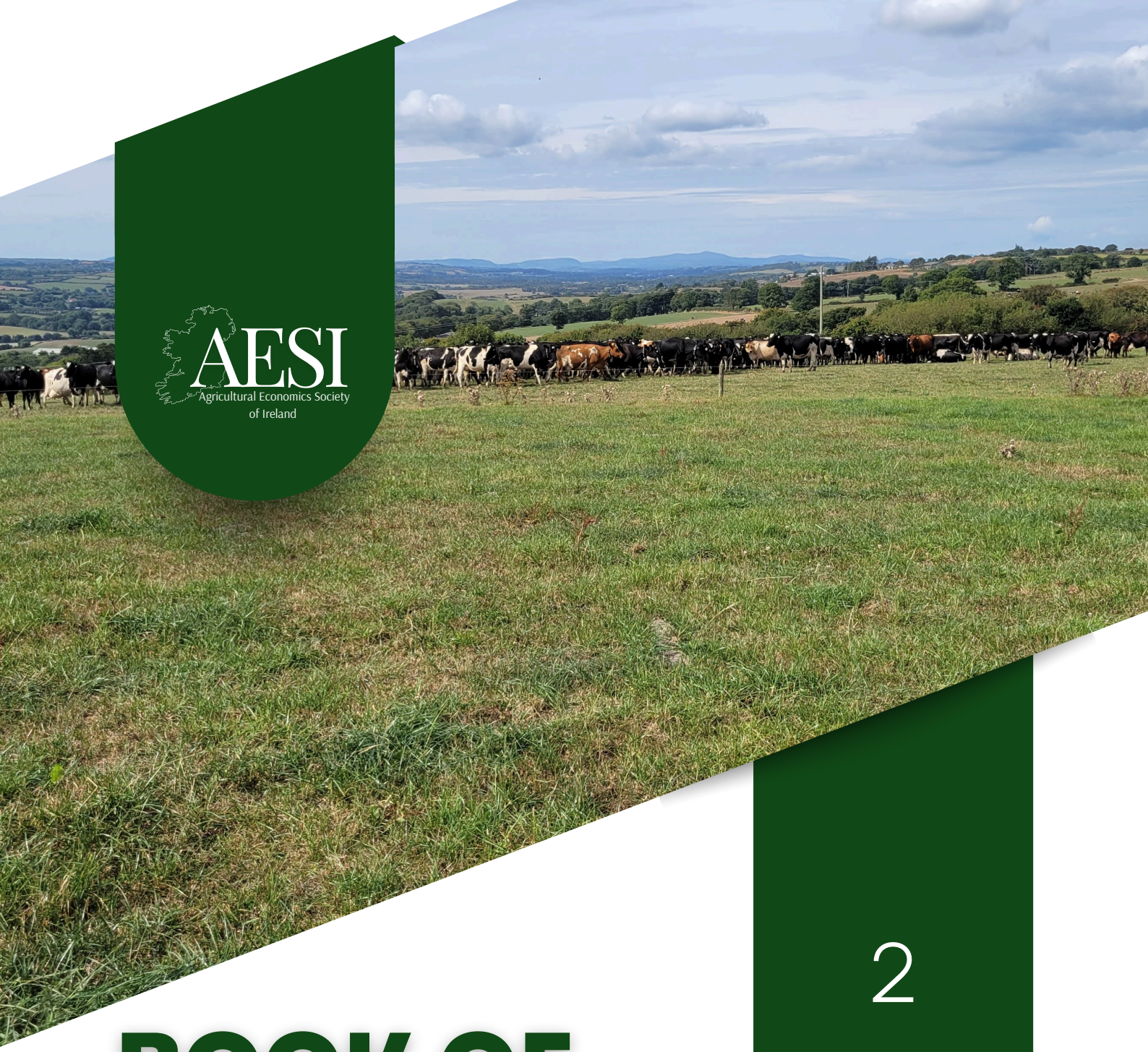

AESI
Agricultural Economics Society of Ireland

BOOK OF ABSTRACTS

AESI Early Career Researcher Day

Teagasc | Ashtown | January 22, 2026

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DISCUSSION SESSIONS

Economic and Animal Health Implications of the New World Screwworm Resurgence in the Americas

Luis Garcia-Covarrubias, *Luis Peña-Lévano, Raul Resendiz-Pozos, Colton Adams*

The resurgence of the New World Screwworm in the Americas poses serious threats to livestock health and agriculture. This paper examines the biological characteristics of NWS, its impact on cattle productivity, and the economic consequences of outbreaks. Using historical eradication data and an input–output model, we estimate direct and indirect losses from infestations and explore policy responses. Preliminary findings suggest that even localized outbreaks can lead to millions in sectoral losses and significant job reductions. These results highlight the urgency of binational coordinated surveillance, biosecurity measures, and sterile insect technique programs to prevent widespread economic disruption.

