Hasanuddin J. Anim. Sci. Vol. 4, No. 2: 119-124
pISSN 2621-9182 eISSN 2621-9190
DOI: 10.20956/hajas.v4i2.19278

Complete Feed Based on Fermented Sago Waste Against the Consumption and Digestion of Goat

Fadly Hidayat Ilyas[a*], Syahriani Syahrir[b], Rohmiyatul Islamiyati[b]

[a]Cervices of Animal Husbandry and Animal Health, Makassar, 90245 South Sulawesi, Indonesia
[b]Departement of Feed and Nutrition, Faculty of Animal Science, Hasanuddin University, Jl. Perintis Kemerdekaan Km.10, Makassar, Indonesia 90245

*Corresponding author: E-mail: Fadlyhidayat93@gmail.com

ARTICLE INFO

Article history:
Submission: December 24, 2021
Accepted: January 19, 2023
Published: January 31, 2023

ABSTRACT

A common method used to improve the nutritional quality of feed is by fermentation method. The working principle is that fermentation activates the growth and metabolism of microorganism so that it can increase the digestibility of feed and produce the preferred aroma of livestock. This study aims to find out the effect of giving fermented sago waste on the consumption and digestibility of goat and cattle. Two feed treatments were tested on 12 goats. The results showed that the consumption and digestibility value of Dry Matter (DM) and Crude Protein (CP) showed no noticeable difference in goat cattle. The study concluded that complete feed-based fermented sago waste did not affect the consumption and digestibility of CP and DM of goat.
Keywords: Sago waste, completed feed, consumption, digestion, dry matter, crude protein

INTRODUCTION

One alternative to meet the needs of goat animal feed is to use agricultural/plantation waste [1], [2], [3]. These wastes are quite abundant but still rarely used as animal feed material, one of which is sago waste[4]. Sago waste has a low nutritional content and a low range of these nutrients; it needs technological action to improve the nutritional quality of sago waste for the purpose of using the sago waste [5].

A common method used to improve the nutritional quality of sago waste is by fermentation method [6], [7]. Fermentation of sago waste was using cellulose microorganisms that function to break cellulose bonds and can reduce the content coarse fibers [8]. The fermentation process was processing by adding a starter of microorganisms (fungi or bacteria) that correspond to the substrate and the purpose of the fermentation process [9]. The fermentation process was preference because it is low production cost compare the other processes, easier to implement and most importantly does not cause a negative impact on

livestock [10].

Several factors, including the type of microorganism and the fermentation time, primarily determine fermentation's success. The longer the time given the more substances can be overhauled [11].

Sago waste used in the manufacture of complete feed this research has gone through the fermentation process using yeast tape first. The parameters used in this study are to find out the level of dry matter consumption, crude protein Consumption of goat and cattle.

MATERIALS AND METHODS

Research Materials

The study used 12 goats. The research materials used are sago waste, water, bran, coconut cake, cornstarch, urea, molasses, salt, cow minerals. The equipment used in this study included metabolic cages, basins, plastic samples, ovens, scales to weigh livestock and feed, as well as equipment in the analysis of dry materials and coarse proteins.

Research Methods

This study was conducted using RAL consisting of 2 treatments and 6 repetitions. Fermented feed treatment will be tested *in vivo.* The two treatments are as follows:

P_0 = Complete feed of sago waste without fermentation

P_1 = Complete feed made from main 10 days fermented sago waste.

Table 1. Composition of feed ingredients of each treatment

Materials (%)	Treatment	
	P0	P1
Sago Dregs	34.50	35.00
Rice bran	20.00	20.00
Coconut cake	12.00	12.00
Cornstarch	20.00	20.00
Urea	1.50	1.00
Molasses	10.00	10.00
Salt	1.00	1.00
Cow Minerals	1.00	1.00
Total	**100.00**	**100.00**

Complete feed testing is carried out for 2 periods, there is the first stage of habituation for 10 days and the second stage is the data collection period of 5 days. Habituation of feed is so that the livestock is accustomed to the feed offered, and all the feed eaten before has been out all for 10 days.

Feed and waste samplings are carried out daily during the collection at each period. The collected samples are mixed homogeneously and then taken 10% for analysis needs in the laboratory.

