



# Biobutanol: Butanol from Cellulosic Biomass

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## Introduction

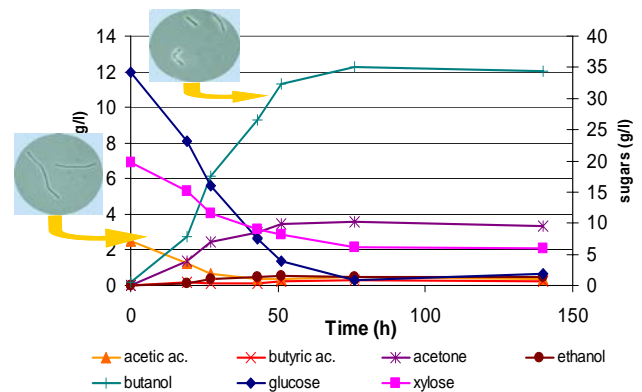
ABE (acetone, butanol, ethanol) fermentation has a great industrial past but has been outcompeted by the petrochemical industry. Due to new developments in biotechnology and the higher oil price, there has been renewed interest in fermentative production of butanol, a platform chemical and alternative biofuel. To date, high substrate costs and low volumetric productivity remain significant bottlenecks that preclude large-scale application of ABE fermentation. By using our combined experience in biomass pretreatment, fermentation, separation technology and energy system design, we are developing new concepts for conversion of cellulosic biomass into butanol. The ultimate goal is to design a new, efficient and economically viable bioprocess for the conversion of low-cost cellulosic feedstocks into butanol.

## Objectives

- Reduce substrate costs for ABE fermentation by using ligno-cellulosic biomass feedstocks
- Improve productivity of ABE by applying high-cell density fermentation and innovative separation techniques
- Develop an efficient and sustainable conversion system for cellulosic biomass into butanol based on:
  - Integration of biomass pretreatment with fermentation
  - In-line butanol recovery from fermentation broth
  - Energy recovery from non-fermentable byproducts



Low-cost, wet biomass (such as grass from grasslands that are no longer used for feed production) are primarily composed of lignocellulose and have great potential as feedstock for fermentative production of biofuels



Batch fermentation of a mixed sugar (glucose/xylose) substrate by *Clostridium beijerinckii*

## Achievements to date

- First lignocellulosic hydrolysates tested for fermentability to ABE
- Laboratory bioreactor developed for continuous fermentation and cell retention
- Preliminary system design and Life Cycle Analysis initiated of biomass-to-butanol conversion

## Industrial Advisory Board

We are inviting selected members of industry to participate in our Industrial Advisory Board. If you have an interest in ABE fermentation and would like to participate, please contact [robert.bakker@wur.nl](mailto:robert.bakker@wur.nl) or [ana.lopez-contreras@wur.nl](mailto:ana.lopez-contreras@wur.nl)

## Clostridium X meeting in 2008

As part of our on-going programme in ABE fermentation, we will be hosting the tenth Clostridium Meeting in 2008 in the Netherlands. More details will soon be placed at our website, [www.biobutanol.nl](http://www.biobutanol.nl)

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