EFFECTS OF FAT SOURCES ON LEAN TISSUE DEPOSITION IN BROILERS

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The modern broiler contains 150 to 200 g fat per kg body weight, over 85% of which is physiologically inessential. Fatness in poultry has three major attributes: a) it depresses feed efficiency; b) some adipose tissues are of little economic value, i.e., abdominal fat is removed by evisceration, thus decreasing processing yield; and c) consumption of saturated fat is associated with increased incidence of cardiovascular risks in humans. Increased fat content in the chicken meat is therefore undesirable both economically and socially. Nutritional manipulations taken to counter excessive body fatness include feed restriction, changing protein to energy ratio and manipulation of the balance of individual amino acids. Although some of these measures have yielded favourable results their practical use has been limited. The current study was undertaken to examine the effect of various fat sources on lean tissue deposition in broiler chickens.

Fish oil, linseed oil, lard and safflower oil was added to a commercial type broiler diet at 20 and 40g/kg levels. It consisted of cereals (sorghum and barley), protein sources (soybean meal, meat meal and cottonseed meal), and vitamin and minerals. Each diet was fed to 6 individual birds for 42 days. On day 42, all birds were weighed and feed was withdrawn. On day 43, all birds were killed by cervical dislocation and the weight of the empty body, abdominal fat pad, breast muscle and viscera was recorded. The abdominal fat pad weight differed between treatments due to fat sources with linseed oil giving a significantly heavier fat pad compared with fish oil and lard (P<0.05).

<table>
<thead>
<tr>
<th>Fat source</th>
<th>% Fat</th>
<th>Fat pad (g)</th>
<th>% Fat</th>
<th>Fat pad (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish oil</td>
<td>2</td>
<td>19.6 (1.44)ᵇᵇ</td>
<td>4</td>
<td>21.6 (2.15)ᵃᵇ</td>
</tr>
<tr>
<td>Lard</td>
<td>2</td>
<td>18.9 (2.67)ᵇ</td>
<td>4</td>
<td>24.6 (2.51)ᵃᵇ</td>
</tr>
<tr>
<td>Linseed oil</td>
<td>2</td>
<td>28.7 (2.99)ᵃ</td>
<td>4</td>
<td>26.8 (4.25)ᵃᵇ</td>
</tr>
<tr>
<td>Safflower oil</td>
<td>2</td>
<td>22.6 (3.35)ᵃᵇ</td>
<td>4</td>
<td>20.7 (2.99)ᵃᵇ</td>
</tr>
</tbody>
</table>

¹Means (± SEM) within a column bearing the same superscript do not differ significantly P<0.05.

Addition of 20 g fish oil or 20g lard/kg to broiler diets markedly (P<0.05) reduced abdominal fat pad weight with no effects on weight gain and feed conversion efficiency of the birds. At 40g/kg, however, the current trial failed to detect a significant (P>0.05) difference between abdominal fat pad weights of birds fed various fat sources. An increase in glucose uptake into the muscle tissue and a decrease in plasma triglyceride concentration due to the effects of n-3 fatty acids is a possible explanation for the current result (Newman et al., 1998).


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