

THE EFFECT OF THE LEVEL OF FAECES QUAILS IN THE RATION ON FINAL BODY WEIGHT, CARCASS, RATION EFFICIENCY AND INTERNAL ORGANS OF BROILER CHICKENS

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Abstract

Quails faeces contains good enough protein also energy and potential to be used as an alternative animal feed ingredient to reduce of production cost. Utilization of quail faeces in broiler ration can be directly given in the form of flour or fermented but however it has a limited to used. This study was aimed to determine the level of quail faeces in the ration that still produce good final body weight, carcass, ration efficiency and internal organs of broiler chickens. The study used 100 DOC of broilers that were divided into 20 units of cages, so each unit of cage consisted of 5 chickens. The study used Completely Randomized Design (CRD) with four treatments that were one ration without quails faeces (R0) and three rations containing quails faeces ie R1 (7.5%), R2 (15%) and R3 (22.5%). The parameters measured were final body weight, ration efficiency, carcass and internal organs of broiler chickens. The data was analyzed using analysis of variance and the difference among treatments was analyzed by Duncan Test. The result of the research show that the rations containing quails faeces 15% still produce good final body weight, ration efficiency, carcass and internal organs of broiler chickens.

Key words: Broiler chickens, final body weight, ration efficiency, carcass, internal organs

INTRODUCTION

The development of quail population in Indonesia is getting higher from year to year this can be seen from the population in 2015, 2016 and 2017 with a total quail population of 13,781,918; 14,107,687 and 14,427,314 respectively [1]. The high quail population, the high faeces produced. The chicken has weight 1.8 kg can produce 113g of faeces per day [2], then if the quail can produce faeces is like the chicken and the average of quail weight is 140g, so in 2017 the faeces produced by quail is 126,816.09 kg per day. Faeces is the residue or waste products from a livestock industry that does not have a sale value, but still useful. A large number of Faeces if is not utilized will become a problem for the environment. [3] said that the poultry industry is one the largest and fastest growing agro-based industries in the world.

There is an increasing demand for poultry meat. The poultry industry currently facing a number of environmental problems. One of the major problems is the accumulation of large amount of wastes, especially manure and litter. Large scale accumulation of these wastes may pose disposal and pollution problems. The negative impact caused by livestock faeces in the community, has become the basis of many studies and innovations related to the use of livestock faeces. Livestock faeces have been widely used as organic fertilizer in agriculture, biogas, and even as alternative feed ingredients.

Utilization of quail faeces in feed can be given in the form of flour. The results of proximate analysis of quail faeces were 13.61% ash, 16.63% protein, 8.17% crude fiber, 4.57% fat, 1.11% Ca, 0.47% P, and Gross Energy 2896 kcal / kg (Animal Nutrition and Chemical Nutrition Laboratory, UNPAD Faculty of Animal Husbandry, 2017). Metabolizable energy is calculated based on the Schaible formula (1970), so we

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get the metabolizable of quail faeces 2027 Kcal / kg. According to [4] dried chickens faeces, raised in cage contain 28.7% crude protein, 1.7% crude fat and 14.9% crude fiber. [2] said that the average faeces of dry poultry contained 26% ash, 10% crude fiber and 33.5% crude protein.

[5] said that fermentation of chicken manure and gamblong can be used as feed ingredients for broilers, laying eggs and ducks. Research on quail faeces used as feed material has been carried out by [6] who explained that fermented quail faeces is suitable for use as cattle concentrate feed because it contains 22.92% protein, crude fiber 18.90%, fat 3.39%, and ash 24%. The results of research on the provision of fermented quail faeces to 24% in cows can increase body weight gain.

Research on broilers given faeces has been conducted by [7] who explained that the addition of 10-15% layer of chicken manure fermentation products in the broiler rations produced optimal performance. Optimal performance is shown by the existence of significant differences in body weight gain compared to control rations, where the results of the body weight gain of control rations are 1672.25 while rations contain 10 and 15 percent quail faeces are 1789.70 and 1768.30 respectively.

