

## PhD Project Advertisement

**Project No/title:** FBS2025 26 Grassby sc / *Sustainable pet food from potato waste: fermentation, nutrition, and consumer acceptance*

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**Co-supervisors:**

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### Project Details

Many pet owners prioritise high-quality food for their cats (obligate carnivores) and dogs (largely carnivorous), often favouring meat-based diets despite their environmental cost. The meat used in pet food is frequently fit for human consumption, raising sustainability concerns. Meanwhile, the UK produces up to 1.8 million tonnes of potato peel waste annually, mostly downcycled into low-value livestock feed. Raw potato peels lack sufficient protein and key amino acids (like taurine for cats) required in carnivore diets. This project will use food-grade microbial fermentation to transform this abundant waste into a nutritious, sustainable ingredient that meets FEDIAF standards. Crucially, it will also investigate whether pet owners would accept such food, exploring how sustainability, price, and perceived health benefits shape purchasing decisions, ensuring the solution is both scientifically sound and market-ready.

**Research aims:** To develop a fermented potato peel-based ingredient for cat and dog food that meets FEDIAF nutritional standards, enhances gut health via probiotics, reduces reliance on meat-sourced protein, aligns with sustainability goals, and is acceptable to diverse pet owners in terms of perceived health benefits, sustainability, and willingness to pay.

**What you will do:** The student will optimise a solid-state fermentation process using food-grade lactic acid bacteria and yeasts to enhance the protein content and amino acid profile, particularly taurine for cats, of potato peels, ensuring alignment with FEDIAF nutritional guidelines. Concurrently, they will investigate consumer preferences through inclusive surveys and focus groups with diverse pet owners, exploring how sustainability claims, price sensitivity, and perceived health benefits shape acceptance. Critically, consumer insights will feed back into fermentation design to align technical development with market needs. The process will then be scaled to a larger solid-state controlled bioreactor, where key parameters (moisture, aeration, temperature) will be refined to ensure batch consistency, safety, and nutritional quality. Year-round access to stored potato peels, supported by Cranfield's postharvest expertise, enables realistic, season-independent testing. All microbial strains will be food-approved to streamline future regulatory approval and commercialisation.

### References:

1. European Pet Food Industry Federation Nutritional Guidelines (FEDIAF) (2024) - <https://europeanpetfood.org/self-regulation/nutritional-guidelines/>
2. Roccatello, R., et. al. (2024). Sustainability of insect-based feed and consumer willingness to pay for novel food: A stated preference study. *Future Foods*, 9, 100336. <https://www.sciencedirect.com/science/article/pii/S266683352400042X>
3. Sabater C., et. al. (2020) Valorization of Vegetable Food Waste and By-Products Through Fermentation Processes. *Front. Microbiol.* 11:581997. <https://www.frontiersin.org/journals/microbiology/articles/10.3389/fmicb.2020.581997/full>

## Student profile

**Essential for project:** A background in practical applied biological sciences (food science, microbiology, biotechnology or similar), equivalent to 6 months full-time in the lab, is essential. This experience can be made up of multiple short periods during study or employment.

**Desirable for project:** Practical experience of microbial fermentation, proximate analysis and/or consumer science and statistics would be desirable. Training in these techniques (and underlying theory) can be provided.

**Minimum requirements for all FoodBioSystems applicants:** An upper 2nd class degree (or equivalent) in a subject relevant to the project. Candidates with a lower class of Bachelors degree, but merit or above at Masters level will also be considered. Demonstrable skills in problem-solving, team-working, communication and time management.

## Training

**Project specific training opportunities:** This transdisciplinary project bridges biosciences and social sciences, offering training in: (1) microbiology—aseptic technique, microbial strain characterisation, and bioreactor design, optimisation and operation (Surrey); (2) analytical chemistry—proximate analysis and chromatography (HPLC, GC-MS) to assess nutritional and functional compounds; and (3) marketing and consumer research—including market segmentation, sustainability framing, and inclusive survey design to explore willingness to pay, perceived pet health benefits, and eco-label credibility. Training will combine hands-on supervision, lab placements, and optional taught sessions. The student will benefit from expertise across the supervisory team: food science (Surrey), postharvest potato storage systems (Cranfield), microbial biotechnology (Surrey), and consumer decision-making and sustainable marketing strategy (Surrey Business School). Occasional visits to Cranfield will support access to fresh potato peel streams and storage infrastructure, ensuring real-world relevance throughout.

**FoodBioSystems training opportunities:** Throughout their studentship, all FoodBioSystems doctoral researchers participate in cohort training that covers four key themes: food systems, big data (data analytics and modelling), business, and research fundamentals. All doctoral researchers complete a placement: either project-related with a non-academic (CASE) partner, or unrelated to the project and outside the academic environment (PIPS). Details of training are available on the DTP website: <https://research.reading.ac.uk/foodbiosystems/training/>.

## Project supervision style

PGRs have an induction with the Doctoral College (Surrey) as well as a local departmental induction. Weekly one-on-one meetings with the primary supervisor (Dr Terri Grassby) for the first 3-6 months, transitioning to bi-weekly meetings thereafter. These will be flexible (in-person/Teams) to provide consistent support. Also, bi-weekly meetings with the broader group to develop a sense of belonging. Formal, minuted supervisory team meetings will be held monthly. Six-monthly formal progress reviews to address any challenges and to monitor progress against objectives and set new ones. These can also highlight any difficulties to the department PGR director. Confirmation viva with two internal examiners at 12-15 months (24-30 months if part-time) to ensure the PhD is likely to be successful. Feedback on manuscripts from the primary supervisor for the first draft (1 month) before the revised draft is circulated to the supervisory team.

## Stipend (Salary)

FoodBioSystems DTP students receive an annual tax-free stipend (salary) that is paid in instalments throughout the year. For 2025/26 this is £20,780 and it will increase slightly each year at rate set by UKRI.

## Equity Diversity and Inclusion

The FoodBioSystems DTP is committed to equity, diversity and inclusion (EDI), to building a doctoral researcher (DR) and staff body that reflects the diversity of society, and to encourage applications from under-represented and disadvantaged groups. Our actions to promote diversity and inclusion are detailed on the [FoodBioSystems DTP website](#) and include:

- Offering reasonable adjustments at interview for shortlisted candidates who have disclosed a disability or specific learning difference.
- [Guaranteed interview](#) and [applicant mentoring](#) schemes for applicants, with UK home fees status, from eligible under-represented ethnic groups who also meet academic eligibility criteria and the student profile essential for the project.

These are opt-in processes.

Our studentships can be offered to home students on a part-time basis, and studentship end date and stipend payments will be amended to reflect the part-time registration. The minimum registration for DTP funded part-time students is 0.5 FTE (studying an average of 20 hours per week over 8 years). We regret that part time registration is not available to international students due to complexities of visa restrictions.

## Funding note

We welcome applications from candidates with Home/ROI fees and international fees status. This studentship is funded by UKRI and covers stipend, fees at Home/ROI rate, and research costs. The host university will not charge UKRI funded international students the difference between Home/ROI fees and international fees.

**Costs that must be found from other sources or met by the individual student include:** visa fees, healthcare surcharge, relocation costs and guarantor services.

**For up to date information on funding eligibility, studentship rates and part-time registration, please visit the [FoodBioSystems website](#).**