NUTRIENT CONTENT EVALUATION OF DRIED OF POULTRY WASTE UREA-MOLASSES BLOCK (DPW-UMB) ON PROXIMATE ANALYSIS

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ABSTRACT

The research purpose was to determine the nutrient content of dried poultry waste molasses block (DPW-UMB). The use of dried poultry waste in the manufacture of the urea-molasses block was as a substitute of urea and could improve the value added in dry season. The treatments used for research were T_1 (15% manure layer chicken and 25% molasses), T_2 (10% manure layer chicken and 30% molasses), and T_3 (20% manure layer chicken and 30% molasses). Chemical analysis: the dried of poultry waste were analyzed for dry matter, crude protein, crude fibre, ash, fat, and gross energy. The stastical formulation diet composed with Microsoft Excel Ver. 2016. The results showed that the 20% manure layer chicken and 30% molasses (T_3) were better than T_2 and T_1 on nutrient content with 92.04% Dry Matter (DM), 13.34% Crude Protein (CP), 13.39% Crude Fiber (CF), 37.16% ash, 3.44% fat, but low in Gross Energy (GE) (2631.63 kcal/kg). It could be concluded that dpw-umb T3 were dried of poultry waste contained sufficient levels of gross energy, crude protein, crude fibre, ash, and fat it could be used as feedstuff for ruminants for supplementation with the required nutrients.

Key words*:* Urea, Manure, Dpw-umb

BACKGROUND

The number of beef cattle population decreased during the dry season. The feedlot system was not supported by the balance of quality and feed availability in dry and rainy season. The large quantity of forage was available in rainy season but limited in the dry season. Therefore, the fattening of beef cattle was restricted due to the use of rice straw for feeding. Normally, rice straw was given to beef cattle during the dry season.

According to Andy and Wahdi (2011) rice straw is a by-product of grain production. Rice straw has low nutrient content on protein, crude fibre, and nitrogen. Low nutrient content decreases rumen microbial population. Supplementation from the feed which consists of energy, mineral, vitamin, protein, and non-protein-nitrogen (NPN) was essential to fattening process (Andi and Wahdi, 2011). Urea molasses block (UMB) is one type of feed supplement which contains microelements. Supplementation from the molasses block containing soluble carbohydrates provides NPN as a source of ammonia and minerals to enhance the formation of microbial protein. Bacteria produce enzymes which digest crude fiber and synthesize protein as the feed source for microbial or as known as microbial protein. Siti et al. (2012) stated that UMB can be used for supplementation that consists of rice bran, pollard, salt, lime, and mineral.

In addition, Andi and Wahdi (2011) stated that the nitrogen element on the urea-molasses block is useful in protein synthesize in which NH_3 is four times faster than the speed of its microbial cells. The principal of digestion in regard to forages is the rumen, where the feed is retained for substantial periods of time and subjected to extensive microbial fermentation. The utilization of urea NPN as animal feed provided in layer chicken manure (Vatta et al., 2007). Boushy and Poel (2000) stated layer manure chicken consists of the pathogenic microorganism. The low content of essential amino acid and metabolic energy from the manure is suggested to not be given for more than 5% of total ration (Sinaga and Silalahi, 2012).

FAO (2010) stated the poultry industry produced 22 million tons of manure from over 18 billion population of poultry. The increased of poultry waste caused a negative effect to the environment from ammonia content. The negative effect from poultry waste needs to be recycled. The one method to recycle is by drying the poultry waste as a source of nitrogen in the urea-molasses block. The dried poultry waste has been used as an animal feed for ruminant. The animal waste and layer chicken manure in ration have limits considered and adapted. The laying chicken manure has high CF content (14.9% DM). Nitrogen need in the beef cattle has an alternative by using sources of nitrogen from manure layer chicken and use balanced with microbial activity (Ghaly and Macdonald, 2012).

