

Sheffield  
Hallam  
University

National Centre  
of Excellence for  
Food Engineering

**COLLABORATIVE**

**PARTNERSHIPS**

**SUSTAINABLE**

**INNOVATIONS**



# HOW CAN WE HELP YOUR BUSINESS?

**Our vision is to be internationally recognised for excellence in sustainable innovations for the global food system.**

We have a mission to drive vitality, sustainability and growth in the global food system by working with our partners through research and innovation.

We aim to deliver world-class capability, innovative sustainable food systems, technology-led solutions and sector competitiveness by working with businesses across the sector to deliver creative solutions to industry challenges.

We use our extensive industry knowledge, pioneering technical expertise and world-class facilities to help keep the UK at the forefront of food and drink manufacturing, as well as supporting global food supply chains to deliver sustainable, healthy food.

At the National Centre of Excellence for Food Engineering (NCEFE), we deliver across four distinct research themes:

- Healthier lives
- Digital connectivity and technology
- Food system sustainability
- Feeding a growing population

With a focus on these themes, we'll work with you to solve real-world problems and improve your business performance.

## HEALTHIER LIVES

“Food engineering research can help improve quality of life by creating new product innovations, including plant-based alternatives and developing processes that reduce the salt, fat and sugar content in consumer diets. Our food safety driven work with New Food Innovation, explores reformulation of products using novel ingredients, advances in plant-based proteins and innovation in appetite regulation, which all positively impact consumer health.”

*Dr Caroline Millman, Senior Lecturer and Research Theme Lead for 'Healthier lives'*



## DIGITAL CONNECTIVITY AND TECHNOLOGY

“Industry 4.0, the Internet-of-Things (IoT) and Artificial Intelligence (AI) will revolutionise the food industry, improving energy efficiency, increasing productivity and enhancing food safety. The combination of connected sensors, advanced computer vision systems, robotics and automation will aid quality assurance processes, production optimisation, and food product tracking throughout the supply chain. Here at NCEFE, we're applying these technologies and principles in our work with Koolmill, QSS Ltd and Rakusen's, improving food processing operations to ensure consistent product output and quality.”

*Dr Alex Shenfield, Associate Professor and Research Theme Lead for 'Digital connectivity and technology'*

## FOOD SYSTEM SUSTAINABILITY

“In a world seeking solutions to its energy and environmental challenges, future food systems need to be smarter and innovative. An interconnected global strategy for controlled and optimised use of resources would encourage sustainable, equitable and eco-friendly food production. Our work at NCEFE is about bringing scientific research and innovation directly to industrial processes with a focus on sustainability and energy efficiency. We are advancing the sector with partners such as Koolmill and ZECK Ltd.”

*Dr Hongwei Zhang, Deputy Director, National Centre of Excellence for Food Engineering*

## FEEDING A GROWING POPULATION

“Feeding the world's growing population requires process innovation across the sector, including new ingredient sources, energy efficient techniques and waste minimisation and valorisation. The NCEFE laboratory and pilot scale food processing facilities allow extensive collaboration with business partners to resolve these technological challenges. Our work with traditional businesses such as Rakusen's, improving sustainability while retaining heritage, is one of the ways we are helping to sensitively transform food manufacturing.”

*Dr Bipro Dubey, Senior Lecturer and Research Theme Lead for 'Feeding a growing population'*

# THE STRENGTH OF OUR COLLABORATIONS



NATIONAL CENTRE OF EXCELLENCE FOR FOOD ENGINEERING

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“NCEFE is at the forefront of sustainable innovations for the food sector. As Chair of the Industrial Advisory Board, I can see first-hand the impact across the strategic research themes and the strength of the Centre’s industrial collaborations, upon which the industry’s future competitiveness depends.”

*Tim Finnigan, Chief Scientific Adviser, Quorn Foods and Chair of the NCEFE Industrial Advisory Board*

“Sheffield Hallam’s National Centre of Excellence for Food Engineering is a valuable asset to the UK food and drink industry, and their research into supply chain sustainability, healthier diets and digital connectivity are vital to feeding a growing population. Collaboration between manufacturers and academic institutions such as NCEFE is important to create a resilient, healthy and sustainable food system of the future.”

