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Farming insects in the UK

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Farming is always changing, with new crop varieties, livestock breeds, and management techniques developing every year. Insect farming is one of the newest farming innovations, with benefits throughout food supply chains. Insect production has many advantages; efficient creation of protein, less food waste, less air and water pollution, fewer livestock welfare issues, lower risk of diseases, and reduced environmental consequences of intensive farming. This inspired the United Nations' FAO and other institutions to initiate insect farming.

On the 4th April 2017, a workshop was held in London to explore the future of insect farming in the UK and to identify the priorities going forward. Organised by ADAS, with support from the British Ecological Society Agricultural Ecology group, the Royal Entomological Society, and the Woven Network, the workshop attracted nearly 100 delegates, including academic researchers, start-up companies, livestock feed suppliers, and NGOs.

The day was divided into two sessions; in the morning invited speakers provided summaries on progress being made in insect production, and the current legislative and practical obstacles. There followed an open 'Industry Showcase' slot, where current businesses had the opportunity to summarise their work. In the afternoon session, the attendees identified the key areas to be addressed, before breaking into small groups to identify the key priorities and next steps.

MORNING SESSION

Insects have always been part of agriculture. We rely on pollinators to grow many horticultural crops, and we use predatory insects to control crop pests. Honeybees have been part of our food supply chains for thousands of years, and silk production continues to influence what we wear. Already there are shrimp, lobsters and crabs on supermarket shelves, and the potential for other arthropods, including insects, to join them is becoming highly likely. In the morning session there were talks from Nick Rousseau, the Managing Director of Woven, Dr Sarah Beynon from The Bug Farm and Grub Kitchen, Rachel O'Connor from Michelmores, Francesca Lotta from Bird & Bird, and Jo Wise from Monkfield Nutrition.

[The Woven Network](#) – Nick Rousseau



Woven is a membership organisation that seeks to support those working on insects for food and feed. Based in the UK, but with an international membership, the network acts as an industry focal point to galvanise this innovative farming industry and academic community. Insect production has many advantages; efficient creation of protein, less food waste, less air and water pollution, fewer livestock welfare issues, lower risk of diseases, and reduced environmental consequences of intensive farming. This inspired the United Nations' FAO and other institutions to initiate insect farming. While there is great potential for insects to become a significant component of our food supply chains in the UK and globally, those involved face many challenges. The Woven network has been established to understand these challenges and work with the community to develop solutions.

[The Bug Farm and Grub Kitchen](#) – Dr Sarah Beynon and Andy Holcroft

[The Bug Farm](#) is a 100 acre working farm, research centre and visitor attraction all about invertebrates “bugs” and sustainable agriculture, based in the heart of the Pembrokeshire Coast National Park. As well as engaging with the public on all things entomological, the farm also hosts the [Grub Kitchen](#) – which always has insects on the menu.

[Legal challenges of using insects in Animal Feed](#) – Rachel O'Connor

Insect meal is a potential alternative source of protein for use in animal feed currently being considered by the United Nations and the European Union. At present, however, there is no specific legislation which outlines the use of insect meal in animal feed and existing legislation governing the use of animal products in feed is very much a product of the BSE crises and prohibits processed animal protein in animal feed. Almost all legislation governing food supply chains (including animal feed) is derived from EU legislation. The cornerstone of food law is the protection of human life and legislation adopts a pre-cautionary approach to the composition, production and distribution of animal feed. Together with additional UK legislation and orders from the Food Standards Agency, strict rules apply to all aspects of feed production. It is expected that by the end of 2017, the EU will have amended legislation to allow some insect meal to be used in aquaculture feed. This will be a

significant first step towards developing the use of insects in livestock feed. It is anticipated that in order to bridge the legislation gap post Brexit that the UK will elect for a wholesale adoption of existing EU laws on animal feed rather than consider new and UK focussed feed law. This would bypass the opportunity for a detailed review and revision of UK animal feed to permit new sources of protein derived from insect meal in livestock feed which may not be revisited for some time. Even as the separation of UK and EU law develops, there will be an ongoing need for UK legislation and feed standards to remain complimentary to EU legislation in order to protect trade within European markets.

Legal aspects of insects for human consumption – Dr Francesca Lotta

In the UK there is not a set list of insect species deemed to be suitable for human consumption, though the Food Standards Agency acknowledge that several insect species are being sold in UK markets as food. The approach to edible insects differs between countries, and ranges from complete bans to defined species and processes that are allowed. When farming insects, the same rules apply as for any other livestock. In particular these dictate what insects can be fed in order to minimise the risk of spread of diseases. For example, current legislation prohibits use of waste product, including catering waste. At present, the living and killing conditions of farmed insects is not regulated at EU level, since they are not covered by vertebrate regulations on animal welfare, transportation and slaughter. Following the entering into force of Regulation 2015/2283 ("New Novel Food Regulation") insects for human consumption are officially considered as novel food and need to be authorized before being placed on the market. This requires that products go through Food Safety Assessment, performed by the European Food Safety Authority (EFSA). Depending on the level of information needed and the procedure chosen, this process can be costly and time consuming. The products must be shown to not pose a safety risk to human health, not mislead the consumer, and not be nutritionally disadvantageous for the consumer. Products must also comply with marketing rules; e.g. clearly stating any allergens, and in communicating any nutritional advantage of health effects to the consumer.

