Improving the efficiency and sustainability of short food supply chain logistics

Short food supply chains create economic, social, and environmental benefits for food producers, communities, and consumers, but their logistics are often both costly and carbon intensive.

New EU4Advice research presents an advanced optimization model, integrated with machine learning, to demonstrate how smart logistics can drive both operational and environmental improvements, cutting costs and carbon emissions. The research by Arijit De of the University of Manchester, and Barbara Tocco and Matthew Gorton from the National Innovation Centre for Rural Enterprise (NICRE), is published in the journal Transportation Research D: Transport and Environment.

It benefitted from a collaboration with Food and Drink North East (FADNE) and real world data from their local heroes initiative, which operated a regional food hub with an e-commerce website, featuring products from over 150 regional producers, and home delivery service during the Covid-19 pandemic.

Key insights from the modelling include:

- Food hubs cut operational costs and carbon emissions, but their efficiency can be further enhanced by collaboration between producers for some logistics tasks.
- Switching to electric vehicles can reduce transport costs by nearly one-third and diminish carbon emissions by as much as 70%.
- Substantial improvements are possible through data driven, optimized logistics strategies.

Chris Jewitt, CEO of FADNE said “Logistics remains a significant challenge in enabling local food supply chains, but this research highlights the critical role of collaboration, aggregation, and self-organization among stakeholders. By working together, producers can streamline distribution, reduce costs, and lower carbon emissions, ultimately building more resilient and sustainable supply chains.”

The research will inform EU4Advice’s training materials for short food supply chain advisors to help their clients’ practices become more economically, socially, and environmentally sustainable. EU4Advice has received funding from the European Horizon Europe research and innovation programme under grant agreement No 101059911, and it seeks to build the capacity of short food supply chain actors.

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