



EVALUATION OF DIETARY PROTEIN LEVEL FOR GROWTH IN KUTTANAD DUCKS

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Abstract

An experiment was conducted to study the effect of dietary protein level for growth in Kuttanad ducks (*Anas platyrhynchos domesticus*). One ninety two ducklings were divided randomly into four dietary treatments each with four replicates of 12 ducklings each. The dietary treatment consisted of T₁ containing 16 per cent CP (Crude Protein), T₂-18 per cent CP, T₃-20 per cent CP and T₄-22 per cent CP. The energy level was 2800 kcal/ kg Metabolizable Energy (ME) in all treatments. Parameters of growth performance viz. body weight, feed consumption and feed efficiency were recorded at weekly intervals till 12 weeks of age. The significantly ($p < 0.05$) higher growth rate along with better feed consumption in treatment with 20 per cent protein diet was compared to other treatments during 8 week of age. The results of the study indicated that the ducklings under dietary treatment containing 20 per cent CP (T₃) showed improved growth performance with regards to 8th week body weight, body weight gain, feed consumption, FCR and economy as compared to T₁, T₂ and T₄.

Keywords: Kuttanad ducks, crude protein, growth, weight

Kuttanad ducks (*Anas platyrhynchos domesticus*) are the indigenous ducks of Kerala which includes two morphological distinct varieties namely both *Chara* and *Chemballi*. They are dual purpose hardy water fowls, and they yield soft and nutritious meat. Kuttanad ducks have the unique advantages of disease resistance and better adaptability to the climatic conditions of the state and are very efficient converters of feed to good quality animal protein. Dietary nutrient density is one of the critical nutritional factor and it has significant effect on growth pattern and the overall performance in duck. Information regarding duck nutrition is very limited compared to chicken. Feed is the single most expensive input in duck production representing more than 60% of the total production and information regarding requirements of nutrients is essential for evolving a standard and practical feeding protocol for ducks. A selection program to develop a meat line of Kuttanad ducks is being carried at University Poultry and Duck

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Farm, Mannuthy, through individual selection has resulted in ducks with rapid growth rate. But their protein requirement has not been evaluated. This work is aimed to evaluate the dietary protein level requirement for growth in Kuttanad ducks.

Materials and Methods

One hundred and ninety two, day-old Kuttanad ducklings were weighed individually, wing banded and assigned randomly to four treatment groups each having four replicates of 12 birds each in a completely randomized design. The four treatments were as follows:

Sl. No.	Treatment groups	Feed
1.	T1	16% CP & 2800 kcal ME/kg
2.	T2	18% CP & 2800 kcal ME/kg
3.	T3	20% CP & 2800 kcal ME/kg
4.	T4	22% CP & 2800 kcal ME/kg

Standard management practices were followed throughout the experimental period. Feed and water were provided *ad libitum* up to 12 weeks of age. Individual body weight was recorded at weekly interval from day old to 12 weeks of age. Feed consumption was recorded replicate wise at weekly interval. Feed conversion ratio (FCR) was calculated from the data on body weight and feed consumption. Data collected on various parameters were statistically analysed

by Completely Randomized Design (CRD) method as described by Snedecor and Cochran (1994). Means were compared by Duncan Multiple Range Test (DMRT) using Statistical Package for Social Studies software.

Ingredient and chemical composition of experimental rations are presented on Table 1.

Results and Discussion

Data on body weight, body weight gain, feed consumption and FCR are summarized in Table 2. During eighth and tenth week of age, body weight of birds fed with 20 per cent protein (T3) had significantly higher body weight than all other treatments. Cumulative weight gain during 0 to eight weeks period was highest in T3 followed by T2 and T4, and lowest in T1 and the difference were significant. Mean cumulative body weight gain from 0 to 10 and 0 to 12 weeks of age were found to be non-significant among all the treatments. This result is in agreement with the findings under NATP where in Kuttanad ducks which showed higher weight gain in the early stages of growth was marked by a lower weight gain in the later stages of growth and vice versa.

