Turning food value chain side streams into high-value products

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8.10.2026



Building the whole value chain together

Support across the whole food value chain

Raw material supply and quality, characterization, process development and scale-up, functionality testing and product development.

Decades of research experience

Research expertise, publications and patents support your development as processing technologies evolve.

Collaboration across sectors

Food and forest-industry value chains offer opportunities for joint material and process development.



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High-Value Products from Food Side Streams

SIDE STREAMS	EXTRACTION & FRACTIONATION	PRODUCTS & APPLICATIONS
 **Berries and fruit** Press cakes and pomaces	 **Drying and grinding**	**Food & nutrition** Dietary fibre, xylitol, supplements, colors, coatings 
 **Oilseeds** Turnip rape, rapeseed and hemp press cakes Caraway distillation residues	 **Supercritical CO_2 extraction**	**Cosmetics** Preservatives, colors, emollients, emulsifiers 
 **Cereals and horticulture** Husks, hulls, bran, straw and other residues	 **Ultrafiltration**  **Resin treatment** **Residues to further processing**	**Functional materials** Antimicrobial and hydrophopic coatings, colors 

Whole-stream utilization in food and bioproducts & Cascade approaches

SIDE STREAMS	EXTRUSION CENTER AND FOOD PILOT	PRODUCTS & APPLICATIONS

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Towards Higher Value and Zero Waste: Cascade processing of lingonberry press cake



Lingonberry press cake

→



$scCO_2$ extraction

↓



BIOWAX with $scCO_2$

→



Extraction residue

→



Solvent extraction

↓



Remaining residue

→ Fibers

→



Bioactive fractions

→ Food ingredients
Cosmetics
Biocolors



Development & assessment

Green extraction method development

Process optimization

Chemical characterization

Bioactivity testing

Product prototypes

Technoeconomic assessment and life cycle assessment

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More information: https://www.luke.fi/en/projects/bio4p

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Higher-value uses for oat hulls under development



Oat hulls

An abundant agricultural side stream

Processing routes

Extraction and fractionation

Extrusion

Fermentation

Examples of target components

Specialty sugars

Dietary fibers

Proteins and fatty acids

Potential value-added applications

Food ingredients

Bread

Oat yogurts

Cosmetics

Feedstock for microbial production processes

Interested in better use of oat hulls?

Get in touch: Senior Customer Manager, Lotta Heikkilä, lotta.heikkila@luke.fi

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Thank you for your attention!

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