BIO RESCUE

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Deliverable 4.1

Enzymatic solution optimised for Spent Mushroom Substrate, including description of results

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PUBLISHABLE SUMMARY

This report describes the lab-scale enzyme formulation, screening and optimization results related to **WP4 – Primary conversion**, comprising work conducted in *Task 4.1 – Optimization of enzymatic solutions to process the pre-treated substrate* and related subtasks. WP4 aims to develop a versatile enzymatic hydrolysis technology compatible with two different types of pre-treated feedstocks, wheat straw (WS) and spent mushroom substrate (SMS). For this aim, MetGen utilised its MetZyme® SUNO™ enzyme solution tailored for specific biomass and process conditions. MetZyme® SUNO™ is a competitive, high performance solution custom designed to significantly improve saccharification yields at high dry solid content (<20% consistency) to replace existing commercial hydrolysis solutions. In addition, in-house produced cellulases from Monaghan and UNINA were tested. The objective was to produce a highly concentrated soluble sugar broth for subsequent processes. The lab-scale work by MetGen aimed to evaluate, define and optimise an enzymatic conversion strategy to hydrolyse the carbohydrates present in WS and SMS in a more efficient and economical way in order to provide an all-year-round robust solution for varying combinations of lignocellulosic feedstocks. Following main performance targets were considered when developing tailor-made enzyme cocktails: 1) improved sugar yields through biomass specificity, 2) Improved hydrolysis efficiency through addressing process conditions, 3) reduced cost through reduced enzyme dosage.

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