Abstract
A study was conducted to determine the effect of short term egg storage period on hatching performance of Japanese quail. A total of 21376 hatching eggs collected from 14-19 weeks old Japanese quail was stored at 15°-18°C and 75% RH for 0-7days and incubated. Storage period had highly significant (P<0.01) effect on hatching performance of Japanese quail eggs. As the length of storage increased, the mean per cent fertility, total and fertile hatchabilities were decreased and total embryonic mortalities were increased. Significantly (P<0.01) better hatching performance was obtained from Japanese quail eggs stored for 0-2 days.

Key words: Japanese quail, hatchability, short term egg storage

Storage of hatching eggs is a necessary part of commercial incubation. Hatchability is influenced by preincubation storage conditions, e.g., the length of storage, temperature, humidity, gaseous environment, and the orientation and positional changes of the eggs. Studies report that long storage periods are detrimental to table and hatching egg quality and hatchability of incubated eggs (Suksupath and Tanpipat, 1991, Romao et al., 2008), hatchability of fertile eggs. Studies on the effects of short-term storage on hatching performance on quail eggs are scanty. As small improvements in the hatchability of eggs can result in important economic gains, a study was designed to determine the effect of short term egg storage period (0-7days) on hatching performance of Japanese quail.

Materials and Methods
A study was conducted at the Poultry Research Station, Tamil Nadu Veterinary and Animal Sciences University, Chennai to determine the effect of short term egg storage period (0-7days) on hatching performance of Japanese quail. A total of 21376 hatching eggs comprising of 2651, 2644, 2692, 2682, 2703, 2677, 2667, 2660 eggs collected from 14-19 weeks old Japanese quail and stored at 15°-18°C and 75% RH in the normal broad end up position without turning for 0,1,2,3,4,5,6 and 7 days respectively. After 7 days of storage, hatching eggs were set in the setter with a temperature of 99.5°F and relative humidity of 55% for first 14 days of incubation. On 15th day of incubation, the eggs were transferred to hatcher, in which 98.5°F temperature and 72 % relative humidity were maintained. Hatching started on day 17 and was completed by the end of the 18th day of incubation. Number of chicks hatched was recorded. Unhatched eggs were examined for early and late embryonic mortality. From the data, fertility, total hatchability, fertile hatchability and total embryonic mortality were calculated. The data were analyzed statistically as per Snedecor and Cochran (1994).

Results and Discussion
The results of the effect of short term egg storage period (0-7days) on hatching performance of Japanese quail are presented in Table I.

The overall mean per cent fertility was 78.09±0.14. Statistical analysis revealed that the short term egg storage period (0-7days) had significant (p < 0.01) influence on fertility of Japanese quail eggs. The mean per cent fertility was higher from 1-3 days of storage and decreased thereafter. As the length of storage increased, the mean per cent fertility decreased. However, fresh eggs had lower fertility than the eggs stored for 1-3 days. Similar observations were also made by Ibrahim Seker et al. (2005) and Romao et al. (loc cit.).
The overall mean per cent total hatchability was 53.65±0.57 and short term egg storage period had highly significant (p < 0.01) influence on total hatchability. The mean per cent total hatchability was higher for 0-2 days stored eggs than other storage periods. In general, as the short term egg storage period increased from 0 to 7 days, the total hatchability declined gradually from 58.47±0.27 to 48.01±0.41% with an average reduction in total hatchability of 1.42% for addition of every one storage day. These results were consistent with previous reports of Pedroso et al. (2006) and Raji et al. (2014). Total hatchability reported in the present study was higher than that reported by Petek and Dikman (2004), Abdel-Azeem and Abdel-Azeem (2009) in quail eggs.

The overall mean per cent fertile hatchability was 68.68±0.67 and short term egg storage period had highly significant (p < 0.01) influence on fertile hatchability. The mean per cent fertile hatchability was higher for 0-2 days stored eggs than other storage period. In general, as the length of storage increased from 0 to 7 days, the fertile hatchability declined gradually from 74.66±0.31 to 62.32±0.28% with an average reduction in fertile hatchability of 1.75% for addition of every one storage day. The extension of the storage period resulted in decreased hatchability values of fertile eggs observed in this study comply with earlier reports of Suksupath and Tanpipat, (loc cit.) Ibrahim Seker et al. (loc cit.) Lacin et al. (2008) and Raji et al. (loc cit.). The mean per cent fertile hatchability of the quail eggs stored for 0-3 days recorded in this study was higher than the value (42.2%) reported by Lacin et al. (loc cit.).

