All-Party Parliamentary Group on Science and Technology in Agriculture

Notes of a Meeting held on Wednesday 22 March 2023

Meeting Room M, Portcullis House and via Zoom

The UK animal feed sector – innovation, sustainability and Net Zero

In attendance:

Chair:
Julian Sturdy MP

Guest speakers:
James McCulloch, Head of Animal Feed, Agricultural Industries Confederation (AIC)
Nick Major, Corporate Affairs Director, ForFarmers
Keiran Whitaker, Founder, Entocycle
John Knight, Technical Director, SugaRich

Attendees:
Ed Barker, AIC; Ollie Szyszka, Defra; Joss Wallace, Defra; Jim Godfrey, farmer/NIAB Trust; Duncan Barker, FCDO; John Royle, NFU; Allan Wilkinson, HSBC; Roger Vickers, PGRO; Dr Craig Lewis, Genus/PIC; Matthew Doran, CLA; Becky Smith, NFU; Stefano Brizzi, BASF; Dave Ross, Agri-EPI Centre; Rick Bruintjes, Defra; Chris Jackson, UK TAG; Rob Hill, Rothamsted Research; Jim Duncumb, Syngenta; Geoff Mackey, Chamerion; James Black, Bacton Pigs; Prof Louise Manning, Lincoln Univ; Jordi Camp, Genus; Rosie Beevor, Defra; Joe Brennan, UK Flour Millers; Seren Kell, GFI Europe; Emily Guest, ADAS; David Roberts, JIC; Dhan Bhandari, AHDB; Jennie Wilson, Trade Roots; Georgia Mitrousia, Rothamsted Reseach; Helen Riordan, Defra; Jon Foot, Genus; Olivia Seccombe, British Sugar; Rachel Davis, Defra; Sophie Butler, Agri-Tech E; Diego Durantini, Agri-Tech E; Emma Bradbury, NSA; Prof Helen Sang, Roslin; Henry Clifford, Defra; Jo Gatcliffe, AB Agri; Ros Lloyd, NIAB; Daniel Pearsall, Group Co-ordinator.

1. Introduction

Julian Sturdy (JS) welcomed guest speakers and attendees to the meeting, briefly introducing the topic for discussion. He noted that the UK animal feed industry was a sector often overlooked for its economic significance not only in providing the high-quality nutrition to support a productive and efficient livestock industry, but also as a major consumer of the arable crops grown on Britain's farms. The session was an important opportunity to hear more about the progress and innovation taking place within the feed industry to address environmental sustainability and Net Zero objectives, and to highlight the importance of new technologies, for example in unlocking the potential of novel feed additives to reduce methane emissions in ruminant livestock, and in developing viable sources of home-grown protein to reduce the UK's dependence on imported feed ingredients. As crop and livestock farmers in the Republic of Ireland and on the continent face restrictions on their farming activities in response to the Net Zero agenda, JS highlighted the importance of demonstrating how science and innovation can help deliver on sustainability objectives, rather than punitive measures which harm livelihoods and economic activity.

2. Guest speakers

(Copies of guest speakers' slides are available to download via the Meetings section of the All-Party Group web-site www.appg-agscience.org.uk)

James McCulloch, Head of Animal Feed, Agricultural Industries Confederation (AIC)

James McCulloch (JMcC) provided an introduction to AIC and the UK animal feed sector.

He highlighted growth trends UK in production and demand for compound feed over the past 30 years, of which 53% was currently produced from home-grown raw materials and 47% from imported raw materials *("as local as possible, as global as necessary")*.

He pointed to the potential for increased use of pulses (peas, beans, lupins) as an area for development as a source of home-grown protein.

JMcC highlighted the importance of innovation in the feed sector to deliver Net Zero, noting that feed inputs currently account for 85% of carbon emissions in the pork sector, and for 72% in both the poultry meat and eggs sectors.

Describing the current and potential areas for innovation to improve the sustainability of the feed sector, JMcC pointed to:

- the continued development of responsible sourcing initiatives for commodities such as soybean meal and palm oil;
- the use of co-products from food and biofuel processing;
- the use of former food products;
- the use of feed additives such as enzymes and methane inhibitors;
- the potential role of novel, low-carbon protein streams such as insects, algae;
- the use of consistent Life Cycle Analysis data and metrics to measure the feed sector's impacts and pass this information on to farmers.

