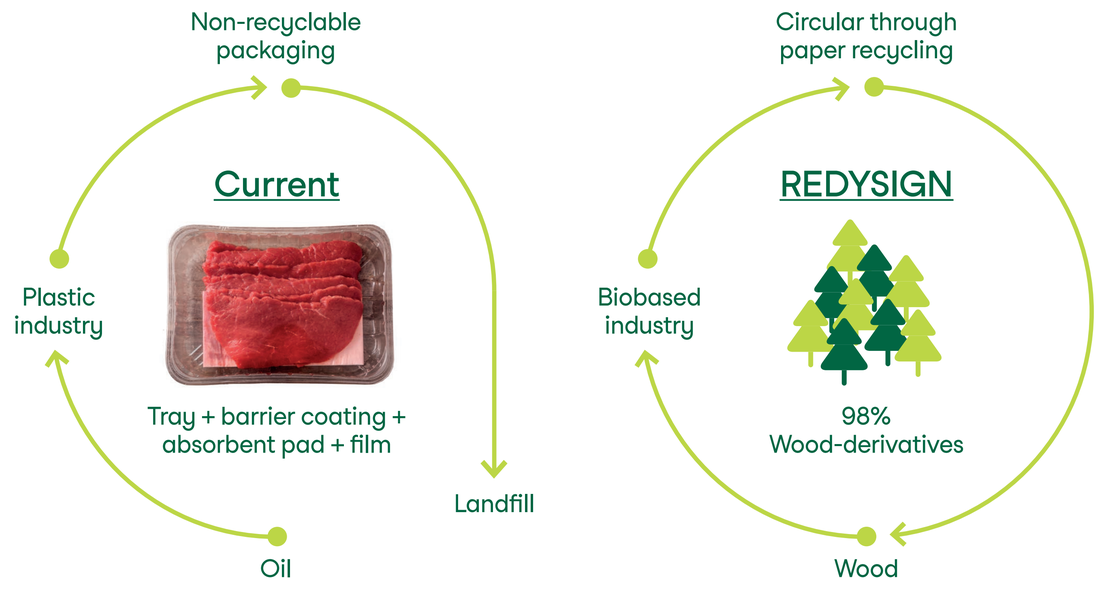
redysign

Resource-efficient processes for the production and circularization of innovative Recyclable-by-Design fresh meat smart packaging from wood

REDYSIGN Concept

REDYSIGN aims to develop new sustainable bio-based materials to replace the non-circular plastic food packaging products. The project focuses on creating a completely bio-based, smart and recyclable fresh meat packaging solution for which every intermediate product —tray, barrier coating, absorbent pad, and transparent film— will be almost exclusively wood-based (macro-micro-nanofibres, lignin and sugars). The new packaging solution will incorporate two sensors to prevent food spoilage (one to detect early rotting, one to detect breaks in the cold chain) and an identification marker to improve sorting and thereby increase recycling efficiency.



Main project innovations

01

Efficient processes for transformation of wood into (fibre-based packaging) FBP

- Enzymatic treatments on softwood chips to reduce energy use by 20% in thermomechanical pulp production.
- New processes to obtain wood-derived compounds for fresh meat packaging.
- Technologies for fibre processing with low water consumption and high energy efficiency.



High-Pressure Disk Refiner.



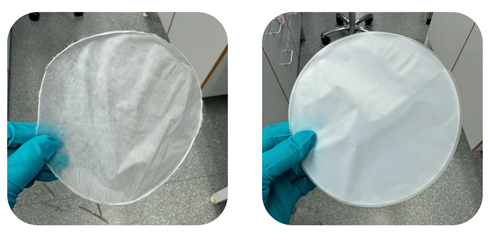
Ozone Generator.

02

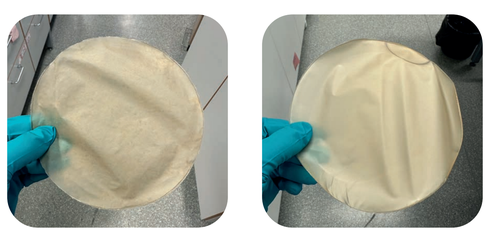
Fresh food packaging from wood-derived products

- Develop technologies to produce new plastic-free trays.
- Create new bio-based barrier coatings.
- Produce fully recyclable absorbing pads.
- Design smart flexible films.

Left: Less fibrillated nanocellulose (coarse).
Right: More fibrillated nanocellulose (fine).



Nanocellulose films without lignin.

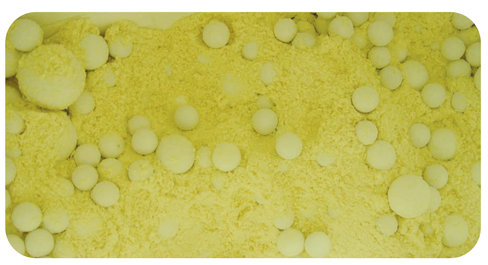


Lignin containing nanocellulose films.

03

Smart Food Packaging

- Produce identification markers for integration into FBP components to enable efficient sorting.
- Design a spectral multi-sensor-based automated quality assessment system.
- Use artificial intelligence to analyse data from the in-line quality system.





Identification marker pre-industrial production process.

04

Efficient recycling and upcycling technologies for contaminated FBP

Through the development of new advanced oxidative and enzyme-assisted treatments to tailor the recycled fibres properties to the requirements of food FBP and to valorise the recalcitrant fractions.



Thermoformed tray.

www.redysign.eu

@REDYSIGNProject

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