Practical challenges behind insect farming in the UK - Jo Wise

Monkfield Nutrition starting breeding live food 25 years ago, and are now producing around 4 million insects a week. The main insects farmed are crickets; originally *Acheta domesticus*, but this was wiped out across Europe and America by the denso nucleo virus. Now black crickets, banded crickets and silent crickets are more commonly farmed, as well as locust, meal worms and a few others. The main challenges to insect farming are legislation (see above) and costs; site, heating and ventilation, labour, and materials. Site costs represent a large initial cost, but saving can be made where bespoke design improves efficiencies, especially in heating and ventilation. Labour costs are heavy for all agricultural practices and insect farming is no exception. To cover this, UK markets may end up paying a premium for UK product insect products. There is a lot of scope to improve on materials used that increases production and processing efficiencies; for example identifying an alternative to egg card as a growing medium, improving feed inputs, and improving conversion of insects to a sellable product. Greater integration with engineers will be needed for this.

INDUSTRY SHOWCASE

International Insect Centre – Marian Peters

The International Insect Centre is a network organisation based in the Netherlands, with the goal of connecting all parties with an interested in contributing to the introduction of insects as feed and food.

Davidsons Animal Feeds – Gary Dow

Davidsons is a family run SME since 1969, delivering 200,000 tonnes of animal feed per year. They are involved in 29 projects in the UK and Europe on topics ranging from engineering to sustainability. Davidsons are looking for new opportunities and partners in the animal feed sector.

Bug Bakes Ltd. – Alexander Lamond

Producing insect based dog treats for the UK market.

Eat Grub Ltd. – Shami Radia

Eat Grub source and sell edible insects, host insect food events, and develop new insect recipes. Their mission is to bring tasty insect dishes to the British palate; spread the word about this under-used food and its benefits; and value sustainable food.

Wyebugs – Mike Copland

Wyebugs already mass produce insects for the biological control market based in Kent at Wye Campus. Facilities available at the site, alongside experts in insect production, are well suited to conversion for insect farming. Contact Mike Copland for more details.

Agri-Food and biosciences Institute, Belfast – Archie Murchie

The risks posed by introduction of the black soldier fly *Hermetia illucens* for protein production and waste management are minimal. It is unlikely to persist in the wild in Ireland and is not considered a pest species or a particular threat to native biodiversity.

AFTERNOON SESSION

A number of issues were raised in the meeting that need to be considered by the insect farming industry. Eight key issues were drawn out and discussed in detail by groups during the afternoon, and each group identified the top priorities that needed addressing.

Topics	Priorities
Marketing and awareness	Raise the profile of insects as food with children, and to farm insects in the UK to ensure low food miles.
Food safety	Establish protocols and documentation for insect production.
Legislation (human consumption)	Create consortia to apply for novel food authorisation.
Legislation (livestock feed)	Begin discussion with government to gain clarity.
Insect farming resources	Maintain network to connect entrepreneurs, experienced insect farmers, and investors.

Economics and technology	Draw together our collective expertise and experience of insect farming and make it available for start-ups. Establish an open innovation approach to involving other such as engineers to assist in building solutions to the challenges of large scale farming of insects.
Insect feed substrate	Improve access to existing research and improve communication across interested parties.
Research and development	Identify the research needs and establish ongoing research themes.

CONCLUSION

Over the last 5 years focus has shifted from the notion of insects as a temporary novelty to a genuine opportunity to diversify our food supply chains. This has been reflected in pending revisions to European and UK legislation, and increasing engagement from current food supply industries. By 2018, insects will be permitted in aquaculture for the first time, and novel food legislation will be ready to assess insects for human consumption. This workshop highlighted the need for ongoing research in this area, as there is still much to discover about how best to safely produce insects at a scale sufficient to compete with existing products. Collaboration will be important, and there will be a vital role for the government and NGOs to engage with the innovators and early adopters who aim to lead the UK into this new era of farming diversification.

This workshop was made possible through the support of the [British Ecological Society Agricultural Ecology group](#), the [Royal Entomological Society Entomophagy group](#), the [Woven Network](#), and [ADAS](#).

ADAS provides advice and solutions to the agri-food industry on securing [resilient and sustainable supply chains](#). Insect food and feed products will need to compete with established supply chains, and therefore will be subject to the same requirements of traceability and accountability. Our experience in assessing sustainability, risk and resilience in global supply chains, and developing sustainable production systems in crops and livestock enable us to support clients develop their business through delivering:

- High quality research
- Policy/strategy development
- Monitoring and evaluation
- Impact assessments
- Market assessment and industry intelligence
- Project management and facilitation








If you would like to know more about the prospect of insects in food and feed supply chains and how it might impact your business please contact [Mark Ramsden](#).

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