The Use of Fermented Cassava Peel (Manihot utilisima) in the Ration on Carcass Quality of Male Local Sheep

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ABSTRACT

Cassava peel (CP) were abundant from agricultural industry. The CP still contained good nutrition and could be used as feed for ruminant. This study aimed to determine how far fermented CP in the rations influenced carcass quality of local sheep. The research was conducted at the farm of Mr. Praditya which located at Bunga Rinte Street, Medan Tuntungan Sub-District, Medan from September until December 2017. The design was Completely Randomized Design (CRD) with 4 treatments and 5 replicates. There were 20 local sheep with an average of 10.18±1 kg/head. The treatments were P0 (fermented CP 0%), P1(fermented CP 20%), P2 (fermented CP 40%), and P3 (fermented CP 60%). Variables measured were slaughtered weight, empty body weight, carcass weight and percentage of carcass weight. The results showed that the fermented CP had a very significant effect (P<0.01) on cut weights of sheep, empty body weight and percentage of carcass weight. There was a significant effect (P<0.05) on carcass weight. The conclusion of this research that high percentage of fermented CP in the ration increased slaughtered weight, empty body weight, carcass weight and percentage of carcass weight.

Key Words: Cassava Peel, Fermentation, Carcass, Local Sheep

INTRODUCTION

Feed is one factor that is very important and very influential on increasing livestock production. Provision of adequate feed ingredients with good quality is one of the elements that determine the success of livestock. (Asizua et al. 2014).

The insufficient land availability as a forage provider causes the availability of forages limited. The limitation of land produced forage have an impact on feed supply for animals. To overcome this, an effort is needed to find an alternative feed that can replace the grass as animal feed. One of the agricultural waste that can be utilized as animal feed is cassava peel (CP).

The CP is waste after the tubers are taken for certain purposes, they cause pollution to the environment if not used or processed properly. Utilization of CP waste certainly provide a positive value to a farm. (Wadha & Bakhsi 2016). Agricultural waste processing for CP as animal feed can be done by fermentation. Fermentation is one of the efforts to eliminate harmful substances for livestock and replaced with more useful substances such as increasing digestibility, protein content, lowering crude fiber and adding flavor in the diet (Diaz et al. 2018).

Sheep is one source of meat and can be developed as a potential source for nutrition. In general, sheep are traditionally kept by the community with minimal feed. To get a high percentage of carcass and good meat quality, one of the strategies is by improving their diet. In order to determine the percentage of carcass, other criteria should be calculated such as cut weight, empty body weight and carcass weight.
Slaughtered weight is body weight after being fasted for 12 hours just before the sheep is slaughtered. The empty body is the slaughter weight minus the amount of contents in the digestive tract, bladder (urine). Carcass weight is the live weight of livestock after reduced weight of the digestive tract, blood, head, skin, and all four legs from the carpus joint or tarsus down. It is stated that there is little modification, sometimes with or without kidney, kidney fat, pelvic fat, fat around udder, diaphragm and tail. Carcass as a unit of production is expressed in carcass weight and percentage of carcass. The percentage of carcass is the ratio of carcass weight to live weight when slaughtered (minus the contents of the gastrointestinal tract and urine) multiplied by 100% (Chanjula et al. 2015).

The percentage of carcass is an important feature in the study of carcass. Percentage of carcass affected by age, sex and feed consumed. The percentage of carcass is an important factor for assessing the production of sheep, because it is very closely related to live weight where the increase of live weight increased the production of carcass. (Alberto 2018).

**MATERIAL AND METHODS**

This research was conducted about three months, starting from September to December 2017. Research location was at local sheep farm of Mr. Pradiya, Medan Tuntungan Sub-District, Medan.

Materials used were 20 heads of local sheep with the age about six months and the average of live weight was 10.18±1 kg. Feed consisted of local grass, CP either fermented or non-fermented and concentrate. The concentrate were formulated by using tofu waste, soybean meal, molasses, ultra mineral, salt and urea. Medicines were anti-helminth, anti-bloat for bloating and vitamins. All sheep had *ad libitum* water.

