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EFFECT OF SUNFLOWER CAKE INCLUSION ON GROWTH, SURVIVABILITY AND CARCASS TRAITS IN JAPANESE QUAILS

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ABSTRACT

Day old 940 Japanese quail chicks were equally and randomly distributed into ten treatment groups of two replicates. All the chicks were reared on cages up to six weeks of age. The chicks in control group were fed corn-soya based diet with no multi-enzyme supplementation. Treatment groups were fed on diets containing 25, 50, 75 and 100 per cent levels of sunflower cake replacing the groundnut cake on an isolysine and isomethionine basis with no multi-enzyme supplementation and, similar treatment groups were fed with multi-enzyme supplementation. The significant ($P<0.05$) differences were noticed between the treatments for six weeks body weight. Quails performed better up to 50 per cent replacement levels. The feed efficiency in different treatments showed highly significant variation ($P<0.01$) and was the best 25 per cent replacement levels. Neither the dietary treatment nor the enzyme supplementation influenced the livability. Better ready to cook yield was observed for the dietary treatments with enzyme supplementation and was the highest at 75 per cent replacement levels.

Key Words: *Japanese Quails, Sunflower Cake, Multi-Enzyme, Carcass Traits*

INTRODUCTION

Quail constitute the largest avian species in our country used for commercial meat production (Banerjee, 1997). Feed being the major input cost and many attempts are made to reduce this. Sunflower oil cake is the cheaper source of vegetable protein than groundnut oil cake and soya and, is also rich in fibre which limits its utilization but could be enhanced through enzyme supplementation. Hence, the present study was undertaken to analyse the effect of Sunflower oil cake on growth, mortality and carcass quality of Japanese quails at different levels of its inclusion replacing the groundnut oil cake.

MATERIALS AND METHODS

Day old 940 Japanese quail chicks were equally and randomly distributed in to ten different treatment groups (T0, T1, T2, T3, T4, T5, T6, T7, T8 and T9) of two replicates. All the chicks were raised in well ventilated cages. The experimental diets were formulated. The composition of T5 to T9 diets were similar to T0 to T4 respectively except for the addition of 500gm

Table 1: Composition of the ration

| Sr. No. | Ingredients | Control | 25% | 50% | 75% | 100% |
|---------|-----------------|---------|--------|--------|--------|--------|
| 1 | Maize | 50 | 50 | 50 | 50 | 50 |
| 2 | Deoiled GNC | 30 | 22.5 | 15 | 7.5 | 0 |
| 3 | SFOC | 0 | 7.5 | 15 | 22.5 | 30 |
| 4 | Soyabean meal | 8 | 8 | 8 | 8 | 8 |
| 5 | Fishmeal | 10 | 10 | 10 | 10 | 10 |
| 6 | Mineral mixture | 2 | 2 | 2 | 2 | 2 |
| 7 | Vitamin mixture | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| 8 | Total | 100 | 100 | 100 | 100 | 100 |
| 9 | CP (%) | 25.20 | 24.38 | 23.55 | 22.73 | 21.90 |
| 10 | ME (Kcal/kg) | 2802 | 2789 | 2776 | 2763 | 2751 |
| 11 | E/P ratio | 111.19 | 114.40 | 117.89 | 121.59 | 125.61 |

of enzyme mix per tonne of feed the enzyme contained cellulase 2000, hemicellulase 2500, glucosidase 245, pectinase 850 protease 48000 and amylase 11000 IU per gram (Table 1) on isolysine

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Table 2: Performance of quails

| | T0 | T5 | Pooled | T1 | T6 | Pooled | T2 | T7 | Pooled | T3 | T8 | Pooled | T4 | T9 | Pooled |
|-------------------------------------|---------------|---------------|-----------------------------|---------------|---------------|-----------------------------|---------------|---------------|-----------------------------|---------------|---------------|----------------------------|---------------|---------------|-----------------------------|
| Initial live body weight (g) | 41.77 ± 1.01 | 43.80 ± 0.91 | 42.78 ± 0.96 ^a | 42.02 ± 0.87 | 42.39 ± 0.86 | 42.20 ± 0.86 ^a | 43.51 ± 0.96 | 41.99 ± 0.89 | 42.75 ± 0.92 ^a | 42.88 ± 1.02 | 44.19 ± 0.86 | 43.53 ± 0.94 ^a | 41.13 ± 0.97 | 44.93 ± 0.81 | 43.03 ± 0.89 ^a |
| Final live body weight (g) | 154.28 ± 2.33 | 148.73 ± 2.65 | 151.50 ± 2.49 ^{ab} | 144.29 ± 2.80 | 155.14 ± 2.14 | 149.71 ± 2.47 ^{ab} | 154.34 ± 2.41 | 162.08 ± 2.48 | 158.21 ± 2.44 ^{ab} | 150.17 ± 2.40 | 145.96 ± 2.86 | 148.06 ± 2.63 ^b | 147.82 ± 2.69 | 152.71 ± 2.80 | 150.26 ± 2.74 ^{ab} |
| Feed efficiency | 4.14 ± 0.10 | 4.60 ± 0.68 | 4.27 ± 0.39 ^a | 4.19 ± 0.01 | 3.76 ± 0.05 | 4.21 ± 0.03 ^a | 4.68 ± 0.74 | 5.01 ± 0.15 | 5.15 ± 0.44 ^b | 4.86 ± 0.37 | 5.44 ± 0.05 | 4.85 ± 0.21 ^b | 4.54 ± 0.10 | 4.36 ± 0.11 | 4.05 ± 0.10 ^a |

Means bearing the same superscript within classes do not differ significantly.

* ($P < 0.05$), ** ($P < 0.01$).

