

H03: Life Cycle Assessments

Session Chair: Rebeka Kovačič Lukman

Room: B: Omnia, R: Momentum 3 (max. 30)

Do short food supply chains have lower true cost? The case of bread.

Mara Petruzzelli, Department of Agricultural and Food Sciences, Alma Mater Studiorum - University of Bologna, Bologna, Italy, mara.petruzzelli@unibo.it

Rico Ihle, Agricultural Economics and Rural Policy Group, Department of Social Sciences, Wageningen University & Research, Wageningen, The Netherlands, rico.ihle@wur.nl

Matteo Vittuari, Department of Agricultural and Food Sciences, Alma Mater Studiorum - University of Bologna, Bologna, Italy, matteo.vittuari@unibo.it

Presenter: Mara Petruzzelli, mara.petruzzelli@unibo.it (in person)

Starting from the Green Revolution, modern large-scale food production has been focusing on increasing the yield per hectare at all costs, to deliver sufficient cheap food for a growing population (Ambikapathi et al., 2022). However, consensus is growing on the fact this setup has pushed farm-gate prices down and externalised unsustainable environmental and social costs (Marsden et al., 2018). Hence, negative externalities of the production process are not reflected in food market prices and not borne by the polluters (Michalke et al., 2022).

In contrast, many authors are advocating for shorter, small-scale chains (Wang et al., 2022) which shift from focusing primarily on yields towards ecological well-being, and a higher internalization of production externalities. This often results in higher costs of production, which tend to make their products less competitive in the market (Dansero et al., 2020).

The emerging question is: if the environmental costs of food production in conventional and short supply chains are made visible, which one better minimizes the gap between the market price of food and its comprehensive cost to society?

The monetary valuation of impacts is an opportunity to include externalities in the resource allocation decisions of our economic system (Ponsioen et al., 2020) and regulate the market functioning accordingly (Aspenson, 2020). As a consequence, True Cost Accounting (TCA) methodologies have been advanced by scientists to close the gap between market prices and the true cost of food by measuring and costing externalities (Baker et al., 2020; de Adelhart Toorop et al., 2021). Still, in-depth studies on the application of these methodologies are scarce (Hendriks et al., 2021).

This paper implements TCA to compare the true cost of bread from short and conventional food supply chains. Bread is chosen due to its role as one of the most important staple foods in Europe - with an average yearly per capita consumption of 50 kg - and worldwide and embodies a unique cultural heritage (Notarnicola et al., 2017). Negative environmental externalities are quantified through a cradle-to-grave Life Cycle Assessment conducted on a short and a long supply chain. Then, we monetize the resulting negative environmental impacts through the abatement approach.

Our study provides results that quantify and compare the true costs across the two different supply chains of one core staple food of Europe.

For guiding and speeding up the sustainability transition of the global food system, negative externalities of food production, processing and trade need to be quantified and valued.

Such knowledge will provide scientists with science-based reference values and benchmarks for the most important externalities in food products. The study will also support decision-making in

defining a corrected price mechanism based on the integration of externalities, that when combined with public funding mechanisms, may encourage producers and processors to produce food in a more sustainable way.