



UCL - Université catholique de Louvain

ELIM - Earth & Life Institute, Applied Microbiology

GEBI - Bioengineering Group

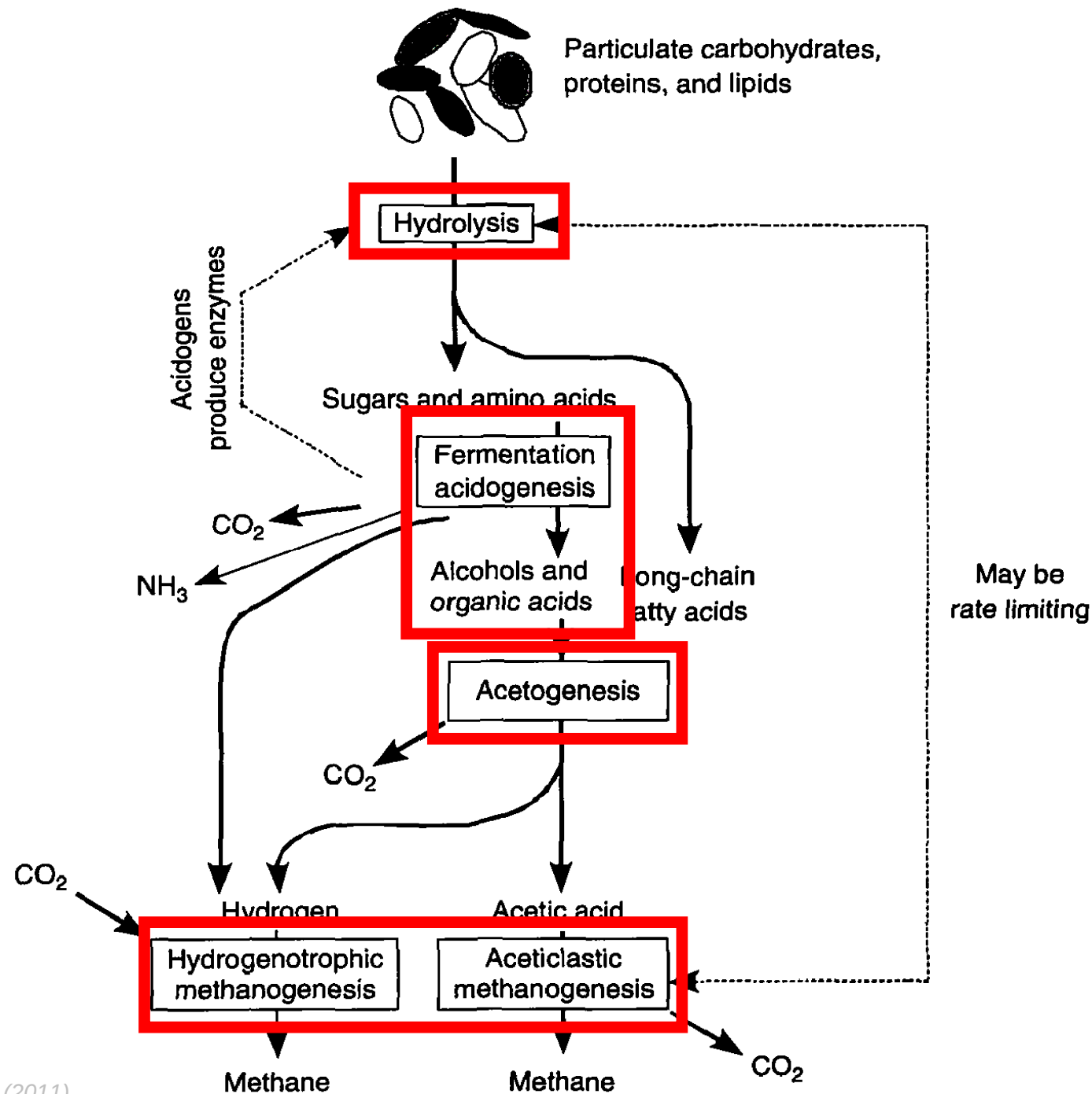


Influence of substrate pre-treatment by steam explosion on the acidogenic fermentation of lignocellulosic substrates by microbial communities

