THE INFLUENCE OF THE ADDITION ABOMASUM FLUID TO THE CONTENT OF CRUDE PROTEIN OF ORGANIC MUD BIO GAS UNIT (OMBGU)

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ABSTRACT

The purpose of the research was to know the influence of the addition of abomasum fluid as a fermented substance of organic mud bio gas unit (OMBGU) to the content of crude protein and to know the best treatment of crude protein in (OMBGU) that has been fermented for seven days. The method that was used in this research was experiment. Data obtained in this study were analyzed by using ANOVA (Analysis Of Variance). However, if the result of this analysis shows significant different it would be continued to use Least Significant Difference (LSD) analysis. The variables measured are crude protein content, pH, and temperature. The result of this research showed that the addition of abomasum fluid have a significant different effect ($P<0.01$) to crude protein content, pH, and temperature of OMBGU solid. The conclusion was influence the addition of 100% abomasum fluid with the content of crude protein 15,82% was able to fulfill the crude protein needed by rabbit. In addition abomasum fluid with a percentage of 100% can be applied on rabbits. It is recommended to do more research about the influence of the addition of abomasum fluid on OMBGU solid to rabbit productivity.

Keywords: Fermentation, rabbit, pH

INTRODUCTION

Beef cattle population in Malang Raya as of the year 2010-2013 was decreased. According to the Department of Animal Husbandry of East Java (2015) that the population of beef cattle in Malang Raya from 2010 to 2013 respectively 150.651 ,230.325, 245.179, 193.386. The number of beef cattle are slaughtered daily in the Slaughterhouse (RPH) Gadang reach 35-40 tail. One of livestock waste was abomasums fluid. Abomasum was true of cattle stomach of ruminants and weighs around 7-8% of the total of the stomach of ruminants. Abomasum fluid was produced per cow per day 4-6 litres. (Nuswantara, L. K. 2002). At Gadang RPH abomasum fluid only removed for granted without further management.

Bio gas-making process required input in the form of feces, urine and water washing enclosure. Feces was produced per cows with equivalent weights of 300 kg weight have production equivalent feces by 15 kg per day, when a farm is composed of 20 cows, after calculated will be known to the bio gas produced 19, 13m^3 of organic mud and bio gas unit

generated about 2.869 kilograms. (Seseray, Daniel Yohanis., S. Triatmojo, dan A. Pertiwiningrum, 2012). Biogas reactor capacity created customized input capacity related to the number of cows are kept. The process of making the outer form of biogas produced from organic mud bio gas. According to Husmy, L. Suradi, dan Y. Wiradana (2008) that the unit gas bio organic sludge was the solid the rest of the bio gas production results still contain organic material that was not been broken down. Organic sludge deposits of gas unit includes crude protein 13, 3%, crude fiber 24.3% and energy 3651 kcal/kg.

The utilization of these two types of waste can be carried out simultaneously to produce a product that in the long run can be rough on the protein requirement of rabbits. One impetus for the study was the given feed on rabbits rarely were used a combination with a cattlemen have assumed because of the used of concentrate would be increased production costs. So it takes other feed sources that contain good nutrition especially crude protein with low cost so that research on " The Influence Of The Addition Abomasum Fluid To The Content Of Crude Protein Of Organic Mud Bio Gas Unit.

MATERIAL AND METHOD

This research was used organic sludge bio gas unit and abomasum fluid. Organic sludge bio gas unit was obtained from dairy farmers named Mr. Imam who live in the village of Kebobang, village Rejo Tumpang, Malang Regency. Abomasum fluid was obtained from the slaughter house, Gadang, Malang. This research was used four until five pieces of abomasums to get 4-6 liters of abomasum fluid from each abomasum. The method that was used in this research was experiment. . Data obtained in this study were analyzed by using ANOVA (Analysis Of Variance) with five treatments and four repetitions. However, if the result of this analysis shows significant different it would be continued to use Least Significant Difference (LSD) analysis. The treatment given as follows:

P0 = 2,0 kg OMBGU

P1 = 2,0 kg OMBGU + 1,022 kg abomasum fluid (50%)

P2 = 2,0 kg OMBGU+ l,533 kg abomasum fluid (75%)

P3 = 2,0 kg OMBGU + 2,044 kg abomasum fluid (100%)

P4 = 2,0 kg OMBGU + 2,555 kg abomasum fluid (125%)

The variables were measured in this research :

1. Crude Protein Analysis.
   Method that used for crude protein analysis was Kjedahl. Crude protein analysis was take place at Pengujian Mutu dan Keamanan Pangan Laboratory, Food Technology Department. Faculty of Agricultural Technology.
2. pH analysis that use pH paper.
   depends the process of fermentation.
3. Temperature Analysis

RESULT AND DISCUSSION

The Influence of The Addition Abomasum Fluid to the Content of Cude Protein of OMBGU Solid.

