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Financial Analysis of the Utilization of Golden Snail Flour (*Pomacea canaliculata)* With Eco Enzyme Fermentation in Quail Ration

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Abstract. Quail has a competitive ability to compete with other sources of meat in meeting the needs of the community. Feed is the basic need of every animal. From an economic point of view, the cost of feed is very high, reaching 70% of the total cost of quail production. One of the ingredients that can be used as feed ingredients for animal protein sources that are widely available is the golden snail or called the mulberry snail *(Pomacea canaliculata L)* . One way to increase the nutritional content of feed ingredients is by fermentation. The golden snail flour is fermented using eco-enzymes, where these eco-enzymes are very easy to make and require little cost to manufacture. So it is necessary to calculate the financial analysis of quail feed made using gold 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 are Total Production Costs, Total Production Results, Profit and Loss Analysis, *Income Over Feed Cost* (IOFC), and R/C *(Revenue/Cost)* . Based on the results of the study, it was found that feeding using golden snail flour fermented using eco-enzymes in the ration as much as 12% got the best results, because Total Production Costs, Total Production Results, Profit-Loss Analysis, *Income Over Feed Cost* (IOFC), and R /C *(Revenue/Cost)* got the best results compared to other treatments.

Keywords : Eco Enzymes, Conch Mas, , Fermentation, Financial Analysis, Profit,Quail.

1. Introduction

Poultry is one of the largest providers of animal protein sources. Data by [1] states that the largest meat contributor is poultry with 1.9 million tons and egg production at 2.0 million tons. Quail egg production in one year ranges from 200-300 eggs/head/period. Eggs and quail meat are in great demand by the public because they have high nutritional value and affordable prices. The current problem is that the main productivity of quail is not optimal as a producer of eggs and meat. One of the causes is inefficient feeding management [2]. Feed is the basic need of every animal. From an economic point of view, the cost of feed is very high, reaching 70% of the total cost of quail production [3]. Various efforts to reduce the costs incurred for the provision of feed, one of which is through the use of local feed ingredients that are cheap, easy to obtain, available

at any time and do not compete with human needs, and have nutritional quality that can meet the needs of livestock. One of the ingredients that can be used as a source of animal protein as well as a source of calcium that is widely available is the golden snail or mulberry snail (Pomacea canaliculata L). One way to increase the nutritional content of feed ingredients is by fermentation. Eko enzyme or known as *garbage enzyme* is one example of the utilization of organic waste into products with a higher use value that was discovered by Dr. Rosukon from Thailand in 2006. Eco-enzymes can accelerate biochemical reactions in nature to produce useful enzymes using fruit or vegetable waste [4]. This study aim for knowing the economic value and benefits of giving fermented golden snail flour using eco-enzymes as quail feed.

2. Materials and methods

This research was conducted at the Compost Center, Faculty of Animal Husbandry, University of North Sumatra . This research will be conducted from November 202 1 to December 202 1 .

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

The tools used in this study were 20 litter cages with a size of 50 cm x 50 cm x 30 cm, 20 feed containers, 20 drinking containers, 1 40 watt incandescent lamp as a source of lighting, analytical scales, stationery and calculators, handsprays, cameras, broomsticks, nets as cage covers, grinders.

2.1. Research methods

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 = Fermented golden snail flour 12% in the ration

2.2. Research Parameters

2.2.1. Total Production Cost

Total production costs are all expenses for the production process obtained by calculating: the cost of feed, the cost of seeds, the cost of making cages and the cost of medicines.

2.2.2. Total Production

Total production or total revenue namely all products produced in economic activities obtained by calculating the sale of eggs, feces and quail. according to [5] formula calculation reception as follows :

$$\textit{Total Revenue} = \textit{Quantity x Price of quantity}$$

Information:

Total Revenue = Total receipts that eggs, feces, used sacks are obtained(IDR/year)

Quantity = Amount product (Units)

Price of quantity = Price per unit units (IDR/Unit)

2.2.3. Profit and Loss (L/R)

According to Salam (2009) [6] the profit can be systematically calculated as follows:

$$\pi = TR - TC$$

Where:

π = Profit (Rupiah/tail)

TR = *Total Revenue* or Total Revenue (Rupiah/head)

TC = *Total Cost* or Total Cost

2.2.4. Income Over Feed Cost (IOFC)

IOFC is the difference between revenue and the cost of ration consumption for each head of livestock (Arianan, et al. 2014) [7] or can be calculated in the following way :

$$IOFC = TP - KR$$

Notes:

