EFFECT OF SUPPLEMENTATION OF PROBIOTICS AND MULTIENZYMES IN LOW PROTEIN DIET ON THE PERFORMANCE OF JAPANESE QUAILS

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ABSTRACT:

An experiment was conducted to study the effect of probiotics and multienzymes in low protein diet of Japanese quails. One hundred sixty quail chicks were uniformly distributed into four groups viz. T0, T1, T2 and T3. Group T2 was supplemented with probiotics and group T3 was supplemented with multienzymes. There was significant (P<0.01) increase in final live body weight and average weight gain in T3 group . The feed consumption of the T2 and T3 group were significantly (P<0.01) increased than T0 and T1. There was significant improvement in FCR in T2 and T3 group as compared to T0 and T1 group. The nitrogen retention was 67.24, 64.91, 61.0 and 60.0 per cent in T3, T2, T0 and T1 respectively. Dressing percentage was 78.84, 77.96, 74.14 and 71.89 percent in T3, T2, T0 and T1 group respectively. Organoleptic test reveals that supplementation of probiotics and multienzymes did not have any objectionable flavour and taste to meat.

KEY WORDS: probiotics, multienzymes, Japanese quails

INTRODUCTION:

The efficiency of broiler quail to convert the feed into meat plays a key role in economics of broiler industry. Therefore it is essential to improve feed efficiency of broiler quail to produce meat economically. Protein per unit of feed is one of the important factors which influence the growth rate of bird. A liberal protein intake tends to cause high level of "deposit protein" in the tissue. The protein requirement in Japanese quails estimated by different workers is 25 and 23 per cent in starter and finisher diet and it may be reduced to 23-21 per cent. (Babu et al.,1986). Protein is the most expensive nutrient in diet. Thus to reduce the feed cost, protein per cent should be reduced ,however, which may affect the growth of birds. It may be possible to accelerate nutrient availability to the birds to some extent by manipulating or modifying the digestion and metabolism of nutrient through the use of performance enhancers called growth promoters such as probiotics (Saha, 2002) and multienzymes (Mujeeb, 2001) which are successfully used in poultry birds to improve feed efficiency and overall performance. Hence, the present study is planned to investigate the effect of supplementation of probiotics and multienzymes with low protein diet on the performance and meat quality of Japanese quail.

MATERIALS AND METHODS:

One hundred and sixty Japanese quail chicks were purchased from commercial hatcheries. These chicks were weighed individually and randomly distributed into four equal groups containing forty quails in each group and designated as T0, T1, T2 and T3. The protein content of T0 is 25% and 23% for starter and finisher respectively. For the treatment group T1, T2 and T3, the protein content is 23% and 21% in starter and finisher diet respectively. Group T2 was supplemented with probiotic (Lact. sporogenous) @ 500mg/kg of the diet and group T3 was supplemented with multienzymes (Cellulase, amylase, arbinase, lipase, protease, pectinase and xylanase) @ 500mg/kg of the diet. All the diets were iso-caloric. Individual live body weight and feed intake were recorded weekly during the experimental period. The feed consumption, feed efficiency, feed conversion ratio, dressing percentage, nitrogen retention were calculated. Carcass evaluation study was conducted as per standard dressing procedure (Panda,1971). Organoleptic evaluation of quail meat was carried out in terms of consistency, flavor etc. with the help of hedonic scale. All the data were subjected to statistical analysis as per Snedecor and Cochran (1995).

RESULTS AND DISCUSSION:

From the data, presented in the table it is revealed that group T3 receiving low protein diet with multienzyme supplementation showed significantly (P<0.01) higher final body weight (169.94 g) followed by group T2 (166.1), T0 (149.3 g) and T1 (138.5 g). The results are in accordance with Jadhav et al. (2000) who observed

increased body weight in broiler fed low energy and low protein diet supplemented with enzymes. The data also revealed that the average weekly gain in body weight of group T2 and T3 were significantly higher than control T0 and T1. These findings are in accordance with Taksande et al. (2008) and Wantia (1993) who found improved weight gain in quails with the supplementation of probiotics and enzymes respectively. The average feed consumption was significantly (P<0.01) higher in T2 and T3 group. FCR was significantly (P<0.05) improved in T3 (2.99) compared to T2, T1 and T0. Swain (1994) also observed similar results in low and high fiber diet supplemented with multi enzymes in broilers.

The comparison of treatment group indicated feed efficiency of quails in group T3 and T2 was significantly (P<0.01) higher than T0 and T1 with no significant difference between T3 and T2. Straznicka (1992) observed improved feed efficiency in quails with multi enzyme supplementation. The beneficial effect of supplementation of enzymes on broiler performance may be due to increase in fiber digestibility and increase in nutrient utilization.

Table . Effect of supplementation of probiotics and multienzymes in low protein diet on growth performance of Japanese quails

Parameter	T_0	T_1	T_2	T_3	Pooled S.E.
Initial body weight	7.22	7.17	7.15	7.13	
Final live body weight (g)**	149.3^{a}	138.5^{a}	166.1^{b}	169.94^{b}	7.34
Gain in weight (g)**	142.08^{b}	131.33^{a}	158.95^{c}	162.81^{c}	7.36
Feed consumption (g)**	470.46^{b}	462.98^{a}	474.56^{c}	476.73^{c}	3.03
FCR*	3.55^{bc}	3.76^{c}	3.08^{b}	2.99^{a}	0.18
Feed efficiency**	0.34^{b}	0.32^{a}	0.37^{c}	0.38^{c}	0.01
N retention %	61.0	60.0	64.91	67.24	--
Dressing %	74.14	71.89	77.96	78.84	--
Organoleptic test	7.7	7.1	6.7	7.8	--

^{abc} values bearing of different superscript in a row differ significantly.

* P<0.05 ** P<0.01

The nitrogen retention in T3 was maximum followed by T2, T0 and T1 These results are in agreement with Marquardate et al. (1996) who observed improved crude protein digestibility in broilers due to supplementation of multienzymes. The dressing percentage was highest in T3 (78.84) followed by T2, T0 and T1. similar results are obtained by Kamble et al. (2007) who found higher dressing percentage with the supplementation of multienzyme. These may be attributed to degradation of non-starch polysaccharide

with the use of multi enzymes especially the cellulases since cellulose is the major component of NSP in diet, cellulase supplementation might have increased hydrolysis of ß-1-4-linkage of glucose monomers and improved utilization in the broilers. It is also possible that on the breakdown of cellulose, the major component of cell wall, the release of encapsulated intracellular nutrients might have been released.

The organoleptic test indicated that there was no effect on quality of meat of quails due to supplementation of probiotics and multi enzymes. Thus it can be concluded that supplementation of multi enzymes or probiotics @ 500 mg/kg in low protein diet of quails enhance the production performance of quails. Particularly addition of multienzymes found to improve growth performance of Japanese quails significantly.

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