Digestible Consumption of Dry Matter in Haylage Complete Feed of Ongole Crossbreed Steers

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Abstract

The result of this research is to determine the effect of the use of layer chicken manure with different levels of haylage complete feed to evaluate the consumption of dry matter digested by the method of in-vivo. Three levels differences of layer chicken manure in the same ratio of maize stalk (40%) and concentrate (60%) on dry matter basis (crude protein 12%). Treatment R_1: 40% maize stalk: concentrate 60% (0% manure), R_2: 40% maize stalk: concentrate 60% (5% manure), R_3: 40% maize stalk: concentrate 60% (10% manure). The results showed that the R_1, R_2 and R_3 were not differences significantly ($p > 0.05$) on the digestible consumption of dry matter by the method of in-vivo. Use haylage complete feed contain maize stalk and chicken manure has the prospect to be used as a source of nitrogen in the rumen for rumen microbial growth at the Ongole Crossbreed Steers.

Key words: haylage, manure, maize stalk, consumption, digestibility

Introduction

Haylage is processed hay products that undergo a process of anaerobic fermentation is stored in the silo and the silage process called ensilage in order to conserve materials and minimize loss of feed nutrient content of feed (Mc Donald, 1981). This way of preserving produce feed materials that have high nutritional value and nutrient content similar digestibility raw materials. Content of dry matter of the manufacture haylage is between 50-55%. A good fermentation process will decrease the pH to 5.5, can reduce the high content of Clostridia when cutting, inhibits the growth of mold and reduce dust. Haylage has potential as a high-quality feed (Rstephenson, 2003).

Complete feed technology is one of the techniques of making the feed used to increase the utilization of agricultural waste and livestock waste treatment process with the physical treatment and supplementation for ruminant feed production. The process involves cutting processing to change the size of particles, drying, milling, mixing between the fiber material and concentrates, and packaging (Didiek and Hardianto, 2004).

Maize stalk has a characteristic crude protein 6.87%, crude fiber : 34.70%, extract ether: 2.96% and ash 10.56% based on dry material (BK) and contain neutral detergent fiber (NDF) is quite high at 65-68%, lignin content: 9-11% and 3-4% silica (Singh and Schiere, 1993). Seeing the potential of corn, then there are opportunities to be used as an alternative livestock feed, especially as a feed source of fiber and energy.

Non-protein nitrogen (NPN) can be used as a protein source of feed ingredients for livestock, especially ruminants. Materials that can be used as a source of NPN is chicken manure. Chicken Manure contains nitrogen, in the form of protein and especially the NPN, the minerals Calcium (Ca) and Phosphor (P), as well as vitamins and energy. Other NPN sources commonly used by farmers is urea, cause urea is the nitrogen source of cheap and easily obtained. Chicken Manure contain crude protein: 20.35%, crude fiber: 25.29%, extract ether: 2.68% and ash: 48.33% based on dry matter (Lokapirnasari, 2008).

Assessment of quality of feed materials in-vivo is to know the effect on performance of cattle through feed consumption, digestibility, retention of nitrogen (N) and body weight change. Feed consumption associated with contain nutrients digestibility, while digestibility influenced by the amount and nutrient content that is consumed by livestock. The amount of nutrients digestibility determine the number that can be used to meet basic living needs and growth can be shown through changes in body weight.

This study aims to determine the optimal level of influence of the use of laying chicken manure in the process of haylage complete feed on consumption of dry matter digested.

Materials and Methods

Livestock: Ongole Crossbreed Steers: 9 males, aged between 1-1.5 years old, 180-200 kg body weight, feed: haylage complete feed (CP ± 12%) with the composition: 1)maize stalk : concentrate 40% + 60% (0 % chicken manure) (R_1), 2). Maize stalk: concentrate 40% + 60% (5% chicken manure) (R_2), 3). maize stalk : concentrate 40% + 60% (10% chicken manure) (R_3).

Concentrates composed of coconut oilcake, bungkil kapok seeds, bran, wheat pollard, onggok, molasses, minerals and urea. Haylage complete feed was analyzed to determine proximate analysis.

Collection of feed consumption and waste

The feed is given based on dry matter. Data of feed consumption obtained in the preliminary period. Weighed

feed was given, if there are remaining feed is also weighted so that the obtained amount of feed consumption. Time of feed was weighed the next morning before feeding and sampled (approximately 10%) every day and dried in a 60°C in the oven for 7 days. At the end of the study, samples of feed and waste of feed the remaining samples mixed proportionally, then ground the size of 1 mm to analyze the content of dry matter.

Collection of faeces

Feces were collected daily for 7 consecutive days in the last week collection period to obtain the total weight of feces daily and take samples (approximately 10%) to analyze the content of dry matter.

Calculation of feed consumption and digestibility (Harris, 1970)

Consumption of Dry Matter (kg / head / day; g / kg BW $^{0.75}$ / day) = (% DM giving x total giving) - (%DM remaining x total remaining).

Dry matter digestibility (%) = {Consumption of Dry matter (kg) – Dry matter of faeces (kg) x 100%} : Consumption of Dry Matter (kg).

