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(RESEARCH ARTICLE)

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Carcass cut from Bali duck (*Anas sp.*) given fermented of grape waste extract in drinking water

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Abstract

Animal protein consumption continues to increase, along with population growth and increasing public awareness of the importance of consuming foods with high nutritional value. Bali duck meat as a source of animal protein is low in quality and quantity, so efforts are made by providing natural feed additives. Providing fermented of grape waste extract in drinking water, is expected to improve the carcass cuts of bali duck male. The experiment using a completely randomized design (CRD) consisted of 4 treatments and 4 replications, with a body weight of bali duck male (46.96 ± 1.84 g). Treatment fermented of grape waste extract in drinking water in bali duck male: 0%, 2%, 4%, and 6%, respectively for treatments P0, P1, P2, and P3. The variables observed were chest percentage, back percentage, upper thigh percentage, lower thigh percentage, and wing percentage. The results of the study showed that, the administration of fermented of grape waste extract in drinking water at levels of 2%, 4%, and 6% has not been able to improve (P>0.05) carcass cuts in the variables of carcass weight, chest percentage, back percentage, upper thigh percentage, lower thigh percentage, and wing percentage. Based on the results of the study, it can be concluded that the administration fermented of grape waste extract in drinking water has not been able to improve the carcass cuts of bali duck male.

Keywords: Bali Duck Male; Carcass Cut; Extract; Fermented; Grape Waste

1. Introduction

Consumption of animal protein is increasing along with the increasing population and public awareness of the importance of nutritional value of the food consumed. One alternative to meet the consumption of animal protein sources is duck meat [7]. Duck meat is quite potential, with nutritional content protein 20 g, calories 129 cal, iron 2 mg, fat 5 g, and vitamin B [3]. Bali ducks are dual-purpose livestock; their meat and eggs can be used and in bali ducks are used as a means of religious ceremonies [12]. The productivity of bali ducks as meat producers is still low in terms of quality and quantity, so the maintenance system needs to be considered.

The use of antibiotic growth promoters (AGP) plays a role in increasing livestock growth, and the prohibition of the use of AGP, then the use of natural feed additives such as grape wine waste as a substitute for AGP. Grape wine waste is industrial waste from the wine making process which has a nutrient content as animal feed, and is cheap [18]. Grape skin and seeds contain phytochemical compounds, such as flavonoids which act as antibacterials. According to [9], flavonoid compounds as antibacterials can increase the efficiency of feed digestion, so that the nutrient absorption process is optimal, and have an impact on livestock live weight and increased meat production. Feeding poultry from grape waste is associated with anti-nutritional compounds that can reduce digestion and nutrient absorption. Additions below 6% have bioactive effects that benefit livestock growth [6].

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Research on the use of non-fermented and fermented wine waste in rations up to 10% did not cause differences in performance and carcasses of local male rabbits [5]. Research by [18], the use of 7.5% fish meal and 2.5% fermented wine waste in rations resulted in the highest final body weight and weight gain. Until now, there has been no research on administering fermented wine waste extract through drinking water to carcass cuts of bali duck male.

2. Material and Methods

2.1. Bali Duck Male

This study used 48 bali duck male (1 day old), which were purchased from breeders in Tabanan, Bali.

2.2. Cage

The cages used with a colony cage system of 16 units, made of wood. The cages are sterilized first with disinfectant before the ducks enter, to avoid disease. Each cage unit is provided with a drinking water place and a plastic feed place, as well as lamps for lighting and heating the cage.

2.3. Feed and Drinking Water

The feed used in this study was commercial feed CP 511B produced by PT. Charoen Phokphan Tbk. The nutrient content of CP 511B feed and the standard requirements of bali duck male with energy of 2900-3000 and protein of 20-22%. Drinking water came from drilled well water, given *ad libitum* with the addition of fermented grape wine waste extract according to the treatment.