Crude protein analysis was presented in Table1. Statistical analysis showed that there was significant different effect(P <0.01) of the addition abomasum fluid to the content of cude protein of OMBGU solid.

Table 1. The Influence of Addition Abomasum Fluid to The Content of Crude Protein of OMBGU Solid

Treatment	Crude Protein Content (%)
P0	$17,420\pm0,55^{d}$
P1	$14,948\pm0,46^{bc}$
P2	$14,546\pm0,73^{ab}$
P3	$15,818\pm0,30^{c}$
P4	$13,671\pm0,06^{a}$

Note : Different superscript in the same row indicate significant effect (P <0.01).

Crude protein analysis results revealed that equivalent results in protein crude was decreased when compared with controls. The case with regards to aerobic fermentation process that was occured. and pH on the optimum condition. Because the survival of microbes that work in the process of fermentation depends on the media which has the optimum temperature and pH. Because the value of crude protein content is also influenced by the long fermentation as described by Utama, I.S (2012) that increased crude protein content in organic mud bio gas unit solid was occurred because the old fermentation treatment can lead the increasing the number of bacteria in the fermentation of organic sludge bio gas unit. The abomasums fluid contains the enzyme protease which can break down the protein from ingredients that are used as fermented that helps the process of creating an acid situation during the fermentation process. According to Ramdhany (2010) in the abomasum was the enzyme protease produced by proteolytic bacteria. The enzyme protease has a function as a long chain molecule breaking protein molecules into simpler, called peptides. Pathogen bacteria cannot survive because the pH in the abomasum was acid is likely to reach 2 as a result of bacterial pathogen would be die (Hernawati,E.P 2012).

Based on the results of LSD test revealed that was the addition of abomasumum fluid 100% with coarse 15,818% protein content was the best treatment for containing the most crude protein approach control and satisfy the standard needs of coarse protein in rabbit. As described Sabilanafsi, B.I., M. Junus, dan N. Cholis (2013) and that the requirement of crude protein in rabbit was12-15% with fat balance 2-3%, crude fibre of 20-

27%, minerals 5-6.5% as well as the needs of the dry ingredients for the growth process range between5.4-6.2% dry matter of body weight. On the treatment of the produced acid scent that can dampen the scent liquid aroma control while in the abomasum posed like OMBGU dry Trinugroho,A., S. Minarti, and N. Cholis (2014) the granting
of organic sludge solid unit gasbio of 15% and 20% of the ration on rations of dried feed materials, consumption tends to decline, it is thought to be due to a high concentration of solids OMBGU tend to reduce the palatability of feed due to the smell or the taste unpalatable.

Research on the organic mud bio gas unit (OMBGU) fermented with abomasum fluid aims to provide information on the utilization of waste that later could be used as feed rabbits considering the protein content that is still contained in the organic sludge solids gas unit bio.

The Influence of The Addition Abomasum Fluid to The pH of OMBGU solid.

pH analysis was presented in Table2. Statistical analysis showed that there was significant different effect (P <0.01) of the addition abomasum fluid to the content of pH of OMBGU solid.

Table 2. The Influence of Addition Abomasum Fluid to The Content of Crude Protein of OMBGU Solid

Treatment	pH
P0	6,63±0,48^{d}
P1	5,63±0,48^{c}
P2	4,00±0,00^{a}
P3	4,88±0,85^{bc}
P4	4,63±0,48^{ab}

Note : Different superscript in the same row indicate significant effect (P <0.01).

