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Effect of Giving Fermented Gold Snail (*Pomacea canalicuta L*) Flour Using Eco Enzymes on Digestibility of Dry Matter and Organic Matter in Quail

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Abstract. Quail is a source of protein and highly nutritious animal. Feed is the basic need of every animal.The cost of feed is very high, reaching 70% of the total cost of producing quail.Gold snail (*Pomacea canalicuta L)* has the potential to be used as feed raw material because of its abundant availability.Eco-enzyme is a fermented that can be used in gold snail fermentation. So it is necessary to do the digestibility of dry matter and organic matter in quail fed with golden snail flour fermented using eco-enzymes.The research design used was a completely randomized design (CRD) with 4 treatments and 5 replications. The parameters studied were dry matter consumption, consumption of organic ingredients, dry matter digestibility (Kcbk) and organic matter digestibility (Kcbo). Based on the results of the study, it was known that feeding using gold snail flour fermented using eco-enzymes in the ration as much as 12% got the best results.

Keywords: eco-enzyme, digestibility, fermentation, golden snail, quail

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1. Introduction

The livestock sub-sector is able to provide food as a source of protein and animals, one of which is quail. Quail (Coturnix coturnix japonica) is one of the land birds that has a small body size but is capable of producing high eggs in one year ranging from 200-300 eggs/head/period. In the maintenance of quail the most important thing is feed because the feed will determine the productivity of the quail [1]. Feed is a basic need of every animal. The golden snail is a plant pest, but on the other hand it can also be useful as a source of nutrition for livestock. Currently, protein source feed ingredients for poultry can be said to be very limited, the fish meal still relies on imports [2]. Gold snails have the potential to be used as feed raw materials because of their abundant availability, the use of golden snails should be boiled for 15-20 minutes to

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remove anti-nutritional substances in the form of thiaminase enzymes. The nutritional content of golden snail flour is crude protein (PK) 46.2%, metabolic energy (ME) 1920 Kcal/Kg, Calcium (Ca) 2.9%, and Phosphorus (P) 0.35% [3]. Eco-enzyme is a complex substrate by utilizing organic wastes such as fruit and vegetable waste, sugar (molasses) and water which is fermented within three months [4]. The purpose of making eco-enzymes itself is to help farmers to obtain better and environmentally friendly harvests. Digestion is a series of processes that occur in the digestive tract until absorption occurs [5]. Digestibility of feed is very important to know because it can be used to determine the quality of the feed. To determine the feasibility of a feed to be given to livestock, it is necessary to do a digestibility test.

Based on this, the authors are interested in conducting research related to the digestibility of dry matter and organic matter in quail fed with golden snail flour fermented using eco-enzymes.

2. Materials and methods

This research was conducted at the Compost Center, Faculty of Animal Husbandry, University of Sumatera Utara. Which was carried out from October to December 2021.

The materials used in this study were 100 ready-to-produce quail 45 days old, golden snails, quail rations (milled corn, rice bran, fish meal, soybean meal, golden snail flour, premix, vegetable oil), Rodalon as a cage disinfectant and equipment.

The tools used in this study were 20 litter cages with a size of 50cm x 50cm x 30cm, 20 feed containers, 20 drinking containers, 1 40 watt incandescent lamp as a source of lighting, analytical scales, stationery and calculators, handspray, camera, broom stick, net as a cage cover, grinder.

2.1. Research Method

The research design used was a completely randomized design (CRD) consisting of 4 treatments and 5 replications. Each treatment consisted of 5 quails.

The treatment is as follows:

1. PO = 8% fish meal (control)
2. P1 = 4% fermented golden snail flour in the ration
3. P2 = 8% fermented golden snail flour in the ration
4. P3 = 12% fermented golden snail flour in the ration

2.2. Research Parameters

- Consumption (Dry Ingredients and Organic Ingredients)
- Dry Matter Digestibility (KcBK)
- Digestibility of Organic Ingredients (KcBO)

3. Result and Discussion

3.1. Dry Ingredients

The average dry matter consumption of quail livestock (g/week) in table.