Regional economic impact of grass yield changes due to climate change on Irish dairy farms

Marie Merlo, *Cathal Buckley*

Climate change is projected to have heterogeneous impacts across regions and sectors. In the Republic of Ireland, annual temperatures, heatwaves and droughts are projected to increase by 2100, which would affect the agricultural sector. Increased temperatures could lead to an increase in grass yields, but grass utilisation could become harder for livestock due to changes in grass growth seasonality. This could change the cost structure of dairy farms, which could use the additional grass to replace purchased concentrate feed but would also experience additional management costs.

This analysis aims to investigate the economic effects of changes in grass yields and growing seasons under five global warming scenarios across NUTS3 regions and soil types in Ireland. For farms with relatively good-quality soils, economic savings occur and are higher in the South of Ireland. For farms with relatively poor-quality soils, savings are higher in the Midlands and North of the country. These geographical patterns hold for all global warming scenarios.

This shows the importance of considering the effects of climate change at a regional level and to take into consideration farm characteristics. Climate change could have heterogeneous impacts in direction and magnitude depending on those characteristics and biophysical attributes of land.

DISCUSSION SESSIONS

What Really Reduces Greenhouse Gas Emissions in Pasture-Based Livestock Systems? A Comprehensive Meta-Analysis

Maurice Osewe, *Donal O'Brien, Maria Markiewicz-Keszycka*

Pasture-based livestock systems are crucial for global food security; however, they also contribute substantially to agricultural greenhouse gas (GHG) emissions. We conducted a systematic review and meta-analysis of 106 empirical studies (comprising 126 effect sizes) that assessed 13 mitigation practices in temperate grazing systems. Using a multivariate random-effects model with robust variance estimation, we quantified standardized mean differences (Hedges' g). Overall, mitigation practices significantly reduced GHG outcomes (pooled g = -2.27; 95% CI -2.66 to -1.89). The strongest reductions were observed for feed additives, nitrification and nitrate inhibitors, improved genetics, and soil pH management. Practices embedded in pasture systems, such as legume-based swards, genetic improvement, and pH correction, were not highly effective but also cost-efficient according to Marginal Abatement Cost Curve (MACC) estimates. These findings provide an empirical basis for prioritizing high-impact, economically efficient interventions in temperate grazing systems, informing both farm management and policy decisions.

Public Decision-Making on Supporting Bioeconomy Innovation in Southwest Ireland

Mina Sadeghzadeh*, Maeve Henchion, Eoin O'Neill*

The development of a sustainable bioeconomy depends on technologies capable of valorising organic waste while reducing emissions, with anaerobic digestion (AD) identified as a priority pathway in EU and national policy frameworks. Yet the successful implementation of AD infrastructure depends not only on technological feasibility but on nuanced, public acceptance. The primary objective of this study is to investigate the public support for AD facilities in the southwest region of Ireland through the application of an extended Theory of Planned Behaviour (TPB). The research employs a behavioural deconstruction approach, distinguishing between passive acceptance (willingness) and active acceptance (intention and support). Using survey data from 405 residents and Partial Least Squares Structural Equation Modelling (PLS-SEM), the study demonstrates that acceptance develops across distinct stages, shaped by different drivers. The factors that influence willingness include attitudes, perceived behavioural control, personal norms, place attachment, and perceived concern, while the factors that influence intention are perceived behavioural control and previous willingness. Active support is significantly shaped by justice, perceived benefits, perceived costs, and intention. The study provides insights into how contextual and psychological factors interact during the decision-making process, which could be useful for stakeholders such as policymakers and developers developing socially responsive bioeconomy plans.

STANDARD PAPER SESSIONS

A Delphi Study to Identify the Key Sustainability Indicators in Irish Horticulture

Anusree Mohanan, *Fiona Thorne, Sinéad McCarthy, Lael Walsh, Thia Hennessy, Mary McCarthy*

This study employs a Delphi methodology to identify which economic, environmental, and social sustainability indicators do experts identify as the most important and measurable for the Irish horticulture sector across three subsectors: top fruits, field vegetables, and protected cultivation. The Delphi method provides a structured, iterative approach for combining expert opinions and is used particularly where evidence is limited and stakeholder perspectives are diverse (Hsu & Sandford, 2007; Linstone & Turoff, 2011).