Consumption of nutrients digested (g/kg BB $^{0.75}$/day) = Dry Matter Consumption x Dry Matter Digestibility

Statistical analysis

Statistical analysis of this study using ANCOVA with a randomized block design pattern 3x3 that is, three treatments of feed and livestock three groups based on initial weight and ANOVA to determine the effect of feed treatmen, followed by Duncan test (Steel and Torrie, 1995).

Results and Discussion

Consumption of dry matter

Maximum feed consumption is highly dependent on the balance of nutrients in the digestive tract (Preston and Leng, 1984; Wilson and Kennedy, 1996). This is because the nutritional needs of a major stimulus to be delivered to the hypothalamus as the hunger center. Preston and Leng (1984) states that imbalance of nutrients of feed will affect for the feed consumption. Balance of nutrients in the ration, particularly related to rumen fermentation, where the carbohydrates and other factors will affect the rumen fermentation, which in turn will affect the consumption of feed (Webster, 1987).

Average consumption of dry feed nutrient treatment during the study are listed in Table 1.

The analysis results showed that the initial body weight of Ongole crossbreed do not give a significant difference ($p > 0.05$) against the consumption of dry matter.

From the results of the analysis range is also known that there is no difference among the three feed treatment. This shows that the three-feed treatments palatability have the same level. According to Faverdin *et al.* (1995) palatability is the main factor explaining the difference between the consumption of dry feed and the cattle that produce low. Further more said that the feed palatability generally associated with high digestibility of a feed. The absence of anti-nutritional substances in maize stalk causing more palatable this feed so that it can affect the amount of feed consumption. No differences among the three feeding treatments also caused by the composition of maize stalk and the proportion of concentrate 40:60.

The addition of chicken manure increased palatability of haylage complete feed. According to Crickenberger and Goode (1996) ensiling process is useful to destroy pathogenic microorganisms and provide a more palatable feed ready consumed by livestock. Dry matter on feed consumption of treated R1, R2 and R3 are respectively 2.53%, 2.74% and 2.52% of body weight. This is in accordance with the opinion of Ørskov and Ibrahim (1991) that the dry matter consumption for beef cattle between 2-3% of body weight. Ruminant livestock will consume the feed according to his needs.

Dry matter digestibility

The potential of feed to provide nutrients for livestock is determined by chemical analysis, but the actual value indicated by the missing parts after digestion, absorption and metabolism. If defined digestibility or digestive power is part of the feed nutrients are not excreted in the faeces and assumed as part absorbed by the livestock (Chuzaemi and Bruchem, 1991).

Table 1. Average of Dry Matter Consumption of Ongole Crossbreed Steers

Variables	Treatment of feed		
	R_1	R_2	R_3
Dry Matter consumption (kg/head/day)	5,14 ± 0,90[a]	5,71 ± 0,78[a]	5,55 ± 0,98 [a]
Dry Matter consumption (g/kg BW 0,75/hr)	97,52 ± 6,05[a]	103,15 ± 6.58[a]	95,44 ± 5,14 [a]
Dry matter digestibility (%)	54,63 ± 0,95 [a]	56,62 ± 2,90[a]	50,87 ± 3,58[a]
Consumption of DM digested (g/kg BB 0,75/hr)	50,69 ± 5,08 [b]	58,70 ± 3,04[a]	48,98 ± 5,62[b]

[a] Superskrip yang sama pada baris yang sama menunjukkan tidak adanya perbedaan yang nyata (p>0,05)

Dry matter digestibility nutrients which obtained treatment during the study are listed in table1 above. The analysis results show that initial weight did not influence the real impact of dry matter digestibility as well as an analysis of variety. Dry matter digestibility absence of differences, between the three treatment feed may be caused because there is no difference in consumption of dry matter thus providing no real effect on digestibility.

Tilman *et al.* (1984) explained that the crude fiber and crude protein, the treatment of feed ingredients, livestock species and the quantity of feed will affect the digestibility. The digestibility often closely associated with the consumption, namely the provision of old plant and slow to digest voluminous compared with the plants that are not fibrous. Relationship is obtained at the digestibility plant below 66%.

According to Minson (1990) dry matter digestibility of plant associated with contain of fiber. Treatments of complete feed R1, R2 and R3 in this study contain NDF suitable to the needs of livestock, respectively 36.95%; 37.97% and 38.19%.

Consumption of dry matter digested

Results of analysis for the consumption of dry matter digested listed in Table 1 above. R2-feed treatment (58.70 g / kg BW 0.75 / day) showed significant differences in the treatment of feed R1 and R3 ($p < 0.05$), while between R1 and R3 showed no significant difference ($p > 0.05$). One of the factors that affect consumption digested nutrients are linked to consumption and nutrient digestibility itself. In this study also consumption of dry matter digested associated with dry matter consumption and dry matter digestibility.

Conclusions

From the results of this study can be drawn the following conclusions: Chicken Manure as non protein nitrogen sources can be used as a concentrate mixture indicated that the results of in-vivo studies there is no negative impact on consumption, digestibility. This gives the implication that the addition of chicken manure has a good prospect for use as the supply of nitrogen for microbial growth because it can supply a source of nitrogen in the rumen.

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