Based on Table 2, Equivalent value in treatment P1 (50%) was the best treatment because it has a value close to the control and according to the results of LSD test . The fermentation process was often associated with the activity of microbial fermentation, has the sense of a process of chemical changes on an organic substrate through the enzyme activity produced by microorganisms. In aerobic fermentation on the survival of microorganisms were dependent on a source of energy in the form of glucose, oxygen in the presence of some microorganisms
digest glucose and produces water, carbon dioxide, and ATP were used to grow. The process was a type of aerobic metabolism (Suprihatin, 2012). One of the factors which has effect on the microbial activity was pH conditions. Conditions would be affect the pH of the media against the growth of pathogen microbes. Microbes in general can grow in a pH range of 3-6 unit. Equivalent decrease in

pH at each treatment can occured due to the fermentation ingredients used was rich in fermentable carbohydrates that was accelerating decline in pH.

Fermentation ingredients w as used as a treatment in this research was supported by the abomasum fluid material other fermentation among others shrimp paste, yeast ,molases, and rice brand. That was supported by the opinion of Ray, F., Bhunia, and S. Bibek (2008) that the addition of fermentable carbohydrate rich can accelerate the decline in the value of the pH of the growth environment and cause a sour taste to fermentable carbohydrates, because it was energy for the growth of the lactic acid forming bacteria.

In addition, organic sludge solid bio gas unit also still contains nutrients that can trigger the growth of microbes. This is reiterated by Oman, W (2003) that waste biogas production of beef in the form of sludge that has been experiencing the final stages of anaerobic decomposition to produce methane. Biogas sludge can be source of carbon for the microbes.

The Influence of The Addition Abomasum Fluid to the Temperature of LOUGB Solid.

Temperature analysis was presented in Table3. Statistical analysis showed that there was significant different effect($P < 0.01$) of the addition abomasum fluid to the content of cude protein of LOUGB solid.

Table 3. The Influence of Addition Abomasum Fluid to The Temperature of LOUGB Solid

Treatment	Temperature
P0	$27,94 \pm 0,07^{c}$
P1	$27,61 \pm 0,45^{bc}$
P2	$27,10 \pm 0,33^{ab}$
P3	$26,98 \pm 0,23^{ab}$
P4	$26,61 \pm 0,36^{a}$

Note : Different superscript in the same row indicate significant effect ($P < 0.01$).

Based on Table 3, Equivalent value in the treatment of the P3 (100%) treatment was the best because it has a value close to the control and according to the results othe calculations on the LSDTest. The fermentation process takes place the room temperature ranges from 26 to 27^{o} C and there was no significant change in temperature during the fermentation process which requires time for 7 days. Microbial growth temperature was basicall temperature rises, growth then the pH optimum for growth is also rising. Temperature also affects the efficiency of the conversion of the substrate (carbon-energy) into a mass of cells. Generally yield the maximum conversion occurs at a lower temperature than the temperature at which the maximum growth rate (Suprihatin, 2012). The equivalent temperature organic sludge bio gas unit (OMGBU) ranged from 26^{O}C to 27^{O}C. The temperature has not yet reached optimum temperature required for fermentation was aerobic. It is influenced by the temperature of the

room at Malang at a time when the fermentation process takes place was low due to the rainy season. Regarding the optimum temperature explained that bacteria vary in terms of optimum temperature for the growth and formation of acid. Most bacteria in lactic culture has the optimum temperature 30 ˚ C, but some cultures can form acid with the same velocity at a temperature of 30 ˚ C until 37 ˚C (Anonymous , 2010).

Microbial resistance was dependent on the temperature of the minimum and maximum temperature of their habitat. This effect there was a kind of microbe that will work in the process of fermentation. According to Ferdaus, F (2008) microbial resistance against temperature was not the same for each species. Each has an optimum temperature, minimum, and maximum for its growth. This is because the temperature below the minimum and maximum temperatures, enzyme activity will be stopped, even at a temperature that is too high would denaturation of the enzyme occurs. Based on the temperature, the microbes can be divided into 3 groups , namely microbial psikrofil is a Microbe can grow at temperatures ranging 0-30^{o}C; mesofil microbes is growing microbes at a temperature range of 30-60^{o}C and microbes thermopiles are microbes that grow at temperatures ranging from 40-80^{o}C.

CONCLUSION AND SUGGESTION

The conclusion of the result in this research is the addition of 100% abomasum fluid with the content of crude protein 15,82% is able to fulfill the crude protein needed by rabbit. In addition abomasum liquid with a percentage of 100% can be applied on rabbits . It is recommended to do more research about the influence of the addition of abomasum fluid on OMBGU solid to rabbit productivity.

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