Although numerous sustainability assessment frameworks exist within broader agriculture, their direct relevance to horticultural systems is often limited, as horticulture presents distinct production characteristics and measurement challenges (Alsanius et al., 2023; Xu, 2022). The absence of consensus on suitable horticulture specific indicators has been highlighted in the academic literature, emphasising the need for developing a horticulture sector specific indicator set to support sustainability assessments (Montemurro et al., 2018; Persiani et al., 2018).

To address this gap, this study engages experts to evaluate a list of sustainability indicators identified from literature. These sustainability indicators were organised using the Pressure-State-Response (PSR) framework, which supports the systematic structuring of indicators and enhances conceptual clarity in sustainability assessments (Binder et al., 2010).

The upcoming Delphi rounds will assess (i) the perceived importance and (ii) measurability of these sustainability indicators, with the goal of developing an informed set of sustainability indicators tailored to the specific needs of Irish horticulture across the three subsectors; top fruits, field vegetables, and protected cultivation.

Spatial assessment of farm-level biodiversity indicators in Ireland

Sofia Tisocco, *Cathal Buckley, Brian Moran, Trevor Donnellan, John Lennon, Emma Dillon*

Preserving and restoring biodiversity and habitat quality are key features of European policies, such as the Common Agricultural Policy (CAP). In Ireland, agriculture plays a critical role in habitat and environmental conservation, given the predominance of agricultural land use. Remote sensing and land cover maps are valuable tools for identifying areas of higher natural value. Previous Irish studies have ranked land cover types using conservation value (CV) scores (0 to 9); however, national biodiversity indicators across farm types remain unavailable. There is a clear need to quantify how farms contribute to biodiversity and landscape management. This study uses the Teagasc National Farm Survey (NFS) to calculate farm-level CV scores and aggregates results across regions and farm systems. The analysis will also explore the factors affecting CV score and biodiversity, including land cover spatiality, regional and climate characteristics. Preliminary results indicate that farms in western regions achieved higher CV scores (4.58–4.34) compared to farms in eastern regions (3.06–3.43). Among farm systems, sheep farms exhibited the highest CV score (5.20), while tillage farms recorded the lowest (2.61). These findings provide a unique approach for estimating national biodiversity indicators and represent an important step toward achieving national and EU sustainability targets.

STANDARD PAPER SESSIONS

An Intervention logic for evaluating the impacts of CAP's direct payments

Paula Palma-Molina, *Emma Dillon, Trevor Donnellan*

The New Delivery Model of 2023-2027 EU CAP brought associated challenges for Member States in terms of monitoring and evaluation. One of the main challenges is the need to report the effectiveness of the interventions included in their national CAP Strategic Plans (CSPs). To support Ministry personnel (Department of Agriculture, Food and the Marine in the Irish case) with CSP reporting requirements, the project team developed an IL of the direct payment interventions included in Ireland's CSP and proposed additional indicators for their monitoring and evaluation based on Teagasc NFS data.

Development of a bio-economic model for studying the effects of biostimulants on spring barley in Ireland

Rumia Basu, *Fiona Thorne*

Agricultural intensification is imperative for meeting the increasing global food demands. However, this has resulted in an increase in use of chemical nitrogen based fertilisers on farms, leading to an increase in greenhouse gas emissions. The agriculture sector in Ireland is a major contributor to the total national emissions. Ireland's climate change mitigation strategies and policies such as the Climate Action Plan, Farm to Fork etc, aim to reduce emission levels in Ireland. In line with such strategies, this study aims to test the efficacy of Plant biostimulants (PBs) as an alternate to chemical fertilisers on yield and nitrogen use efficiency of spring barley and other rotation crops using a bio-economic modelling approach.

The Value Chain Impact of A major Aquaculture and Agri-Food Strategy

Antonina Stankova, *Cathal O'Donoghue*

Ireland's aquaculture sector has been repeatedly identified as a sustainable growth area within national food and climate strategies. Yet its potential contribution to emissions mitigation remains under-assessed in economic and environmental terms. As Ireland's flagship agri-food policy, Food Harvest 2020 (FH2020) positioned aquaculture as a cornerstone of the national "smart, green growth" agenda, linking marine expansion with rural development, export growth, and climate sustainability. This paper evaluates the ex-post effects of achieving the FH2020 aquaculture target - a 78% increase in output, using a disaggregated, environmentally extended Input-Output (IO) model. The analysis covers five subsectors (penned salmon, land-based finfish, suspended mussels, seabed mussels, and oysters) and simulates climate outcomes under a constant-protein substitution with beef. Results show that full target achievement could have avoided approximately 420,000 tonnes of CO_2 emissions while generating higher economic multipliers per unit of protein. The findings confirm the relevance of value chain-oriented IO modelling for aquaculture policy evaluation and highlight the strategic underutilisation of low-emission marine proteins. Embedding aquaculture more fully into Ireland's climate and agricultural frameworks would better align economic development with long-term sustainability goals.

