

INSECT BIOCONVERSION REFORMING THE FOOD SYSTEM

FERA EXPERTISE



REDUCE
REPURPOSE
REDISTRIBUTE
REASSURANCE

Repurposing Surplus Waste
for Systematic Change



Original thinking... applied

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Fera has led insect biomass R&D technology in the UK and EU for the past 10 years and has a strong international reputation. That reputation translates to excellence in regulatory understanding, insect breeding & rearing, process quality assurance and product certification.

To better support clients, Fera has recently launched its insect research laboratory. As the only purpose build insect unit in the UK, and one of only a few in Europe, Fera is in a unique position to offer companies looking to reduce their waste and therefore their environmental footprint, with insect bioconversion solutions that help solve the challenge of producing insects at industrial scale.

INTRODUCING FERA'S EXPERTS



ANDREW SWIFT



MAUREEN WAKEFIELD



JESS BARKER



ADRIAN CHARLTON



ROSARIO ROMERO



KATHARINA HEINRICH

FERA AND INSECT BIOCONVERSION

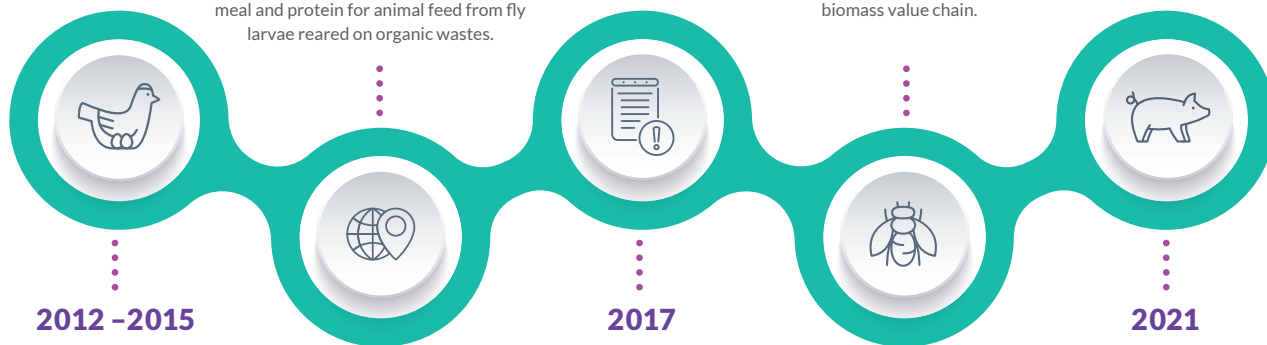
The timeline below demonstrates Fera's expertise and experience with key projects and important regulation changes in industrial insect applications

2013 - 2016

PROteINSECT, an EU FP7 funded project led by Fera, with partners across Europe, China & Africa establishes the feasibility of obtaining high quality & safe insect meal and protein for animal feed from fly larvae reared on organic wastes.

2018 - 2020

Fera chairs the UK Task + Finish Group on insect biomass Conversion, representing key stakeholders across the insect biomass value chain.



2012 - 2015

ABAgri & Fera conduct a project funded by The Technology Strategy Board to investigate the potential of fly larvae as a source of protein in poultry feed.

2017

The European Commission adopt a Regulation amending the TSE Regulation: Regulation (EU) N° 2017/893, partially uplifting the feed ban rules regarding the use of insect processed animal proteins (PAPs) for aquaculture animals. This new EU legislation was adopted on 24 May 2017 and the authorisation was officially applicable from 1st July 2017.

2021

Following a vote of EU members, the European Commission amends the regulation (EU) No 2021/1372 to allow the use of insect PAPs in poultry and pig feed effective from September 2021 for EU Member States.

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Dr Andrew Swift

Chief Executive Officer

Andrew, CEO of Fera, is responsible for all aspects of the Fera business. A Doctor of Philosophy (PhD), Chemistry, University of Manchester and a graduate of the London Business School Executive Development Programme, Andrew brings his scientific expertise and strong commercial acumen to support the future success of Fera's innovative insect research laboratory.

An adept and inspirational leader of global intellectual teams, Andrew's scientific expertise is in analytical chemistry and the life sciences. Throughout his career Andrew, has consistently delivered business success and impact from investment science and has an outstanding track record of achieving strong growth globally.

“ Insect protein production can be a big part of the solution to the global protein deficit for sustainable rearing of livestock. This innovative and 'clean' industry has huge economic and environmental potential, and the launch of Fera's insect research laboratory is a move to help businesses take advantage of this opportunity. ”

Dr Maureen Wakefield

Principal Scientist (Entomology)

Maureen is a research entomologist with 30+ years' experience. Her current research interests focus on the potential use of insects as a novel source of protein for animal feed and other high value materials, as well as integrated pest management of agriculturally important invertebrate pests and invasive species.

Maureen is co-leading the launch of Fera's insect research laboratory.

For the last 10 years, her research has focussed primarily on insects as a novel source of protein for animal feed and for other high value materials with an emphasis on insect rearing methodologies and nutrition. Maureen is an experienced project manager



who has led commercial, government and European Commission funded projects and was a partner in Fera's co-ordinating team for the EU FP7 project PROteINSECT.

“ Insects are adapted to growing on low-value feedstuffs and manures whilst producing high quality protein and fat in a relatively short period. The potential is evident and significant. ”

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Jess Barker

Business Development Manager

Jess, Business Development Manager for Fera, brings her commercial acumen and sustainability expertise to lead on growing and developing business for Fera's innovative insect research laboratory. A graduate (BSc) in Geography, University of Plymouth, Jess has over 11+ years in the commercial arena with a specific focus on sustainability and the circular economy.