*Jayne Almond, Director of Policy and Corporate Affairs, Food and Drink Federation*

## NCEFE is a catalyst for innovation, forward thinking and problem-solving.

We enable the development of unique collaborations between manufacturers, specialist engineers, government and industry stakeholders, academics, researchers and scientists to meet challenges in food and drink manufacturing with ground-breaking solutions.

Our sector expertise means we are perfectly placed to see things differently, close skills gaps and bring together the right collaborators for every challenge. With every project, as well as helping individual businesses and the wider sector, we’re also always enhancing our own understanding and developing our research and expertise.

Based in Sheffield, South Yorkshire, the research-led centre includes pilot-scale production facilities, laboratories, workshops and teaching spaces. Collaborators and students can also access the plant room – the beating heart of the facility – to control and study the building’s bespoke environment.

## WE’RE CONNECTED TO THE WHOLE INDUSTRY

We work very closely with specialist sector organisations, including the Food and Drink Federation, New Food Innovation and the National Skills Academy for Food and Drink. We’re also active members of the KTN Food Sector Advisory Group. So whether you need advice on manufacturing or talent development, we know exactly who to ask.

We’ve already helped Greencore, Arla, Quorn and Nestlé, as well as a host of smaller, independent businesses such as Henderson’s Relish, Dext Heat Recovery, ZECK Ltd and Koolmill. Talk to us about your challenges and we’ll help you develop solutions to overcome them.

By working together to tackle your specific problems, we’re not only helping your business, we’re also developing technology and thinking that is revolutionising the whole food and drink sector – securing the UK’s position as world leaders and strengthening the industry for businesses like yours to thrive.



We have experts in process engineering, digital technologies, sustainable energy solutions and novel ingredient processing. Plus, we have the state-of-the-art facilities and equipment needed to produce and test any solution we create.



# SUSTAINABLE INNOVATIONS



“Sustainable innovations can be achieved through technical advances in processes, equipment or systems, whether this be through a structured approach to continuous improvement, the application of leading-edge processing capability or the effective utilisation of automation and robotics. All these are key considerations of the work of the National Centre of Excellence for Food Engineering and where our researchers have created impact for industry partners such as Greencore and Nestlé.”

*Professor Martin Howarth, Director, National Centre of Excellence for Food Engineering*

“This international consortium is one of the most ambitious projects we’ve ever embarked upon. With 13 partners across the UK and India, effective collaboration and communication is critical to our success. That’s where our relationship with Sheffield Hallam really comes into its own. NCEFE’s experience of complex partnership working, collaborative research and technical expertise put us in a strong position. Our outcomes could really transform the future of rice milling”.

*Alec Anderson, Managing Director, Koolmill*



“Our ambitious partnership with NCEFE has created the potential to transform the UK dairy industry. The University’s leading reputation for research and delivery of advanced process control combined with our industrial partners’ knowhow positions us as leaders in the field. The development of new milk processing technology will be a major achievement but the integration within the supply chain will really set our work apart.”

*Ryan McNeil, Nestlé UK*

“We developed and patented a new form of process heating technology which has enormous potential to offer zero carbon emission and provide a substantial upgrade to food manufacturing security within the sector. We needed the independent expertise of food engineering professionals to rigorously investigate our claims. The team at NCEFE were extremely knowledgeable and were able to provide that validation. We have gone on to develop further collaborations on new technologies and can only see this partnership developing further in time.”

*Marc Hayes, Director, ZECK Ltd*

**NCEFE offers a wide range of services and support. From research and consultancy tailored to individual businesses across a range of engineering disciplines, to expert advice on funding.**

Our state-of-the-art facility combines flexible, cutting-edge production space and a range of equipment with workshops and technical food engineering-focused laboratories.

