EFFECTS OF CHOICE FEEDING A COMPLETE FEED AND CORN
ON THE PERFORMANCE OF BROILERS

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Summary

Poultry feeding systems are likely to change for increased efficiency of production. An experiment
was conducted to compare the response of broilers to choice feeding of corn with a standard broiler
ration. The treatments consisted of providing broiler feed as the only feed (SINGLE FEED) and
access to corn as a choice to a complete broiler feed (CHOICE FEEDING). Weights and feed con-
sumption were obtained at weekly intervals. Samples at the conclusion of the experiment were taken
to determine the weight of abdominal fat.

Results showed that there was no significant difference in term of liveweight between the two
feeding regimes. However, birds given a choice of the broiler feed and corn had better feed efficiency
which is reflected by the lower total feed intake. Corn intake was 23.1% of total feed intake in the
choice fed birds. In terms of carcass colour, birds fed corn as a choice was observed to have a deeper
yellow skin colour than the birds fed with broiler feed only.

(Key Words: Choice Feeding, Growth, Abdominal Fat, Broiler Performance)

Introduction

Meat-type chickens have traditionally been
fed a balanced complete feed and given on an
ad libitum basis. The current economics of the
poultry industry indicates that food should be used
as efficiently as possible and one of the method
of achieving efficiency and reducing feed costs
is to feed choices of grain with pelleted feed
(Cowan and Michie, 1978; Scott and Heuser,
1957). On the other hand, the practice of choice
feeding of split-diets, which were concentrated
sources of either crude protein or energy in
broilers was not beneficial as the birds on split-
diets grew slowly as compared to the control
(Summers and Leeson, 1978).

There are substantial reports of choice feeding
studies with pullets, layers and breeders (Cowan
et al., 1978; Farrell et al., 1981; Karunajeewa,
1978; Karunajeewa and Tham, 1984) but very
few reported studies in broilers. The following
experiment was conducted to study the response

Materials and Methods

Animals and management

A total of 850 day-old broilers (Avian) were
randomly distributed into 10 pens at a density
of 0.13 m² per chick. The chicks were housed
in a conventional broiler house with galvanized
wire netting walls partitioned into twenty pens
each measuring 3.0 m × 3.6 m. Only ten of the
pens were used. The chicks were brooded for
two weeks by the use of electric hovers. Wood
shaving was used as bedding material with app-
proximately 10 cm. in depth. All chicks were fed
a crumbled starter diet of 22% crude protein and
12.13 MJ/kg ME for the first three weeks. The
finishing pelleted diet, containing 19% crude
protein and 12.55 MJ/kg ME, was fed from
22 to 49 days of age. The compounded feeds
were obtained from a local feedmill. All groups
were fed once daily using two hanging tube
feeders (pan diameter of 42 cm). Water was
provided by automatic bell-shaped drinker. Feed
and water were provided ad libitum. The birds
were managed under continuous lighting of 12
hours natural daylight and 12 hours supplemen-
tary lighting from 19:00 to 07:00 h.

Feeding regimes
The two feeding treatments were; (1) SINGLE FEED; ad libitum feeding of a broiler feed during the entire 49 days experimental period; (2) CHOICE FEEDING; coarsely ground corn was provided as a choice to a broiler feed from 15 days of age until 49 days. The corn was provided in a separate feed container as a choice to the broiler feed. Five replicate pens with 85 broilers per pen were utilized per treatment.

Traits measured
The birds were weighed on a per pen basis and feed consumption was recorded at weekly intervals. Feed conversion was calculated as feed/gain for the seven weeks. At the conclusion of the study, 10 birds from each treatment were selected at random, slaughtered and processed. The carcasses were then eviscerated and the abdominal fat pads removed as described by Cable et al. (1987). The carcasses and the abdominal fat pads were weighed, and expressed as a percentage of total body weight (grams per 100 g).

Statistical analyses

The analysis of variance using a computer software (Statgraphics®, 1988) was used to determine differences in treatment means and significance was assessed at the 0.05 level. When significance was found, means within treatments were separated using the Least Significance Difference test.

Results
A summary of the effects of choice feeding on broiler performance and protein and ME intakes is shown in Table 1. There was no significant difference in term of final liveweight, daily liveweight gains, total feed intake, feed conversion ratio, mortality and abdominal fat weights between the two treatments. Although there was no significant difference in term of feed intake between the two treatments, there was a reduction of 4.26% in total feed intake of the choice fed birds as compared to the control. Also a lower mortality by 1.64% in the choice fed birds as compared to the single fed birds. Feed cost in the choice fed birds was 15.8% lower than the single fed birds.

