On Farm Feeding

Poultry Trial: Wholegrain Wheat in the Commercial System

Background

The ever increasing price and decreasing availability of oil has a major affect on the price and availability of imported and processed animal feeds across all sectors. Organic produce is often seen as niche and expensive. If organic producers continue to use feedstuffs produced in an oil expensive fashion they will become exactly that.

Organic systems aim to operate in an ecological and economical way, importing cereals grown thousands of miles away, processed at a mill and then transported again to our farms is costly in oil and therefore money. It is neither ecologically nor economically sustainable. British farms are capable of producing a large amount of high quality cereal, the majority of which is usually sold. Transportation and processing of the grain uses oil and leaves farms vulnerable to market prices.

If farmers could formulate diets and feeding programmes for their poultry and pig systems using home-grown cereals, market variables, oil emissions and costs could be cut dramatically.

The Trial

The use of increased levels of cereals in poultry rations was seen as an important first step for a SOF ration. Work undertaken in by O'Connel and Lynch in Ireland for the National Steering Group for the Organic Sector[1] gives suggested maximum levels of cereals in table bird rations which range up to as high as 60% for wheat. These figures, however, are for processed cereals included in the ration and not whole grain. Information on whole grain suggested that up to 30% is broadly beneficial for the bird and improves the efficiency of utilisation of the balancer diet, other marginal benefits or disbenefits are not generally significant. Birds are known to positively select for increasing quantities of whole grain as they grow older in choice feeding scenarios and this is strongly influenced by the protein in the balancer. In one study where the balancer diet had 270g/kg crude protein birds were selecting 55% whole grain at 35-42 days old[2].

Objectives

This trial looked at the possibility of feeding 30% whole grain wheat as a finisher diet in the commercial system at Sheepdrove. The wheat was home-grown so transport and processing costs and emissions were immediately eliminated. No adjustment was made to the formulation of the compound feed so it represented the simplest form of on farm feeding. The cereal was fed as whole grain as it requires minimal energy and labour, it has also been muted as an important feed for poultry as it has been suggested that it improves the digestive tract of the bird, ensuring good digestion of the grain and a more beneficial microflora.[3]

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[1] O'Connell, K and Lynch, B. (2004). A report commissioned by The Partnership Expert Working Group (a sub-group of the National Steering Group for the Organic Sector) 31 May 2004 Teagasc, Moorepark, Co. Cork http://www.agriculture.gov.ie/organics/publications/organic_poultry_report.pdf

[2] Sahin, A., Yldrm, H. Kava, S., Canogullar, S. & Bavlan, M. (2001) Selection of whole wheat by broiler chickens in semi-commercial experimental conditions. *Journal of Animal Production* 40(1): 8-20

[3] Gabriel, I., Mallet, S., Leconte, M. Fort, G. & Naciri, M. (2006) Effects of whole wheat feeding on the development of coccidial infection in broiler chickens until market-age. Animal Feed Science and Technology 129(3/4): 279-303