Once we understand your specific challenges, we use our specialist knowledge to find the most cost-effective way to fund collaboration. We have a successful track record of securing funding through research councils, Innovate UK (the UK's national innovation agency) and other sources of finance. Our PhD and masters students offer a wealth of specialist expertise.

# EVERYTHING YOUR BUSINESS NEEDS UNDER ONE ROOF

“We had created a new technology that could not be tested to any normative standards, so we approached Sheffield Hallam to gain some independent validation to offer to our potential first client. The client had indicated they were prepared to trial our system if it proved viable. Sheffield Hallam seemed best suited to our needs – lateral thinkers and able to work around our budget and timescale. The initial work exceeded our expectations, and we have since established a close working relationship with the team – they are our ‘go to-guys’ for any viability or improvement studies and CFD modelling.”

*Dr Gareth Evans, Technical Director, Dext Heat Recovery*



## OUR FOOD ENGINEERING SERVICES:

- Process engineering to improve nutritional value
- Energy management and reclaiming waste energy (including heat)
- Process control and simulation
- Automation and robotics
- Food rheology
- Product formulation
- Waste reduction
- Thermo-dynamics modelling
- Net zero systems
- Industry 4.0 and AI

## SHEFFIELD HALLAM UNIVERSITY AND THE FOOD AND DRINK SECTOR

The food and drink system is at the centre of dramatic changes — from food security, net zero, health and evolving lifestyle trends to the rise of digital solutions and sustainable practice.

We have a successful track record of collaboration with the sector to find ways of working that address challenges through skills, research and innovation across all parts of the University including food and nutrition, supply chain, product and packaging design, leadership and management and health and wellbeing.

# DEVELOPING TALENT FOR THE FUTURE

NCEFE is committed to delivering excellence in the learning and development of the current and next generation of the global food system's engineering innovators.

The University houses specialist engineering and food laboratories, and the centre contains state-of-the-art facilities that enable students to participate in advanced-level research.

Our offer includes:

- Co-delivery of five higher and degree apprenticeships
- Post-graduate and doctoral research training programmes
- Student internships and placement opportunities
- Talent development and continuing professional development for food industry professionals

Our offer is designed in close partnership with sector experts, including the National Skills Academy for Food and Drink, the Food and Drink Federation and high-profile companies such as Cranswick, Asda, Premier Foods, Samworth Brothers, Co-op, 2 Sisters, Morrisons and Fox's Biscuits.

Our strong links with leading organisations ensure we can provide real-world examples that support academic studies and broaden industry knowledge, through case studies, factory site visits and guest lectures. Many of our partners offer industrial placements to students studying at Sheffield Hallam.

All learners have access to our world-class facilities and become part of a dynamic, industry-focussed academic community. By educating the professionals of tomorrow, we can ensure highly qualified engineers enter the industry with the confidence and knowledge to help grow the sector.

## HIGHER AND DEGREE APPRENTICESHIPS

Designed alongside leading industry employers, our programmes combine honours level education with workplace learning to help address technical knowledge and skills gaps in the sector:

- Food and Drink Advanced Engineer
- Food Industry Technical Professional
- Supply Chain Leadership Professional
- Product Design and Development Engineer
- Packaging Professional

Why not get in touch to see how we can support your business? Visit [shu.ac.uk/ncefe](http://shu.ac.uk/ncefe)



## COLLABORATE WITH US

### National Centre of Excellence for Food Engineering

Sheffield Hallam University  
811 Attercliffe Rd  
Sheffield  
S9 2AA

 [business@shu.ac.uk](mailto:business@shu.ac.uk)

 [shu.ac.uk/ncefe](http://shu.ac.uk/ncefe)

 [@NCEFoodEng](https://twitter.com/NCEFoodEng)

 [@national-centre-of-excellence-for-food-engineering](https://www.linkedin.com/company/national-centre-of-excellence-for-food-engineering)



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## CONTACT US

Get in touch to find out how we can collaborate with your business  
 0114 225 5000  
 [business@shu.ac.uk](mailto:business@shu.ac.uk)  
 [shu.ac.uk/ncefe](http://shu.ac.uk/ncefe)