Table 1. Avarage dry matter consumption of quail livestock (g/week)

Treatment	Replications					Total	Mean±SD
	U1	U2	U3	U4	U5		
P0	107,93	108,90	109,41	109,00	109,02	544,26	108,852±0,55^{b}
P1	80,00	105,00	81,34	83,31	95,40	445,05	89,01±10,8^{a}
P2	104,94	108,14	106,41	103,29	106,98	529,76	105,952±1,88^{b}
P3	86,50	100,44	102,54	104,36	105,06	498,9	99,78±7,63^{b}

Description : Different superscripts in the same row and column show differences real (P<0.05)

Based on the results of the study in Table 5, it is known that the highest dry matter consumption was found in treatment P0 of 108.852 g/week and the lowest was found in treatment P1 which was 89.01 g/week. Duncan's further test results showed a significant difference between giving golden snail flour in fermentation to the consumption of quail dry matter (P<0.05). Giving golden snail flour to quail during the study was added a little molasses water mixture to increase the palatability of quail to gold snail flour fermented with Eco enzymes. Palatability itself is strongly influenced by physical and chemical conditions in the feed such as smell, appearance, taste and texture as well as the nutritional value contained in the feed. According to [6] almost the same level of palatability will provide the same level of dry matter consumption in quail.

3.2. Organic Ingredients

The average consumption of quail organic matter (g/week) is shown in table 2

Table 2. Avarage consumption of quail organic matter (g/week)

Treatment	Replications					Total	Mean±SD
	U1	U2	U3	U4	U5		
P0	92,28	93,94	94,43	94,14	94,22	469,01	93,802±0,86^{b}
P1	69,69	91,59	70,97	72,72	83,30	388,27	77,654±9,46^{a}
P2	91,32	94,16	92,71	90,10	93,43	461,72	92,344±1,63^{b}
P3	75,31	87,55	89,43	91,08	91,75	435,12	87,024±6,74^{b}

Description : Different superscripts in the same row and column show differences real (P<0.05)

The highest consumption of organic matter was found in treatment P0 of 93,802 g/week and the lowest was found in P1 of 77,654 g/week. Duncan's further test results showed a significant difference between giving golden snail flour in fermentation to the consumption of quail organic matter (P<0.05). The size of feed consumption will affect the consumption of organic matter in quail. [7] added that the high content of crude fiber causes the birds to feel full quickly and causes limited feed consumption. The results that have a significant effect are adjusted to the results of dry matter consumption. This is because the consumption of feed organic matter is in line with the consumption of dry matter feed because dry matter consists of organic matter and ash so that the amount of organic matter consumption is directly proportional to the amount of dry matter consumption. This is in accordance with the statement [8] which states that organic matter is part of dry matter, so that when dry matter increases, organic matter increases, and vice versa.

3.3. Dry Matter Digestibility

From the research results obtained data on the average dry matter digestibility in table 3.

Table 3. Average dry matter digestibility of golden snail flour in feed for 7 days (%)

Treatment	Replication					Mean±SD
	1	2	3	4	5	
P0	52,68	57,29	54,94	59,04	57,54	56,30±2,50[b]
P1	33,25	49,62	37,28	41,31	43,92	41,08±6,26[a]
P2	59,18	52,10	52,63	55,25	51,97	54,23±3,07 [b]
P3	43,14	45,28	50,19	55,40	58,87	50,58±6,62 [b]

Description : Different superscripts in the same row and column show differences real (P<0.05)

Based on the results of the study in Table 11 the average dry matter digestibility obtained dry matter digestibility that is 41.08-56.30%. The highest treatment average was at P0 (8% fish meal) which was 56.30±2.50, and the lowest treatment average was P1 (4% fermented golden snail flour in the ration) which was 41.08±6. This is presumably because the fermented golden snail flour given to quail cannot be absorbed by the livestock body properly so that the feces produced are higher and the digestibility of dry matter obtained is lower. The average dry matter digestibility of the results of the study was much lower than Research [9] which had the highest average dry matter digestibility of rations in treatment P1 (rations with 5% snakehead fish meal and 5% commercial fish meal) of 77.96%. Then the lowest was in the P2 treatment (ration with 10% commercial flour) of 76.26%. [5] explained that the level of digestibility was influenced by environmental temperature, the rate of passage of feed through the digestive tract, the physical

form of the feed ingredients, the composition of the ration and the effect on the ratio of other food substances.