Anastasios Perimenis

ENVITAM-GEPROG PhD day
Gembloux, 08/02/2012

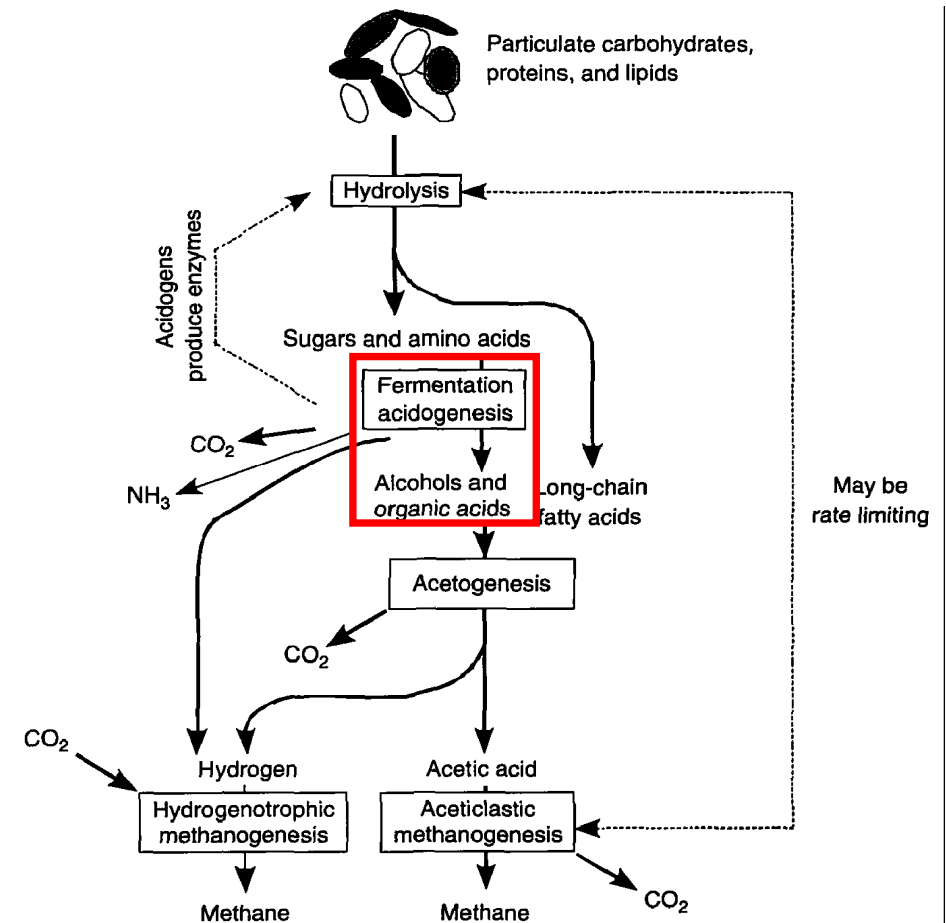
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Acidogenic fermentation

- Studied mostly as intermediate for the optimisation of methane production
- Part of biorefining concept for production of “green” chemicals (e.g. volatile fatty acids (VFA))



Source: Batstone and Jensen (2011)

Influence of substrate pre-treatment by steam explosion on the acidogenic fermentation of ***lignocellulosic substrates*** by microbial communities

Substrate

- Agro-industrial residues with a complex structure
- Lignocellulosic material not directly competing with food

