INFLUENCE OF DIETARY PEPTIDE LEVELS ON ENDOGENOUS NITROGEN FLOW IN BROILER CHICKENS

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Summary

In the present study, the enzymatically hydrolysed casein (EHC) method was used to determine the effect of dietary peptide level on ileal nitrogen flows in broiler chickens. It was found that the endogenous flow of nitrogen was similar (P>0.05) between birds fed the protein-free diet and those fed the 50 g/kg EHC diet. Increasing dietary EHC levels from 50 g/kg to 200 g/kg significantly (P<0.05) increased the endogenous nitrogen flows. These results demonstrate that the presence of peptides causes increased losses of endogenous nitrogen from the small intestine of broiler chickens and that the magnitude of the losses is influenced by the dietary levels of peptides.

RESULTS AND DISCUSSION

The traditional approach of determining endogenous nitrogen and amino acid flows is to feed the bird a diet devoid of protein. This method has been criticised since lack of protein may result in reduced digestive enzyme secretion and rate of protein turnover in the gut. Ravindran et al. (2004) reported that dietary protein and peptides exert a positive influence and endogenous amino acid flows. Limited data is available on the effects of dietary concentrations of protein or peptide on endogenous amino acid flows (Hodgkinson et al., 2000). In the present study, the enzymatically hydrolysed casein (EHC) method was used to determine the effect of dietary peptide level on ileal nitrogen flows in broiler chickens. Five experimental diets containing EHC at 0, 50, 100, 150 and 200 were formulated. All diets contained 3 g/kg titanium oxide as an indigestible marker. Each diet was fed ad libitum to four pens (6 birds/pen) of male broilers (Ross) from 28 to 35 days of age. On day 35, terminal ileal contents were collected and endogenous nitrogen flows were determined as previously described (Moughan et al., 1992). The endogenous flows (mg/kg dry matter intake) of nitrogen are shown below.

<table>
<thead>
<tr>
<th></th>
<th>Protein-free diet</th>
<th>50 g/kg EHC</th>
<th>100 g/kg EHC</th>
<th>150 g/kg EHC</th>
<th>200 g/kg EHC</th>
<th>Pooled SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>1232a</td>
<td>1311a</td>
<td>1733b</td>
<td>2096b</td>
<td>2722b</td>
<td>58.4</td>
</tr>
</tbody>
</table>

a,b Means in a row bearing different superscripts are significantly different (P<0.05).

The endogenous flow of nitrogen was similar (P>0.05) between birds fed the protein-free diet and those fed the 50 g/kg EHC diet. Increasing dietary EHC levels from 50 g/kg to 200 g/kg significantly (P<0.05) increased the endogenous nitrogen flows. These results demonstrate that the presence of peptides causes increased losses of endogenous nitrogen from the small intestine of broiler chickens and that the magnitude of the losses is influenced by the dietary levels of peptides.

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REFERENCES