2.4. Experimental Design

This experiment used a completely randomized design (CRD) with four treatments and four replications. Each treatment unit used 3 bali duck male, with an average homogeneous body weight (46.96 ± 1.85 g), so that the total number of bali duck male used was 48. The treatment of fermented grape wine waste extract through drinking water in bali duck male was as follows: P0 = 0% fermented grape wine waste extract; P1 = 2% fermented grape wine waste extract; P2 = 4% fermented grape wine waste extract; and P3 = 6% fermented grape wine waste extract.

2.5. Making Fermented Grape Wine Waste Extract

The grape wine waste used came from CV Timan Agung, Klating Village, Kerambitan District, Tabanan Regency, Bali. The cleaned grape wine waste was then added with water in a ratio of 1:1 (1 kg grape wine waste: 1 liter of water) then effective microorganisms (EM_4) was added as much as 5% of the weight of the material. The mixture of materials was put into a place (*anaerobic*) and stored for 5 days, and after 5 days the mixture of materials was blended and then filtered, the result was fermented wine waste extract.

2.6. Observed Variables

The variables observed in this study are

Carcass weight, obtained by weighing the carcass without blood, feathers, head, feet, and internal organs. Carcass weight is calculated using the following formula

Carcass weight (g/head) = slaughter weight – weight (blood, feathers, head, and internal organs)

Chest percentage, obtained by weighing the chest in the scapula area to the sternum. The chest percentage is calculated using the following formula

$$\text{Chest percentage} = \frac{\text{chest weight (g)}}{\text{carcass weight (g)}} \times 100\%$$

The back percentage, is obtained by weighing the spine to the pelvic bone. The back percentage is calculated using the following formula

$$\text{The back percentage} = \frac{\text{back weight (g)}}{\text{carcass weight (g)}} \times 100\%$$

The percentage of upper thigh, is obtained by weighing the carcass section taken from the joint area of the lower thigh bone to the hip. The percentage of upper thigh is calculated using the following formula:

$$\text{The percentage of upper thigh} = \frac{\text{upper thigh weigh (g)}}{\text{carcass weight (g)}} \times 100\%$$

Percentage of lower thigh, obtained by weighing the carcass section taken from the lower thigh joint to the knee. The percentage of lower thigh is calculated using the following formula:

$$\text{Percentage of lower thigh} = \frac{\text{lower thigh weight (g)}}{\text{carcass weight (g)}} \times 100\%$$

Wing percentage, is obtained by weighing the joint between the upper arm and the scapula. Wing percentage is calculated using the following formula:

$$\text{Wing percentage} = \frac{\text{wing weight (g)}}{\text{carcass weight (g)}} \times 100\%$$

2.7. Data Analysis

The data obtained were analyzed using variance, if there was a significant effect (P<0.05), then the calculation continued with Duncan's multiple range test [17]. Data analysis used the SPSS program, version 26.

3. Results and discussion

The results of the study (Table 1), showed that the administration of fermented grape wine waste extract through drinking water to Bali duck male carcass pieces in treatments P0, P1, P2 and P3 was statistically not significantly different (P>0.05) in all variables.

Table 1 Effect of administering fermented grape wine waste extract through drinking water on carcass cuts of bali ducks (*Anas sp*.) aged 1-8 weeks

Variable	Treatment[1)]				SEM[2)]
	P0	P1	P2	P3	
Carcass Weight (g/head)	808.25[a3)]	841.25[a]	792.50[a]	815.25[a]	14.04
Percentase of Chest (%)	25.32[a]	29.21[a]	26.14[a]	29.14[a]	1.30
Percentase of Back (%)	32.94[a]	32.21[a]	34.63[a]	33.97[a]	0.95
Percentase of Upper Thigh (%)	12.04[a]	9.64[a]	9.73[a]	8.98[a]	0.80
Percentase of Lower Thigh (%)	14.62[a]	13.76[a]	14.61[a]	13.28[a]	0.66
Percentase of Wing (%)	15.08[a]	15.18[a]	14.89[a]	14.63[a]	0.23