Table 3: Caracass traits of quails

| | T0 | T5 | Pooled | T1 | T6 | Pooled | T2 | T7 | Pooled | T3 | T8 | Pooled | T4 | T9 | Pooled |
|-----------------|--------------|--------------|----------------------------|--------------|--------------|----------------------------|--------------|--------------|-----------------------------|--------------|--------------|----------------------------|--------------|--------------|-----------------------------|
| NYDW (%) | 79.60 ± 0.78 | 79.64 ± 0.78 | 76.62 ± 0.78 ^a | 78.09 ± 0.94 | 78.32 ± 0.63 | 78.21 ± 0.79 ^a | 78.21 ± 0.95 | 78.02 ± 0.38 | 78.12 ± 0.67 ^a | 77.13 ± 1.39 | 78.79 ± 0.56 | 77.96 ± 0.98 ^a | 80.65 ± 0.93 | 77.35 ± 1.35 | 79.00 ± 1.14 ^a |
| EW (%) | 59.37 ± 0.80 | 58.49 ± 0.54 | 58.93 ± 0.67 ^a | 58.97 ± 0.44 | 59.90 ± 1.54 | 59.44 ± 0.94 ^a | 58.07 ± 0.97 | 60.19 ± 0.52 | 59.13 ± 0.75 ^a | 59.94 ± 0.54 | 60.26 ± 0.88 | 60.10 ± 0.71 ^a | 59.64 ± 1.10 | 58.99 ± 1.09 | 59.32 ± 1.09 ^a |
| GW (%) | 5.43 ± 0.70 | 8.54 ± 0.63 | 6.99 ± 0.67 ^a | 7.11 ± 0.80 | 8.57 ± 0.58 | 7.84 ± 0.69 ^a | 6.91 ± 0.81 | 6.35 ± 0.38 | 6.63 ± 0.59 ^a | 6.49 ± 0.53 | 6.09 ± 0.83 | 6.29 ± 0.68 ^a | 6.63 ± 0.61 | 6.97 ± 0.67 | 6.80 ± 0.64 ^a |
| RCY (%) | 64.80 ± 0.96 | 67.04 ± 0.69 | 65.92 ± 1.65 ^{ab} | 66.08 ± 0.80 | 68.48 ± 1.52 | 67.28 ± 1.16 ^b | 65.82 ± 1.69 | 66.54 ± 0.73 | 66.18 ± 1.21 ^a | 66.43 ± 0.90 | 66.35 ± 1.35 | 66.39 ± 1.13 ^{ab} | 66.27 ± 1.24 | 65.96 ± 1.54 | 66.12 ± 1.39 ^{ab} |
| OW (%) | 14.79 ± 1.45 | 12.60 ± 0.60 | 13.61 ± 1.03 ^c | 12.06 ± 0.89 | 10.94 ± 1.27 | 11.50 ± 1.08 ^{ab} | 13.22 ± 2.03 | 11.48 ± 0.73 | 12.35 ± 1.38 ^{abc} | 10.70 ± 1.25 | 11.84 ± 1.43 | 11.27 ± 1.34 ^a | 14.38 ± 1.64 | 11.39 ± 1.34 | 12.89 ± 1.40 ^{abc} |

Means bearing the same superscript within classes do not differ significantly.

* ($P < 0.05$), ** ($P < 0.01$).

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(1.3%) and isomethionine (0.5 %) basis according to NRC standards (1977). The dietary treatments were control – T0 corn GNC based diet T1, T2, T3, T4 were 25, 50, 75 and 100 per cent replacement of GNC by SFOC T5 corn GNC based diet with multi enzyme, T6, T7, T8, T9 were 25, 50, 75 and 100 per cent levels replacement of GNC by SFOC with multi enzyme supplementation. Feeding was carried out up to sixth week of age and four birds from each replicate comprising of two males and two females were slaughtered at the end of sixth week. New York dressed weight (NYDW), Eviscerated weight (EW), Giblet weight (GW), Ready to cook yield (RCY) and offals weight (OW) were estimated. Mortality was also recorded up to sixth week. The data collected was analysed as per Snedcor and Cochran (1989).

RESULTS AND DISCUSSION

The means live body weight at six weeks of age (Table 2) in different treatments showed significant variation ($P<0.05$) and the effect is not significant for other biweekly body weight measures. It was also observed that quails can perform better up to 50 per cent replacement levels. Enzyme supplementation also showed a non- significant effect on body weight and these findings are in accordance with Rekhate et al. (2010).

The feed efficiency in different treatments showed highly significant variation ($P<0.01$) and was also observed that the maximum feed conversion efficiency was observed at 25 per cent replacement levels. Enzyme supplementation though was observed as a non-significant variation, at 2-4 weeks intervals it was highly significant ($P<0.01$). This is in agreement with Singh and Prasad (1978) where the replacement of groundnut oil cake with sunflower oil cake improved the efficiency of protein and dietary energy utilization. Neither the dietary treatment nor the enzyme supplementation influenced the livability in quails and is in agreement with earlier findings of Ibrahim and Eluzubier (1991).

Carcass traits viz., New York dressed weight (NYDW), Eviscerated weight (EW), Giblet weight (GW) in all treatment groups were not influenced (Table 3). But, Ready to cook weight (RCW) and offal weight (OW) showed significant variation. Enzyme supplementation influenced the Eviscerated weight (EW), Ready to cook weight (RCW) and offal weight (OW) significantly, whereas, York dressed weight (NYDW) and Giblet weight (GW) were not influenced. Better ready to cook yield was observed for the dietary treatments with enzyme supplementation and was the highest at 75 per cent replacement levels. These results are in accordance with the findings of Paradis (1993).

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