A Study: Dried of Poultry Waste Urea-Molasses Block (DPW-UMB) as Potential for Feed Supplementation

(Studi : kotoran ayam molasses (kamblok) sebagai potensi supplementasi pakan)

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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 T1 (15% manure layer chicken and 25% molasses), T_2 (10% manure layer chicken and 30% molasses), and T3 (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 statistical formulation diet composed with Microsoft Excel Ver. 2016. The results showed that the 20% manure layer chicken and 30% molasses (T3) were better than T2 and T1 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.

Keywords: dpw-umb, urea, and manure

ABSTRAK Tujuan penelitian ini bertujuan untuk mengkaji kandungan nutrisi dari Kotoran Ayam Molasses Blok (KAMBLOK) dengan analisis proksimat. Sebagai bahan pengganti urea dengan kotoran ayam kering dalam pembuatan urea molasses blok dan meningkatkan nilai tambah dalam suplementasi Kotoran Ayam Molasses Blok (KAMBLOK) pada musim kemarau. Perlakuan yang digunakan pada penelitian ini adalah Kotoran Ayam Molasses Blok (KAMBLOK) dengan T_1 (Kotoran Ayam Petelur 15% dan Molasses 25%), T_2 (Kotoran Ayam Petelur 10% dan Molasses 30%), T_3 (Kotoran Ayam Petelur 20% dan Molasses 30%). Analisis kandungan nutrisi yang dilakukan adalah bahan kering, protein kasar, serat kasar, abu, lemak, dan gross energi. Analisis statistik menggunakan Microsoft Excel versi 2016. Hasil Penelitian menunjukkan Kotoran Ayam Molasses Blok (KAMBLOK) T_3 lebih baik dari T_2 dan T_1 pada bahan kering (BK) 92, 04%, protein kasar (PK) 13,34%, serat kasar (SK) 13,39%, abu 37,16%, lemak 3,44% tetapi rendah dalam gross energi (GE) adalah 2.631,63 kal/kg. Kesimpulan dari penelitian ini adalah kotoran ayam mengandung beberapa kandungan yaitu protein kasar, *gross energy*, serat kasar, abu, dan lemak yang bisa digunakan sebagai pakan potensial untuk supplementasi.

Kata kunci: Kamblok,urea, dan kotoran ayam petelur

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INTRODUCTION

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 Andi 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

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of energy, mineral, vitamin, protein, and non-protein-nitrogen (NPN) was essential to fattening process. 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 is element on the urea-molasses block is useful in protein synthesize. 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 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 feed have limits considered and adapted. The laying chicken on its 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).

MATERIALS AND METHODS

Materials

The principal equipment for the manufacture of dried poultry waste urea-molasses block (DPW-UMB) are gloves, bucket capacity 10.000 g, plastic 500 g, UMB-block 500g 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 (T1) 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 was collected from under the battery cages of laying house accommodating approximately 50,000 hens. The first step 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 105^0C. The second step are 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).

Statistical analysis

The statically formulation diet composed with Microsoft Excel Ver. 2016.

RESULTS AND DISCUSSION

Crude Protein (CP) of Dried Poultry Waste-Urea Molasses Block (DPW-UMB)

Based on Table 1 result from proximate analysis conducted in the Nutrition and Feed Animal Laboratory, Animal Husbandry Faculty, Brawijaya University on the DPW-UMB are showing the content of nutrients in each treatment. The several factors affected are processing, formulation, and kind of material from one place. The table show the content of the DPW-UMB on crude protein (CP) T_3 highest than T_1 and T_2 the result is 13.34% compared with 10.05% and 10.33% this is because the percentage of formulation ration

layer manure is 20% than T_1 and T_2 15% and 10%. The highest are due to the level dried poultry waste given with level manure are highest than T_1 and T_2.

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 T3 is 13.34% using dried poultry waste combining with molasses the statistics better than urea molasses block (UMB). Comparison crude protein content on the dried layer chicken is 13.47% and dried broiler excreta is 21.59%. The result was similar to Sinaga and Silalahi (2012) stated the content of protein in the dried poultry waste is 12-31% layer chicken.

Table 1. DPW-UMB nutrient content

Treatments	Code Name	Feedstuff Content					
		DM	CP	CF	Ash	Fat	GE
				(%)			(cal/kg)
18-07-2016	T_1	61.42	10.05	17.41	27.26	3.51	3065.82
	T_2	90.92	10.33	8.20	31.69	3.95	2949.50
29-08-2016	T_3	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).
Note: the 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).

Gross Energy (GE) of Dried Poultry Waste-Urea Molasses Block (DPW-UMB)

Energy is defined as the ability or capacity to work in living organism. 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 cal/kg higher than 2949.50 cal/kg and 2631.63 cal/kg. The level of gross energy highest depend on the molasses content in the feedstuff that given the sources of the energy. Molasses is 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 taken from Rejosari sugarcane industry. The molasses is reached 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 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. Wayne *et al.* (2003) stated microbial production is high-quality by-pass protein and drastically altered rumen VFA. The result giving additional statement from Arnita *et al.* (2010) stated rumen microbial growth requires N availability as much as 1.28% N or equivalent with 8% protein.

Dry Matter (DM) of Dried Poultry Waste-Urea Molasses Block (DPW-UMB)

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%. 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 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 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

Agarwal *et al.* (2015) 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 the result compared with Agarwal *et al.* (2015) 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.

Fats of Dried Poultry Waste-Urea Molasses Block (DPW-UMB)

Lipids or fats are a heterogeneous group of organic compounds found in living microorganism. Lipid are 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 1 show 3.44% lower than 3.95 and 3.51% its because condition happen from rice bran while the rice bran as gave the fats condition to the feedstuff and increase the content of the fat.

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 high digestible and reducing dustiness.

Crude Fiber (CF) of Dried Poultry Waste-Urea Molasses Block (DPW-UMB)

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%. The T_1 are highest due to the level of the dried poultry waste given that increasing the crude fiber. 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. Crude fiber content of high feed can be a limiting factor for consumption. Crude fiber that is both bulky feed will stay longer in the rumen and can suppress consumption.

Nurhayu *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 result 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 of Dried Poultry Waste-Urea Molasses Block (DPW-UMB)

Ash content from dried poultry waste urea-molasses block on the T_3 is highest than T_2 and T_1 from the table show 37.16% higher than 31.69% and 27.26%. Those condition due to the dried poultry waste formulation. 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 nutritionally 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 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 on this case made of dried poultry waste urea-molasses block. The total ash knowing type of material composed, and as a determinant of the nutritional value parameters of a feedstuff.

CONCLUSIONS

It could be concluded that dpw-umb T_3 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.

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