

#FACT1

A NOVEL BIOREFINERY CONCEPT FOR MUSHROOM COMPOST

The BIOrescue research project has developed a new biorefinery concept to demonstrate the production of high-value products from what was previously considered a waste, turning used mushroom compost into bio-based products for market applications.



Total fresh mushroom production
in the EU is around

1 million tonnes
a year



1 tonne = **3 tonnes**
mushroom harvested compost is generated

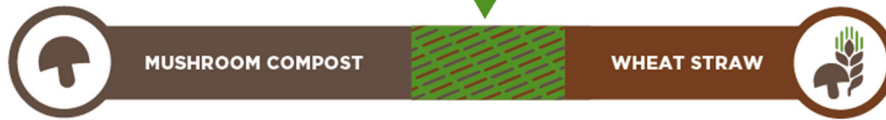


BIOrescue
gives new life
to used mushroom compost

BIOrescue process



Before the process starts, the feedstock is analysed using **novel dynamic modelling tools**, based on Nearly Infrared Spectroscopy, to determine its characteristics.



Used mushroom compost is mixed with another underutilised agricultural waste (wheat straw).

A **thermochemical pretreatment** is used to extract sugars from the combination of compost and straw.



An **organosolv pretreatment** is used to obtain the maximum amount of lignin from the compost. Biomass is heated up to 250°C with water and solvent.

Biomass is **heated with an acid catalyst and water** for around 15 minutes.



Up to 37% of soluble lignin was extracted from the total amount of lignin of mushroom compost.

LIGNIN

LIGNIN SUGARS

Tailored enzymatic solutions have been developed to extract sugars and lignin in an optimal way.

The carbohydrates isolated through this process are broken down into sugars through an **enzymatic hydrolysis process** with a maximal conversion yield (96%).



The residual solid fraction, obtained after thermo-chemical pretreatment and enzymatic hydrolysis, is also subjected to the same organosolv process to **maximise lignin recovery**, resulting in yields of up to 42%.

Then they are fermented for the production of either biopesticides or enzymes.



The lignin is then converted into nanocarriers for drug encapsulation.

BIODEGRADABLE NANOCAPSULES

BIOPESTICIDES

ENZYMES



ENCAPSULATED BIOPESTICIDES



Read more here
<http://bit.do/biorescue-process>

www.biorescue.eu

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The BIOrescue project has developed a new biorefinery concept to demonstrate the production of high-value value products from used mushroom compost and other underutilised feedstocks. It has received funding from the Bio-Based Industries Joint Undertaking under the European Union's Horizon 2020 research and innovation programme, under Grant Agreement N°720708.