- Description
  - P0 = 0% 0% fermented grape wine waste extract; P1 = 2% fermented grape wine waste extract; P2 = 4% fermented grape wine waste extract; P3 = 6% fermented grape wine waste extract
  - SEM = "*Standard Error of the treatment Means*"
  - Values with the same letter in the same row indicate no significant difference (P>0.05)

The administration of fermented grape wine waste extract through drinking water up to a level of 6% did not affect the percentage of chest, back, upper thigh, lower thigh, and wing percentages. The carcass in the chest is the main place of meat deposition in poultry, and economically has the highest value compared to other carcass parts. In this study, the administration of fermented grape wine waste extract tended to be higher than the P0 treatment, indicated by the percentage of the chest bali duck male ranging from 25.32 - 29.21%. This is thought to be because the fermented grape wine waste extract contains phytochemical compounds, such as flavonoids that function as antibacterials. These flavonoids are able to inhibit the growth of pathogenic bacteria in the digestive tract, so that feed digestibility and nutrient absorption in the body increase [1]. The mechanism of action of flavonoid compounds as antibiotics, by

disrupting the function of microorganisms and helping to inhibit pathogenic microbes in the digestive tract, thereby increasing feed digestibility which indirectly increases the conversion of feed into meat [11].

The percentage of carcass cuts in the back ranged from 32.21 - 34.63% (Table 1), in treatments P2 (34.63%) and P3 (33.97%) tended to be higher compared to P0 (32.94%), while in P1 (32.21%) tended to be lower than P0. The back is the part that contains the highest bone components, so the percentage of the back is influenced by bone weight [19]. Bone growth is influenced by the age of the livestock, and the parts of the livestock's body that are dominated by bones, such as wings, back, head, and legs. This is supported by [15], that bone growth tends to be constant and decreases as the livestock gets older.

The administration of fermented wine waste extract through drinking water at level of 0, 2, 4 and 6% has not been able to affect the percentage of Bali duck male thighs. This result is influenced by the low meat deposit and high bone proportion. The thigh is a limb and body support, so the value of the meat component in this section tends to be smaller [10]. The percentage of thighs will decrease along with decreasing bone growth and increasing muscle growth [13]. When the thigh muscles have reached maximum growth, the percentage of thighs does not change significantly [8]. The growth of the thigh will grow earlier compared to the chest and general growth. When the growth of the chest and other parts increases, the thigh to carcass weight decreases [14].

The administration of fermented grape wine dregs extract through drinking water did not affect the percentage of bali duck male wings. This is because the wing carcass is dominated by bones whose formation occurs at the beginning of growth. This statement is supported by [16], that the wing is a part of the carcass that is dominated by bone components and does not have the potential to produce meat. The protein content in the feed absorbed by the livestock's body is mostly converted for feather formation. This statement is supported by [2], that in the growth phase, most of the protein absorbed by the livestock's body is used for feather growth. The wing carcass does not experience significant growth when the duck is more than 8 weeks old. This statement is supported by [4], that wing growth up to 12 weeks of age is relatively constant, resulting in relatively the same wing weight.

4. Conclusion

Based on the research results, it can be concluded that administering fermented grape wine waste extract through drinking water at levels of 2%, 4%, and 6% has not been able to improve the carcass cuts of bali duck male.

Compliance with ethical standards

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Disclosure of conflict of interest

We certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

Statement of ethical approval

The animal ethics committee has approved 48 bali duck male (1 day old) used in this study from the Faculty of Veterinary Medicine, Udayana University, Badung, Bali, Indonesia.

References

[1] Aditia, Y. 2017. The Effect of Giving Tembelekan Leaf Extract (Lantana camara Linn) in Drinking Water on Live Weight and Carcass Characteristics of Broilers. Thesis. Faculty of Animal Husbandry, Andalas University, Padang.

[2] Adnyana, I. G. S., G.A.M.K. Dewi, and M. Wirapartha. 2014. Effect of Energy and Protein Ration Balance on 30-Week-Old Female Native Chicken Carcasses. Thesis. Department of Animal Husbandry, Faculty of Animal Husbandry. Udayana University, Denpasar.

