Effect of herbal immunomodulator on sensory evaluation in Giriraja birds

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Abstract
The present study was undertaken to evaluate the effects of herbal immunomodulator powder and liquid form (with and without vaccine) comparing with levamisole powder (with and without vaccine) in Giriraja birds from day one to 8 weeks periods to evaluate on sensory evaluation in birds. In a completely randomised design, 525 day old Giriraja chicks were assigned to seven treatments with each treatment group consisting of five replicates with 15 chicks each. The effect of supplementation of different immunomodulators viz levamisole, herbal immunomodulator liquid and powder with and without vaccine did not show significant difference among the treatment groups. The highest mean score for flavor (4.65) was recorded in herbal immunomodulator liquid with vaccine supplemented group (T4) and significantly compared with other treatment groups (T1, T2, T3, T5 and T6). The highest mean score for taste (4.10) was recorded in herbal immunomodulator powder without vaccine supplemented group (T4) and other treatment groups exhibited non-significant difference among themselves. The highest mean score recorded for juiciness was 3.95 in herbal immunomodulator powder with vaccine (T5) and herbal immunomodulator immunomodulator without vaccine supplemented group (T6) and significantly comparable with 3.65 score recorded in treatment groups (T1, T2, and T4) and non-significantly comparable with treatment groups (T3 and T7). There was no significant difference observed in texture and there was no significant difference in overall mean score of different treatment groups.

Keywords: Giriraja, levamisole, immunomodulator, sensory, texture, flavor

1. Introduction
Antibiotics as antimicrobial growth promoters have been widely used in the poultry feed industry. The advantages of using antibiotics as feed additives in terms of growth stimulation and improvement of feed efficiency are well documented [1]. However, the possibility of developing resistance of bacteria, the side effects of using antibiotics as growth promoters in farm animals/poultry, the loss of efficacy of antibiotics as growth stimulants and controlling an outbreak of bacterial diseases have been of concern.

The ban on the use of antibiotics as feed additives has accelerated and led to investigations of alternative feed additives in animal production. As one of the alternatives, herbal extracts are already being used as feed additives to improve the growth performance under intensive management systems [2]. Plant extracts and spices as single compounds or as mixed preparations can play a role in supporting both performance and health status of the animal. Beneficial effects of herbal extracts or active substances in animal nutrition may include the stimulation of appetite and feed intake, the improvement of endogenous digestive enzyme secretion, activation of immune response and antibacterial, antiviral, antioxidant and anti-helminthic actions [3].

2. Materials and Methods
A total of 525 straight run day old Giriraja chicks from a single hatch were wing banded for identification, weighed and randomly distributed to seven treatment groups in Completely Randomised Design. Each treatment had five replicates with 15 birds in each replicate. A practical diet comprising of Yellow Maize, Soya bean meal, feed supplements and feed additives without antibiotics and coccidiostat constituted the control diet for all the seven treatment groups. The feed for the treatment group was formulated as per BIS (1994) requirements for all the nutrients except antibiotics and coccidiostat. The experimental birds in T1 were fed with control diet without any antibiotics and coccidiostat. The birds were administered with ND and IBD vaccines. The experimental birds in T2 were fed as in T1 and...
supplemented with Levamisole powder. The experimental birds in T1 were fed as in T2 and administered vaccines. The experimental birds from T4 and T5 were fed with Herbal Immunomodulator preparation in powder form containing Mandukaparni, Yasthi madhu, Guduchi, vridddadaru, Amalaki, Nimba and etc without and with vaccines, respectively and birds from T6 and T7 were fed with Herbal Immunomodulator preparation in liquid form containing Himsara, Kasani, Vasaka, Guduchi, Daraksha, Jhavuka, Shatavari etc., without and with administration of vaccines, respectively against ND and IBD.

3. Result

3.1. Sensory evaluation

The results of effect of supplementing herbal immunomodulator liquid and powder (with and without vaccine) and levamisole powder (with and without vaccine) on sensory evaluation of meat are presented in Table 1. Statistical analysis of the data revealed significant influence of flavor, taste, juiciness and non-significant influence of colour, texture and overall quality on supplementation of different immunomodulators.

The highest mean score for color (3.90) recorded in herbal immunomodulator liquid without vaccine supplemented group (T6) and the lowest 3.40 color score recorded in levamisole without vaccine supplemented group (T2). The effect of supplementation of different immunomodulators viz levamisole, herbal immunomodulator liquid and powder with and without vaccine didn’t show significant difference among the treatment groups (Table 1).

The highest mean score for flavor (4.65) was recorded in herbal immunomodulator liquid with vaccine supplemented group (T1) and significantly compared with other treatment groups (T2, T3, T4, T5 and T6). The lowest mean flavor score (3.25) was observed in control (T1) and significantly comparable with herbal immunomodulator liquid without vaccine supplemented group (T6) and herbal immunomodulator liquid with vaccine supplemented group (T7). However, non-similarly comparable with other treatment groups (T2, T3, T4 and T5). However, levamisole supplemented group (T2 and T3), herbal immunomodulator powder supplemented group (T4 and T5) exhibited non-significant difference between themselves and herbal immunomodulator liquid supplemented group (T6 and T7) significantly differed among themselves (Table 1).