IOFC = *Income Over Feed Cost* (Rupiah/head)

TP = Total revenue from livestock (IDR/head)

KR = Cost for rations consumed by livestock (IDR/head)

2.2.5. Analysis of R/C Ratio (*revenue cost ratio*)

according to Asnidar and Asrida (2017) [8] formula calculationreception as following :

$$R/C = \frac{Total\ penerimaan\ kotor}{Total\ seluruh\ biaya}$$

Information :

R/C ratio > 1 = Business efficient and profitable

R/C ratio = 1 = Business unfavorable and do not experience loss

R/C ratio < 1 = Inefficient and unprofitable business

R = Revenue (IDR/year)

C = Cost/production cost (IDR/year)

3. Results and Discussion

3.1. Total Production Cost

3.1.1. Cost of Seed Purchase

The cost of purchasing seeds is the cost incurred to buy quail seeds with the age of 6 weeks as many as 100 birds at a price of IDR 10,000 / head. The cost of purchasing seeds can be seen in "Table 1".

Table 1. Cost of Purchasing Quail Checks (IDR/treatment).

Treatments	Replications					Total	Average
	1	2	3	4	5		
P0	50,000	50,000	50,000	50,000	50,000	250,000	50,000
P1	50,000	50,000	50,000	50,000	50,000	250,000	50,000
P2	50,000	50,000	50,000	50,000	50,000	250,000	50,000
P3	50,000	50,000	50,000	50,000	50,000	250,000	50,000
Total	200,000	200,000	200,000	200,000	200,000	1,000,000	200,000

3.1.2. Ration Purchase Fee

Quail rations consisted of corn flour, soybean meal, rice bran, fish meal, gold snail flour, fish oil and premix. The amount of ration consumed by quails during the study can be seen in “Table 5”.

Table 2. Total Consumption of Quails (g/plot).

Treatments	Replications					Total	Average
	1	2	3	4	5		
P0	4,838.2	4,586,4	4,821.0	4,962.3	4,834.2	24,042.1	4,808.42
P1	4,329.0	4,510.0	4,168,6	4,154.7	4,519,0	21,681.3	4,336.26
P2	4,509.4	4,705.3	4,441.4	4,445.6	4,492.1	22,593.8	4,518,76
P3	4,175.6	4,629.4	4,624.1	4,730.1	4,724.4	22,883.6	4,576.72
Total	17,852.2	18,431.1	18,055.1	18,292.7	18,569.7	91,200.8	18,240,16

Table 3. Cost of Cages and Medicines (IDR/Plot)

Type of Financing	Average cost (IDR/plot)
The cost of making the cage	16,100
Medicine cost	500
Total	16,600

3.1.3. Total Production Cost

The total total cost of production is obtained by adding up all the costs incurred to start a business (production costs).

Table 4. Total Production Cost (IDR)

Total production cost	(IDR)
Cost of buying quail chicks	1,000,000,0
Feed purchase cost	551,240.2

The cost of making the cage	322.0000.0
Medicine cost	100000.0
Total	1,883,240.2

Based on the total production cost, it can be seen the total production costs for each treatment during the study.

The total production of costs during the study of each treatment can be seen in "Table 5"

Table 5. Total production costs by Every Treatment (IDR/plot).

Treatments	Replication					Total	Average
	1	2	3	4	5		
P0	97,903.2	96,274.0	97,791.9	98,706.1	97,877.3	488,552,5	97,710.5
P1	93,266.6	94,381.6	92,278.6	92,192.9	94,437.0	466.556.7	93.311.3
P2	93,160.4	94,314.2	92,759.8	92,784.6	93.058.5	466.077.5	93,215.5
P3	90.150.4	92,709.8	92679.9	93,267.8	93,245.6	462.053,5	92410.7
Total	374480.6	377,679.6	375,510.2	376,951.4	378,618.4	1,883,240.2	376,648

The highest total production cost was found at P0 (the use of 8% fish meal and 0% fermented golden snail flour in the ration) with an average of IDR 97,710.5. This is because the costs incurred are more expensive in making rations. The lowest total production cost was found in the P3 treatment (the use of 0% fish meal and 12% gold snail flour fermented using eco-enzymes) with an average of IDR 92,410.7. This is because the costs incurred are cheaper in making rations.

3.2. Total Production

The amount of revenue generated from operations depends on the number of goods that can be produced and the selling price obtained [9].