Looking further ahead, he highlighted prospects for more sustainable innovation in the UK feed sector, for example by using green energy for feed production, introducing blockchain systems, robotics and AI to improve efficiency, as well as using electric vehicles for transport and distribution of animal feed ingredients and products.

Nick Major, Corporate Affairs Director, ForFarmers

Nick Major (NM) described in more detail the animal feed industry's contribution to improved sustainability in three key areas: measuring and improving environmental impact; alternative proteins; and methane reduction.

NM outlined the feed sector's longstanding involvement in developing harmonised methodologies for measuring and calculating the environmental impact of feed using Life Cycle Analysis, and also ensuring the resulting datasets are freely available. Building on equivalent global and European LCA initiatives, AIC's European member association FEFAC led the development of PEFCR (Product Environmental Footprint Category Rules) for feed for food producing animals, setting out the agreed methodology to calculate the environmental impact of one tonne of compound feed delivered to the farm.

NM also pointed to the critical need for feed manufacturers to understand the environmental footprint of the raw materials used to produce each tonne of feed, which was provided through the not-for-profit company GFLI (Global Feed LCA Institute). GFLI was established by the global

feed industry to develop a database of environmental emissions data for nearly 1500 raw materials, freely available to download and covering a wide range of environment impacts in addition to carbon emissions. He also highlighted the importance of ensuring policymakers are aware of these resources and do not duplicate them or re-create work that has already been done.

Alongside the initiatives already in place to source imported proteins more responsibly, NM explained that a key opportunity for the feed industry to reduce its carbon footprint was by switching to alternative feed materials, ranging from novel algae and insect proteins to more conventional sources – eg using the advances made possible through the new Precision Breeding Act to develop home-grown protein supplies, such as N-fixing legumes and pulses as a win:win for farmers and the environment. He also pointed to the potential reintroduction of Processed Animal Protein (PAP) in UK feedstuffs, noting that the EU has already reauthorised its use in feed for opposite species, eg poultry PAP to pigs and vice versa, which could undermine the competitiveness of UK producers. NM observed that this was clearly a sensitive issue in view of the past history of BSE and meat and bonemeal, but it was also an area where safe use of by-products and the feed circularity opportunities involved could help reduce the environmental impact of raw material demands and pressures elsewhere. He therefore urged policymakers to take decisions based on the scientific evidence, allowing the feed industry to develop those circularity opportunities as appropriate and in response to market demand.

Turning to the issue of methane mitigation, NM noted that a number of feed-related measures can help reduce methane emissions. Improving feed quality and intake, lower fibre feeds and higher starch and fat diets all have a role to play, as do methane reducing feed additives which can be synthetic chemicals, natural supplements and compounds, such as tannins and seaweed, or fats and oils. To date, in UK legislation, no feed additive has been authorised for the function of delivering environmental benefits by reducing methane emissions, and a fit-for-purpose UK system to provide a regulatory pathway for such products is urgently needed to help deliver on Net Zero ambitions.

Keiran Whitaker, Founder, Entocycle

Keiran Whitaker (KW) introduced Entocycle as one of the founding members of Insect Industry UK, bringing together producers, genetics companies and technology specialists in a sector growing rapidly globally, but in which the UK - having previously a world leader in the science - is now falling behind due to regulatory barriers not constraining the industry elsewhere.

KW noted that recent economic forecasts suggest that the insect sector is set to become an $8-12bn global market by 2030, and a recent report from Tesco predicted that demand for insect meal from the UK pig, poultry and salmon sectors could reach 540,000 tonnes/year by 2050.

KW explained that 95% of the global insect industry currently is focused on the black soldier fly, for a number of reasons: it is hungry and fast-growing, increasing in size 8000x in 14 days; it is omnivorous, eating a wide range of substrates; it is high in protein (40-60% when processed); and it provides a low carbon alternative, reducing GHG emissions compared to other protein feed sources by being produced locally. The benefits of farming black soldier fly larvae include turning waste into a valuable resource, producing low carbon, high protein feed and improving animal nutrition, and also enhancing crop production using the remaining insect frass (excrement) as a source of fertiliser.