In the choice fed birds, corn consumption was 23.1% of the total feed intake contributing 9.8 % of daily protein and 22.2% daily ME intakes.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Single feed</th>
<th>Choice feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final liveweight (g/b)</td>
<td>1,968.40 ± 32.14</td>
<td>1,952.60 ± 25.44</td>
</tr>
<tr>
<td>Liveweight gain (g/b/d)</td>
<td>39.32 ± 0.66</td>
<td>39.00 ± 0.51</td>
</tr>
<tr>
<td>Total feed intake (g/b)</td>
<td>4,040.26 ± 118.7</td>
<td>3,868.06 ± 210.4</td>
</tr>
<tr>
<td>Daily feed intake (g/b)</td>
<td>82.46 ± 2.41</td>
<td>78.94 ± 4.29</td>
</tr>
<tr>
<td>Daily protein intake (g/b)</td>
<td>15.86 ± 0.21</td>
<td>13.83 ± 0.32</td>
</tr>
<tr>
<td>Daily ME intake (kJ/b)</td>
<td>1,027 ± 16</td>
<td>1,007 ± 13</td>
</tr>
<tr>
<td>FCR (Feed/Gain)</td>
<td>2.10 ± 0.08</td>
<td>2.03 ± 0.13</td>
</tr>
<tr>
<td>Mortality (%)</td>
<td>6.58 ± 1.69</td>
<td>4.94 ± 0.58</td>
</tr>
<tr>
<td>Abdominal fat (%)</td>
<td>2.97 ± 0.12</td>
<td>2.86 ± 0.21</td>
</tr>
<tr>
<td>Feed cost (RM)</td>
<td>3.23</td>
<td>2.73</td>
</tr>
</tbody>
</table>

1 Means ± Standard Error.
Means are not significantly different (p > 0.05).

Discussion
The feed intake between the two treatments was not significantly different, but the reduction in feed intake by the choice fed birds was 4.26% of the control. The reduced feed intake in choice-fed birds is consistent with the findings by Mastika and Cumming (1981). In the choice
fed birds, the intake of corn is 23.1% (table 2) of the total feed consumed and this is in agreement with the study by Scott and Heuser (1957) but less than that as reported by Cowan and Michie (1978) with a choice of wheat. The intakes of corn in the choice-fed birds contribute 9.8% protein and 22.2% ME of the total intakes of energy and protein by the birds. Also the average intake of corn (23.1%) could not be due to its yellow colour as in term of colour preference by the birds there was no difference between yellow and red coloured feed (corn and pelleted feed) as reported by Hurnik et al. (1971).

**TABLE 2. FEED AND NUTRIENT INTAKES OF BROILERS GIVEN CHOICES OF FEEDS (CHOICE FEEDING GROUP)**

<table>
<thead>
<tr>
<th>Intakes</th>
<th>Broiler feed</th>
<th>Ground corn</th>
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</thead>
<tbody>
<tr>
<td>Daily feed intake (g/b)</td>
<td>60.70</td>
<td>18.20</td>
</tr>
<tr>
<td>% of feed intakes</td>
<td>76.9%</td>
<td>23.1%</td>
</tr>
<tr>
<td>Daily protein intake (g/b)</td>
<td>12.47</td>
<td>1.36</td>
</tr>
<tr>
<td>% of protein intakes</td>
<td>90.2</td>
<td>9.8</td>
</tr>
<tr>
<td>Daily ME intake (kJ/b)</td>
<td>783.44</td>
<td>223.56</td>
</tr>
<tr>
<td>% of ME intakes</td>
<td>77.8</td>
<td>22.2</td>
</tr>
</tbody>
</table>

The total protein intake of the choice-fed birds is lower than the control. The ME intake was almost similar and is reflected in the abdominal fat weights, as there was no difference in term of abdominal fat weights between the two treatments. A reduction of feed cost by 15.5% could be achieved by feeding corn as a choice.

The success of choice feeding is attributed to the ability of the chicks to select a diet which provides it with all the nutrients necessary for maintenance and growth provided the sources of the choices were palatable, and in this case, corn could be considered as palatable.

**Conclusions**

Choice feeding of broiler feed with corn have a potential application in broiler chicken production especially with farmers practicing range rearing since there were no differences in term of performance between the two groups and also a saving in feed cost could be achieved with the feeding of corn as a choice.

**Literature Cited**


Statistical Graphics Corporation Inc. 1988. Statgraphics®, Statistical graphics system, STSC, Maryland, USA.