

Biomaterial flows in Scottish cattle supply chains

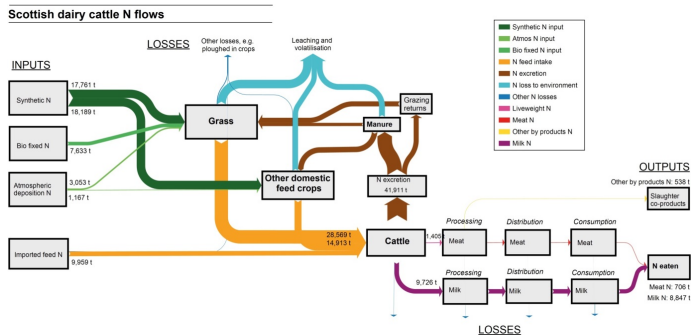


The Challenge

Cattle supply chains make an important contribution to the Scottish economy, comprising about one third of gross agricultural output in 2016. Cattle production is associated with some of the biggest biotic material flows in Scotland, including feed and fertiliser inputs, nutrients cycled and post-farm processing.

Policy Implication

Quantified biomaterial flows can be used to appraise interventions to improve circularity of supply chains. Initial analysis shows that post-farm losses are relatively small compared to those on farms. As we move down the supply chain, value is added and the cost of each kg of N lost increases, in terms of the financial value and the embedded emissions. Cattle systems have other strengths, they produce high value commodities and enable food to be produced from land that is unsuitable for cultivating crops, thereby contributing to food security.



Research

Supply chain biotic material flow were studied using material flow analysis. The Scottish Agricultural Emission Model was used to calculate the fertiliser applied to crops; nutrients lost after application to crops; feed imported; feed consumed by cattle; excreta produced; nutrient losses during manure management; and liveweight and milk offtake.

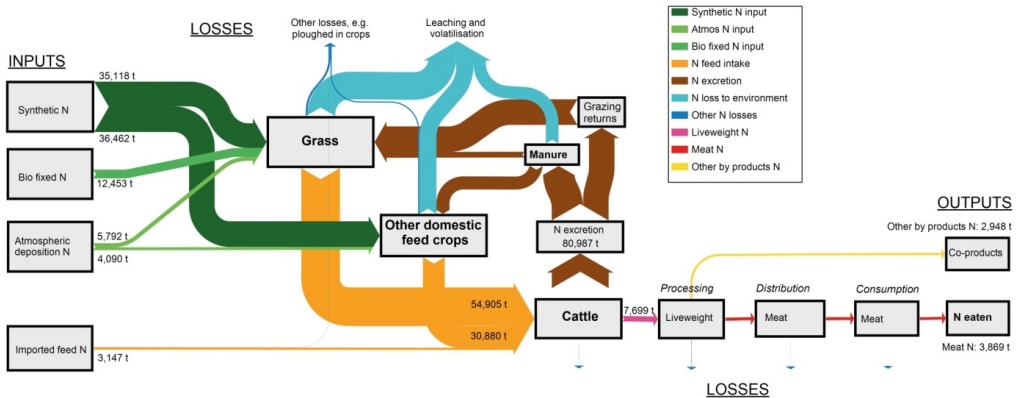
Results

Flows were expressed in terms of mass of nitrogen (N), a key element of meat and milk. Suckler beef systems have low biological efficiency, compared to pigs and poultry. Dairy systems increase nutrient use efficiency by providing milk to calves and humans.

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Scottish beef cattle N flows



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About

The Land Economy, Environment and Society (LEES) Research Group is one of the largest groupings of economists and social scientists working in the rural, agricultural and land based sectors in the UK. Our vision is to be recognised as one of the leading centres for agricultural and wider rural economic and social research globally, benefiting the land use sector, the environment and rural communities.

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