Effect of dietary levels of tallow and NSP degrading enzyme supplements on nutrient efficiency of broiler chickens

K. Taibipour, H. Kermanshahi
Dept. of Animal Sci., Ferdowsi Univ. of Mashhad, Mashhad, Iran P.O.Box 91775-1163
*Email kermansh@ferdowsi.um.ac.ir

Introduction

Fat digestibility in broilers depends not only on fat type but also on the particular cereal grain that is used. There are considerable evidences showing antinutritive effect of NSP in cereals have a pronounced negative effect on digestibility of fat in young birds. An increase in intestinal viscosity depresses fat digestibility more in animal fat-based diets. Reduction in viscosity due to enzyme addition in such diets should exert a more pronounced effect (Danicke, 1999a). Significant interaction effect between dietary fat type and carbohyrdrase addition was also reported (Danicke, 1999b). The objective of the present study was to examine the effects of dietary levels of tallow and NSP degrading enzyme supplements on broiler chickens.

Materials and methods

In a completely randomized design experiment with a 3*3 factorial arrangement (tallow levels; 0, 20, and 40 g/kg and NSP degrading enzyme levels; 500 and 1000 mg/kg containing 1200 U/g arabinoylanase and 400 U/g beta-glucanase, GNC Bioferm Inc., Canada) with 4 replicates of 4 birds each, 144 day-old Hubbard Classic male broiler chickens were fed wheat- soybean meal based diets containing 620 g/kg wheat. To make the diets isoenergetic and isonitrogenous with different tallow levels, corn starch was used. For nutrient digestibility using Cr2O3 as indigestible marker, feces samples were collected from 18-21 days of age. At 21 day s of age, two birds from each replicate of treatments were killed for ileal digesta collection. Data were analyzed using the general linear procedure of SAS (1986).

Result

Apparent metabolizable energy (AME), apparent lipid digestibility of feces (ALDf), apparent protein digestibility (APD), and apparent lipid digestibility of ileal digesta (ALDi) are shown in table. AME in all treatments affected by tallow and enzyme levels (P<0.01). Increasing the level of tallow in the diet significantly reduced ALDf (P<0.01) and enzyme addition significantly improved it (P<0.01). This improvement was highest when the level of tallow in the diet was at its maximum level (80.238 vs 68.791). APD was not affected by treatments but improved when enzyme added to each level of tallow. ALDi was significantly reduced by levels of tallow but increased by enzyme (P<0.01).

Table

<table>
<thead>
<tr>
<th>Tallow(g/kg)</th>
<th>0</th>
<th>20</th>
<th>40</th>
<th>P values</th>
<th>Enzyme(mg/kg)</th>
<th>0</th>
<th>500</th>
<th>1000</th>
<th>P values</th>
<th>SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>AME</td>
<td>12.898&lt;sup&gt;a&lt;/sup&gt;</td>
<td>12.365&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>11.368&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.009</td>
<td>11.158&lt;sup&gt;b&lt;/sup&gt;</td>
<td>12.319&lt;sup&gt;a&lt;/sup&gt;</td>
<td>13.155&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.008</td>
<td>0.2188</td>
<td></td>
</tr>
<tr>
<td>APD</td>
<td>81.609</td>
<td>80.662</td>
<td>80.657</td>
<td>NS</td>
<td>79.786</td>
<td>80.959</td>
<td>82.182 NS</td>
<td>0.7063</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALD&lt;sub&gt;f&lt;/sub&gt;</td>
<td>82.151&lt;sup&gt;a&lt;/sup&gt;</td>
<td>73.748&lt;sup&gt;b&lt;/sup&gt;</td>
<td>68.791&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.0001</td>
<td>67.723&lt;sup&gt;a&lt;/sup&gt;</td>
<td>76.738&lt;sup&gt;b&lt;/sup&gt;</td>
<td>80.238&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.001</td>
<td>0.0902</td>
<td></td>
</tr>
<tr>
<td>ALD&lt;sub&gt;i&lt;/sub&gt;</td>
<td>84.420&lt;sup&gt;a&lt;/sup&gt;</td>
<td>74.321&lt;sup&gt;b&lt;/sup&gt;</td>
<td>70.522&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.001</td>
<td>69.121&lt;sup&gt;b&lt;/sup&gt;</td>
<td>78.450&lt;sup&gt;a&lt;/sup&gt;</td>
<td>81.756&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.012</td>
<td>0.740</td>
<td></td>
</tr>
</tbody>
</table>

P values for tallow and enzyme effects were significantly different (p<0.01). AME, apparent metabolizable energy; APD, apparent protein digestibility; ALD<sub>f</sub>, apparent lipid digestibility of feces; ALD<sub>i</sub>, apparent lipid digestibility of ileal digesta, NS; not significant. The values in each row with different superscripts are significantly different (p<0.05)

Conclusions

Under the condition of this experiment, it was concluded that increasing the level of Tallow to diets containing 620 g/kg wheat decreases their AME, ALD<sub>f</sub> and ALD<sub>i</sub>. Addition of NSP degrading enzyme to diets containing wheat also increases their AME, ALD<sub>f</sub> and ALD<sub>i</sub>. Addition of NSP degrading enzyme to diets containing wheat also increases their AME, ALD<sub>f</sub> and ALD<sub>i</sub>. Addition of NSP degrading enzyme to diets containing wheat also increases their AME, ALD<sub>f</sub> and ALD<sub>i</sub>. Addition of NSP degrading enzyme to diets containing wheat also increases their AME, ALD<sub>f</sub> and ALD<sub>i</sub>. Addition of NSP degrading enzyme to diets containing wheat also increases their AME, ALD<sub>f</sub> and ALD<sub>i</sub>. Addition of NSP degrading enzyme to diets containing wheat also increases their AME, ALD<sub>f</sub> and ALD<sub>i</sub>.

Acknowledgement

Financial support of Ferdowsi university of Mashhad, Iran is greatly acknowledged.

References

