

EFFECT OF FEEDING DIFFERENT DIETARY PROTEIN LEVELS ON CARCASS CHARACTERISTICS OF KADAKNATH CHICKEN

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ABSTRACT

A study was carried out to assess the effect of dietary crude protein on growth performance and carcass characteristics of Kadaknath chicken up to 12 weeks of age. A total of 240-day old Kadaknath chicks were purchased from the College of Poultry Production and Management, TANUVAS, Hosur and wing banded, weighed individually and distributed randomly into four experimental groups with three replicates of 20 chicks each. Four experimental diets were formulated with four levels of crude protein viz., 14, 16, 18 and 20 per cent with 2800 kcal/kg ME. Growth performance and carcass characteristics were studied. All the data generated were statistically analysed and interpreted. The Kadaknath chicken fed with 20 per cent crude protein with 2800 kcal /kg ME had highest 12th week body weight (1018.66± 55.19 g) when compared to other treatment groups. The carcass characteristics of Kadaknath chicken showed significant difference ($P \leq 0.05$) among treatment groups for eviscerated carcass weight, eviscerated carcass yield, ready-to-cook weight, ready-to-cook yield and per cent giblets. The per cent cut-up parts of Kadaknath chicken at 12th week of age did not show significant difference among treatment groups. The present study concluded that Kadaknath chicken fed with higher crude protein (20 % CP) resulted in significantly higher 12th week body weight, eviscerated carcass and ready-to-cook yield.

Key words: Kadaknath chicken, Dietary crude protein, Carcass characteristics.

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INTRODUCTION

Indigenous chicken breeds are good source of animal proteins (Singh *et al.*, 2017) and could be very helpful in combating the nutritional deficiencies and generating income for the rural masses. Kadaknath chicken is the breed famous for its black colour and black meat chicken which has commercial scope in Tamil Nadu, Andhra Pradesh, Telangana and Kerala states. The available broiler and egg type chick mash was the option for feeding; certainly, the nutrient requirement of Kadaknath chicken is different when compared with broiler birds. In order to obtain optimum growth performance and efficient utilization of feed ingredients, there is a need to work out the requirements of major nutrients mainly crude protein for Kadaknath birds as the practice of providing commercial broiler or native chicken diet may not be economical and ideal to bring out the optimum performance. Further, nutrition of birds has a significant impact on poultry meat quality and safety and assessment of carcass characteristics make this breed more important among the poultry. Very little research work has been carried out on nutrient requirement and carcass characteristics of Kadaknath chicken. Hence, the present research work was designed to study the effect of dietary protein on growth performance and carcass characteristics of Kadaknath chicken.

MATERIALS AND METHODS

A study was carried out to assess the effect of different dietary crude protein levels on the growth performance and carcass characteristics in Kadaknath chicken for a

period of 12 weeks at the Department of Poultry Science, Madras Veterinary College, Chennai- 07 during the year 2021. A total of 240-day old chicks were wing banded and weighed individually. Four treatment groups with three replicates of 20 chicks each were allocated by randomization based on body weight. The diet required for four different treatment groups with varying crude protein (CP) levels (14, 16, 18, 20 %) with constant energy level (2800 kcal/kg ME) were prepared. During the initial period of first two weeks, the chicks were housed in cages and later shifted to deep litter system. The feed and water were provided *ad libitum* and reared under standard managemental conditions. At the end of 12th week, four birds from each replicate were randomly selected for carcass study. Parameter such as 12th week body weight, carcass yield, cut-up parts, meat : bone ratio and body fat content were studied. The data arrived were statistically analyzed by one-way ANOVA with Duncan's multiple range test for interpretation.

