

# Research and development into the viability of a one hundred per cent organic ration for organic table birds within a silvo-poultry system

J. O'Brien, C. Aspray, and L. Philipps

**Abstract – The study was conducted on a commercial organic table bird enterprise to investigate the impact of feeding a one hundred per cent organic feed ration to organic table birds. Performance of birds on the one hundred per cent diet was compared with that on a commercially available eighty per cent organic feed ration (and after a change in regulation an eighty-five per cent organic ration). In the first section of the trial the performance of two different bird strains (ISA 257 and colourpac) was investigated during the summer season, and in the second section the performance of a ISA 257 strain was investigated during the winter season. Agronomic and welfare factors as well as production traits were considered. The first section of the trial revealed no overall health, growth or welfare concerns or increases in production costs when comparing the two rations. Some minor differences were identified between the two strains of bird. The second section of the investigation is still on going, but there are early indications of a increase in cost and larger differential in performance for birds on the one hundred per cent ration, when compared to the spring/summer trial.<sup>1</sup>**

## INTRODUCTION

In August 2005 the derogation allowing the use of up to a 20 per cent non-organic component in the ration of broiler chickens (table birds) was reduced to 15 per cent. Prior to this change, the derogation was set for removal. Due to concerns that the removal of this derogation and a subsequent change to rations would impact on the nutritional quality of the ration, resulting in poor animal health and welfare and a drop in the quality of the final product, the reduction to 15 per cent was put in place. The primary concern relates to the amino acids in the ration; in particular methionine, which is important for bird growth, and is supplied, in the most part, through the non-organic component. There was, and still is, a perception that the ingredients used to supply methionine do not have a suitable organic substitute. There were, and are, also fears that moving to a wholly organic ration will increase the cost of production, through increased feed costs, and reduced performance, negatively impacting on the finances of a system that operates within narrow profitability margins. Research with organic laying

flocks suggests that performance can be maintained on 100 per cent organic rations (Rose *et al.* 2004). The aim of the investigation was to conduct a series of trials on a commercial organic table bird enterprise to investigate the impact of a 100 per cent organic feed ration when compared with a commercially available 80/85 per cent organic feed rations. Agronomic and economic factors, nutritional requirements, welfare, production traits and behaviour of the birds were considered, in both summer and winter periods. In the summer section of the study, the performance of two strains (ISA 257 and colourpac) was also investigated.

## METHODOLOGY

In the summer section of the investigation, two trials were undertaken investigating the impact of the 100 per cent organic rations on 500 mixed sex and strain bird flocks. The trials were undertaken over the period March to May and April to June 2004, at Sheepdrove Organic Farm, Lambourn, Berkshire, UK. Birds were reared to the Soil Association standards, housed in two identical brooder houses, with one house fed on 80 per cent and the other on 100 per cent organic rations, both with starter crumb and finisher pellet components. The feeds were supplied by Humphries Farms Ltd, Hampshire, with the nutrient formulation of the 100 per cent ration prepared so it was as similar as possible to the 80 per cent ration. The birds were moved to two field sheds in the same field, with each shed split to house 100 and 80 per cent ration birds in separate areas. In the winter section of the smaller flocks of 100 birds were housed in four small sheds and only ISA 257 birds were used. Winter trials are on going; January 2005 trials are completed with January 2006 trials on-going.

Data collection included weekly live weights, behavioural observations, and gait scoring one week prior to slaughter. At slaughter, on-line flapping, feather damage and cleanliness, contact dermatitis, dressed carcase weight, and carcase quality and conformation were assessed.

## RESULTS AND DISCUSSION

*Agronomic and economic factors*

J. O'Brien, C. Aspray, L. Philipps; Elm Farm Research Centre, Hamstead Marshall, Newbury, Berkshire, RG20 0HR, UK. [josie.o@efrc.com](mailto:josie.o@efrc.com)

To date statistical analyses have been conducted on the data from the summer section if the investigation only.

