ZEROW
innovations for zero food waste

ZeroW has received funding from the European Union's Horizon 2020 programme under grant agreement No 101036388.

Funded by the European Union

Retail food waste valorisation through microalgal cultivation - a circular economy strategy

Technical and economic feasibility of using processed retail food waste as an alternative nutrient source for microalgae cultivation was demonstrated at a pilot scale.

Inedible waste was transformed into a standardized powder through dehydration and homogenization, effectively replacing conventional nutrients in microalgae growth media. Microalgae achieved comparable productivity while recovering nutrients that would otherwise become landfill pollutants.

The solution provides dual benefits:

1. Retailers gain a circular outlet for unsold products
2. Algae producers reduce medium costs while securing sustainable nutrients

Implementation faces regulatory challenges, particularly for animal-derived byproducts.

Scaling-up requires:

1. Standardised end-of-waste / byproduct regulation
2. Certified processing methods
3. Regulatory and client acceptance of microalgal biomass based on its compositional quality rather than medium origin

The solution becomes economically viable at an industrial scale, where combined cost savings and environmental benefits (waste diversion, reduced resource input) are maximized. This work establishes a practical framework for circular nutrient management in algal biotechnology, addressing both technical and commercial adoption barriers ■