3.4. Digestibility of Organic Ingredients

From the results of the study obtained the results of the digestibility of organic matter in table 4.

Table 4. Average digestibility of gold snail flour organic matter in feed for 7 days (%)

Treatment	Replications					Mean±SD
	1	2	3	4	5	
P0	38,30	42,82	40,48	44,61	43,16	41,87±2,49 [b]
P1	24,07	37,58	27,92	31,68	32,96	30,84±5,12 [a]
P2	46,63	39,35	40,08	43,08	39,63	41,75±3,11 [b]
P3	32,27	32,85	37,48	42,45	45,86	38,18±5,94 [b]

Description : Different superscripts in the same row and column show differences real ($P<0.05$)

Based on the results of the study in Table 14, the average digestibility of organic matter obtained was 30.84-41.87%. The highest treatment average was found at P0 which was 41.87%±2.49 and the lowest average was found in treatment P1 (4% fermented golden snail flour in the ration) of 30.84±5.12. The average digestibility of organic matter results from the study was much lower than research [9] that the highest average digestibility of organic matter obtained from the study was achieved by P1 (the ration with snakehead fish waste flour was 5% and commercial flour 5%) with a result of 78 ,41% and the lowest is in P2 (sand fish waste flour by 10%) with 76.75%. This is presumably because [10] states that the increase in the digestibility of organic matter is in line with the increase in dry matter digestibility, because most of the dry matter components consist of organic matter so that the factors that affect the high and low dry matter digestibility will also affect the level of organic matter.

4. Conclusion

Fermented golden snail flour can be given at 8% and 12% of the feed as an alternative feed for quail because it can increase the digestibility of dry matter and organic matter.

REFERENCES

[1] Widodo, A. R., H. Setiawan, Sudiyono, Sudibya dan R. Indreswari. Kecernaan nutrient dan performan puyuh (Coturnix coturnix japonica) jantan yang diberi ampas tahu fermentasi dalam ransum. Tropical Animal Husbandry. 2 (1): 51-57. 2013.

[2] Zainudin, S., dan Syahrudin Pemanfaatan TKM Sebagai Suntitusi Tepung Ikan Terhadap Performa Dan Produksi Telur Puyuh. skripsi. Jurusan Ilmu Peternakan Universitas Negri Gorontalo. . 2012.

[3] BPTP Kalimantan Timur. 2001. Pengkajian Tehknologi Budidaya Ayam Buras. PAATP Kaltim TA 2001.

[4] Thirumurugan P. Production and analysis of enzyme bio-cleaners from fruit and vegetable wastes by using yeast and bacteria. Student project Report (D.O.RC.No.1082/2015A; Project No:28) submitted to Tamil Nadu State Council for Higher Education (TANSCHE). 2016.

[5] Anggorodi. Ilmu Makanan Ternak Umum. PT. Gramedia. Jakarta. 1994.

[6] Khotijah, *et al.* Nutruent Requirement of Poultry. USA. 2019.

[7] Anita, W. Y., I. Astuti, dan Suharto. Pengaruh Pemberian Tepung Daun Teh Tua dalam Ransum terhadap Performa dan Persentase Lemak Abdominal Ayam Broiler. Trop. Anim. Husb. 1(1): 1-6. 2012.

[8] Fathul, F. dan S. Wajizah. Penambahan mikromineral Mn dan Cu dalam ransumterhadap aktivitas biofermentasi rumen domba secara in vitro. JITV 15(1) : 9-15. 2009.

[9] Boangmanalu, R. T.H.Wahyuni dan S. Umar. Kecernaan Bahan Kering, Bahan Organik dan Protein Kasar Ransum Yang Mengandung Tepung Limbah Ikan Gabus Pasir (*Butis amboinensis)* sebagai Substitusi Tepung Ikan Pada Broiler. Program Studi Peternakan Fakultas Pertanian. Universitas Sumatera Utara. 2016.

[10] Suharyanti. Pemberian Enzim Pada Ransum Puyuh Mengandung Indigofera Terhadap Performa, Energi Metabolis Dan Kualitas Fisik Telur. Disertasi, IPB University. 2021.