MATERIAL AND METHODS

Location and Time

The research was conducted from 21st Januaryto 4th July 2015 at Janggan Village, Poncol District Magetan, East Java Province. The analysis proximate was conducted July-August 2016 at Nutrition and Feed Animal Laboratory, Animal Husbandry Faculty, Brawijaya University Malang East Java, Province. Janggan Village was chosen for research location due to as one of center for beef cattle fattening, sugarcane industry, and layer farm in Magetan Regency.

Materials

The principal ingredients are molasses, manure layer chicken, rice bran, limestone, cement, brick, salt, water, urea, and mineral mix.The principal equipment for the manufacture of dried poultry waste urea-molasses block (DPW-UMB) are gloves, bucket capacity 10.000 gr, plastic 500 gr, UMB-block 500gr with shape round and love, pressing tool, and analytic scale. The principal ingredients are molasses, manure layer chicken, rice bran, limestone, cement, brick, salt, water, urea, and mineral mix. Treatment one (T_1) were 15% manure layer chicken and 25% molasses, (T_2) were 10% manure layer chicken and 30% molasses, (T_3) 20% manure layer chicken and 30% molasses.

Methods

The poultry waste obtained from a layer farm on Magetan Regency, East Java. The poultry waste was collected from under the battery cages of laying house accommodating approximately 50,000 hens. The poultry waste collected was fresh and was not subjected any treatment on the farm. It was placed in clean plastic bags and transported to the Janggan Village. The poultry waste drying at temperature $105^0_{C.}$Chemical analysis: the dried of poultry waste were analyzed for dry matter, crude protein, crude fibre, ash, fat, and gross energy according to AOAC (1990). The stastical formulation diet composed with Microsoft Excel Ver. 2016.

RESULTS AND DISCUSSION

Crude protein on dried of poultry waste-urea molasses block

Based on Table 1 result from a proximate analysis conducted in the Nutrition and Feed Animal Laboratory, Animal Husbandry Faculty on the DPW-UMB showing the content of nutrients in each treatment. The table showing content of the DPW-UMB on crude protein (CP) T3 higher than T1 and T2 the result is 13.34% combining with 10.05% and 10.33% this is because the percentage of formulation ration layer manure is 20% than T1 and T2 15% and 10%.

Protein is high molecular weight organic compounds essential to the structure and formation of all living cells consist of amino acids joined by peptide bonds and are composed of 50-55% carbon, 15-18% nitrogen. Nurhayu *et al*., (2010) stated urea-molasses block (UMB) nutrient content consist urea and molasses showed crude protein is 12.76%. Crude protein (CP) on T_3 is 13.34% using dried poultry waste combining with molasses the statistics better than urea-molasses block (UMB). The layer manure chicken on the formulation taken around Magetan from layer manure farm. The poultry waste in the Magetan act as crop residues and increase production every year. The layer manure chicken makes the disturbing environment and need treatment to convert from residual into feedstuff. Comparison crude protein content on the dried layer chicken is 13.47% and dried broiler excreta is 21.59%. The resulting match with the Sinaga and Silalahi (2012) stated the content of protein in the dried poultry waste is 12-31% layer chicken manure production from average 150 g / day, hundred laying chicken can produce 1.6 tons of dry manure / year.

T The differences effect from layer chicken manure based on the treatment. The layer manure chicken sun drying for three days to reduce heavy metals, pesticide residues, pathogenic bacteria, fungi from the feed given to layer chicken. The formulation combining layer manure chicken 30% and molasses 20%, layer manure chicken has the bulky texture and need to be dried before formulation and transform into the feedstuff and given to the animal. The drying process manually to reduce the water content of the layer manure chicken, to reduce the odor from the layer manure chicken because quite highly. The resulting match with Boushy and Poel (2000) stated high moisture content on the manure layer (75-80%) are possibly contaminated with pathogen microorganism.