RESULTS AND DISCUSSION

Growth performance

The effect of different levels of crude protein on 12th week body weight and carcass characteristics of Kadaknath chicken is presented in Table 1. The birds fed with 20 per cent crude protein with 2800 kcal /Kg ME had highest body weight when compared to all the other treatment groups. In our study higher 12th week body weight of 1018.66 g was recorded in group fed with 20 % CP followed by 979.33 g, 861.66 g and 811.33 g in groups

received 18, 16 and 14 % CP respectively . The present finding agrees with the findings of Gupta *et al.* (2016), who found the body weights of Kadaknath chicken as 901.67 g and 867.0 g when fed with 20.06 and 19.43 % CP respectively.

Carcass yield

The eviscerated carcass weight, eviscerated carcass yield, ready-to-cook weight, ready-to-cook yield and per cent giblets showed significant difference ($P \leq 0.05$) for different levels of crude protein fed groups. However, non - significant difference was found in abdominal fat per cent and meat : bone ratio. The higher eviscerated carcass weight (672.50 ± 36.68 g), eviscerated carcass yield (67.95 ± 0.91 %), ready-to-cook weight (727.66 ± 40.37 g) and ready-to-cook yield (72.75 ± 0.85) was observed in T_4 fed with 20 % CP. This result inferred that dietary protein had significant role on carcass traits of Kadaknath chicken. These results were comparable with Nguyen *et al.* (2010) who evaluated the effect of different protein levels on carcass characteristics of Betong chicken and obtained a maximum yield of 1.189 kg in chicken fed with 19 % CP and 1.141 kg carcass with 15 % CP diet. Similarly, Dairo *et al.* (2010) observed a carcass yield of 70.6 % in local chicken fed with 20.14 % CP at 8th week of age and Haunshi *et al.* (2013) observed that ready-to-cook yield of 58.44 per cent at 10th week and 66.47 per cent at 20th week of age in Aseel fed with 16% CP and 2500 kcal/kg ME.

In our study, the higher per cent giblets (6.02 %) yield was observed in T_1 group (14 %

CP) and showed significant difference among various CP level fed groups, which was comparable with Haunshi *et al.* (2013) who observed the giblets yield of 4.88 and 4.06% respectively at 10th and 20th week of age in Aseel fed with 16 per cent crude protein and 2500 kcal/kg ME. The abdominal fat content showed no significant difference among various level of CP fed groups. However, numerically higher abdominal fat per cent was observed in 16 % (1.58 %), 18 % (1.33 %) and 20 % (1.33 %) than 14 % (0.91) CP fed group which might be due to low protein diet leads to lesser fat deposition in abdomen.

Cut-up parts

The effect of different levels of crude protein on per cent cut-up parts of Kadaknath chicken at 12 weeks of age is presented in Table 2. The cut-up parts of Kadaknath chicken viz. per cent neck, breast, back, thigh, drumstick, and wing showed non-significant difference among different CP levels fed groups. However, numerically higher breast yield (27.31 %) and back yield (21.00 %) were observed in T_3 (18 % CP) and T_4 (20 % CP) group. The thigh yield found to be numerically higher (15.37 %) in T_1 and drumstick yield was higher (16.86 %) in T_2 group. The present findings agree with the findings of Preeti *et al.* (2018) who found 16.88 % breast and 5.94 % wing in Kadaknath chicken fed with 18 % CP. Similarly, Azharul *et al.* (2005) in Sonali and Fayoumi cockerels, Darsi *et al.* (2012), Magala *et al.* (2012) in native chicken, Rahman *et al.* (2013) in Hilly chicken, and Miah *et al.* (2016) in native chicken, and Ravivarman (2021)

Table 1: Effect of different levels of crude protein on carcass characteristics of Kadaknath chicken at 12 weeks of age (Mean $\pm$ SE), n=12