Equipment used in this research were (1) 20 units of individual cage; (2) Live body weight and carcass weight scale (50 kg capacity scale); (3) Feed weight used 2 kg capacity scale with 5 g of sensitivity; and (4) Plastic container for fermentation of CP.

Processing of CP flour by washing CP then drying under the sun. When cloudy days, the CP was put in the oven 60°C for 12 hours until a moisture content reached ±10%. The dried CP then was milled and kept for further process. For the fermentation process, the water content of the dried CP was increased up to ±40% by adding water. The watered dried CP was then fermented by adding starbio as fermentor, kept in a plastic container, then closed tightly or anaerobically for 10 days.

**Research methods**

The experimental design was Completely Randomized Design (CRD) with 4 treatments and 5 replications. The treatments were P0 = 0% of fermented CP + 60% of non-fermentation CP + 20% of native grass + 20% concentrate; P1 = 20% of fermented CP + 40% of non-fermented CP + 20% of native grass + 20% concentrate; P2 = 40% of fermented CP + 20% of non-fermented CP + 20% of native field grass + 20% concentrate; P3 = 60% of fermented CP + 0% of non-fermented CP + 20% of native grass + 20% concentrate. Variables were: (1) Slaughtered weight; (2) Empty body weight; and (3) carcass weight and percentage of carcass.
RESULTS AND DISCUSSION

Slaughtered Weight (kg/head)

Slaughtered weight was obtained from weighing the final weight of sheep after the animal was fasted for 12 hours before being slaughtered. This was done by emptying the contents of the digestive tract. The highest slaughtered weight was on P3 (16.18 kg/head) and the lowest was found in P0 treatment being 12.99 kg/head.

Table 1. Slaughtered weight, empty body weight, carcass weight and percentage of carcass weight

<table>
<thead>
<tr>
<th>Variables</th>
<th>Treatments</th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slaughtered weight (kg)</td>
<td></td>
<td>12.99b</td>
<td>13.54b</td>
<td>15.17a</td>
<td>16.18a</td>
</tr>
<tr>
<td>Empty body weight (kg)</td>
<td></td>
<td>9.59a</td>
<td>9.84b</td>
<td>11.59a</td>
<td>12.02a</td>
</tr>
<tr>
<td>Carcass weight (kg)</td>
<td></td>
<td>5.23b</td>
<td>5.23b</td>
<td>6.00ab</td>
<td>6.24a</td>
</tr>
<tr>
<td>Percentage of carcass</td>
<td></td>
<td>51.36b</td>
<td>52.77ab</td>
<td>53.12a</td>
<td>54.04a</td>
</tr>
</tbody>
</table>

The numbers followed by different superscript letters on the same line (a, b, c, d) show significantly different (P<0.05)

One of the factors influence slaughtered weight of livestock is feed consumption. This was reinforced by the statement Campbell et al. (2006) who stated that the same amount of nutrient feed consumption will produce the same slaughtered weight. According to Usmiyati & Setyanto (2008) type and age of livestock very significant by affected to the cut weight, while the sex has no effect on small ruminant. Sheep have more carcass weight (10.59 kg) compared to goats (9.01 kg) and old sheep have carcass weight heavier (11.26 kg) compared with young sheep (8.34 kg).

In this research, slaughtered weight was influenced significantly by P2 and P3 treatment. This was due to fermented CP in P2 and P3 had nutrients contents needed by sheep and affected the contents of the gastrointestinal tract in the sheep. Campbell et al. (2006) mentioned that the rations of ruminant livestock generally consisted of forage and concentrate, the provision of rations in the form of a combination of these two materials provided opportunities for the fulfillment of nutrients.