STANDARD PAPER SESSIONS

Measuring the economic sustainability of European livestock production: A participatory approach to develop policy-relevant indicators

De Ponti , Santiago, *Balaine, Lorraine, McGuire, Ryan, Buckley, Cathal*

Although livestock production is a cornerstone of European agriculture, different challenges threaten its sustainability. Established monitoring frameworks have long informed assessments of profitability but may not capture the full set of contemporary economic issues. This study aims at improving measurements of the economic sustainability of European livestock production to better align them with current policy needs. A multi-step participatory approach is proposed. 17 experts were interviewed, and thematic analysis was conducted to derive impact categories, which were prioritised using an internal stakeholders survey. In future steps, indicators will be derived from the top four categories, and an expert survey will be conducted to validate them. The thematic analysis identified contemporary opportunities and challenges, linked to eight impact categories with potential for new indicators development. Challenges for further indicator development were identified. The top four impact categories ranked through the survey were Resilience, Compliance Costs, Risk Management, and Income Volatility. Preliminary results show that decomposing economic sustainability into different impact categories help to explain the sector's current situation. Further indicator development is needed to improve current policy monitoring, although its feasibility will depend on improved data coverage. The ongoing transition from FADN to FSDN represents an opportunity to broaden available metrics.

Integrating Household Budget Survey Data with Teagasc National Farm Survey Data for CGE Modelling: A Propensity Score Matching Approach

Jim Pat Dwyer, Trevor Donnellan, Ole Boysen

My PhD research examines how climate change mitigation policies will impact agricultural productivity, income and welfare in Ireland, using a Computable General Equilibrium (CGE) modelling framework. A significant challenge in the construction of the Social Accounting Matrix (SAM) that is the core database of the CGE model in this work, is the integration of two national-level household surveys that differ in sampling design, variable structure and demographic focus. This presentation focuses on the methodological component of combining these datasets in the database construction.

I employ propensity score matching (PSM) to construct a synthetic dataset harmonising households across the CSO Household Budget Survey (HBS) and the Teagasc National Farm Survey (NFS), matching on demographic, socioeconomic and agricultural characteristics, reflecting micro-level household data while maintaining the national representativeness of the NFS for farming households. Several matching approaches were tested including nearest neighbour and full matching, with performance evaluated using balance statistics and sensitivity analysis. Preliminary results indicate that full matching yields a synthetic dataset that is adequately balanced across the treated and matched control subsamples and crucially retains the representativeness of the NFS. There are however a lack of strong agriculture-specific covariates common to both the HBS and NFS datasets. This may ultimately challenge the robustness of the matching procedure, and I would therefore welcome feedback on my methodological choices and the viability of this statistical matching method.

The presentation will outline the motivation behind the matching approach chosen, discuss trade-offs between the matching specifications and seek feedback both on the method overall and on improving the matching design.

STANDARD PAPER SESSIONS

Generational Perspectives - Investigating Factors that influence the attractiveness of dairy farming

Pádraig Lacey

Generational renewal (GR) is a national and European policy priority aimed to encourage young farmer entry to the sector as well as provide support for farmers who wish to take a step back from farming. GR encompasses more than simply reducing the age of the farming population. It aims to empower a new generation, facilitating future sustainability of farming (DAFM, 2025; ENRD, 2025). The European Commission (2025) states the key objective of GR is to attract and sustain young farmers in rural areas to facilitate sustainable agricultural development. The current mean age of farmers in the EU is 57 years, with 12% of the farming population representing farmers under the age of 40. The EU has set a target for doubling the share of young farmers in the sector by 2040, with a goal of young and new entrants representing 24% of European farmers. Addressing the attractiveness of the sector is fundamental to tackling the GR challenges faced by European agriculture. This PhD sets out to establish perceptions of the attractiveness of dairy farming in Ireland. Ultimately bringing perspectives to the fore in order to address what needs to be done to improve the attraction of farming, what has changed in terms of its attraction and how we can develop a vibrant and attractive sector for the farmers of tomorrow.

