

Valorising food waste with insects

A protocol for cross-country comparative research

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Introduction & Aim

Background & Rationale

Europe generates substantial agricultural by-products, food processing side streams, and pre-consumer food waste.

Insects offer a circular bioeconomy solution, converting low-value waste streams into:

- High-quality protein
- Valuable lipids
- Biofertilizers (frass)

Despite rapid innovation, the use of agri-food waste as feedstock in the insect farming sector remains uneven across Europe, shaped by:

- Regulatory frameworks
- Waste feedstock supply chains
- Market maturity
- Climate

Aim

To develop and apply a replicable, mixed-methods research protocol that identifies country-specific barriers and opportunities for insect-based agri-food waste valorisation across Europe.

Research Questions

- What regulatory, economic, and infrastructural factors shape insect farming viability in each country?
- How do waste feedstock supply chains differ across contexts?
- Which ecosystem indicators best predict sector maturity?
- What policy and practice interventions could strengthen circular bioeconomy outcomes?

Methods

Policy & Regulatory Analysis

- Mapping national and EU legislation
- Identifying regulatory gaps and ambiguities
- Comparing feedstock authorisation pathways
- Assessing alignment with EU circular bioeconomy goals

Stakeholder Mapping & Interviews

Stakeholders:

- Feedstock suppliers
- Insect producers
- Buyers (feed producers, pet food manufacturers, farmers, etc.)
- Regulators

Methods:

- Semi-structured interviews
- Influence-interest mapping
- Thematic analysis of:
 - Barriers
 - Opportunities
 - Innovation pathways
 - Perceptions of risk/value

Quantitative Benchmarking

Indicators:

- Waste feedstock availability
- Energy & labour costs
- Market demand
- Regulatory clarity
- Public perception
- Investment landscape

Analytical Tools:

- Comparative dashboards
- Cluster analysis
- Cross-country scoring matrix

Outputs & Significance

Expected Outputs

Country-specific:

- Challenge maps
- Opportunity profiles
- Mitigation strategies
- Stakeholder ecosystem diagrams

Cross-country:

- Comparative dashboards
- Clustered challenge typologies
- Policy briefs
- Recommendations for harmonisation

Significance and Impact

This protocol provides a systematic, replicable framework for understanding how diverse European contexts shape insect-based agri-food waste valorisation. It supports evidence-based policy, infrastructure investment, and market development aligned with EU circular bioeconomy goals.

Conclusion

A structured, cross-country methodology should reveal how regulatory, economic, and cultural contexts shape the viability of insect-based valorisation of agri-food waste. The protocol offers a foundation for harmonised policy, targeted investment, and accelerated adoption across Europe.

If you would like to be involved in this research project please email S.Milliken@greenwich.ac.uk