The highest mean score for taste (4.10) was recorded in herbal immunomodulator powder without vaccine supplemented group (T4) and significantly compared with 3.70 score recorded in control (T1), 3.65 score recorded in levamisole without vaccine (T2) and 3.80 score recorded in levamisole with vaccine supplemented group (T7). However, non-significantly comparable with other treatment groups (T3, T5, T6 and T7). However, levamisole supplemented group (T2 and T3), herbal immunomodulator liquid supplemented group (T6 and T7) and herbal immunomodulator powder supplemented group (T6 and T7) exhibited non-significant difference among themselves (Table 1).

The highest mean score recorded for juiciness was 3.95 in herbal immunomodulator powder with vaccine (T3) and herbal immunomodulator liquid without vaccine supplemented group (T6) and significantly comparable with 3.65 score recorded in treatment groups (T1, T2, and T3) and non-significantly comparable with treatment groups (T6 and T7). However, levamisole supplemented group (T2 and T3), herbal immunomodulator liquid supplemented group (T6 and T7) were non-significantly comparable among themselves and herbal immunomodulator powder supplemented group (T6 and T7) exhibited significant difference among themselves (Table 1).

The highest mean score recorded for texture was 3.80 in herbal immunomodulator powder without vaccine (T4) and herbal immunomodulator powder with vaccine (T3), herbal immunomodulator liquid without vaccine (T6) and herbal immunomodulator liquid with vaccine (T7) and 3.65 texture score was observed in control (T1) and levamisole powder with vaccine supplemented group (T6) and 3.70 score was recorded in levamisole without vaccine supplemented group (T2). However, levamisole powder supplemented group (T2 and T3), herbal immunomodulator liquid supplemented group (T6 and T7) and herbal immunomodulator powder supplemented group (T6 and T7) were non-similarly comparable among themselves (Table 1).

The overall mean score of 3.85 was observed in control (T1), herbal immunomodulator liquid without vaccine (T6) and herbal immunomodulator liquid with vaccine (T7) and 3.80 observed in levamisole powder without vaccine (T2) and levamisole powder with vaccine (T3) and herbal immunomodulator powder with vaccine (T6) and herbal immunomodulator powder supplemented group. The overall score of 3.90 was observed in herbal immunomodulator powder without vaccine (T4). However, there was no significant difference in overall mean score of different treatment groups (Table 1).

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Colour</th>
<th>Flavour</th>
<th>Taste</th>
<th>Juiciness</th>
<th>Texture</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 Control</td>
<td>3.70 ±0.00</td>
<td>3.25±0.05</td>
<td>3.70±0.00</td>
<td>3.65±0.05</td>
<td>3.65 ±0.05</td>
<td>3.85±0.05</td>
</tr>
<tr>
<td>T2 Control+ levamisole</td>
<td>3.40 ±0.00</td>
<td>3.40±0.20</td>
<td>3.65±0.05</td>
<td>3.65±0.05</td>
<td>3.70 ±0.00</td>
<td>3.80±0.00</td>
</tr>
<tr>
<td>T3 Control+ levamisole</td>
<td>3.70 ±0.10</td>
<td>3.60±0.20</td>
<td>3.80±0.10</td>
<td>3.75±0.15</td>
<td>- 3.65 ±0.05</td>
<td>3.80±0.00</td>
</tr>
<tr>
<td>T4 Control+ HIM powder</td>
<td>3.80 ±0.20</td>
<td>3.35±0.05</td>
<td>4.10±0.10</td>
<td>3.65±0.05</td>
<td>3.80 ±0.10</td>
<td>3.90±0.00</td>
</tr>
<tr>
<td>T5 Control+ HIM powder</td>
<td>3.75 ±0.15</td>
<td>3.80±0.00</td>
<td>4.00±0.00</td>
<td>3.95±0.05</td>
<td>3.80 ±0.10</td>
<td>3.80±0.00</td>
</tr>
<tr>
<td>T6 Control+ HIM liquid</td>
<td>3.90 ±0.00</td>
<td>3.95±0.35</td>
<td>4.05±0.05</td>
<td>3.95±0.05</td>
<td>3.80 ±0.00</td>
<td>3.85±0.05</td>
</tr>
<tr>
<td>T7 Control+ HIM liquid</td>
<td>3.70 ±0.30</td>
<td>4.65±0.05</td>
<td>4.05±0.05</td>
<td>3.85±0.05</td>
<td>3.80 ±0.00</td>
<td>3.85±0.05</td>
</tr>
</tbody>
</table>

Means bearing at least one common superscript column wise does not differ significantly (P<0.05).

4. Discussion

4.1. Sensory evaluation

The results of sensory evaluation revealed non-significant difference among treatment groups due to dietary supplementation of herbal immunomodulator powder and liquid (with and without vaccine) and levamisole powder (with and without vaccine). The overall acceptability score was almost similar in all the treatment groups which clearly indicate that dietary supplementation of herbal immunomodulator and levamisole in different form had no effect on sensory evaluation score of meat of birds. However, the score card values for sensory evaluation are similar to that
of the findings of \cite{4} who observed that dietary inclusion of turmeric at 0.5 per cent level in broiler diets did not reveal any abnormal odour, flavor and appearance of the meat. The results of the present study are in contrary with the findings of \cite{5} who revealed that there was a significant improvement in the sensory and color attributes of the carcass traits in vitamin C and Ayucee liquid supplemented group as compared to untreated control.

5. Conclusion
The results of the present study revealed that significant influence of flavor, taste, juiciness and non-significant influence of colour, texture and overall quality on supplementation of herbal immunomodulators with or without vaccines.

6. Reference