Complete feed examination was carried out over 2 periods, where the first stage was habituation for 10 days and the second stage was the data collection period for 5 days. Feed habituation aims to make the cattle get used to the feed given, and all the feed eaten before has all been out for 10 days.

Parameters measured in this study are the consumption and digestibility of dry matter and crude proteins from the complete feed. Where the consumption of rations is measured based on the number of rations given on that day is reduced by the remaining rations the next day. The formulation for the consumption and digestion of dry ingredients and crude proteins are:

a. Consumption of Dry Materials (DM) (g) = DM given- DM remaining feed
b. Consumption of Crude Protein (CP) (g) = CP given- CP remaining feed
c. Dry Material Digest

$$\text{Digestibility Dry matter } (\%) = \frac{\text{Feed (DM)consumption} - \text{ feces DM}}{\text{Feed (DM) consumption}} x\ 100\%$$

d. Crude Protein (CP) Digestibility

$$\text{CP digestibility } (\%) = \frac{\text{CP consumption} - \text{ feces CP}}{\text{CP consumtion}} x\ 100\%$$

Experimental results data are analyzed using the T test for 2 different averages [12] (Sudjana, 2005):

$$t = \frac{\bar{x}1 - \bar{x}2}{s\sqrt{\frac{1}{n1} + \frac{1}{n2}}}$$

Where

$$S^2 = \frac{(n1 - 1)S1^2 + (n2 - 1)S2^2}{n1 + n2 - 2}$$

Information:

$\bar{x}1$ = Average treatment 1
$\bar{x}2$ = Average treatment 2
S = Standard deviation
S_1 = Standard deviation of treatment 1
S_2 = Standard deviation of treatment 2
N_1 = Number of goats in treatment 1
N_2 = Number of goats on treatment 2

RESULTS AND DISCUSSIONS

The average results of consumption and digestion in goat cattle are given complete rations made from the main sago waste presented in Table 2.

Table 2: Average Consumption and digestibility of DM and CP each treatment

Parameters	Treatment	
	P0	**P1**
Consumption of DM (g/h/d)	367.04	302.08
Consumption of CP (g/h/d)	45.83	42.90
Digestibility of DM (%)	86.13	88.75
Digestibility of CP (%)	60.09	67.34

Note : g/h/d (gram/head/days); DM= Dry Matter; CP=Crude Protein; P_0 = Complete feed of sago waste without fermentation; P_1 = Complete feed made from main 10 days fermented sago waste.

Consumption of DM in the P0 treatment showed no noticeable difference (P>0.05) in the P1 treatment. This may be due to the composition of feed rations and the physical form of feed treatment being the same. The reason is in accordance with the opinion of Mubarok [13] that the uniformity of the physical properties of feed can cause the palatability of the same feed. Consumption of dry ingredients in the P0 treatment is higher than the consumption of dry ingredients in the P1 treatment.

Consumption of DM in the P0 treatment showed no noticeable difference (P>0.05) in the P1 treatment. This may be due to the composition of feed rations and the physical form of feed treatment being the same. The reason is in accordance with the opinion of Mubarok [13] that the uniformity of the physical properties of feed can cause the palatability of the same feed. Consumption of dry ingredients in the P0 treatment is higher than the consumption of dry ingredients in the P1 treatment.

The digestibility of dry ingredients showed no noticeable difference (P>0.05) between treatments. The digestibility value of dry materials in P1 treatment tends to be higher than P0 treatment. Where P1 feed is the main feed of fermented sago waste, while P0 feed uses feed made from sago waste without fermentation (control).

The results of the various analysis showed no significant effect (P>0.05) treatment of crude protein digestibility. The digestibility value of crude protein tends to be higher in the P1 treatment (67.34%) compared to the P0 treatment (60.09%). Statistically, analysis was displaying that the digestibility of each treatment's crude protein provides information that no difference, meaning that all treatments given had the same effect on the digestibility of crude proteins in goats. The digestibility of this crude protein is not different because the type and quality of feed material of the protein source given in both treatments are the same so the degradation of proteins in the rumen is almost the same. Digestion depends on the content of crude protein in rations and the amounts of crude protein consume [14].

