Effect of dietary supplementation of Shatavari, Ashwagandha root powder and vitamin E on performance of colour broilers

Kiran Chikwa, SS Atkare, JK Bhardwaj, RP Nema, Jitendra Kumar, Pratibha Padwar and Rashmi Viswakarma

Abstract
An experiment was conducted to study the effect of dietary supplementation of shatavari (Asparagus racemosus), Ashwagandha (Withania somnifera) and vitamin E on the performance of coloured broilers. Result indicated that 1% Shatavari root powder (SRP) significantly improve body weight, feeding efficiency, conformation traits (Breasr angle, Shank length and Keel length) and carcass yield over control broilers. 1% Ashwagandha root powder (ARP) and 200mg/kg vitamin E did not show significant difference for these traits except feeding efficiency. Combination of 1% SRP with 1% ARP (T3), 1% SRP with 200mg/kg vitamin E (T5) or all three together (T7) significantly improved performance than its single effect. T7 treatment group was than superior among all treatments.

Keywords: Shatavari, Ashwagandha, Vitamin E, colour broilers, performance

1. Introduction
Poultry is one of the fastest growing segment of the agricultural sector in India which has emerged on the world poultry map as the 3rd largest eggs (66 billion eggs) and 5th largest poultry meat (2.6million tons) producer. Indian broiler industry is growing at a rate of 10-15% per annum. There are various promising natural herbs as liver tonic, immunomodulator and adaptogenic to stress and toxins, leading to lower mortality, morbidity and enhance growth and production performance. Supplementation of shatavari root powder had beneficial effect on body weight and feed conversion efficiency and improves general health status of the bird, Rekhate et al. [8]. Ashwagandha widely used herbal medicine as immunomodulatory, general tonic, hepatoprotective, antistress and growth promoter, Akotkar et al. [1]. Vitamin E is a natural antioxidant and its supplementation has been reported to improve feeding efficiency. Studies related to shatavari, Ashwagandha and vitamin E effect on performance of broiler are scanty and almost lacking in literature in multi colour broilers which are mostly used in rural poultry production. Considering nutritional benefits of these herbs and vitamin E, the present research experiment was planned to assess its effect as a single and combined form on performance of colour broiler.

2. Material and methods
Experimental coloured broiler chicks were produced by crossing sire of colour synthetic female line broilers breeder with coloured dual type female line. A total of 180 healthy day old chicks were distributed into 9 dietary treatment groups. Each treatment group was randomly allocated 20 chicks in 2 replicates. Each replicate consisting of 10 chicks (5 males and 5 females). Basal diet was prepared with 23% CP with 2900ME kcal/kg for 0-3 weeks and 21% CP with 3000 ME kcal/kg for 4-7 weeks period which act as control (T0). Various other dietary treatments were T1 shatavari root powder 1%, T2 Ashwagandha 1%, T3 vitamin E 200mg/kg diet, T4 shatavari 1%+Ashwagandha 1%, T5 shatavari 1%+vit.E 200mg/kg diet, T6 Ashwagandha 1%+vit.E 200mg/kg, T7 shatavari 1%+Ashwagandha 1%+vit. E 200mg/kg, T8 shatavari 0.5%+Ashwagandha 0.5%+vit. E 100mg/kg diet. At 7 week age conformation traits breast angle, shank length and keel length were measured. Birds were fasted for 12 hours than slaughtered to study carcass traits. Collected data were analysed by using compete randomized design as per Snedcor and Cocharan [9]. The following statistical model was used to test the effect of treatment on performance traits of colour mediocore broiler.
3. Results
Treatment T₁ (1% SRP) had significantly higher body weight than T₀ (Control), T₂ (1% ARP) and T₃ (200 mg/kg vit. E) treatment broilers. T₁ and T₃ were nonsignificantly different from control group. Result indicated that SRP and its combination with ARP and vitamin E or all three together favour higher body weight gain. Treatment T₃ has significantly highest body weight among all treatments. All single supplements T₁, T₂ and T₃ were significantly improved in breast angle, shank length and keel length over T₀ control group. Group T₁ was significantly better than T₂ and T₃. In combination treatment effect, T₇ has superior conformation than control and all other treatment groups. Result has shown that 1% SRP in combination with 1% ARP or 200 mg/kg vit. E or all three together (T₇) attained better conformation compared to 1% ARP with 200 mg/kg vit. E or all three together in half doses (T₅).
Total meat yield in T₁ single supplement was found significantly higher than T₀ control group. Whereas effect of T₂ and T₃ in meat yield was not observed. All combine supplements T₁, T₃, T₅ and T₇ were significantly higher in meat yield than control group. A significantly highest total meat yield was observed in T₇ treatment group. Percent breast meat yield in T₀, T₁ and T₅ revealed nonsignificant difference and these were significantly lower than all other treatment groups. Breast cut up portion of T₁, T₂, T₃ and T₅ shown similarly in yield with numerically higher value observed in T₄ treatment group.