Future Farmers – Developing and assessing the potential of collaborative farming models on Irish dairy farms

Diarmuid Delaney

Irish agriculture is facing challenges regarding generational renewal while demand is rising around work life balance and sustainability. Within this, Irish dairy farming is under significant pressure from labour shortages and rising costs. This research explores whether collaborative farming models such as farm partnerships, share farm agreements etc. could tackle these pressures. Using qualitative research such as semi structured interviews with both Irish and New Zealand farmers along with a survey of Irish farmers. The research aims to examine farmers future intentions, their openness to collaborative farming models as well as the social, economic and cultural factors that support a successful collaborative farming arrangement. In the end the research hopes to co-design and assess the financial feasibility of progression pathways suitable for Irish dairy farms.

Research to date suggests that collaborative farming is viewed as a potential way to improve efficiency, reduce workload. However, there are several barriers that this research also mentions such as trust, autonomy and financial uncertainty. This research aims to develop a pathway that farmers can avail of to assess whether collaborative farming would work for their own individual case. Ultimately, the research looks to understand if collaborative farming can help the Irish dairy industry to be more resilient, sustainable and attractive.

STANDARD PAPER SESSIONS

Bioeconomic analysis of intervention strategies to reduce antimicrobial usage on Irish pig farms

***Mayowa Adeleke**, Michael Wallace, John O'Doherty, Peadar Lawlor*

An Excel-based bioeconomic simulation model (PigNutriStrat Model) was developed and used to evaluate the biological and economic outcomes of implementing alternative strategies to reduce antimicrobial use on Irish pig farms. The model integrates herd dynamics, growth curves, nutritional requirements (gestating, lactating and growing pigs), reproduction, labour, buildings and herd health costs. An economics sub-model integrates revenue and cost, linking the biophysical outputs with price projections to assess farm profitability and other financial metrics. In turn, the model's assumptions (input parameters) can be readily varied to assess both direct and indirect effects of intervention strategies.

Three scenarios were assessed using parameter inputs derived from recent empirical studies:
(1) Supplementation of piglets with a milk replacer post-weaning; (2) Use of acid-preserved grain versus conventionally dried grain in sow and grower-finisher diets; (3) Implementation of optimised farrowing pen hygiene.

All intervention strategies reduced antimicrobial use. Milk replacer supplementation improved early growth but reduced margins due to high feed cost. Acid-preserved grain delivered the greatest economic gains through improved daily gain, slaughter weight and lower feed cost. Enhanced farrowing hygiene substantially increased profit margin through reduced pre-weaning mortality. These findings support the integration of targeted nutritional and management interventions to improve profitability and reduce antimicrobial use in Irish pig systems.

STANDARD PAPER SESSIONS

Galway residents perceive local food, connection, and less plastic and food waste as priorities for sustainable food systems

Olweean, N., *Mullen, A.*

There is growing consensus that societal buy-in and bottom-up societal change must accompany other forms of innovation if sustainable food systems are to be achieved. Despite their power to drive change as consumers and the electorate, little is known about what householders in Ireland perceive as sustainable in food practice, and what they find affordable, feasible, and culturally acceptable in adopting healthier, more sustainable food practices. In this qualitative study among residents in County Galway, we explore individuals' perceptions of and experiences with food sustainability, as well as what they are prepared to do to help achieve sustainable food systems and their perceived barriers and opportunities for change. Eight focus group sessions were held both in Galway City and online for a total of 30 participants. A survey (n=82) was used as a recruiting tool and supplements focus group data with demographic data. Focus group topics included: perception of sustainable/unsustainable food systems and participants' roles within; engagement with food environment; what participants are prepared to do to make food practices more sustainable; and what tools, supports, or changes could help participants be more sustainable. Thematic analysis was used to generate the major themes of focus group discussions. Focus group results suggest perceived sustainability of locally sourced diets, community-driven food systems, and less or no plastic food packaging. Participants describe disconnect, distrust, uncertainty, and unwanted complicity in unethical, unsustainable practices as issues within current food systems, along with feelings of isolation and disempowerment in sustainable food action. Connection, education, and learning from the past are seen as remedies to current food systems issues. Time, energy, mindset, and power dynamics are areas where barriers present themselves and where there are also opportunities for positive solutions. Expected significance includes identifying key beliefs and perceptions about sustainable food practices in Galway, informing sustainable food policy, and laying groundwork for co-creation of tools and supports that could be implemented in food environments to encourage sustainable food practices.