Treatment (CP level)	Live body weight (g)	Eviscerated carcass weight (g)	Eviscerated carcass yield (%)	Ready-to-cook Weight (g)	Ready-to-cook yield (%)	Abdominal fat (%)	Giblets (%)	Meat: bone ratio
T₁ (14%)	811.33 ^a $\pm$ 55.86	533.66 ^a $\pm$ 39.01	65.73 ^a $\pm$ 0.79	582.35 ^a $\pm$ 41.60	71.60 ^a $\pm$ 0.82	0.91 $\pm$ 0.20	6.02 ^b $\pm$ 0.21	0.79 $\pm$ 0.06
T₂ (16%)	861.66 ^{ab} $\pm$ 47.65	572.00 ^{ab} $\pm$ 34.61	66.30 ^{ab} $\pm$ 0.54	617.41 ^{ab} $\pm$ 35.09	71.75 ^a $\pm$ 0.44	1.58 $\pm$ 0.21	5.35 ^{ab} $\pm$ 0.29	0.69 $\pm$ 0.02
T₃ (18%)	979.33 ^{bc} $\pm$ 33.12	663.50 ^b $\pm$ 21.77	67.56 ^b $\pm$ 0.48	712.41 ^b $\pm$ 23.56	72.43 ^{ab} $\pm$ 0.53	1.33 $\pm$ 0.27	4.98 ^a $\pm$ 0.09	0.70 $\pm$ 0.02
T₄ (20%)	1018.66 ^c $\pm$ 55.19	672.50 ^b $\pm$ 36.68	67.95 ^b $\pm$ 0.91	727.66 ^b $\pm$ 40.37	72.75 ^{ab} $\pm$ 0.85	1.33 $\pm$ 0.26	5.40 ^{ab} $\pm$ 0.28	0.64 $\pm$ 0.04
F value	3.97*	4.123*	3.627*	3.929*	2.744*	1.324 ^{NS}	3.292*	2.18 ^{NS}

NS Not significant, *Significant ($P \leq 0.05$).

Means bearing different superscripts within a column differ significantly ($P \leq 0.05$). \

Table 2. Effect of different levels of crude protein on per cent cut-up parts of Kadaknath chicken at 12 weeks of age (Mean $\pm$ SE), n=12

Treatment (CP level)	Neck (%)	Breast (%)	Back (%)	Thigh (%)	Drumstick (%)	Wing (%)
T₁ (14%)	7.86 $\pm$ 0.78	26.31 $\pm$ 0.76	20.00 $\pm$ 0.96	15.37 $\pm$ 0.66	16.15 $\pm$ 0.51	14.31 $\pm$ 0.32
T₂ (16%)	7.81 $\pm$ 0.33	26.96 $\pm$ 0.62	19.70 $\pm$ 0.58	14.68 $\pm$ 0.37	16.86 $\pm$ 0.08	13.98 $\pm$ 0.30
T₃ (18%)	7.55 $\pm$ 0.42	27.31 $\pm$ 0.32	20.15 $\pm$ 0.56	14.60 $\pm$ 0.48	15.75 $\pm$ 0.47	14.63 $\pm$ 0.53
T₄ (20%)	7.81 $\pm$ 0.28	26.36 $\pm$ 1.00	21.00 $\pm$ 0.90	14.06 $\pm$ 0.39	16.01 $\pm$ 0.62	14.76 $\pm$ 0.38
F value	0.279 ^{NS}	0.459 ^{NS}	0.515 ^{NS}	1.049 ^{NS}	1.027 ^{NS}	0.843 ^{NS}

^{NS} Not significant

in cross bred chicken found non-significant effect on relative weight of breast, back, thigh and wings from different protein fed diets. The present study had higher breast (26.31 % to 27.31 %) and back yields (19.70 to 21.00%) in Kadaknath chicken with various levels of crude protein.

CONCLUSION

From the present study, it is observed that Kadaknath chicken fed with higher crude protein (20 % CP) resulted in significantly higher 12th week body weight, eviscerated carcass and ready-to-cook yield. Higher protein in the diet with higher absorption leads to higher body weight which in turn reflected in carcass characteristics. Whereas, other parameters like abdominal fat content and meat: bone ratio had minimal effect.

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