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EFFECT OF DIETARY INCLUSION OF SHEANUT CAKE (*VITELLARIA PARADOXA*) ON PERFORMANCE OF QUAILS

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ABSTRACT

A trial was conducted on 160 quails to evaluate the level of inclusion of Sheanut cake in the diets using four dietary treatments at (0%) T_1, (3%) T_2, (6%) T_3 and (9%) T_4 level of Sheanut cake at Poultry Experimentation Station, College of Veterinary Science Rajendranagar Hyderabad. Significantly ($P<0.05$) highest body weight gain was observed for T_2 compared to other test diets. Feed consumption was significantly ($P<0.05$) highest in T_2 compared to other test diets. Feed conversion efficiency was reduced with increased levels of Sheanut cake and the T_2 diet was comparable to control diet. The performance of birds was comparable with control diet at 3% level of inclusion, although their performance was significantly reduced by inclusion of Sheanut cake at 6% and 9%.

Key words: Anti-nutritive factors, Bodyweight gain, feed conversion ratio, Quail, Sheanut cake.

The poultry industry in India is being **confronted** by rising cost of feed ingredients and shortage of traditional feed ingredients which impede the growth of poultry sector. In this situation, there is a great need to look for other alternative protein source. Due to increase in the cost of protein source like soyabean meal,efforts are being made to evaluate alternative feed sources such as Karanj (*Pongamia glabra vent*), Sesame (***Sesamum indicum***),Kosum (*Schleichera oleosa*), Jatropha (***Jatropha curcas***), in quail feeds. One such feed ingredient is Sheanut meal, it is the residue obtained from the nuts of *Vitellaria paradoxa* after extraction of the edible fat. Poor and variable response due to presence of anti-nutritive factors such as tannins and saponins in sheanut cake fed to poultry has been reported [1&7]. In order to access the nutritive value of Sheanut cake in quails, the study has been carried out.

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MATERIALS AND METHODS

A trail of six weeks duration was conducted on 160 Japanese quails at Poultry Experimentation Station, College of Veterinary Science Rajendranagar Hyderabad. The chicks were weighed and equally distributed to four dietary treatments. Each treatment having four replicates of 10 birds each (4X4X10) CRD design. All the birds were maintained in battery brooders throughout the experiment period under standard managemental conditions. A reference diet was formulated with maize and soyabean meal. In (T_1) group no dietary inclusion of SNC, (T_2) group 3% Shaenut cake,(T_3) 6% Sheanut cake and (T_4) 9% Sheanut cake inclusion. All the chicks were allowed to free access to feed and water throughout the trial period. The diets were made iso-caloric and iso- proteinous containing

metabolisable energy 2800 Kcal /kg and 21.5% crude protein. The individual body weight, group feed intake and mortality were recorded at weekly intervals. All the data pertaining to various parameters were analyzed statistically using SPSS15 statistical software. The significant means difference between treatments were determined at (P<0.05) using Duncan's multiple range test (DMRT) as modified [5].

RESULTS AND DISCUSSION

Body weight gain

During starter phase (0-28days) the body weight gain (BWG) were significantly (P<0.05) influenced by dietary treatments (Table 1). Higher BWG (125.62±1.27) was seen at 3% level of Sheanut cake, while the lowest (99.18±3.96) was observed with 9% level Sheanut cake compared to control (123.22±2.87). During the finisher stage (29-42 days), the highest and lowest BWG were observed in 3% and 9% diets respectively, compared to those fed with control diet (Table.1).However, at 42 days of age significant (P<0.05) difference were observed in cumulative BWG of quails fed with different levels of Sheanut cake. The reduced BWG observed for Sheanut cake at 6% and 9% reduced BWG probably due to higher levels Sheanut cake inclusion in the diet. The results were in accordance[2] who have reported the mean daily weight gain did not differ significantly at 2.5% level of inclusion in broilers compared to control. Also found that higher level than 4.5% significant depression on weight gain and feed intake. Similar findings were reported[8] that there was significant reduction in weight gain with inclusion of SNC in diets. Inclusion level above 2.5% (5% and 7.5%) significantly decreased weight gain was reported [1].