The results for mean cumulative feed consumption show that differences among treatments were significant ($p < 0.05$) upto eight, 10 and 12 weeks of age. During these periods, the birds fed with 22 per cent protein had lower feed consumption than the other treatments. This result is in agreement with findings of Siregar *et al.* (1982), Joshi *et al.* (2015) and Mohanty *et al.* (2016) who found that feed

Table 1. Ingredient composition of experimental ration [Percent wise]

SL. No.	Ingredients	Per cent composition of different experimental diet			
		T1	T2	T3	T4
1	Bajra	66.7	65.6	62.6	60.6
2	De-oiled soybean meal	16.2	22.4	28.9	35.4
3	De-oiled rice bran	13	8.00	4.5	-
4	Dicalcium phosphate	2.05	2.00	2.00	2.00
5	Calcite	1.55	1.50	1.5	1.5
6	Salt	0.5	0.5	0.5	0.5
	Total	100	100	100	100

consumption was decreased by increase in dietary protein level.

During 0 to 8 weeks, the cumulative FCR was 4.20, 3.95, 3.76 and 3.97 in T1, T2, T3 and T4, respectively. During this period, birds fed with 16 per cent protein had lower FCR than the other treatments. This result is agreement with findings of Roy *et al.* (1994), who reported that feed efficiency significantly improved with increasing level of protein in the diet. The differences were found to be non-significant

among all the treatments for cumulative FCR from 0 to 10 and 0 to 12 weeks of age.

The livability in all the treatment groups was close to 100 per cent and there was no apparent difference among the treatments. Margin over feed cost/duck revealed that during all periods of observation, birds fed with 20 per cent protein (T3) gave the maximum margin over feed cost, followed by bird fed with 18 per cent protein in the diet (T2).

Table 2. Body weight, body weight gain, feed intake and feed conversion ratio of Gramasree cockerels in different treatments

Treatment groups	Age in weeks		
	8	10	12
Body weight			
T1	1213.75± 16.11 ^c	1451.70± 10.20 ^c	1560.68± 10.11
T2	1307.90± 16.82 ^{ab}	1513.08± 15.38 ^{ab}	1555.60± 12.43
T3	1359.77± 23.06 ^a	1522.93± 23.49 ^a	1565.18± 17.91
T4	1256.19± 18.25 ^{bc}	1463.80± 19.47 ^{bc}	1561.88± 14.97
F-value	11.383	3.933	0.080
p-value	0.000	0.010	0.971
Cumulative weight gain (g)			
T1	1176.48± 16.09 ^c	1389.46± 30.39 ^a	1523.57± 10.03
T2	1270.93± 16.71 ^{ab}	1476.27± 15.32 ^a	1518.80± 12.39
T3	1322.23± 22.97 ^a	1485.50± 23.40 ^a	1527.63± 17.87
T4	1219.07± 18.15 ^{bc}	1427.02± 19.49 ^{ab}	1524.73± 14.97
F-value	11.447	3.851	0.067
p-value	0.000	0.011	0.977
Cumulative feed consumption (g)			
T1	4947.69± 36.22 ^a	6666.34± 19.28 ^a	8450.34± 16.95 ^b
T2	5016.07± 26.33 ^a	6720.00± 33.83 ^a	8569.91± 35.99 ^a
T3	4972.54± 15.08 ^a	6663.25± 30.92 ^a	8451.71± 42.05 ^b
T4	4839.23± 15.85 ^b	6542.75± 19.41 ^b	8235.56± 25.36 ^c
F-value	9.125	7.875	19.435
p-value	0.002	0.004	0
Cumulative FCR			
T1	4.20± 0.55 ^b	4.64± 0.08	5.47± 0.04
T2	3.95± 0.10 ^a	4.48± 0.02	5.55± 0.06
T3	3.76± 0.05 ^a	4.37± 0.05	5.40± 0.04
T4	3.97± 0.02 ^a	4.53± 0.08	5.34± 0.02
F-value	7.875	2.780	2.969
p-value	0.004	0.087	0.064

Means bearing same superscript within a column do not differ significantly at 5% level

The results of the study indicated that the ducklings under dietary treatment containing 20 per cent CP showed better growth performance with regards to 8th week body weight, body weight gain, feed consumption and FCR than treatment groups with 16, 18 and 22 percent protein levels. At 12 week of age the body weights were similar but the feed efficiency was very poor (5.34 to 5.55). From this study, it was concluded that rearing Kuttanad ducklings upto eight weeks of age with 20 per cent CP and 2800kcal/ kg ME was economical for meat production.

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