The crude fiber content of chicken faeces is quite high, far above the ability of poultry to accept it, so that chicken faeces cannot be used too much in the ration, but if the processing is good and can be combined with other ingredients it may be used 20% to 30%

of the ration [8]. [9] stated that ration containing fermented sago pulp and chicken faeces mix up to 8% showed an increase in body weight and percentage of carcass in broiler chickens. Carcass is part of a chicken body without feathers, offal, head, neck, shanks, lungs and kidneys [10].

MATERIAL AND METHOD

This study used 100 DOC broiler chickens which were randomly divided into 20 cages. The experiment was carried out experimentally and used a Completely Randomized Design (CRD), consisting of 4 types of ration treatments. The treatment was repeated 5 times and each experimental unit consisted of 5 broilers. The treatment given is the level of quail faeces in rations, there are : 0%, 7.5%, 15% and 22.5%. Variables observed include: final body weight, ration efficiency, carcass, and internal organs (liver, heart, gizzard). The rations used in the study contain 22% protein and 3000 kcal / kg of metabolic energy [11]. The treatments are:

R0 = rations that do not contain quail faeces

R1 = rations containing 7.5 percent quail faeces

R2 = rations containing 15 percent quail faeces

R3 = rations containing 22.5 percent quail faeces

The composition of the research rations used during the study can be seen in Table 1. The contents of food substances in the research ration can be seen in Table 2.

Table 1 The composition of the research rations

Ingredient	R0	R1	R2	R3
	%			
Corn	48.00	46.00	43.00	38.00
Quail Faeces	0.00	7.50	15.00	22.50
Soy Bean Meal	22.00	22.00	22.00	22.00
Rice Bran	8.50	5.00	2.00	1.00
Fish Meal	19.00	17.00	15.00	13.00
Coconut Oil	2.00	2.00	2.50	3.00
Premix	0.25	0.25	0.25	0.25
Grit	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00

Table 2 The contents of food substances in the research ration

ME and Nutrition	Treatments Ration				The Needs of Broiler *
	R0	R1	R2	R3	
ME (Kcal/Kg)	3066.51	3045.35	3027.96	3015.03	3000.00
Crude Protein (%)	22.19	22.07	22.05	22.02	22.00
Crude Fat (%)	6.22	6.12	6.51	6.93	≤ 8.00
Crude Fiber (%)	3.52	3.64	3.80	4.17	≤ 8.00
Calcium (%)	1.43	1.39	1.34	1.30	0.90-1.00
Phosphorus (%)	0.64	0.60	0.57	0.55	0.40-0.80
Lysine	1.68	1.58	1.48	1.39	0.95-1.20
Methionine+Cystine	0.87	0.85	0.82	0.73	0.72-0.90**
Methionine	0.52	0.50	0.49	0.46	0.50***

Source : (*)[11], (**)[12], (***) [13]

RESULTS AND DISCUSSIONS

The result of the research on broiler chickens fed rations containing quail faeces can be seen in Table 3.

Table 3 The effect of treatments on final body weight, carcass, ration efficiency and internal organs of broiler chickens

Variables	R0	R1	R2	R3
Final Body Weight (g)	1360.75 ^b	1341.90 ^b	1196.30 ^{ab}	1125.75 ^a
Ration Efficiency	59.01 ^b	60.78 ^b	56.41 ^b	43.77 ^a
Carcass Weight (g)	1007.58 ^b	918.82 ^{ab}	902.98 ^{ab}	825.42 ^a
Carcass (%)	67.58	69.33	67.44	68.32
Heart weight (g)	7.78	7.20	8.00	7.62
Liver (g)	27.94	26.56	31.24	26.80
Gizzard (g)	17.76	16.82	18.84	19.56
Heart weight (%)	0.65	0.60	0.68	0.62
Liver (%)	2.33	2.21	2.63	2.16
Gizzard (%)	1.47	1.40	1.60	1.60

