



Regenerative upcycling food bio-technologies for busting the Mediterranean food system's circularity

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Background

Several Mediterranean agri-food side streams have a nutritional composition with encrypted potential functional and bioactive properties. They are rich in nutrients but are usually underutilised, and generally under, creating different ecological problems.

Materials and Methods

- Selection of suitable agro food side streams;
- solid state fermentation (SSF) setup using edible mushroom *Pleurotus ostreatus*;
- liquid state fermentation (LSF) with probiotic yeasts like *Debaryomyces hansenii*, *Lachancea thermotolerans*, *Starmarella* spp 18, and *Saccharomyces boulardii*;
- innovative food and beverage formulations

Aims

The aim of this PhD is to identify the different process steps (like pretreatment, volume reduction, phase change, solid removal, purification, and formulation) required to recover high-value products from agri-food residues.

The conversion of agri-food side stream coming from Marche region crops into **high-added-value** and low-cost food **ingredients** is the challenge to formulate healthy and innovative foods and beverages.



Preliminary Results

1) Evaluation of the best combination of agro food side streams for the growth of *Pleurotus ostreatus* during SSF

Thesis	Combination %	Growth
M	wheat straw (15%) sawdust (15%) blackberry wastes (70%)	+
T	wheat straw (15%) sawdust (15%) brewery spent grain (70%)	+
C	wheat straw (15%) sawdust (15%) spent coffee grounds (70%)	+++



2) Set-up of chemical-physical conditions

Condition	Growth
No air flow, dark, humidity of 70%, Temperature 25 C°	+
Constant air flow, dark, humidity of 70%, Temperature 25 C°	+++

3) Evaluation of the survival of probiotic yeasts in LSF of a liquid apple wastes infusion