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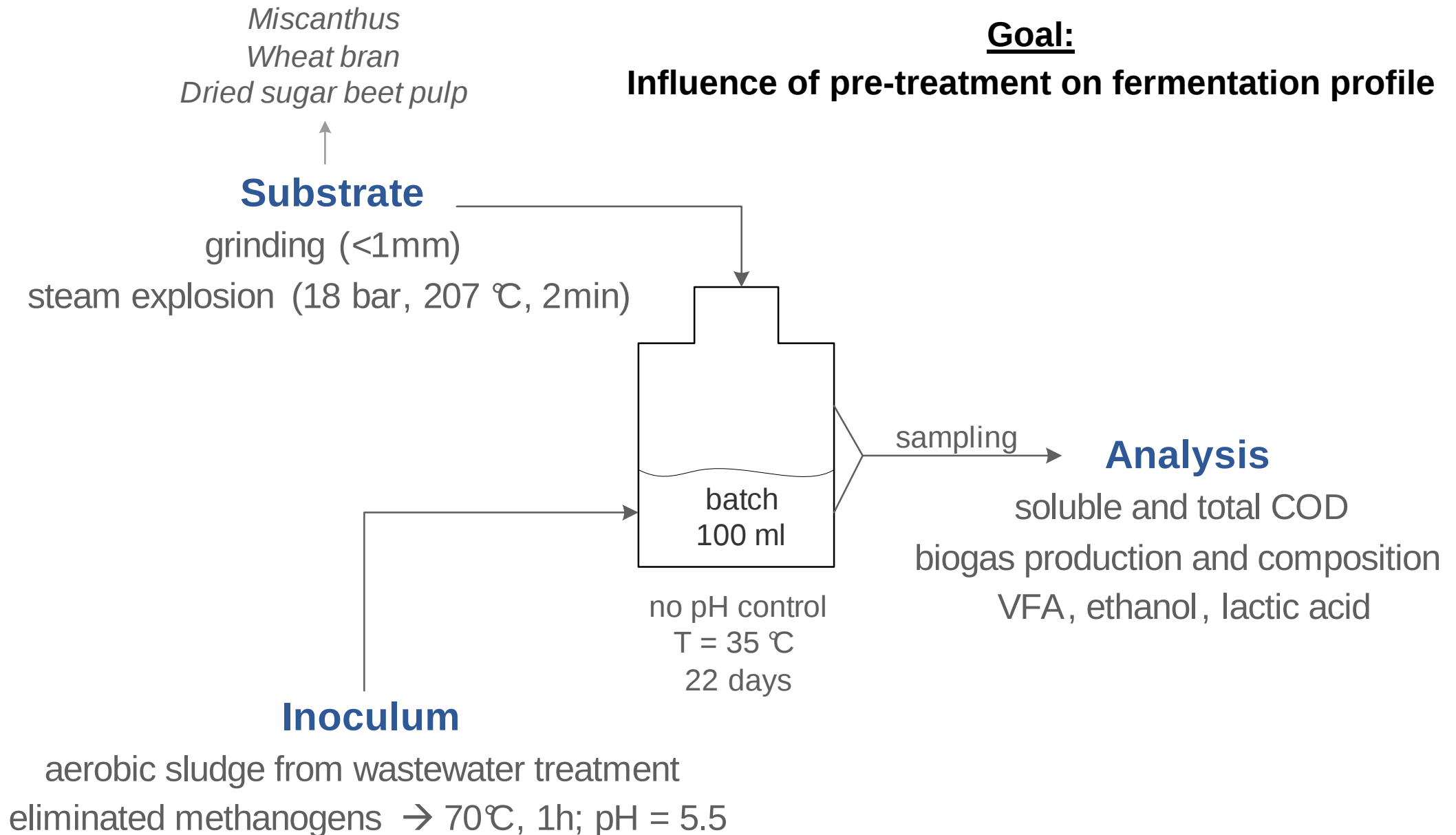
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Inoculum

- Existence of a wide range of microorganisms under natural conditions
- Synergistic and/or competing effect
- High microbial diversity allows treatment of complex substrates

