EVALUATION OF A BANTAM CROSS EGG LAYER

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Summary

This paper reports on a cross between a bantam White Leghorn and commercial Lohmann Brown females. The mean weight of the bantam cross females was 1.64 kg at 45 weeks of age. Production peaked at 96% at 26 weeks of age and averaged just under 90% from weeks 27-45. Mean feed consumption was approximately 11% lower than the commercial Lohmann Brown egg layers while egg weight was, on average, approximately three grams lighter (5%). The overall production characteristics of this bantam cross suggests the possible commercial use of bantamised layers, if significant improvements in feed conversion efficacy can be demonstrated.

I. INTRODUCTION

Genetic selection over the last 40 years has seen substantial improvements in the performance of laying hens; however the rates of feed efficiency gain are likely to slow as egg production approaches the threshold of 365 eggs per annum. Two genetic approaches to improvement in feed efficacy have been suggested, both of which involve substantial reduction in body weight in commercial laying strains, viz. the introduction of dwarf or bantam genes into commercial lines. Research with the sex linked dwarfing gene demonstrated lower peaks of production and reduced persistency of production (Polkinghorne and Lowe, 1973).

Unlike the introduction of the sex-linked dwarf genes, bantam genes have shown more promise as a mechanism to alter the relationship between body weight and egg weight without affecting ovulation rate. Yoshida and Saito (1983) found that the introduction of Sebright bantam genes into various strains of fowl reduced adult body weight by 8-17%, reduced egg weight by only 3-4% and had no effect on production. Additionally, Stanhope and Parkinson (1988) introduced bantam genes into a commercial White Leghorn x New Hampshire cross with promising results. The bantamised hybrid (F1) had a mature body weight ranging from 1.5-1.8 kg with an average feed consumption of 90 grams/day. The bantamised hybrid egg weight ranged from 56.6 - 61.6 grams, production was 263-305 eggs to 78 weeks of age and egg mass was 14.9-18.9 kg. Clearly these bantamised hybrids had unusually high egg weight to body weight ratios and maintained competitive rates of egg production compared to Australian commercial egg laying stocks.

The experiment reported here assessed the performance of a cross between a commercial Lohmann Brown female and a bantamised White Leghorn male for production characteristics and general viability, and to compare these results with the commercial Lohmann Brown layer.

II. MATERIALS AND METHODS

The strains used in this trial were a commercial Lohmann Brown, and a cross between a bantam White Leghorn male (mature body weight of 1.35 kg) and the commercial Lohmann Brown bird. Both strains were raised in litter based environments on different properties in the same area, were fed similar diets, and were exposed to natural daylength to 13 weeks of

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age. In November at 13 weeks of age, 48 birds from each strain were placed into two bird cages at a research facility, where light was constant at 16 hours per day.

The birds were kept in an environmentally controlled room with temperatures varying between 16-26°C with an average between 20-22°C. All birds were fed a commercial grower ration (12.1 MJ ME/kg and 180 g crude protein/kg) until 19 weeks of age, followed by a commercial layer diet (11.6 MJ ME, 179 g crude protein and 35 g calcium/kg) for the remainder of the experimental period. Feed and water were available ad libitum.

Birds were weighed at two-week intervals, commencing at 17 weeks of age and continuing through to the end of the experiment at 45 weeks. Egg production was recorded daily and accumulated to provide weekly figures. Egg weight was measured weekly (all eggs from a particular day were weighed) while feed consumption was calculated from 20 to 44 weeks.

Also included in the results and discussion section are references to the Lohmann White-LSL standard. The data provided is obtained from the management guide provided by Lohmann Tierzucht, and is used to provide a comparison for the bantam cross bird.

III. RESULTS

(a) Comparison of bantam cross with commercial Lohmann Brown

Table 1. Summary of production parameters of the bantam cross and the commercial Lohmann Brown to 45 weeks of age.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Layer strain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lohmann Brown</td>
</tr>
<tr>
<td>Body weight at 45 weeks (kg)</td>
<td>2.08</td>
</tr>
<tr>
<td>Ave. feed consumption (gm/bird/day)</td>
<td>120.6</td>
</tr>
<tr>
<td>Ave. number of eggs / hen housed (weeks 20-44)</td>
<td>157.4</td>
</tr>
<tr>
<td>Average egg weight (gm)</td>
<td>60.3</td>
</tr>
<tr>
<td>Egg weight / 45 week body weight ratio (gm/kg)</td>
<td>29.0</td>
</tr>
<tr>
<td>Feed conversion - kg feed / dozen eggs</td>
<td>1.55</td>
</tr>
<tr>
<td></td>
<td>2.08</td>
</tr>
<tr>
<td>Mortality (including culls) (%)</td>
<td>10.5</td>
</tr>
</tbody>
</table>

* significant difference at P<0.05
** significant difference at P<0.001

(b) Summary of bantam cross characteristics

(i) Body weight

At 13 and 45 weeks of age the bantam cross had an average body weight of 991 and 1641 respectively. The bantam cross was significantly smaller (P<0.01) than the Lohmann White-LSL standard and the trial Lohmann Brown (Figure 1).
Figure 1. Average body weight of the bantam cross (▲), Lohmann Brown (■) and Lohmann White-LSL standard (●).

(ii) Egg production

The bantam cross had high levels of egg production, peaking at 96% at 26 weeks of age and averaging approximately 90% from week 27-45 (Figure 2).

Figure 2. Average egg production of the bantam cross (▲), Lohmann Brown (■) and Lohmann White-LSL standard (●).

(iii) Egg weight

The bantam cross had an average egg weight of 57.3 grams from 21 to 44 weeks, which is almost identical to the Lohmann White-LSL (Figure 3).

Figure 3. Average egg weight of the bantam cross (▲), Lohmann Brown (■) and Lohmann White-LSL standard (●).
IV. DISCUSSION

The average body weight of the bantam cross at 45 weeks of age was 1.64 kg. Despite the large reduction in body weight (21% at 45 weeks) compared to the Lohmann Brown, the reduction in both egg weight (5%) and production (3.7%) were relatively small. It is anticipated that the production performance can be further improved by backcrossing to the commercial strain whilst retaining selection for the bantam traits, and providing a diet that more closely meets the bird’s nutritional requirements.

The lower average egg weight in the bantam cross bred than in the two Lohmann birds was not unexpected as egg weight is generally correlated with bird weight. However, the ratio of egg weight to body weight in the bantam cross (34.9 g/kg as compared to 29.0 g/kg in the commercial brown egg layer) illustrates the large egg size relative to body size of the former.

Feed consumption of the bantam cross was 11% lower than that of the Lohmann Brown and feed conversion was slightly, although not significantly, better. The increased recognition of the importance of feed conversion efficiency in egg production suggests the possibility of commercial use of bantamised layers if such can be demonstrated to be superior in this regard. Additional research will be directed at producing bantam crosses smaller than those produced in this trial. For example, a cross between the bantam White Leghorn male used in this trial and a commercial White Leghorn female (mature body weight of 1.8 kg) would produce a female F1 with a mature weight of approximately 1.4 kg.

REFERENCES