

Effect of Different Vegetable Oils in Rations on Chemical Quality of Local Duck Meat

A K Wati*, R F Hadi, Sudiyono

Department of Animal Science, Faculty of Agriculture, Universitas Sebelas Maret
Jalan Ir. Sutami 36A Kentingan Surakarta, Indonesia 57126

*Email: wati_arikusuma@staff.uns.ac.id

Introduction

Ducks are a type of semi-aquatic poultry that are starting to be bred and have the potential to diversify food ingredients while reducing dependence on broiler chicken meat. The nutritional content of duck meat includes protein content of 20.04%, fat of 8.2%, ash of 1.2% and energy value of 15.900 kcal/kg. The national consumption of duck meat per capita per year in Indonesian is still low at 0.052 kg, compared to native chicken meat has reached 0.78 kg/year [2].

Poultry like chicken and duck needs a high-energy diet to help its quick growth and metabolism. Thus, approximately 2 to 5% of oil is suggested in broiler chicken diets for optimal growth performance [3] [4]. Animal fat, soybean oil, and combinations are energy resources for diets of broiler chickens. A past report showed that energy metabolism of broiler chickens is enhanced by dietary animal-vegetable oil blends (A-V blend) [5]. In that study, [6] announced that a diet containing joined animal fat and vegetable oil could increase performance and feed efficiency, as well as breast and drumstick yields, in birds compared with those birds fed only with animal fat or vegetable oil alone. A comparative perception was made by [7] [8].

Several types of plants can produce vegetable oils. The productivity and growth of ducks can be optimized by giving feed enriched using feed ingredients rich in protein and natural antioxidants such as those contained in perilla seeds. Therefore, research was needed on the effect of different vegetable oils in rations on chemical quality of local duck meat.

Table 1. Feedstuffs composition (on dry matter basis) and nutrient content of experimental diets

Ingredients	T1 (Palm oil)	T2 (Canola oil)	T3 (Coconut oil)	T4 (Soybean oil)
Yellow corn (%)	37	37	36.75	37.50
Pollard (%)	10.25	10.25	11.25	9.75
Rich polish (%)	24.5	23.25	23.75	23.50
Soy Bean Meal (%)	21.5	22.75	21.50	22.50
Premix (%)	2.35	2.35	2.35	2.35
Limestone (%)	0.30	0.30	0.30	0.30
NaCl (%)	0.10	0.10	0.10	0.10
Vegetables Oils				
Palm oil (%)	4	0	0	0
Canola oil (%)	0	4	0	0
Coconut oil (%)	0	0	4	0
Soybean oil (%)	0	0	0	4
Total (%)	100	100	100	100
ME, kcal/kg	3258.97	3262.89	3241.44	3266.61
Crude protein, %	19.64	20.14	19.71	19.99
Crude fiber, %	6.09	6.02	6.11	6.00
Extract ether, %	5.64	5.56	5.61	5.56
Ca, %	0.97	0.98	0.98	0.98
P av, %	0.71	0.71	0.71	0.71

Material and Methods

Treatment and Experimental Diets

The ducks used in this study were divided into 4 treatment groups, with 6 replicates and each replicates consisted of 6 head ducks. The treatment included; P1: (96% basal ration + 4% palm oil); P2: (96% basal ration + 4% canola oil); P3: (96% basal ration + 4% coconut oil); and P4: (96% basal ration + 4% soybean oil). The experiment were conducted for 9 weeks.

Research methods

The diets were comprised of yellow corn, pollard, rice clean, soybean meal, premix, NaCl, limestone, and vegetable oils. Feedstuffs composition and nutrient content of treatment diets were presented in Table 1.

Chemical Analyses

The chemical composition of meat (collagen, fat, water content, protein) [13] analysis was conducted in duplicate on fresh samples of the breast and expressed on a fresh basis.

Data analyses

This research used one way randomized design. The data were analyzed using analysis of variance (ANOVA) and differences between treatment means were further analyzed using Duncan's New Multiple Range Test (DMRT).

Results and Discussion

The results of the research on the physical quality of local duck meat with the addition of different vegetable oils in the ration consisting of collagen, fat, water content, and protein can be seen in Table 2.

Table 2. The average chemical quality of local duck meat aged 9 weeks

Variable	Treatment				P Value
	P1	P2	P3	P4	
Collagen (%)	2.29±0.23	2.06±0.20	1.95±0.15	2.05±0.22	0.053
Fat (%)	3.51±0.38	3.69±0.77	3.07±0.92	3.81±0.78	0.357
Water content (%)	72.63±1.00	73.04±0.55	73.16±0.76	72.24±0.90	0.223
Protein (%)	20.64±0.34 ^a	21.32±0.72 ^a	21.24±0.62 ^a	22.34±0.48 ^b	0.000

^{a,b} Different superscripts in the same row show significant differences (P<0.05)

P1: 96% basal ration + 4% palm oil; P2: 96% basal ration + 4% canola oil; P3: 96% basal ration + 4% coconut oil and P4: 96% basal ration + 4% soybean oil

Conclusion

It can be concluded that the addition of vegetable oil in the ration can increase the protein of local duck meat but did not affect collagen, fat, and water content.

Acknowledgements

This research was funded by the research project of Sebelas Maret University (PNBP UNS Nomor : 452/UN27.21/PN/2020).

References

- [2] DPKH, *Statistik Peternakan dan Kesehatan Hewan 2018/ Livestock and Animal Health Statistics 2018* (Direktorat Jenderal Peternakan dan Kesehatan Hewan Kementerian Pertanian RI)
- [3] Noy Y and Sklan D 1995 *Poult Sci* 74:366-373
- [4] Nitsan Z, Dvorin A, Zoref Z and Mokady S 2007 *Br Poult Sci* 38:101-106
- [5] Cao M H and Adoola O 2016 *Poultry Science* 95:268-275 <http://dx.doi.org/10.3382/ps.2016.0317>
- [6] Mohammadreza P, Ahmad A Q, Vito L and Vincenzo T 2013 *Asian Australas J Anim Sci* 26:705-710
- [7] Cera K R, Mahan D C and Reinhart G A 1990 *J Anim Sci* 68:2756-2765
- [8] Abdel Warith A, Russell P M and Davies S J 2001 Inclusion of a commercial poultry by product meal as a protein replacement of fish meal in practical diets for African catfish *Clarias gariepinus* (Burchell 1822). *Aquacult. Res.* 32:296-305.
- [13] AOAC 2005 *Official Methods Anal. Assoc. Anal. Chem.* 18th Ed., AOAC, Gaithersburg, Maryland. (2006)