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Mapping Industrial Food Side Streams and By-Products in Sweden: Moving Beyond Aggregated Industrial Statistics

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Abstract

Food waste and by-products are substantial side-stream flows in the Swedish food industry. Their volumes and allocations are essential for resource optimization but remain insufficiently quantified. In line with the EU's third food waste reporting obligation, Hultén et al. (2024) surveyed Swedish industrial food waste. 305,000 tonnes of food were discarded in 2022, indicating significant system inefficiencies. This estimate was almost six times higher than the estimate for 2020, suggesting a high degree of uncertainty in Sweden's national statistics. Although environmentally and economically burdensome, the food waste generated by the Swedish food processing industry could be viewed as a largely untapped national resource of food ingredients, functional components and nutrients. Reintroducing these resources into the food system would result a more circular and resilient food system. Estimates of high-volume food industry by-products in northern Europe were conducted by Soloha et al. (2025) and point to theoretical Swedish annual production volumes of by-products that manyfold outweigh food waste volumes. National Swedish statistics neither reveal the generated volumes of by-products nor their current uses (Hultén et al., 2024). To support realising the full potential of the resources in food waste and by-products, more precise and accurate measurements are required. This work provides a new independent dataset which can support validation of national statistics. Furthermore, the current statistics lack the resolution necessary for the development of circular resource uses – for instance geographical location, quality, and temporal variability of side streams. The present study addresses all these data gaps. This study maps resource use in the Swedish food industry through compilation of gathered primary data on food waste and by-products. The aim is to illuminate the availability and current utilisation of resources in these side streams by recording the annual production of waste and by-products, their geographical location, readiness for food or feed uses and temporal variations in production. Food processing establishments with 50 or more employees (n=200) were selected using Statistics Sweden's Business Register (SCB, n.d.) and contacted for structured interviews. The gathered data were categorized by NACE Rev 2.1 (European Commission, 2025). Preliminary results indicate substantial quantities of potentially recoverable resources in both food waste and by-product streams, and their high degree of heterogeneity demonstrates the limitations of sector-aggregated statistics. For example, in the

beverage sector, brewers' spent grain constitutes a major material flow suitable for food and feed applications. However, aggregation with low-value waste streams such as bottled water production waste masks differences in resource quality and recovery potential.

Keywords: Circular bioeconomy, Resource recovery, Waste valorisation, Food processing, Industrial ecology

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