A hierarchical model found no significant difference in final live weights between the two strains. There was a statistically significant difference between the two ration types ( $p < 0.05$ ) with a significantly lower average weight for the birds on one hundred per cent ration with an average difference (reduction) of 114g. In terms of production this difference is very small and the similarities in the population distributions of weights are more striking than the differences (Figure 1). A hierarchical model conducted on the dressed carcasse weights produced results similar to live weight, but with significant differences between the genotypes ( $p < 0.05$ ), with a significantly higher weight for the colourpac birds and a significantly lower weight for the birds on 100 per cent ration, an average difference of 65g. As with live weight, these differences were small and the similarity of is more notable than the differences.

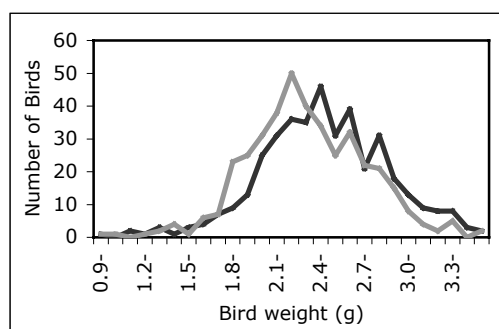


Figure 1. Population distribution of live weight (g) (weighed on day 69/70 and 72, for the two rations, grey – 80 per cent, black – 100 per cent).

There was a difference in feed consumption between the two rations with a clear trend for lower consumption on the 100 per cent ration. These differences in weight and feed consumption in this trial translated into differences in the average cost per kilo for the average dressed carcasse weight (£/kg). Despite an increase in price to purchase the 100 per cent organic ration, this was not reflected in the cost of production. In terms of £/kg of dressed carcasse weight the birds on the 100 per cent ration were cheaper to produce, excluding mortalities. The difference in £/kg of dressed carcasse weight was 3 pence for the first summer trial and 2 pence for the second. This was primarily due to their lower feed consumption. This is contrary to expectation as research with layers and 100 per cent rations has shown that despite comparable production to those birds on 80 per cent rations, there was a cost increase due to feed costs and feed consumption levels on an 100 per cent organic diet (Rose *et al.* 2004).

#### *Behavioural health and welfare factors*

Behavioural observations were only carried out during the summer phase of the investigation. Observations carried out indicated a few sporadic significant differences between strains and ration types, but clear no trends. Increases in cannibalistic be-

haviours could indicate a nutritional deficiency. However, there was virtually no incidence of cannibalistic behaviour observed and was no difference between the strains and rations. There were no differences in the gait score between strains or ration type and low level gait score throughout all the flock, indicating good leg health.

#### *Carcasse condition findings*

There were several differences between the two strains in carcasse condition. There was a significant difference between the amount and severity of on-line flapping, with more severe flapping in the colourpac birds. However, ISA 257 birds had a significantly higher prevalence of red wing tips and wing haemorrhaging on their carcasses. ISA 257 birds were also found to be significantly less clean, and had more feather damage and back bruising than colourpac birds. However, these were generally at low levels. The ISA 257 was found to have better carcasse conformation when compared with the colourpac. There were no differences between the two strains for the following conditions: skin blemishes, breast blisters, breast and leg bruising and, footpad and hock dermatitis. Due to the small difference between the strains in the summer trial and a difficulty in obtaining two strains, only the ISA 257 was used for the winter trial.

The results of the winter trials will be discussed in more detail in the presentation but early indications suggest an increase in cost and larger differential in performance for birds on the 100 per cent ration, when compared to the summer trial.

#### CONCLUSIONS

The summer section of the trial revealed no overall health, growth, behaviour or welfare concerns or increases in production costs when comparing the 80 and 100 per cent organic rations, contrary to the assumption that nutritional inadequacy would result on the 100 per cent ration. There were some small differences between the two strains of birds; but it is concluded that both strains of bird are suitable for production with either ration. The winter section of the trial is on going, but there are early indications of an increase in cost and larger differential in performance of birds on the 100 per cent ration, when compared to the summer trial.

#### ACKNOWLEDGEMENT

We would like to thank Sheepdrove Trust for supporting this work, the University of Bristol, Clinical Veterinary Science team and our colleagues at Elm Farm Research Centre for their help and advice.

#### REFERENCES

Rose, S.P., Craig, L. and Pritchard, S. (2004). *British Poultry Science* **45** S63-S64.