Jess has spent her career working in agribusiness and agriculture with a particular focus on science and innovation, to ensure long term sustainability and circularity within these industries. Her recent appointment as Business Development Lead for Fera's innovative insect research laboratory comes after previous roles at Corteva Agriscience and Dupont.

“ I am delighted to be a part of the collaborative team at Fera, the powerhouse of scientific research, combining world class science research in partnership with industry and I am looking forward to working closely with our clients to ensure they achieve their goals and objectives. ”

Dr Adrian Charlton

Principal Scientist (Biochemistry)

Adrian, a protein biochemist with a particular focus on food safety, has 20+ years' experience and has over 60+ peer-reviewed publications. Adrian's current work focuses on food safety, surveying the main classes of contaminants that are regulated in the human and animal feed supply chain as well as the potential allergens in both food and feed. A Doctor of Philosophy (PhD), Biochemistry, University of Sheffield, Adrian is a leading specialist for Fera's innovative insect research laboratory.

Adrian has spent his career investigating the control and regulation of adulterants, contaminants and allergens that threaten a sustainable food and feed supply chain. His research has used analytical approaches such as nuclear magnetic resonance (NMR) spectroscopy and high-resolution mass spectrometry (HR-MS) to develop rapid and holistic testing methods for a range of food and feed chemicals.



“ Fera's innovative Insect Research Unit will conduct analyse of insect larvae to establish nutritional profile and the quality of the elements produced such as protein, oils, fats and chitin. Safety testing will be undertaken to ensure the absence of any harmful materials. This work plays to Fera's strengths in research and practice. ”

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Rosario Romero *Science Lead in the Food Programme*

Rosario, a senior scientist working on food quality and safety, with particular focus on novel foods and alternative proteins. With a PhD in Biology, Rosario is a leading specialist for Fera's innovative research unit. Rosario has been working with Fera for 12+ years.

Rosario has a background in biomedical research with 25+ years' experience in cell biology, protein biochemistry, proteomics and is currently leading work on applications of protein tools and technologies to food research, with a specific interest in developing proteomics methods for food authenticity and safety issues.

“ Fera's innovative insect research laboratory will conduct extensive testing of the insect products, whether it be protein, fats, oils, chitin, or frass to ensure the required quality is produced and to ensure the absence of any harmful materials. ”

Katharina Heinrich *Senior Scientist / Higher Analytical Chemist*

Katharina, a senior scientist with particular focus on food safety and authenticity, has 20+ years' experience and over 15 peer reviewed publications. Katharina's current work focuses on analytical chemistry across various food safety and authenticity programs, including vet drug, stable isotope and CBD analyses; especially antibiotics in milk and honey.

With an MSc in Chemistry, University of Cologne, Katharina is a leading specialist for Fera's innovative insect research laboratory.

Katharina is a senior scientist at Fera, responsible for the project management and delivery of stable isotope analysis, for a wide range of matrices (from agricultural produce to insects) within Fera's Food Authenticity and Profiling



team. In her current role, Katharina also supports Fera's training activities, and other teams across the site, with her analytical chemistry expertise.

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Mike Barnard *Senior Scientist & Delivery Manager*

Mike is a scientist with a background in human and animal nutrition, food systems, and policy. He has a keen interest in using insects as feed. Mike's previous work at the University of Glasgow included developing novel foods and feeds for the dairy sector to improve the nutritional quality of

milk and dairy products. Mike is the Delivery Manager and Senior Scientist for Fera's insect research laboratory and is responsible for daily operations and project delivery. Having previously managed large teams in the catering and hospitality sector, Mike returned to education to follow his interest in

food, science, and nutrition, receiving a BSc (Hons) in Nutrition from the University of Nottingham and a MRes from Queen Margaret University in Nutrition and Food Policy. He has conducted funded work on novel feeds for insects and brings his expertise in entomological nutrition to the lab.



Giuseppe Fiamingo *Insect Colony Technician*

Giuseppe is an agronomist with a keen interest in novel farming and food technologies. He has a Master's and Bachelors with Honours Degree from the Mediterranean University of Reggio Calabria in Agricultural Science and Technology. Giuseppe is an Insect Colony Technician in the Fera insect research laboratory.

Previously a crop scientist, Giuseppe conducted work on vertical farming and finding ways of trying to produce our food more sustainably. Giuseppe decided to join the Fera team to expand his knowledge of insect bioconversion and learn about the future of insects in a circular economy.

Jack Murrie *Insect Colony Technician*

Jack is a zoologist whose interest lies in the potential use of insects as a viable protein source for use in animal feed. He has a Bachelor's with Honours Degree from the University of Hull in Zoology and is an Insect colony Technician in the Fera insect research laboratory.

Jack is responsible for the day to day running of insect colony breeding and rearing activities and experimental work. Jack discovered his interest in insects whilst studying in Brazil and is keen on expanding and conducting work on insect bioconversion at Fera.



Charles Brakspear *PhD Student*

Charles Brakspear is a postgraduate researcher (PhD) with a background in entomology and he has a passion for the black soldier fly. His current research focuses on the use of insect frass as a sustainable fertiliser and biostimulant.

His current research investigates the impact of frass-based fertilisers on the bacterial and fungal populations in soil and whether frass amendment has the potential to control fungal pathogens such as *Fusarium oxysporum* and *Verticillium dahliae* in tomato. Charles hopes to join the Fera insect research team full-time after the completion of his PhD.