



CASE STUDY: White House Livestock & Energy (BROILERS)

Can home-grown faba beans substitute soya in the broiler ration?

White House Livestock & Energy Ltd ran a feeding trial comparing a standard soya-based broiler diet with one where 10% of the soya was replaced with UK-grown faba beans.

Farmer Will Wastling, who rears 330,000 broilers alongside pig and arable units near Hull, is committed to continual improvement and sustainability across the business. When ABN invited him to participate in the NCS project, he saw an opportunity to explore whether faba beans could be a viable alternative protein source.

With sustainability goals in mind and broiler margins under pressure, Will was keen to understand whether homegrown protein sources could reduce reliance on imported soya without compromising bird performance.

The White House trial was run across three crops of birds concluding in late 2024. It involved a simple swap from the usual soya-based pelleted food provided by ABN to one that replaced 10% of the soya with UK-grown faba beans.

The trial aimed to expand understanding of how raw whole field beans can be integrated into modern commercial broiler diets. The goal was to assess their potential as a partial replacement for soya bean meal - quantifying their impact on bird performance, flock economics, and feed manufacturing processes. While field beans are not new to poultry nutrition and are commonly used at low inclusion rates, they are typically incorporated at higher levels in processed forms and blended with other raw materials such as rapeseed. These trials focused on the use of raw whole beans to evaluate their viability in a more sustainable and cost-effective feeding strategy.

“One of the key challenges from the trial’s feed production standpoint was the integration of an additional bulk raw material into the feed mill,” explained ABN’s Brian Kenyon. “Managing bulk deliveries, bin capacities, and aligning stock levels with fluctuating demand proved to be a complex balancing act.”

Will’s main concern was uncertainty around performance especially at a time when margins are under intense pressure. Through the NCS project, ABN was able to underwrite performance outcomes, significantly reducing the risk and providing reassurance during trial implementation.

The only change to management of the birds during the trial was additional observations to spot any changes to litter which may indicate challenges to the birds’ gut health which may require environmental changes. However none were needed and Will observed that litter was actually drier, suggesting health and welfare benefits.

Over the three crops within the trial performance was best with the first and declined slightly over the subsequent two crops. This could be explained by the changing season and reduced temperatures. Overall performance was good, and food intakes were consistent, but food conversion ratio was lower compared to the soy-based ration. This led to birds being two to three days behind their growth targets and therefore smaller at 33 days at 1.7kg rather than the usual 1.95kg expected. However, the quality of the birds was slightly improved with lower rates of pododermatitis, hock burn or breast blisters which meant lower rejection rates by the processor.

Although growth rate and FCR were moderately affected, welfare improvements and consistent intakes demonstrate that raw whole beans can be incorporated at modest inclusion rates without causing digestive or behavioural problems.

Importantly, the trial highlighted that processing may be key to unlocking higher performance. Antinutritional factors naturally present in raw beans may limit digestibility suggesting that processing could help to close the performance gap.

Table 1 summarises the performance impact of bean inclusion, comparing it with a broader dataset across multiple poultry trials including this one.

Table 1: Performance summary

	Control		Raw beans	
	Site	Overall*	Site	Overall*
39 day live weight (kg)	2.551	2.585	2.513	2.571
39 day FCR	1.666	1.639	1.679	1.687
Mortality	4.75%	4.02%	2.96%	3.32%
European Production Efficiency Factor (EPEF)	374	389	372	378

* Average across all sites participating in the trial

Carbon differences

Data from all the NCS project broiler trials was analysed by project partner Farm Carbon Toolkit. This highlighted that bean-fed birds consume around 3.6% more feed than control groups. However, the bean diet had a considerably lower carbon footprint (1169 kg per tonne of feed compared to 1371 kg) than the control diet

containing more soya. As bird weights from both diets were virtually identical, performance of both diets was equal, allowing a fair comparison of carbon efficiency. This showed that even with the higher quantities consumed by the bean-fed birds carbon emissions were 12% lower than those fed the control diet.

Table 2: Carbon cost of bean fed birds vs control (data from across all NCS broiler trials)

	Beans	Control
Feed consumed per bird (kg)	4.615	4.455
CO ₂ +LUC* (CO ₂) per tonne of feed	1169	1371
Carbon value of feed consumed	5.39	6.11
Live weight (kg)	2.678	2.679
Carbon cost (of feed) per kg liveweight gain	2.01	2.28
Full carbon cost** per kg live-weight gain	3.45	3.81

*LUC = Land Use Change

**Full carbon cost also includes emissions from manure and other elements



Next steps

Further trials began at White House Farm in November 2025. This new phase focuses on extruded field beans where processing is expected to reduce antinutritional factors, improve protein digestibility and support overall bird performance.

In the future Will says he will consider growing beans on the arable unit if it can be profitable. "At the moment it is an unreliable crop of low value because of the lack of market, but if the project can succeed in driving demand for beans it could be viable in the future."

"It's always good to look at possible improvements first hand by running our own trials. Previously it didn't feel possible or viable to reduce our soya use, but as a business we have sustainability goals so getting involved was important to us. If in the next round of trials we can maintain our target weight then – subject to cost – it will be a good step forward."

Will Wastling, Farmer

White House Livestock

- Coniston near Hull, Yorkshire
- 333,000 broilers
- Pig unit and arable enterprise
- Broilers produced for Clive Soanes and Sullivans.

NCS Project

Nitrogen efficient plants for Climate Smart arable cropping systems (NCS) is a four-year £5.9m research programme aiming to enable UK farming to bring about a reduction of 3.4MtCO₂e p/a or 54% of the maximum potential for the industry through increased production and use of pulses. Led by PGRO it involves 200 UK farms and 17 partners. The project is funded by the Farming Futures R&D Fund: Climate smart farming, part of Defra's Farming Innovation Programme. Defra is working in partnership with Innovate UK who are delivering the programme.