The formulation of the dried poultry waste-urea molasses block using the manure layer chicken have the bulky texture. The formulation combining several material binder ingredients like molasses, cement, and water in the filler ingredients using rice bran to increase the nutrient content. The additional nutrient content using feedstuff like limestone, brick, salt, and mineral mix to add the macro and micro mineral. The function of manure layer chicken is for substitution function of urea that has a certain limit. The resulting match with Arnita *et al*., (2010) stated Non-protein

Tabel 1. DPW-UMB nutrient content

Treatments	Code Name	Feedstuff Content					
		DM	CP	CF	Ash	Fat	GE
				(%)			(Kcal/kg)
18-07-2016	T1	61.42	10.05	17.41	27.26	3.51	3065.82
	T2	90.92	10.33	8.20	31.69	3.95	2949.50
29-08-2016	T3	92.04	13.34	13.39	37.16	3.44	2631.63

Source: (Nutrition and Feed Animal Laboratory, Animal Husbandry Faculty, Brawijaya University Malang, 2016).

nitrogenous (NPN) in the formulation feedstuff of beef cattle in certain limits. The use urea more than 5% causing poisoning. Urea has a content of nitrogen approximately 45%. Nitrogen represents 16% of the true protein, when equivalent to 5.25 times the nitrogen content.

Gross energy on dried of poultry waste-urea molasses block

Energy is essential for the maintenance of life processes including cellular metabolism, growth, reproduction, and physical activity. Gross energy (GE) is the quantity of heat resulting from the complete oxidation of food, feed, or other substances. Gross Energy (GE) from dried poultry waste urea-molasses block on the T_1 is higher than T_2 and T_3 from the table show 3065.82 kcal/kg higher than 2949.50 kcal/kg and 2631.63 kcal/kg. The proximate analysis result affected from the molasses. Molasses is a residual crop from sugarcane in the liquid form and bagasse is solid form the content of the molasses is providing energy and source of carbohydrate. The molasses took from Rejosari sugarcane industry. The molasses is reached a maximum during dry season and residues cannot utilize well in the Magetan Regency.

The molasses gave 25% for T_1 and 30% for T_2 and T_3. The result of T_1 higher because during the mixing with other feedstuff molasses absorb well into dried poultry waste urea-molasses block. The method during made of DPW-UMB is the factor to given the result of content DPW-UMB. The result matches with Mubi *et al*., (2013) stated molasses and sugar are sources of energy for ruminants. Molasses in the formulation formula less than 8% of dry mater same with corn. Molasses can increase microbial growth in the rumen.

Bata (2008) give additional information stated the main uses of molasses are as a binding agent or binder in feedstuff. The molasses act granules to improve palatability in feedstuff ration. The table showed given molasses in the dried poultry waste urea-molasses block on the formula T_1, T_2, and T_3 for supplementation used to stimulate microbial activity in the rumen. Wayne *et al*., (2003) stated microbial production is high-quality by-pass protein and drastically altered rumen VFA.

Dry matter on dried of poultry waste-urea molasses block

Dry Matter (DM) from dried poultry waste urea-molasses block on the T_1 is lower than T_2 and T_3 from the table show 61.42% lower than 90.92% and 92.04%. The condition happens from drying method during manufacturing dried poultry waste urea-molasses block. Dried poultry waste urea-molasses block packaged and sun drying for seven days. The drying does not literally cover on the T_1 and dry matter only 61.42 % indicate still wet. The second factor is indicated by the treatment T_1 due to the addition of additives (molasses) in each treatment that increasing water content in the DPW-UMB. The greater availability of dissolved carbohydrates causes increased activity of fermentation by bacteria to produce lactic acid. The fermentation activity causing loss dry matter in the dried poultry waste urea-molasses block. Decreasing dry matter is affected by respiration and fermentation respiration will cause a lot of the nutrients to break down and reduce the dry matter, while fermentation will produce lactic acid and water. The higher water produced during made of DPW-UMB, then a loss of dry matter increase. The dry matter loss affected by increased levels of water coming fermented form of simple sugars the result compared with Andy and Wahdi (2011) stated the omasum helps in the absorption of water and variation in omasum dry matter was 0.6%, 1.2%, and 3.3% of the body weight in the dairy cows and beef cattle