R0 = 0% ; R1 (7.5% QF); R2 (15% QF); R3 (22.5% QF); QF = Quails Faeces

Statistical analysis showed that the treatment had a significant effect ($P < 0.05$) on the final body weight. The final body weight of the treatment R1 (7.5% Quail flour) was not different from the chicken fed R0 (without Quail faeces) and R2 (15% Quail flour). Likewise, the final body weight between treatments R2 and R3 (22.5% Quail flour). The final body weight in treatment R3 was significantly lower ($P < 0.05$) compared to quail fed R0. This shows that the use of quails faeces flour up to 15% does not reduce body weight and is still safe to use, but the use of faeces flour up to 22.5% is not good and can reduce body weight. This is because the fiber content of Quail faeces flour is very high. This is in line with opinion [14] that the use of DPW (Dried Poultry Waste) at 10% did not affect weight gains and feed efficiency of young chicks (1 to 5 weeks of age), but 20% DPW could greatly depressed

growth and feed efficiency. When laying Hen were fed diet containing DPW at 25%, egg production rate and feed efficiency were decreased significantly. Faeces flour cannot be use a lot in ration because another problem. [15] said that the nitrogen present in the uric acid in the poultry manure is not utilized by the chick and may even be toxic.

Statistical analysis showed that the treatment had a significant effect ($P, 0.05$) on ration efficiency. The Duncan Test results show that the treatments of R0 (0%), R1 (7.5%) and R2 (15%) is not different at the ration efficiency, but is significantly higher ($P < 0.05$) compared to R3 (22.5%). So the use of faeces flour in rations 15% does not reduce the value of ration efficiency, while the use of quail flour by 22.5% has decreased ration efficiency. This happens because an increase in the use of quail flour until 22.5%, will increase the crude fiber in the ration, and

can decreased ration digestibility. If this happened can causes less the nutrient absorption and be converted into body weight. The consumption of rations in R3 treatment were not different with R0, R1 and R2, but the result of final body weight is smaller. [16] said that in general, the lower the crude fiber contained in food ingredients, the more easily digested, because the cell walls of these food ingredients are thin and easily penetrated by digestive enzyme.

The results of the analysis of variance showed that the treatment had a significant effect ($P < 0.05$) on carcass weight. Duncan test results showed that the treatments R0, R1 and R2 produced carcass weights that not differ as well as the treatments of R1, R2 and R3. However, the R0 treatment produced a significantly higher carcass weight ($P < 0.05$) compared to R3. This is because the carcass weight follows the body weight. High body weight produces high carcass weight. Carcass weight is related to the weight of broiler life, the higher the live weight, the higher the carcass weight. Carcass weight is influenced by age, type of livestock (species), ration and body weight or body size ([17]; [18]). Carcass composition influenced by body weight, sex, nutrient content of the ration and rationing program [19]. The use of faeces flour until 15% does not reduce the carcass weight, so the quail faeces can be used in the ration to reduce the price of rations or production costs.

The results of the analysis of variance showed that the treatment had no significant effect to percentage of carcass. This is because the percentage of carcasses is a proportion of the body that is not easily changed. Carcass percentage is the ratio between carcass weight and final body weight multiplied by 100%. The result of Percentage of carcass in this research has ranging from 67.44% - 69.33%. The results are close to the percentage of carcasses of the research of [7] that ranging between 64.86 - 66.86%. The results of the research showed that the used quails faeces flour up to 22,5% did not effect to percentage carcass. It is different with the result of [9] research which shows that the use of sago pulp fermentation and chicken faeces at the level 12% in the

ration reduced the percentage of carcasses. According to [20] the percentage of carcasses is influenced by growth rate and feed quality. The growth rate is indicated by the increase in body weight which will affect the percentage of carcass. Carcass weight is influenced by age, type of livestock (species), ration and body weight or body size [17]. The percentage of carcass is influenced by the age of the chicken, because the flesh of the carcass is getting thicker in accordance with the increase in age, especially the chest. The opposite of the carcass, other body parts such as the head, neck, shank and internal organs, are parts of the body that mature early, so the percentage will shrink in line with the age of the chicken.