Feed consumption

The cumulative feed consumption (FC) was significantly (P<0.05) influenced by dietary treatments at starter and finisher phase (Table.1).The cumulative FC at 28th and 42nd day of age was increased with incorporation of 3% Sheanut cake in the quail diets. No significant difference in feed consumption with 2.5% SNC inclusion compared to control was reported[2]. At the end of starter phase the FC in the control and 6% diets were comparable, but during the 42nd day, the FC was low in 6% Sheanut cake and 9% Sheanut cake level of inclusion compared to control. The dietary replacement of soyabean meal beyond 3% level with SNC resulted in a significant (P<0.05) reduction in feed consumption from the 4th week onwards. The trend in feed consumption continued till the end of experiment. Similar trends were reported [2&1]that significant depression in feed intake with higher levels of SNC (3.5% and 4.5%) in diets. The reduced FC can be attributed to poor palatability of the SNC and presence of certain anti-nutritional factors such as tannins, saponin and theobromines in broilers. The adverse effects of SNC on FC were in accordance[1]. Anti-nutritive factors which include saponins (3.0-30.0 g/kg), tannins (98.7 – 156.4 g/kg) and theobromine (4.5 g/kg), which have detrimental effect on performance of poultry[3]. The voluntary feed intake is always influenced by palatability, dietary nutrient balance, physiological status, presence of in-discriminating factors[6]. A similar depression of feed intake was reported in Japanese quails fed 11.20% solvent extracted karanj cake in the diet[4]. In contrasts to our findings[8] reported highest feed consumption in chicks in diets containing 10% level of SNC.

Feed conversion ratio

FCR was significantly (P<0.05) influenced at starter phase (0-28 days) and finisher stage (29-42 days) of age between control and treatment groups. Values were comparable in 6% level of inclusion and control group from 28th to 42nd day. However with increasing levels of inclusion, not only BWG and FC but also FCR was significantly (P<0.05) affected. The feed conversion efficiency in 3% level of inclusion group was mainly due to better utilization of feed. Feed/gain ratios were similar for all diets except 4.5 percent SNC, which was poor[2]. The experimental diet containing SNC were containing anti-nutritional factors which might have hindered with better utilization of nutrients and decreased the feed conversion efficiency of birds. The results are in agreement with[8] who have reported decreased feed efficiency with addition of SNC to diets at 5% in broilers. Similarly[7] have also observed poor and variable growth performances in birds with Sheanut cake.

Table-1.Cumulative Body Weight Gain, Feed Consumption and Feed Conversion Ratio of the Japanese Quail at different Levels of Sheanut cake

CUMULATIVE WEEKLY BODY WEIGHT GAIN BY BIRDS AT DIFFERENT AGE (g)						
Days	0-7	7-14	14-21	21-28	28-35	35-42
T1	16.36±.49^{a}	50.20±.47^{b}	86.14±.61^{c}	123.22±2.87^{b}	177.06±1.08^{b}	197.32±1.66^{b}
T2	18.63±.72^{b}	53.28±1.19^{c}	87.94±1.39^{d}	125.62±1.27^{b}	183.7±2.28^{c}	207.49±1.76^{c}
T3	16.15±.81^{a}	43.45±.74^{a}	70.74±1.35^{b}	105.39±1.89^{a}	170.08±1.65^{b}	189.59±2.32^{b}
T4	14.37±.41^{a}	41.64±.28^{a}	68.92±.93^{a}	99.18±3.96^{a}	155.74±4.90^{a}	176.73±4.10^{a}
CUMULATIVE WEEKLY FEED INTAKE BY BIRDS AT DIFFERENT AGE (g)						
T1	31.39±.83^{a}	121.91±2.98^{a}	224.71±2.00^{a}	338.49±3.87^{b}	470.32±4.04^{b}	638.21±2.00^{c}
T2	32.20±1.10^{a}	135.80±1.53^{b}	247.66±1.51^{b}	371.01±3.27^{c}	529.00±2.77^{c}	702.85±2.36^{d}
T3	32.40±.53^{a}	122.66±.66^{a}	223.56±1.82^{a}	334.66±2.94^{b}	467.23±1.44^{b}	624.81±1.18^{b}
T4	31.88±.74^{a}	125.78±1.89^{a}	223.89±2.68^{a}	324.72±2.62^{a}	453.40±2.71^{a}	605.78±3.32^{a}
FCR OF BIRDS AT DIFFERENT AGE						
T1	1.92±.01^{abc}	2.43±.04^{a}	2.69±.01^{a}	2.75±.07^{a}	2.63±.02^{a}	3.23±.02^{a}
T2	1.73±.04^{a}	2.55±.07^{a}	2.72±.04^{a}	2.80±.01^{b}	2.87±.02^{b}	3.38±.02^{b}
T3	2.01±.11^{bc}	2.82±.04^{b}	2.86±.03^{b}	2.52±.05^{a}	2.74±.03^{ab}	3.29±.04^{a}
T4	2.22±.10^{d}	3.02±.05^{c}	3.11±.05^{c}	2.82±.09^{b}	2.91±.07^{c}	3.42±.07^{b}

Means with different superscripts differ significantly (P<0.05) in column

CONCLUSION

The present findings suggest that Sheanut cake can be incorporated up to 3% level replacing soyabean meal of control. The higher level of SNC at 6% and 9% failed to improve the BWG, lowered the feed consumption and feed conversion efficiency. The performance of bird was significantly reduced by inclusion of Sheanut cake at 6% and 9%. However, Sheanut cake could still serve as replacement for soybean meal in quail's diet during severe scarcity.

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