3.2.1. Egg Sales Results

Egg sales are obtained from the selling price of quail eggs per grain. The selling price of eggs is IDR 350/grain. The number of quail egg production during the study can be seen in table 10 and the results of egg sales can be seen in "Table 6".

Table 6. Total Egg Production (egg/plot)

Treatments	Replication					Total	Average
	1	2	3	4	5		
P0	81	76	83	81	81	402	80.4

P1	50	59	37	42	63	251	50.2
P2	64	79	47	73	63	326	65.2
P3	78	99	79	92	79	427	85.4
Total	273	313	246	288	286	1.406	281.4

Table 7. Egg sales (IDR/plot).

Treatments	Replication					Total	Average
	1	2	3	4	5		
P0	28,350	26,600	29,050	28,350	28,350	140,700	28.140
P1	17,500	20,650	12.950	14,700	22.050	87.850	17,570
P2	22,400	27,650	16,450	25,550	22.050	114,100	22,820
P3	27,300	34,650	27,650	32,200	27,650	149,450	29,890
Total	95,550	109.550	86,100	100,800	100,100	492,100	98,420

The highest quail egg sales results were in the P3 treatment (using 12% golden snail flour fermented using eco-enzymes) with an average of IDR 29,890. The lowest egg sales results were found in P1 (using 4% golden snail flour fermented using eco-enzymes) with an average of IDR. 17,570.

3.2.2. Results of Sales of Quail Feces

The sale of quail feces is obtained from the selling price of quail feces per kilogram. The selling price of feces is IDR. 1,500/kg multiplied by the total quail feces of 66.986 kg. Then the selling price of all quail feces is IDR. 100,479. The selling price of quail feces can be seen in table 12.

Table 8. Sales of quail feces (IDR/plot).

Treatments	Replication					Total	Average
	1	2	3	4	5		
P0	7335.0	5,164.5	5,874.0	7.546.5	5,839.5	31,759.5	6,351.9
P1	3,736.5	4,041.0	4,537.5	3,469.5	4,881.0	20,665.5	4,113.1
P2	4,537.5	5,067.0	5,203.5	4,699.5	5,262.0	24,769.5	4,953.9
P3	4,021.5	4,359.0	4,374.0	6,082.5	4,447.5	23,284.5	4,656.9
Total	19,630.5	18,631.5	19,989.0	21,798.0	20,430.0	100,479.0	20,075.8

3.2.3. Quail Sales Results

The sale of quail is obtained from the selling price of live quail. The selling price of quail is IDR.

15,000/head so that the sales of quail are IDR. 1,500,000. The results of the sale of quail can be seen in “Table 9”.

Table 9. The sale of quail (IDR/plot).

Treatments	Replication					Total	Average
	1	2	3	4	5		
P0	75,000	75,000	75,000	75,000	75,000	375,000	75,000
P1	75,000	75,000	75,000	75,000	75,000	375,000	75,000
P2	75,000	75,000	75,000	75,000	75,000	375,000	75,000
P3	75,000	75,000	75,000	75,000	75,000	375,000	75,000
Total	300,000	300,000	300,000	300,000	300,000	1,500,000	300,000

Table 10. Total Production

Total Production	IDR
The sale of quail eggs	492,100
Feces sale proceeds	100,479
The sale of quail	1,500,000
Total	2,092,579

Table 11. Total Production (IDR/plot).

Treatments	Replication					Total	Average
	1	2	3	4	5		
P0	110,685.0	106,764.50	109,924.0	110,896.5	109.189.5	547,459.5	109,491.9
P1	96.236.5	99,691.0	92,487.5	93,169.5	101.931.0	483.515.5	96,703.1
P2	101.937.5	107,717.0	96653.5	105,249.5	102.312.0	513,869.5	102.773.9
P3	106,321.5	114.009.0	107.024.0	113,282.5	107.097.50	547,734.5	109,546.9
total	415,180.5	428,181.5	406.089	422,598.0	420.530.0	2,092,579	418,515,8

From “Table 11”, it can be seen that the highest total production was found in P3 with an average of IDR. 109,546.9. The lowest total production was found in P1 with an average of IDR. 96,703.1.

3.3. Profit – Loss Analysis

The income statement is a report that shows the amount of profits earned and costs incurred in a period [10]. The business results are obtained by comparing income and costs over a certain period of time.