[3] Angga, D.P., I G. N. G. Bidura, and N.W. Siti. 2015. The effect of adding papaya leaf flour in commercial rations on carcass fraction of Bali ducks. Journal of Tropical Animal Husbandry. 3(3): 645- 656.

[4] Anggraeni. 1999. Allometric Growth and Morphological Review of Pectoral Muscle Fibers (Muscullus pectoralis and Muscullus supracoracoracorideus) in Local Ducks and Muscovy Ducks. Dissertation. Postgraduate Program, Bogor Agricultural University, Bogor.

[5] Atmaja, I G. M., and A. B. Kresna. 2020. Performance and carcass of local male rabbits (Lepus nigricollis) fed rations containing fermented grape wine waste. Agri Humanis: Journal of Agriculture and Human Resource Development Studies. 1(1): 68-76.

[6] Costa, M. M., Alfaia, C.M., Lopes, P. A. Pestana, and J. A. M. Prates. 2022. Grape by-products as feedstuff for pig and poultry production. Animals. 12: 2239.

[7] Departogi, and I M. Swiman. 2008. Physical Composition of Carcass of 10-Week-Old Bali Ducks Male Fed Commercial Feed Substituted with Pollard and Duck Mineral Additives. Udayana University.

[8] Kristiani, N.K.M., N. W. Siti, and N. M. Suci Sukmawati. 2017. Commercial carcass cuts of female Bali ducks fed with rations supplemented with fermented papaya leaves. Journal of Tropical Animal Science. 5(1): 159-170.

[9] Lestariningsih, O. Sjofjan, and E. Sudjarwo. 2015. The effect of meniran plant flour (Phyllanthus niruri Lin.) as additional feed on the small intestine microflora of broiler chickens. Journal of Animal Husbandry Agribusiness. 15(2): 85-91.

[10] Massolo, R., A. Mujnisa, and L. Agustina. 2016. Percentage of carcass and abdominal fat of broilers given inulin prebiotics from dahlia flower tubers (Dahlia variabillis). Animal Nutrition and Feed Bulletin. 12(2): 50-58.

[11] Muiz, A. 2016. The effect of using binahong leaf flour (Andredera cordifolia (Ten) Stennis) as a feed additive on the quality of broiler chicken carcasses. Journal of Agri Science. 17(1): 54-61.

[12] Nitis. 2006. Culturally Insightful Farming. Art Foundation, Denpasar.

[13] Pribady, W.A. 2008. Goose Carcass Production (Anser cygnoides) at Various Slaughter Ages. Thesis. Faculty of Animal Husbandry, Bogor Agricultural University, Bogor.

[14] Putra, A., Rukmiasih., and R. Afnan. 2015. Percentage and quality of carcass of Cihateup-Alabio (CA) ducks at different slaughter ages. Journal of Animal Husbandry Production Science and Technology. 3(1): 27-32.

[15] Soeparno. 2009. Science and Technology of Meat Processing. 5th Edition. Yogyakarta: Gadjah Mada University Press.

[16] Suprianto, I. K. E., N. W. Siti, and N. M. S. Sukmawati. 2019. The effect of administering effective probiotic Microorganism-4 in drinking water on commercial carcass cuts of eight-week-old Bali duck male. Journal of Tropical Animal Husbandry. 7(2): 599-611.

[17] Steel, R.G.D., and J.H. Torrie. 1993. Principles and Procedures of Statistics: A Biometrical Approach. Translated by B. Sumantri. Gramedia Pustaka Utama, Jakarta

[18] Susana, I W., I M. Nuriyasa, and N. W. Siti. 2018. The effect of fish meal replacement with fermented grape wine waste on broiler performance. Scientific Journal of Animal Husbandry. 21(1): 29-31.

[19] Ulupi, N., H. Nuraini, J. Parulian, and S. Q. Kusuma. 2018. Characteristics of carcass and non-carcass of male and female broiler chickens at 30 days of slaughter age. Journal of Animal Production Science and Technology. 6(1): 1-5.