Effect of Dietary Protein on Embryonic Mortality in Breeder Japanese Quail
(*Coturnix Coturnix Japonica*)

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(Materials and Methods)

Commercial Japanese quail farming has created a reasonable impact in recent years and many farms have been established throughout the country for egg and meat production. At present, Tamil Nadu is one of the leading states in commercial Japanese quail farming in India. One of the critical inputs for commercial Japanese quail farming is cost effective quality day old quail chick. Feed is the major cost factor in production, of which protein is a crucial factor that influences the cost of feed and reproductive performance especially through embryonic mortality during incubation. In this context effect of dietary protein on embryonic mortality is to be explored with respect to reproductive performance of breeder Japanese quail.

At the end of the sixth week, the four treatment groups of grower were further divided in to 12 groups with three groups in each treatment with two replicates (7 males and 14 females per replicate) and offered three different dietary protein levels (17, 19 and 21 per cent) during breeding period. The above diets at each phase were maintained isocaloric (brooder -2750, grower-2650 and breeder-2700 kcal metabolizable energy per kg diet). The birds were maintained in colony cages during breeding period and standard managemental practices were followed. The hatching eggs of the breeder Japanese quails were collected group wise twice daily during the experimental period at 8 00 A.M and 3.00 P.M. The eggs collected during 10, 14, 18, 22, 26 and 30th week of the experimental period were subjected to hatchability and embryonic mortality studies. The collected hatching eggs were fumigated with formaldehyde gas for 20 min at 2X concentration as per standard method (North and Bell, 1990). The temperature and relative humidity in the setter and hatcher were maintained at 37.5° ± 0.3°C (99.5° ± 0.5°F), 37.0° ± 0.3°C (98.5° ± 0.5°F) and 60, 70 per cent respectively. After 15 days of incubation, the eggs were transferred from setter to hatcher and eggs were placed in pedigree boxes treatment wise to record the respective embryonic mortality. After taking out all the
hatched out chicks from the hatcher trays, the unhatched eggs were collected treatment group wise and subjected to post-hatch breakout analysis on 18th day (Mujeer, 1992). All the unhatched eggs were opened and examined macroscopically under bright light to record embryonic mortality and dead in shell. The collected data were subjected to factorial ANOVA analysis after making suitable transformation of the data.

Results and Discussion

Significantly (P<0.01), the lowest embryonic mortality of 4.42 ± 0.40 per cent was recorded in 22/18/21 dietary protein group. The dietary protein group of 22/18/ recorded significantly (P<0.01) higher embryonic mortality of 7.53 ± 0.58 per cent. Dietary protein groups that received 24 per cent dietary protein during brooding recorded significantly lower (P<0.05) embryonic mortality per cent than groups reared under 22 per cent dietary protein. The dietary protein groups that received 21 per cent protein during breeding period recorded significantly (P<0.05) lower per cent embryonic mortality of 5.23 ± 0.27 than 19 and 17 dietary protein groups. The findings revealed that higher dietary protein levels during brooding and breeding period resulted in significantly lower embryonic mortality and such a trend

<table>
<thead>
<tr>
<th>Protein levels (%)</th>
<th>Period (wk)</th>
<th>Overall**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Embryonic Mortality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22/18/17</td>
<td>7.09±2.00</td>
<td>6.19±1.50</td>
</tr>
<tr>
<td>22/20/17</td>
<td>5.04±1.12</td>
<td>6.46±0.21</td>
</tr>
<tr>
<td>24/18/17</td>
<td>6.73±0.17</td>
<td>5.38±0.50</td>
</tr>
<tr>
<td>24/20/17</td>
<td>4.66±0.89</td>
<td>6.11±0.56</td>
</tr>
<tr>
<td>Overall**</td>
<td>5.83±0.42</td>
<td>5.50±0.44</td>
</tr>
</tbody>
</table>
| **Highly significant (P<0.01), *Significant (P<0.05), NS-Not significant (P>0.05)**

Mean values within each identified group sharing any one common superscript in a row or column do not differ significantly
was not visible during growing period. The values reported earlier for embryonic mortality in quails fed 20 per cent dietary protein during breeding period were 5.20 (Sachdev et al., 1988), 8.7-12.0 (Bandyopadhyay et al., 1992), 14.50 (Seker et al., 2004) and 6.70 (Mani et al., 2008) per cent. Arumugam (2008) reported relatively high embryonic mortality of 12.87 per cent in meat type Japanese quail fed 18.79 per cent protein during breeding period. Over all, embryonic mortality in this experiment had been lower than many earlier reports indicating a satisfactorily high standard of management practiced. The various dietary protein groups did not differ significantly in per cent dead in shell, however, the dietary protein of 24/18/17 recorded numerically the lowest per cent dead in shell of 1.98 ± 0.44.

Summary

Based on the study it was evident that brooder and breeder dietary protein levels had significant influence on embryonic mortality and higher dietary protein levels significantly lowered the incidence of embryonic mortality. However, it was observed that dietary protein did not influence the per cent dead in shell significantly. Over all means for embryonic mortality and dead in shell were observed to the 5.83 ± 0.22 and 2.45 ± 0.15 per cent respectively.

References


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