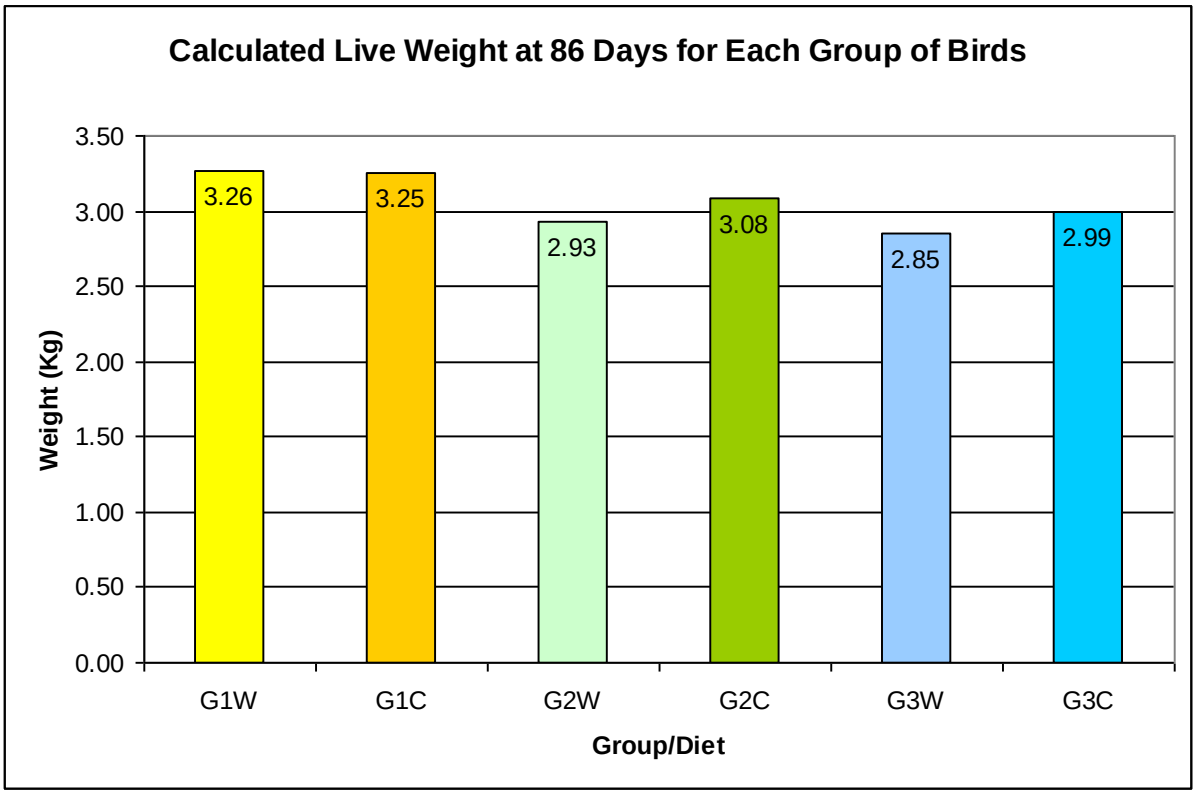
The key objectives were

- To establish whether birds finished to target weights in the given time period.
- To establish the economic and ecological value of feeding home produced wheat.
- To ensure that SOFs' high welfare standards were maintained.

6,600 birds were used in this trial. Three different age groups of 2,200 birds were split into 2 equal groups, one group were fed the control diet of 100% bought in concentrate, the second group were fed 70% bought-in concentrate and 30% wholegrain wheat. Wheat was introduced to all the birds at the same time, the birds were therefore different ages when they were introduced. This was done to see how early it could be included in the ration without affecting production parameters. The wheat was available in 30% of the feeders in the house, it was measured and recorded to ensure it was being eaten at a rate of 30%. A sample of birds from each shed were weighed weekly. Carcass information is from slaughter house data.

Results

Group1 birds were slaughtered at the intended age of 86 days. Group 2 birds were slaughtered at 84 days and Group 3 birds at 79 days. Calculations to correct to an 86 day live weight were made using Microsoft Excels function FORECAST for a superior comparison



There is no statistical difference between Wheat fed (W) and Control (C) birds within any group.

Target carcass weights are between 1.4 and 2.4 kg. In each group more wheat fed birds fell into the correct weight zone than the control birds.
Carcass quality was not affected by the inclusion of wheat from any age

Emissions

	kg CO^2 (e)	MJ
Control(10 t processed concentrate)	570	8,060
Trial (7 t processed concentrate, 3 t wheat from SOF)	401	5,642
Saving made by Trial Diet	**169**	**2,418**

Approximately 30% less energy and CO^2 would be used when 30% SOF grown wheat is included in the ration. Over a year this would reduce Sheepdrove's carbon footprint by 8.8 tonnes

Economical

The cost is expressed as the cost to finish one batch of birds (2200 birds from 4 weeks to 12 weeks of age), 30% whole grain wheat being included from week 6. Labour costs are shown as differences from the 'normal' control costs. Loss of income through not selling wheat is not taken into account; cost of wheat is entered as zero as no extra costs are incurred by using it at home instead of exporting it. Estimation of labour cost would be 0.16 hours per day including the use of a vehicle which would be about £15/hr to feed four feeders in one shed.

Diet	Cost of Feed	Labour Cost	Total for 12 week finishing	Actual Cost
100% Concentrate	£340/t	0	£3,773	**£3,773**
70% Concentrate	£340/t	0	£2,924	**£3,063**
30% Wheat	£0	£15/hour	9.3 hours = £139	

The saving per batch of birds is £710, if one batch is finished each week this is an annual saving of £36,920. However, wheat is usually sold from Sheepdrove. The average price for wheat was £180/t at the time of the trial and this affects the cost saving calculated above by £19,936 per year. If this loss is included the annual saving is £16,984.

Discussion

- None of the groups showed a significant difference between carcass weights of Wheat fed and Control birds within a group regardless of length of time the 30% whole grain wheat ration was included.
- Including 30% whole grain wheat could reduce the cost of production by £36,920 per annum as well as reducing Sheepdrove's carbon footprint by 8.8 tonnes per year.
- Birds on the mixed diet did not show any reduction in welfare, there were no carcass bruises, hock burn or foot pad lesions. It can be argued that the welfare was increased because birds had a choice of feeds.
- No affects on the carcass were reported by the Sheepdrove Processing Team although no specific measurements were taken

The On Farm Feeding, Poultry Trial: Wholegrain Wheat in the Commercial System project was carried out in association with Sheepdrove Organic Farm and we are very grateful for their help

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