CONCLUSION

The study concluded that the use of fermented sago waste as the main ingredient of complete feed does not affect the level of consumption and digestibility of Dry Matter and Crude Protein of goat.

REFERENCES

[1] T. M. N. H. Harahap, G.A.W. Siregar, A.H. Daulay, and A. Purba,"Analysis of the potential development of goat and sheep in Batu Bara", Jurnal Peternakan Integratif, Vol. 10, no. 3, pp. 162-169, 2022. DOI: 10.32734/jpi.v10i3.10438

[2] S. Anwar, T.H. Wahyuni, and R.E. Mirwandhono,"The study of the potential development of goat and sheep in North Labuhan Batu Regency to support Borth Sumatera Province as a producer of goat and sheep",IOP Conf. Series: Earth Environ. Sci., Vol. 782, 022098, 2021. DOI 10.1088/1755-1315/782/2/022098

[3] L. O. M. Munadi, A.A. Palaga, and D. Zulkarnain,"Analysis of the carrying capacity of food crop follow-up as source of ruminant animal feed in Kolaka", Chalaza Journal of Animal Husbandry, Vol. 6(, no. 1, pp. 12-20, 2021.http://dx.doi.org/10.31327/chalaza.v6i1.145

[4] B.M.W.Tiro, P.A. Beding, and Y. Baliadi, "The utilization of Sago as cattle feed",IOP Conf. Series: Earth Environ. Sci.,Vol. 119, 012038, 2021. doi:10.1088/1755-1315/119/1/012038

[5] N. Lani, A. Husaini, N.S. Ngieng, K.S. Lee, K. A.A. Rahim, H.A. Roslan, and Y. Esa,"Solid substrate fermentation of sago waste and its evaluation as feed ingredient for red hybrid tilapia", Malays. Appl. Biol, Vol. 50, no. 1, pp. 1-10, 2021.

[6] H.P.Wardono, A. Agus, A. Astuti, N. Ngadiyono, and B. Suhartanto,"The effect of fermentation time on the nutritional value of sago Hampas", Advances in Biological Sciences Research, Vol. 18, pp. 97-102, 2022.

[7] N. Ginting and E. Pase,"Effect of incubation time of sago (Metroxylon sago) waste by local microrganism "ginta" on pH, crude protein, and crude fiber content",IOP Conf. Series: Earth Environ. Sci.,Vol. 130, 012022, 2018. doi:10.1088/1755-1315/130/1/012022

[8] S. Sumardiono, G. Adisukmo, M. Hanif, B. Budiyono, and H. Cahyono,"Effect of pretreatment and ratio of solid sago waste to rumen on biogas production through solid-state anaerobic digestion", Sustainability, Vol. 13. No. 7491, pp. 1-11, 2021. https://doi.org/10.3390/su13137491

[9] R. Sharma, P. Garg, P. Kumar, S.K. Bhatia, and S. Kulshrestha,"Microbial fermentation and its role in quality improvement of fermented foods, Fermentation, Vol. 6, no. 4, pp. 106, 1-20, 2020. https://doi.org/10.3390/fermentation6040106

[10] P. K. Robinson,"Enzymes: principles and biotechnological applications", Essays Biochem. Vol. 59, no. 59, pp. 1-41, 2015. doi: 10.1042/bse0590001

[11] Sulaiman, “Study of microbial protein manufacturing process with amyllolytic yeast and simba yeast in solid media with raw materials of sweet potatoes*(Manihot Utilisima Pohl)*”, [Thesis] Faculty of Agricultural Engineering IPB. Bogor, 2000.
[12] Sudjana,“Statistical Method”, Bandung, Transito, 2005.
[13] M. S. Mubarok, “Utilization of feed energy in sheep with complete feed from various agricultural waste and argoindustri”,[Thesis] Livestock Production Study Program, Faculty of Animal Husbandry, Diponegoro University, Semarang, 2008.
[14] Riswandi, A. I. M. Ali, Muhakka, Y. Syaifudin, and I. Akbar, “Nutrient digestibility and productivity of Bali cattle fed fermented Hymenachne emplexiacalis based rations supplemented with Leucaena Leucocephala”, Media Peternakan, Vol. 38, no. 3, pp. 156-162, 2015. Doi:10.5398/medpet.2015.38.3.156.