KW set out three key regulatory challenges preventing growth in the insect sector in the UK:

- The UK is behind the EU, which approved insect PAP for use in pig and poultry feed in 2021, having already approved its use in aquaculture and pet food in 2017. The UK only permits feeding of live larvae to pig and poultry and insect PAPs to fish. With political support, rapid UK approval could be secured by leveraging EFSA risk assessments and

EU legislation, enabling the UK sector to catch up in terms of legislation and the opportunity to scale up production;

- Secondly, because insects are classified as farm animals, animal by-products cannot be fed to the insects, limiting overall feedstocks and growth potential for the industry, even though it would be entirely natural for the insects to feed on this material *("a 2 million year-old product for the 21st century").* KW explained that an FSA commissioned study is evaluating this issue, although progress is slow. Accessing new feedstocks, especially from supermarket and supply chain waste, would be transformative in terms of growth potential and reduced costs for the farmed insect industry.

- Thirdly, the ability to use raw frass as a nutrient-rich fertiliser by creating a legal definition and conditions for its application. The EU has done the work, requiring frass to be sterilised at 70ºC for one hour or composting – KW suggested that the UK could adopt the same legislation, enabling frass to be used as an alternative to synthetic fertiliser.

KW indicated that pressure for regulatory change in this area was attracting widespread support, including from leading food retailers such as Tesco, M&S and Morrisons. He explained that Government action to address each of these three challenges would accelerate uptake of insect protein, reducing current feed sector carbon emissions, increasing supply chain resilience by reducing import dependence, and providing a diversification opportunity for farmers. With the right incentives, eg through ELMS and by providing incentives for farmers to diversify, the UK still had the opportunity to regain its global lead in the farmed insect sector.

John Knight, Technical Director, SugaRich

John Knight (JK) introduced the UK Former Foodstuffs Processors Association (UKFFPA), set up 10 years ago by the FSA as a vehicle to deal with food waste by promoting its use in animal feed. He explained that UKFFPA represents, defends and promotes the interests of the former foodstuffs processing industry, and provides guidance to members in sourcing and producing safe former foods. Members handle over 650 000 tonnes per annum which represents over 90% of the former foods being processed in the UK. Using former foodstuffs (or unintended products) as animal feed saves the equivalent of 750,000 tonnes of wheat, enough to make 1.4 billion loaves of bread, and requiring a land area the size of the Isle of Wight.

He noted that former foodstuffs can either be fed unprocessed, such as bread, or formulated into highly palatable, high-energy feeds, and are often used by nutritionists in youngstock and grower rations.

JK explained that the Waste Framework Directive in 2018 provided clear guidance on the waste hierarchy, and clarified the potential use of former foodstuffs as animal feed (and its regulation as such) rather than classifying it as food waste.

In terms of sustainability, JK noted that nearly twice the amount of CO2 is saved by using former foodstuffs in animal feed rather than as a feedstock for biogas production. Furthermore, in 2021 the GFLI database listed UK former foods as having an environmental impact of between 0.03 and 0.16 Kg CO2 eq/ Kg of product, lower than UK wheat at 0.43 and significantly lower than imported palm oil at 9.23 Kg CO2 eq / Kg of product.

JK also noted that UKFFPA members continue to seek improvements in the efficiency and environmental sustainability of their operations, for example by embracing new digital solutions and telemetry to record and transfer information about the quantity and nutritional profile of former foodstuffs awaiting collection.

But JK indicated that a significant volume of former foodstuffs is still going to waste in the food retail and processing sectors. UKFFPA is working with Government and industry to raise

awareness within the foodchain and where necessary seek further regulatory change. He also identified potential synergies with the insect farming industry.

3. Questions and discussion

The following key points arose during questions and discussion.

The need for regulatory equivalence in UK agriculture compared with other countries, otherwise innovation and investment will take place elsewhere and UK producers will be at a competitive disadvantage.

Discussion of the key breeding targets needed to drive increased production of home-grown pulses, from agronomic factors to oil content and palatability/digestibility of the protein fraction.

The need to differentiate between, or factor in, embedded carbon as well as carbon emissions in calculations of the carbon footprint associated with different feed sources.

Concluding the meeting, JS thanked guest speakers and attendees for their contribution to an informative and thought-provoking session, not only highlighting the strategic significance of the UK animal feed sector and the progress taking place to deliver Net Zero, but also emphasising some of the policy and regulatory changes needed to deliver even more sustainable innovation in the feed sector.