### Table 1: Effect of dietary treatments on performance of colour broilers

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Body wt. (g)</th>
<th>Conformation traits</th>
<th>Breast meat yield (%)</th>
<th>Total meat yield (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Breast angle (%)</td>
<td>Shank length (cm)</td>
<td>Keel length (cm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T₀ (Control)</td>
<td>1154.0⁶</td>
<td>59.3⁳</td>
<td>6.9⁷</td>
<td>8.1⁸</td>
</tr>
<tr>
<td>T₁ Shatavari 1% in diet</td>
<td>1215.0⁶</td>
<td>62.6⁵b</td>
<td>7.6⁹c</td>
<td>9.0⁸b</td>
</tr>
<tr>
<td>T₂ Ashwagandha 1% in diet</td>
<td>1184.5⁶</td>
<td>62.0⁶b</td>
<td>7.1⁹d</td>
<td>8.4⁸b</td>
</tr>
<tr>
<td>T₃ Vitamin E 200 mg/kg in diet</td>
<td>1179.5⁶</td>
<td>61.1⁶c</td>
<td>7.0⁹e</td>
<td>8.3⁸c</td>
</tr>
<tr>
<td>T₄ Shatavari 1% + Ashwagandha 1% in diet</td>
<td>1243.0⁶</td>
<td>63.3⁵b</td>
<td>7.6⁹e</td>
<td>9.2⁸b</td>
</tr>
<tr>
<td>T₅ Shatavari 1% + Vitamin E 200 mg/kg in diet</td>
<td>1255.7⁶</td>
<td>63.1⁷c</td>
<td>8.0¹b</td>
<td>9.2⁸b</td>
</tr>
<tr>
<td>T₆ Ashwagandha 1% + Vitamin E 200 mg/kg in diet</td>
<td>1218.5⁶</td>
<td>62.1⁷c</td>
<td>7.2²d</td>
<td>8.9³d</td>
</tr>
<tr>
<td>T₇ Shatavari1%+Ashwagandha + Vitamin E 200mg/kg in diet</td>
<td>1298.2⁶</td>
<td>63.8⁵b</td>
<td>8.1⁰d</td>
<td>9.4⁶a</td>
</tr>
<tr>
<td>T₈ Shatavari0.5%+Ashwagandha 0.5%+VitaminE100mg/kg in diet</td>
<td>1202.7⁷d</td>
<td>61.6⁶b</td>
<td>7.0²d</td>
<td>8.3⁷f</td>
</tr>
</tbody>
</table>

Means bearing different superscripts in a column are significantly different. (p<0.01)

4. Discussion
Significantly high body weight with 1% SRP was in agreement with the result of Rekhate et al. [⁸] and Gaikwad et al. [⁹] Result did not supported finding of Dahale et al. [⁴] who reported nonsignificant effect of shatavari root powder on body weight gain. Considering combine affect, Kant et al. [⁷] reported significantly improved body weight in 1% SRP with 200 mg/kg vitamin E supplementation than their individual effect. Similar finding was also reported by Srivastava et al. [¹⁰] on supplementation of *Asparagus racemosus*, *Withania somnifera* and *mucuna pruriens* in broiler diet. The present results supported finding of above authors and concluded that T₇ significantly improved body weight of chicks. Table observation shown that 1% SRP (T₁) has significantly better conformation than control (T₀), 1% ARP (T₂) and 200 mg/kg vit. E (T₃). Bhardwaj [²] reported significantly improved conformation of quail chick in 1% SRP and 1% ARP than control group and effect was found better in 1% SRP supplementation. Similar finding for effect of SRP and vit. E on shank length and keel length was reported by Kant et al. [⁷]. Further Kant et al. [⁷] reported that synergistic effect of combine treatment given better result than individual effect of 1% SRP and 200 mg/kg vit. E. The present result shown better effect in combined treatments and T₇ was significantly highest values than all treatment groups. Percent total meat yield was significantly higher in 1% SRP. Similar finding was reported by Kant et al. [⁷] and Gaikwad et al. [⁹]. Significantly higher total meat yield in combined supplement was in accordance with the result of Srivastava et al. [¹⁰]. The present result shown highest meat yield in T₇ treatment group. Nonsignificant effect of 1% ARP on total meat yield was in agreement with the finding of Kale et al. [⁶]. Effect of vit. E on total meat yield was also nonsignificantly different from control group. The finding was in accordance with the result of Bobade et al. [³]. Significantly higher percent breast meat yield portion in 1% SRP and 1% ARP than control group broilers was in agreement with the finding of Bhardwaj [²]. In contrary Kale et al. [⁶] reported nonsignificant difference in % cut up yield due to 1% ARP supplementation. In accordance with Bobade et al. [³] effect of vit. E was not observed on % cut up yields of broilers.

5. Conclusion
Result of these investigation concluded that shatavari was beneficial in improving growth traits and carcass yield of coloured broilers and T₇ combine supplements was superior among all treatments.

6. Acknowledgement
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7. References
2. Bhardwaj RK. Study on efficiency of shatavari and...