Decreasing dry matter is affected by respiration and fermentation respiration will cause a lot of the nutrients to break down and reduce the dry matter, while fermentation will produce lactic acid and water. The higher water produced

during made of DPW-UMB, then loss of dry matter increase. The pressing processing help to reduce water content that can be seen in figure 11. The dry matter loss affected by increased levels of water coming fermented form of simple sugars.

Fats on dried of poultry waste-urea molasses block (DPW-UMB)

Lipid is soluble in the organic solvents like ether or chloroform. Fats are required for a long-term storage of metabolic energy to supply essential fatty acids and to carry fat vitamin. Fat in the dried poultry waste urea-molasses block on the T_3 is lower than T_2 and T_1 from the table shows 3.44% lower than 3.95 and 3.51%. The condition happens from rice bran.

Nurhayu *et al.*(2010) stated urea-molasses block (UMB) nutrient content consist urea and molasses showed fat is 2.51%. Fat on T3 is 3.44% using dried poultry waste combining with molasses the statistics better than urea-molasses block (UMB). The rice bran provides some key nutrients including fat and phosphorus. Rice bran helps absorbent for the moisture contained in molasses and gives structure to the block. The fats are highly digestible and reducing dustiness.

Crude fiber on dried poultry waste-urea molasses block

Crude fiber from dried poultry waste urea-molasses block on the T_1 is higher than T_2 and T_3 from the table show 18.41% higher than 8.20 and 13.39%. Crude fiber will stimulate the process of rumination and rumen contractions, which in turn will improve the fermentation process the fiber feed. The main result of the fermentation of fibrous carbohydrates is acetic acid. The crude fiber content of high feeds can be a limiting factor for consumption. Crude fiber that is both bulky feed will stay longer in the rumen and can suppress consumption.

NNurhayu *et al*., (2010) stated urea-molasses block (UMB) nutrient content consist urea and molasses showed crude fiber (CF) is 6.65%. Crude fiber (CF) on T_3 is 18.41% using dried poultry waste combining with molasses the statistics better than urea-molasses block (UMB). Crude fiber is also an indicator of the low digestibility of a feed material. The digestibility of crude fiber depends on the content of crude fiber in formulations. The resulting match with Wayne *et al*., (2003) stated supplementation in the solid form effect same with the concentrate because both have a function to increase growth and number of rumen microbes

Ash on dried of poultry waste-urea molasses block

Ash content from dried poultry waste urea-molasses block on the T_3 is higher than T_2 and T_1 from the table show 37.16% higher than 31.69% and 27.26%. The ash content from dried poultry layer waste is 6.95% combining with dried broiler waste 6.49%. Ash is residues remaining after all the combustible material has been turned off. The nutritional ash values have little importance on DPW-UMB in this component salt and limestone given the content of ash. The cement function in the DPW-UMB is for source silica (micro-mineral) and hardener. The ash content has a positive correlation with crude protein (CP) content in dry poultry waste urea-molasses block.

Nurhayu *et al*., (2010) stated urea-molasses block (UMB) nutrient content consist urea and molasses showed ash is 14.04%. Ash on T_3 is 37.16% using dried poultry waste combining with molasses the statistics better than urea-molasses block (UMB). Determination of total ash can be used for many purposes for this case to determine whether or not a treatment in this case made of dried poultry waste urea-molasses block. The total ash knowing the type of material composed, and as a determinant of the nutritional value parameters of a feedstuff.

CONCLUSION

Dried of poultry waste contained sufficient levels of gross energy, crude protein, crude fibre, ash, and fat it could be used as feedstuff for ruminants for supplementation with the required nutrients.

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