

Influence of different SSF conditions on ethanol production from corn stover at high solids loadings - DTU Orbit (09/11/2017)

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In this study, three different kinds of simultaneous saccharification and fermentation (SSF) of washed pretreated corn stover with water-insoluble solids (WIS) content of 20% were investigated to find which one resulted in highest ethanol yield at high-solids loadings. The different methods were batch SSF, prehydrolysis followed by batch SSF and fed-batch SSF. Batch-SSF resulted in an ethanol yield of 75-76% and an ethanol concentration of 53 g/L. Prehydrolysis prior to batch SSF did not improve the ethanol yield compared with batch SSF. Fedbatch SSF, on the other hand, increased the yield, independent of the feeding conditions used (79-81%, 57-60 g/L). If the initial amount of solids during fed-batch SSF was lowered, the yield could be improved to some extent. When decreasing the enzyme dosage, the greatest decrease in yield was seen in the fed-batch mode (75%), while lower or the same yield was seen in batch mode with and without prehydrolysis (73%). This resulted in similar ethanol yields in all methods. However, the residence time to achieve the final ethanol yield was shorter using fed-batch. This shows that fed-batch can be a better alternative also at a lower enzyme loading.

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