 4 months rising. Parameters observed in this study were carcass weight, meat weight and fat weight of thin tail sheep. The data were analyzed using correlation analysis. The result of this study showed that CP content on diet had weak and negative correlation with meat production ($r = -0.06$) ($y = -0.148x + 62.54$) but had weak and possitive correlation with fat production ($r = 0.3$) ($y = 0.807x^2 - 18.40x + 119.1$). Based on the result, it can be concluded that the optimum CP content for sheep is 12.5% CP.

1. Introduction

Increasing economic growth will stimulate increasing the demand of livestock product such as meat. One of meat which people like is sheep meat. Nowadays, people prefer to consume lean meat. This is due to public interest in nutrition and healthy eating [1,2]. Since consumers need to be assured the quality of meat, understanding how the factors affect carcass and meat quality is very important for the lamb meat industry.

One of the factors that affect on meat and fat production is feed quality. Commonly, the quality of feed is determined from its protein content. One of the functions of protein is to support the growth of livestock. When metabolizable protein supply of the basal diet can fulfill the protein requirements [3] therefore, the growth performance will increase as well [4,5]. Increase of the growth efficiency will affect meat and fat production [6, 7]. Several researches were done to found the optimum feed protein level to get high meat production and low fat meat. As reported by [8] Anggora goats fed 14.7% CP give 13.5% body protein, 26.5% body fat and 52.8% body water. Other results presented by [9] in Tunisia local goats fed different level protein diet (10, 13 and 16%) give 74.3% to 76% body water 22.4% DM to 23.4% body protein and 2.0% to 4.5% body fat. However, more sheep industry has had the difficulty of balancing the heavy slaughter weights of lambs with a desirable amount of fat thickness. In the other hand, optimizing nutrient efficiency is essential to increase sustainability, since it may reduce nutrient excretion, environmental pollution and production costs.

Based on the explanation above, it's necessary to known the optimum protein content on feed to get high meat production and low fat meat. In this study we investigated the effect of dietary protein on sheep meat quantity and quality.



2. Materials and Methods

Twenty four male thin tail sheep aged 6-7 months with average body weight of 13 ± 1.56 kg were used in this study. The sheep penned individually and fed 10-14% crude protein (CP). Sheep were slaughtered after 4 months rising and they reached body weight amount 16.75 kg. Lambs were fasted for 6 hours before slaughtered. The slaughter was done following Islamic methods.

Immediately after slaughter, hot carcasses were weighed. Carcasses were weighed before and after chilling at 18°C for 10 hours. Then carcass was separated into meat, fat and bone. The *Longissimusdorsi* (LD) and *Biceps femoris* (BF) of the right part of carcass were excised to measure protein and fat (%) content.

Parameters observed in this study were carcass weight, meat weight and fat weight of thin tail sheep. The data were analyzed using correlation analysis.

3. Result and Discussion

The correlation of dietary crude protein with meat productivity and fat content shows on Figure 1. Crude protein dietary content had weak and negative correlation with meat production ($r = -0.06$) ($y = -0.148x + 62.54$) but had weak and positive correlation with fat production ($r = 0.3$) ($y = 0.807x^2 - 18.40x + 119.1$). Figure 1 showed that percent of meat was stable, but percent of fat was increase by increasing dietary crude protein. It is due to muscle cell have the maximum size capacity to growth. Therefore, the nutrient intake did not used for meat growth. Protein intake in this study was used to fat growth. It is caused by sheep's age. In this study, sheep is in the maximum muscle growth phase, so the nutrient intake was allocated to the growth fat [10]. From the equation above, it is known that the optimum crude protein content in diet is 12.5%.

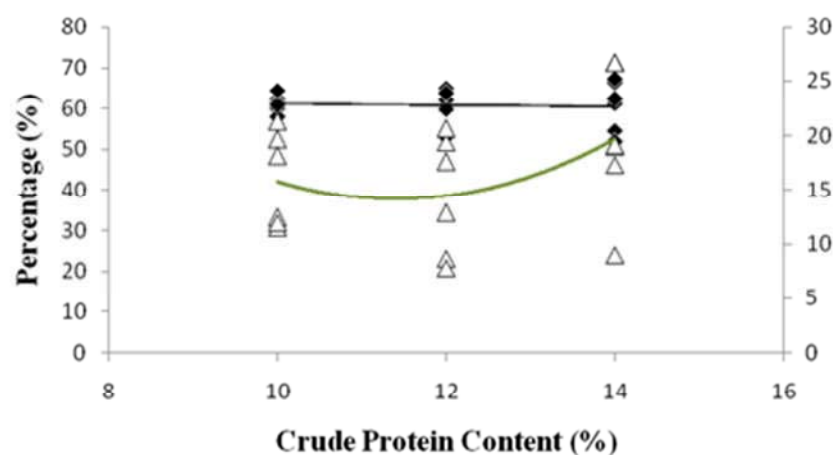


Figure 1. Correlation of Dietary Crude Protein with Meat and Fat Production on Sheep

4. Conclusion

Based on the result, it can be concluded that the optimum CP content for sheep is 12.5% CP.

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