The overall mean per cent dead germs, dead in shell and total embryonic mortalities were 15.41±0.36, 15.48±0.31, and 30.89±0.59, respectively. Highly significant (p < 0.01) differences were observed among different egg storage periods with regard to per cent dead germs, dead in shell and total embryonic mortality on fertile eggs set and fresh eggs had lower per cent dead germs, dead in shell and total embryonic mortality than the eggs stored for 1-7 days. As the length of storage increased from 0 to 7 days, the total embryonic mortality increased from 25.34±0.31 to 37.68±0.28% with an average of 1.76% for addition of every one storage day. Lacin et al. (loc cit.) reported that the influence of storage length on early embryonic death was significant (p<0.01) and the mean early embryonic death rate for storage period 1-3 days was 25.10%. Quail eggs stored for 2 d as short-term storage period showed lowest mid and late embryo mortality rate than long-term stored groups (Abdel-Azeem and Abdel-Azeem, loc cit.). The extension of the storage period resulted in increased embryo mortality rate of fertile eggs observed in this study is in agreement with.

Table I. Mean (±S.E.) hatching performance of Japanese quail as influenced by short term egg storage period

<table>
<thead>
<tr>
<th>Egg Storage</th>
<th>No of Eggs</th>
<th>Fertility**</th>
<th>Dead germs**</th>
<th>Dead in shell**</th>
<th>Total embryonic mortality**</th>
<th>Hatchability%**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days</td>
<td>Set</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>2651</td>
<td>78.31±0.22</td>
<td>13.34±0.30</td>
<td>11.99±0.15</td>
<td>25.34±0.31</td>
<td>58.47±0.27</td>
</tr>
<tr>
<td>1</td>
<td>2644</td>
<td>79.46±0.12</td>
<td>12.85±0.06</td>
<td>14.23±0.18</td>
<td>27.08±0.14</td>
<td>57.94±0.14</td>
</tr>
<tr>
<td>2</td>
<td>2692</td>
<td>78.38±0.24</td>
<td>13.98±0.13</td>
<td>12.85±0.18</td>
<td>26.83±0.18</td>
<td>57.35±0.29</td>
</tr>
<tr>
<td>3</td>
<td>2662</td>
<td>78.34±0.16</td>
<td>13.80±0.27</td>
<td>17.32±0.12</td>
<td>31.13±0.30</td>
<td>53.59±0.27</td>
</tr>
<tr>
<td>4</td>
<td>2703</td>
<td>77.80±0.20</td>
<td>14.26±0.32</td>
<td>17.21±0.29</td>
<td>31.47±0.50</td>
<td>53.31±0.31</td>
</tr>
<tr>
<td>5</td>
<td>2677</td>
<td>77.62±0.34</td>
<td>17.47±0.21</td>
<td>15.92±0.32</td>
<td>33.39±0.17</td>
<td>51.70±0.24</td>
</tr>
<tr>
<td>6</td>
<td>2667</td>
<td>77.76±0.41</td>
<td>17.94±0.57</td>
<td>16.25±0.32</td>
<td>37.69±0.28</td>
<td>48.49±0.68</td>
</tr>
<tr>
<td>7</td>
<td>2660</td>
<td>77.03±0.46</td>
<td>19.62±0.16</td>
<td>18.06±0.21</td>
<td>34.19±0.73</td>
<td>48.01±0.41</td>
</tr>
</tbody>
</table>

Overall mean 21376 78.09±0.14 15.41±0.36 15.48±0.31 30.89±0.59 53.65±0.57 68.68±0.67

**Mean bearing different superscripts within the columns differ significantly (P<0.01)

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earlier reports of Ibrahim Seker et al. (loc cit.) and Raji et al. (loc cit.).

**Summary**

The results of the present study suggested that short term egg storage period (0-7 days) has highly significant (P<0.01) influence on total hatchability, fertile hatchability and total embryonic mortality. In general, as the length of storage increased, the mean per cent fertility, total and fertile hatchabilities were decreases and total embryonic mortalities were increased. Significantly (P<0.01) better hatching performance was obtained from Japanese quail eggs stored for 0-2 days.

**References**


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**Production Performance of Broilers Fed with Glucose, Egg Powder and Whey Powder During Juvenile Period**

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**Abstract**

The biological trial was conducted by using two hundred fifty six commercial, sex separated, day-old broiler chicks. These chicks were randomly grouped into eight treatments with four replicates of eight chicks each and fed with basal diet as T<sub>1</sub> (Control), T<sub>2</sub> (Control + 100g of glucose/kg), T<sub>3</sub> (Control + 100g of egg powder/kg), T<sub>4</sub> (Control + 100g of whey powder/kg), T<sub>5</sub> (Control + 100g of glucose + 100g of egg powder), T<sub>6</sub> (Control + 100g of glucose + 100g of whey powder), T<sub>7</sub> (Control + 100g of egg powder + 100g of whey powder) and T<sub>8</sub> (Control + 100g of glucose + 100g of egg powder + 100g of whey powder). The experimental feed was formulated according to the standards prescribed in Bureau of Indian Standards by including *viz.* glucose, egg powder, whey powder and their combinations.

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