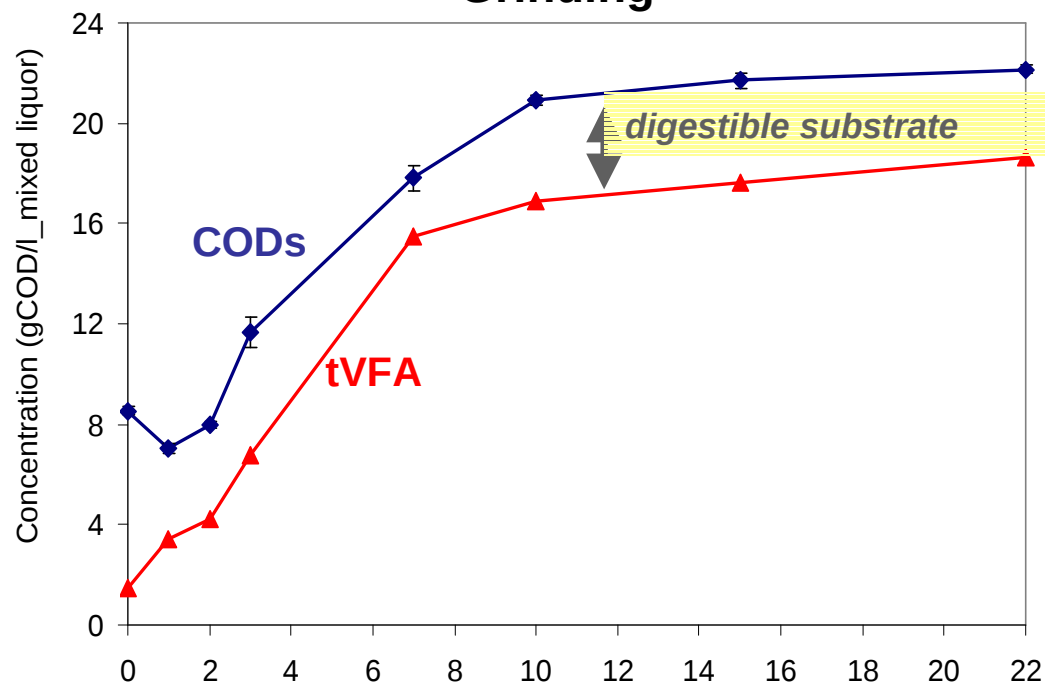
Experimental procedure

Project LIGNOFUEL (Région Wallonne), collaboration with CBI/ULg-GxABT

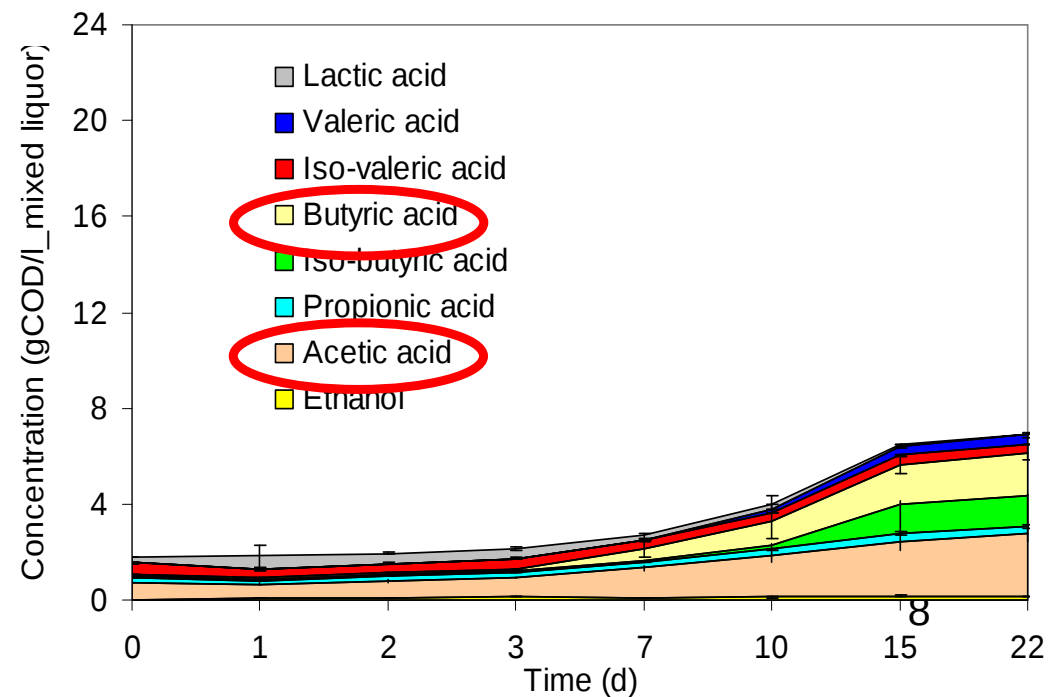
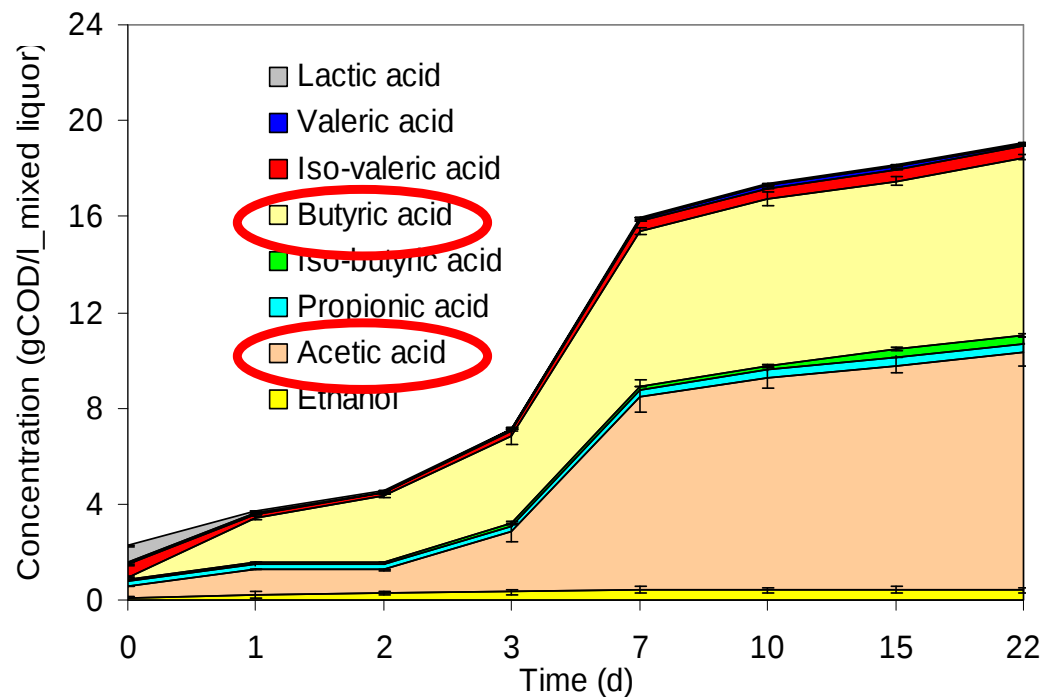
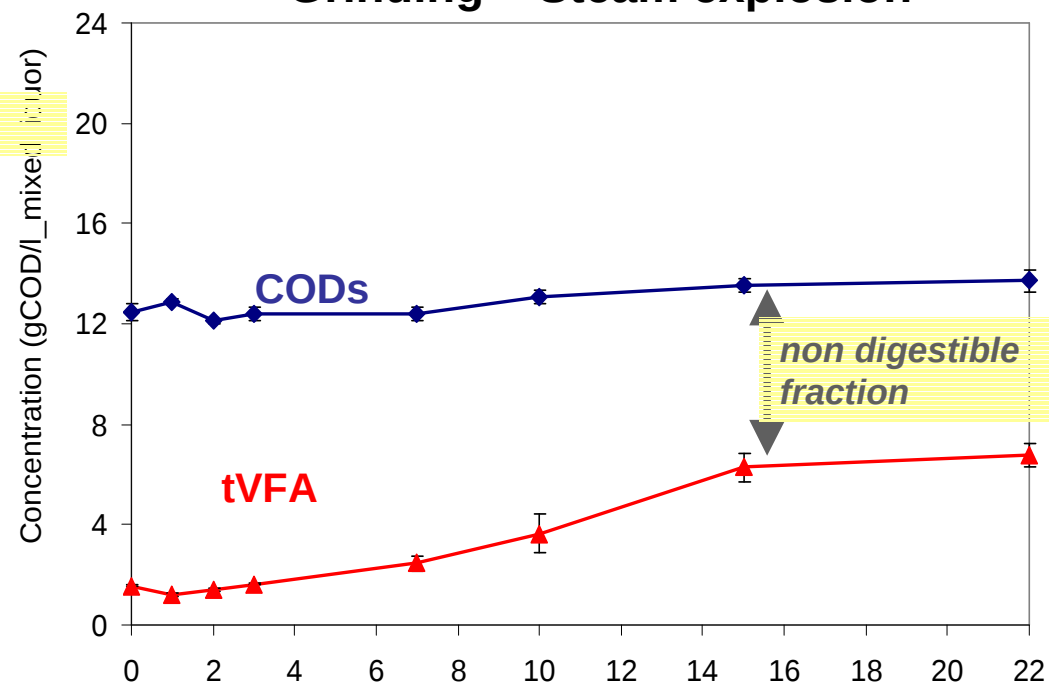


Results – VFA (with the example of beet pulp fermentation)

Grinding



Grinding + Steam explosion



General goals of the research

- Investigate the parameters influencing acidogenic fermentation (e.g. pH, T, substrate composition)
- Study the fermentation profile of various substrates (e.g. metabolite concentration, kinetics of conversion, product yields, reproducibility)
- Master acidogenic fermentation towards a specific product (selectivity, link between microbial population and specific metabolites)
- Create added value from residual biomass streams (production of “green” chemicals)



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