Effect of Different Levels of Dietary Garlic on Cumulative Feed Consumption and Feed Conversion Ratio of Japanese Quail

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Abstract
A biological experiment was conducted by adding garlic at 0, 0.5, 1.0 and 1.5 per cent level in the basal diet of Japanese quail for a period of 4 weeks to assess the production performance. The result of the experiment revealed that dietary inclusion of garlic had significant dose related influence (P<0.05) on cumulative feed consumption in Japanese quail. Dietary supplementation of garlic showed better feed conversion ratio in Japanese quail.

Key words: Garlic, Feed consumption, Feed conversion, Japanese quail.

Phytogenic and herbal products have been given considerable attention in feed antibiotics substitutions. Beneficial effects of bioactive plant substances in poultry nutrition improve the stimulation of appetite and feed intake, which in turn improves the endogenous digestive enzyme secretion. Garlic contains organosulfur compounds such as allicin, ajoene, diallyl disulfide, S-methylcysteine sulfoxide and S-allylcysteine. These are responsible for good flavour, stimulating appetite, improving feed palatability, increasing feed consumption and better body weight gain. Poultry tend to take more feed when the feed is highly palatable which improves body weight and feed efficiency.

Materials and Methods
A biological experiment was conducted by using 240 day old Japanese quail chicks belonging to single hatch. These chicks were randomly grouped into 4 treatments with 6 replicates of 10 chicks each. All the birds were reared under standard managerial conditions up to 4 weeks of age. The locally available garlic was purchased, powdered and incorporated into the standard Japanese quail diet to form different experimental diets.

Throughout the study period of 4 weeks, data on daily feed consumption and weekly body weight were recorded. The data collected were subjected to statistical analysis as per the method suggested by Snedecor and Cochran (1989). The treatment groups of the experiment were as follows:

Results and Discussion
The mean (± S.E.) cumulative feed consumption (g/bird) and feed conversion ratio of Japanese quail reared from one to four weeks of age as influenced by dietary supplementation of garlic are presented in Table I and II, respectively.

The analysis of variance of data revealed significant difference (P<0.05) in the cumulative feed consumption between treatment groups throughout the study period. Among the garlic supplemented groups, it was noticed that as the inclusion level of garlic is increased in the diet, there was a proportionate increase in feed consumption. At four weeks of age, the group T4 recorded higher feed intake (499.98 g) followed by T3 (482.73 g), T2 (480.13 g) and T1 (457.63 g) groups.

The analysis of variance of data revealed that there was no significant difference in feed conversion ratio between the treatment groups for the first week. At the end of second week, group T4 recorded better feed conversion ratio compared to rest of the treatment groups. The same trend continued in the third week and at the end of the experimental period there was no significant difference between the treatment groups, however the group T4 recorded better feed conversion ratio (2.49) compared to rest of the treatment groups.

The results were in accordance with
the findings of Abdullah et al. (2010), Raessi et al. (2010), and Elagib et al. (2013) who also recorded higher feed consumption due to garlic supplementation. Similarly, Yalcin et al. (2007), Abdullah et al. (loc. cit), Choi et al. (2010), and Issa and Omar (2012) recorded no significant differences in feed conversion ratio by supplementing garlic in the diet.

**Summary**

It has been concluded that by feeding different levels of dietary garlic to Japanese quail, the group $T_4$ (1.5 % garlic) recorded higher cumulative feed consumption (499.98 g) compared to other treatment groups at four weeks of age. There was no significant difference on the feed conversion ratio between the treatment groups at four weeks of age but the group $T_4$ recorded better feed conversion ratio (2.49) compared to rest of the treatment groups.

**References**


**Table I**: Mean (± S.E.) cumulative feed consumption (g/bird) of Japanese quail reared from 1 to 4 weeks of age as influenced by different levels of garlic in the feed

<table>
<thead>
<tr>
<th>Treatment groups</th>
<th>I Week</th>
<th>II Week</th>
<th>III Week</th>
<th>IV Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T_1$</td>
<td>35.31 ± 0.21</td>
<td>132.11 ± 0.60</td>
<td>267.20 ± 0.65</td>
<td>457.63 ± 0.81</td>
</tr>
<tr>
<td>$T_2$</td>
<td>36.24 ± 0.58</td>
<td>132.83 ± 1.11</td>
<td>275.38 ± 2.53</td>
<td>480.13 ± 2.46</td>
</tr>
<tr>
<td>$T_3$</td>
<td>36.62 ± 0.09</td>
<td>133.83 ± 1.82</td>
<td>277.26 ± 1.44</td>
<td>482.73 ± 1.10</td>
</tr>
<tr>
<td>$T_4$</td>
<td>37.44 ± 0.25</td>
<td>135.45 ± 1.97</td>
<td>285.23 ± 2.01</td>
<td>499.98 ± 2.88</td>
</tr>
</tbody>
</table>

Value given in each cell is the mean of 6 observations

$a-c$ Means within a column with no common superscript differ significantly (P<0.05)

**Table II**: Mean (± S.E.) feed conversion ratio of Japanese quail reared from 1 to 4 weeks of age as influenced by different levels of garlic in the feed

<table>
<thead>
<tr>
<th>Treatment groups</th>
<th>I Week</th>
<th>II Week</th>
<th>III Week</th>
<th>IV Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T_1$</td>
<td>1.62 ± 0.05</td>
<td>2.02 ± 0.05</td>
<td>2.19 ± 0.04</td>
<td>2.55 ± 0.04</td>
</tr>
<tr>
<td>$T_2$</td>
<td>1.61 ± 0.04</td>
<td>1.92 ± 0.06</td>
<td>2.12 ± 0.04</td>
<td>2.54 ± 0.04</td>
</tr>
<tr>
<td>$T_3$</td>
<td>1.58 ± 0.05</td>
<td>1.88 ± 0.04</td>
<td>2.08 ± 0.03</td>
<td>2.52 ± 0.04</td>
</tr>
<tr>
<td>$T_4$</td>
<td>1.53 ± 0.03</td>
<td>1.78 ± 0.02</td>
<td>2.07 ± 0.03</td>
<td>2.49 ± 0.03</td>
</tr>
</tbody>
</table>

Value given in each cell is the mean of 6 observations

$ab$ Means within a column with no common superscript differ significantly (P<0.05)