Empty body weight (kg/head)

The empty body weight of the study was obtained from slaughtered weight minus the contents of the gastrointestinal tract and urine. The data was processed by the method of SAS and it was known that the highest body weight was found in P3 treatment of 12.02 (kg/head) and the lowest empty body weight of sheep was in P0 treatment of 9.59 (kg/head).

According to Husin (2014), feeds contain high fiber will reduced the digestibility coefficients of other nutrients, because to digest crude fiber requires a lot of energy. The higher the crude fiber, the slower the movement rate of food substance in the cecum, so it is estimated that the food digestibility coefficient will be lower. In this research, P3 contains less fiber and more protein than other treatments as the effect of highest level of
fermented CP used (60%), which caused higher consumption as well as body gain. As the result, empty body weight was better in P3 than other treatments.

**Carcass weights (kg/head)**

The weight of carcass was obtained from the difference in body weight minus blood weight, head, skin, legs, tail, internal organs (other than kidney), and reproduction apparatus. The data was processed by the method of SAS and then continued with Duncan test. The results indicated that the highest carcass weight was found in P3 treatment which was 6.23 kg and the lowest carcass weight was found at P0 which was 5.22 (kg).

Carcass was the main result of slaughtered livestock that had high economic value. Factors that affect the results of cuts include sex, age, cutting weight, species, nutrition, and health. This is in accordance with the statement of Philips (2001), the increasing weight of sheep followed by increasing in the production of carcass. Factors affecting carcass composition and meat quality are sex and cutting weight. As Soeparno (2005) pointed out, that at the same weight there can be a different carcass composition between the sex, for example fat in ewe was greater than the young castrated lamb and both were larger than the male sheep.

**Percentage of carcass (%)**

Percentage of carcass was obtained from the ratio of fresh carcass weight with empty body weight multiplied by 100%. The data was processed by the method of SAS and it was known that the highest percentage was in P3 treatment (54.04%) and the lowest percentage was found in P0 treatment (51.36%). The mean was influenced by the average of carcass weight. The highest carcass weight on P3 treatment (6.238 kg) resulted in the highest percentage of carcass being 54.04%.

This was also in accordance with the opinion of Sumasprastowo (1993), which stated that carcass percentage of special fattened sheep about 56-58%, fat sheep 45-55% and 12-16 weeks sheep about 48-50%. Increasing the percentage of carcasses is in line with the increase of body weight of the sheep. This was in accordance with the report of Philips (2001) which stated that carcass was an important factor to assess the production of livestock as it was very closely related to the live weight. The higher live weight would be followed by increasing carcass production. Rough protein content after fermentation often increases due to microbes that have good growth and reproduction, so that the utilization of existing proteins can be digested well and fermentation can also reduce the content of crude fiber. However, fermentation can not eliminate anti-nutrients in the skin of cassava tubers, but can reduce the existing anti-nutritional substances. So the nutrient content is channeled into the body of livestock but within a certain time and the consumption of food in balance and in accordance with the needs. This was in accordance with the statement of Ginting (2018) and Mirwandono et al. (2018), which stated that the crude protein content after fermentation often increased due to better growth of microbes. Thus it can change more of the constituent components derived from the microbial body itself that will increases the crude protein content of the substrate.
CONCLUSION

The use of fermented cassava peel (Manihot utilissima) up to 60% in ration increased slaughtered weight, empty body weight, carcass weight and percentage of carcass weight on local male sheep. Slaughtered weight increased from 12.99 to 16.18 kg/head, empty body weight increased from 9.59 to 11.59 kg/head, carcass weight increased from 5.23 to 6.24 kg/head and percentage of carcass increased from 51.36 to 54.04%.

REFERENCES


Husin AH. 2014. Use of palm oil palm fermentation with different levels of biomol + on feed against local lambs carcass. Medan (Indonesia): University of North Sumatra.


DISCUSSION

Question

Was there any formulation (complete feed) in this research? And why did you choose 60% CP not until 100%?

Answer

Yes, there was a formula of complete feed and 60% was the limit of usage of CP.