Profit = Total output – Total production cost

= IDR 2,092,579 0.0 – IDR 1,883,240,2

= IDR 209,338.8

So that the total production, namely the total sales of livestock plus the total sales of quail eggs and plus the total sales of manure, has a higher value than the total production costs, namely the cost of seeds, the cost of rations, the cost of medicines and the cost of making cages.

Table 12. Profit (Profit – Loss) of Each Treatment (IDR/plot).

Treatments	Replication					Total	Average
	1	2	3	4	5		
P0	12,781.8	10,490.5	12.132.1	12,190.4	11,312.2	58,907.0	11,781.4
P1	2,969.9	5,309.4	208.9	976.6	7,494.0	16,958.8	3,391.8
P2	8,777.1	13,402.8	3,893.7	12,464.9	9,253.5	47,792.0	9558.4
P3	16,171.1	21,299.2	14,344.1	20,014.7	13,851.9	85,681.0	17,136.2
Total	40,699.9	50,501.9	30,578.8	45,646.6	41,911.6	209,388.8	41,867.8

3.4. *Income Over Feed Cost* (IOFC)

[11] states that *Income over feed cost* (IOFC) is the difference between livestock business income and feed costs .

Table 13. *Income Over Feed Cost* (IOFC) for each treatment (IDR/plot).

Treatments	Replication					Total	Average
	1	2	3	4	5		
P0	79,381.8	77,090.5	78,732.1	78,790.4	77,912.2	391907.0	78.381.4
P1	69,569.9	71,909.4	66,808.9	67,576,6	74,094.0	349,958.8	69.991.8
P2	75,377.1	80.002.8	70,493.7	79,064.9	75,853.5	380,792.0	76,158.4
P3	82.771.1	87,899.2	80,944.1	86,614.7	80,451.9	418,681.0	83,736.2
Total	307,099.9	316,901.9	296,978.8	312,046.6	308,311.6	1,541,388.8	308,267.8

Based on “Table 13”, the largest average IOFC was found in P3 (the use of 0% fish meal and gold snail flour with 12% eco-enzyme fermentation) an average of IDR . golden snail with 4% eco-enzyme fermentation) which is IDR. 69.991.8/treatment.

Table 14. *Analysis of Variant (ANOVA*) IOFC Quail

SK	DB	JK	KT	Fhit	P-value	$F_{0.05}$	$F_{0.01}$
Treatment	3	485465392.6	161821797.5	18.37	0.00002	3.24	5.29**
Error	6	140979804,4	8811237,78				
Total	19	626445197					

** very real difference

The results of the Analysis of Variant (ANOVA) above show that the use of fermented golden snail flour using 0-12% eco-enzymes in bird rations shows very significant different results (F count is greater than F table 0.05 and greater than f. table 0.01) to Income Over Feed Cost (IOFC).

3.5. Analysis of R/C Ratio (*revenue/cost ratio)*

Table 15. Revenue/cost ratio (R/C Ratio) Each Treatment.

Treatments	Replication					Total	Average
	1	2	3	4	5		
P0	1.13	1.10	1.12	1.12	1.11	5.58	1.12
P1	1.03	1.05	1.00	1.01	1.07	5.16	1.03
P2	1.09	1.14	1.04	1.13	1.09	5.49	1.09
P3	1.17	1.22	1.15	1.21	1.14	5.89	1.18
Total	4.42	4.51	4.31	4.47	4.41	22.12	4.42

The R/C ratio obtained showed that the administration of fermented golden snail flour using eco-enzymes in quail rations was feasible to carry out (developed) because the average of all treatments had a yield of 1.10 (R/C > 1) . With the highest average value of R/C ratio found in treatment P3 which is 1.18 and the lowest average value of R/C ratio is found in P1 of 1.03. This is in accordance with the statement If the R/C Ratio > 1, then the business being run experiences profit or worthy for developed [12].

4. Conclusion

Utilization of golden snail flour fermented using eco-enzymes in quail rations as much as 12% provides better benefits compared to the use of fish meal. This can be seen from the average total production cost in P3 (the use of fermented golden snail flour as much as 12%) of IDR. 92,410.7; the total production of P3 (the use of fermented golden snail flour as much as 12%) was IDR. 109,546.9; P3 profit (use of fermented golden snail flour as much as 12%) was IDR. 17,136.2; IOFC P3 (use of fermented golden snail flour as much as 12%) was IDR. 83,736.2 and R/C ratio P3 (used of fermented golden snail flour as much as 12%) was 1.18. So the use of golden snail flour fermented using eco-enzymes as much as 12% in the ration is more profitable.

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