The results of the analysis of variance showed that the treatment had no significant effect on heart of broiler chicken. This shows that the use of quail faeces flour in rations until 22.5% does not give a negative effect to chicken's heart. The heart weight of this research 7.20 - 8.00 gram. This is close to the heart weight of another research is 8.00 - 8.87 gram [21]. The heart percentage of this research is 0.60% - 0.68%. This result is higher than the results of the study of [22] which 0.43% - 0.57%. According [23] the percentage of heart of broiler is 0.42% - 0.70%. [24] said that the heart in broiler chickens is very sensitive to poisons and anti-nutrient substances, the accumulation of poisons and anti-nutrient substances can affect the heart size of broiler chickens. The Percentage of heart weight in this studi still normal, so the use of quail faeces flour up to 15% does not give a negative effect.

The results of the analysis of variance showed that the treatment had no significant effect on liver of broiler chicken. the range of liver weights in this study ranged from 26.56 to 31.24 grams. This is lower than result of the research of [21] which 40.38-45.25 gram. The percentage of hearts in this study was 2.16-2.63%, this is close to the result the research [22] which is 2.04% - 2.15%. [24] said that an increase in liver weight is caused by a disease or poison that is carried along with feed. The Percentage of liver weight in this studi still normal, so the use of quail

faeces flour up to 15% does not give a negative effect.

The results of the analysis of variance showed that the treatment had no significant effect on gizzard of broiler chicken. This shows that the use of quail faeces flour in rations until 22.5% does not give a negative effect to chicken's gizzard. In this study from R0 to R3 the weight and percentage of gizzard tended to increase even slightly. According to [25] gizzard weight increase is due to an increase in fiber in the feed. This gizzard load to physically reduce the ration particle size so that the gizzard vein will be thicker thereby increasing the gizzard size. Weiss and Scott 1979 in [26] said that high fiber in the feed will increase the size of the gizzard because this organ is stimulated to work more physiologically in processing fiber both mechanically and enzymatically. In this study the percentage of gizzard from 1.47 to 1.60% is smaller than the results of the study by [22] which a gizzard percentage 1.77% - 2.08% and [23] with a gizzard percentage 1.60% - 2.30%. Based on this it can be stated that gizzard in this study is still normal.

CONCLUSIONS

1. The level of quail faeces in the ration influence on final body weight, carcass, ration efficiency and internal organs of broiler chickens.

2. The use of quails faeces up to 15% still produce a good final body weight, carcass weight, ration efficiency and internal organs of broiler chickens

REFERENCES

[1]. Kementerian Pertanian. 2017. Populasi Burung Puyuh menurut Provinsi 2013-2017*. [Online]. Tersedia di : www.pertanian.go.id

[2]. North, M. O. and D. D. Bell. 1990. Commercial Chicken Production Manual. Van Nostrand Reinhold. New York.

[3]. Bolan, N.S, A.A. Szogi, T. Chuasavathi, B. Seshadri, M.J. Rothrock Jr. and P. Panneerselvam. 2010. Uses and Management Of Poultry Litter. © World's Poultry Science Association 2010 World's Poultry Science Journal, December Vol. 66 page 673-698

[4]. Allen, R.D. 1982. Feedstuffs Ingredient Analysis Table. Feedstuffs Vol 54. No.30: 25-30

[5]. Djunaedi dan Aulani'am. 1998. Rekamaya Teknologi Fermentasi Campuran Limbah Pabrik Tepung Tapioka (Gamblong) Sebagai Bahan Pakan Ternak Unggas. An OAI Repository, Central Library of Brawijaya Universitas-Malang. <http://www.digilib.brawijaya.ac.id/oai>

[6]. Indria Ukrita. 2014. Efisiensi Biaya Ransum Dengan Pemberian Pakan Faeces Puyuh Fermentasi Pada Usaha Ternak Sapi. Jur: Embrio (7)(2)(58-64) ISSN No.2085-403X. Page 59-64

[7]. Wattiheluw, M. J., U. D. Rusdi., Y. A. Hidayat., dan T. Widjastuti. 2014. Performa Ayam Broiler yang diberi Fermentasi Kotoran Ayam Layer dalam Ransum. Jurnal Agrinimal (4) (2) (45-88).

[8]. Rasyaf, M. 1990. Bahan Makanan Unggas di Indonesia. Yogyakarta. Penerbit Kanisius.

[9]. Hehanussa, H.Ch.S, Supadmo, Wibowo A. 2006. Pengaruh Penggunaan Campuran Ampas Sagu dan Eksreta Ayam Fermentasi Dalam Ransum Terhadap Penampilan Kualitas Karkas dan Daging Ayam Broiler. Agrosains. 19 (2)

[10]. Badan Standardisasi Nasional. 2009. Mutu Karkas dan Daging Ayam. SNI 3924:2009. http://websisni.bsn.go.id/index.php?/sni_main/sni/unduh/9960.

[11]. Dagher, N. J. 1995. Poultry Production in Hot Climates. UK at The University Press. Cambridge.

[12]. National Research Council. 1994. Nutrient Requirements of Poultry, ninth Revised edition. Academy Press. Washington D.C.

[13]. Standar Nasional Indonesia. 2008. Kumpulan SNI Bidang Pakan. Direktorat Budidaya Ternak Non Ruminansia, Direktorat Jenderal Peternakan, Departemen Pertanian. Jakarta.

[14]. Trakulchang N and S.L. Balloun. 1975. Use of Dried Poultry Waste in Diets For Chicken. Poultry Science 54: 609-614.

[15]. Couch J.R. 1974. Poultry Science Department Texas A&M University College Station, TX 77843 page 279-289

[16]. Anggorodi, R. 1994. Ilmu Makanan Ternak Umum. Gramedia Pustaka Utama, Jakarta

[17]. Priyatno, M.A. 2000. Mendirikan Usaha Pematangan Ayam. Cetakan ketiga. Penebar Swadaya. Jakarta

[18]. Iskandar, S. 2005. Pertumbuhan dan Perkembangan Karkas Ayam Silangan Kedu x Arab (Pada Dua Sistem Pemberian Ransum. JITV10(4): 253 – 259.

[19]. Leeson, S. and D.J. Summer. 2008. Commercial Poultry Nutrition. Third Edition. Canada. University Books Guelph.

[20]. Soeparno. 2005. Ilmu dan Teknologi Daging. Yogyakarta. Penerbit Universitas Gajah Mada

[21]. Suryanah, H. Nur dan Anggraeni. 2016. Pengaruh Neraca Kation Anion Ransum Yang Berbeda Terhadap Bobot Karkas Dan Bobot Gible

- Ayam Broiler. Jurnal Peternakan Nusantara ISSN 2442-2541 April Vol 2 No.1. Hal 1-8
- [22]. Wandono, Y.T., B. Brata, H. Prakoso. 2013. Persentase Organ Dalam dan Deposisi Lemak Broiler Yang Diberi Pakan Tambahan Tepung Kelopak Bunga Rosella (*Hibiscus sabdariffa* Linn). Jurnal Sain Peternakan Indonesia ISSN 1978-3000. Vol 8 No.1.
- [23]. Putnam, PA. 1991. Handbook of Animal Science. Academi Press. San Diego.
- [24]. Frandson D.R. 1992. Anatomi dan Fisiologi Ternak. Edisi ke-4. Terjemahan Srigandono dan Praseno Koen. Yogyakarta. Penerbit Universitas Gadjah Mada.
- [25]. Usman, A.N.R. 2010. Pertumbuhan Ayam Broiler (Melalui Sistem Pencernaannya) Yang Diberi Pakan Nabati dan Komersial Dengan Penambahan Dysapro. Institute Pertanian Bogor. Bogor.
- [26]. Rosyani, S. 2013. Pemberian Pakan Konsentrat Mengandung Tepung Inti Sawit Yang Ditambahkan Pollar atau Dedak dan Pengaruhnya Terhadap Persentase Organ Dalam Ayam Broiler. IPB Bogor