



Enzyme Technology for Improved Drainability of Recycled Paper

Wageningen UR / Paper and Board

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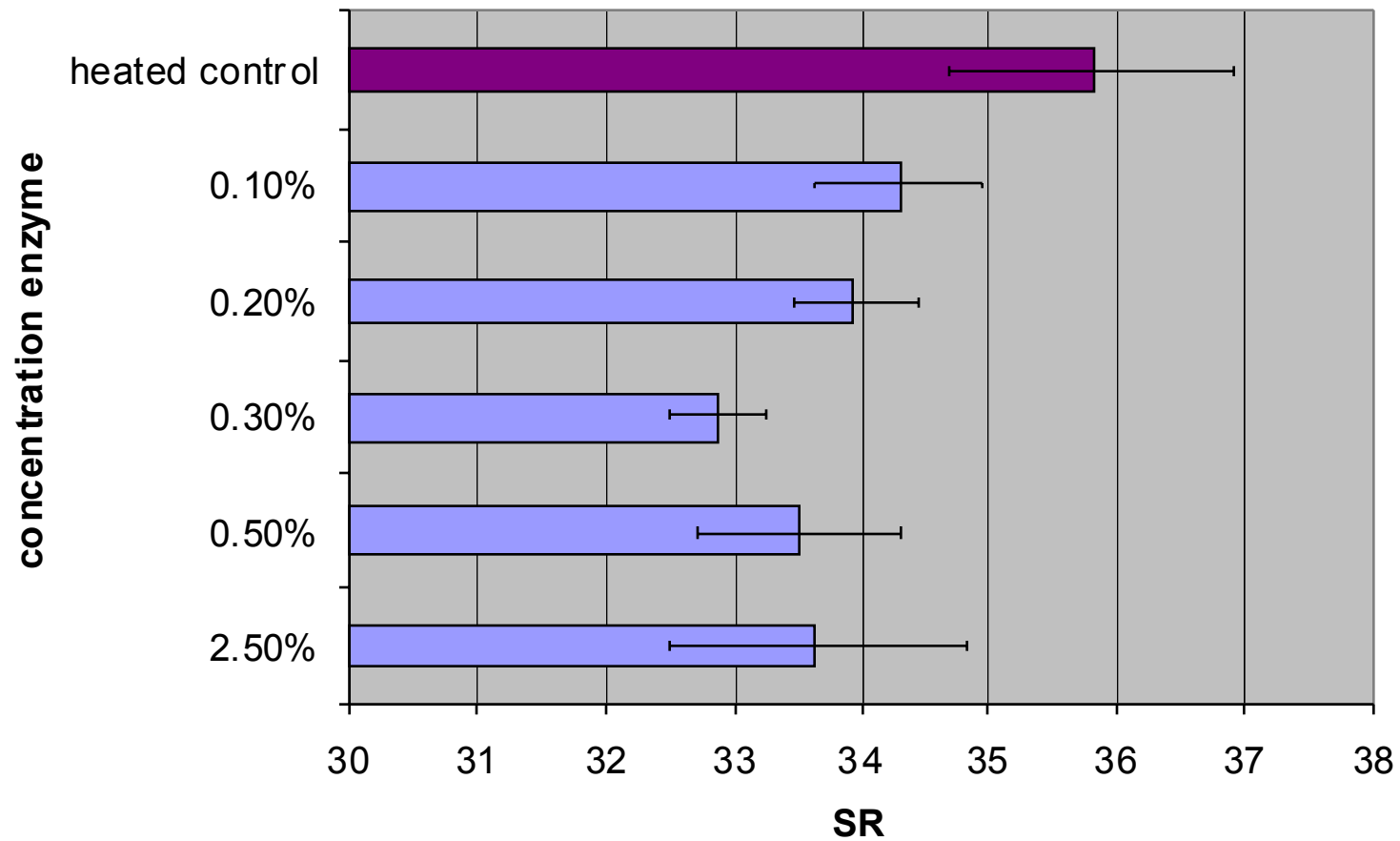
PIRA 4 March 2005

How to apply?

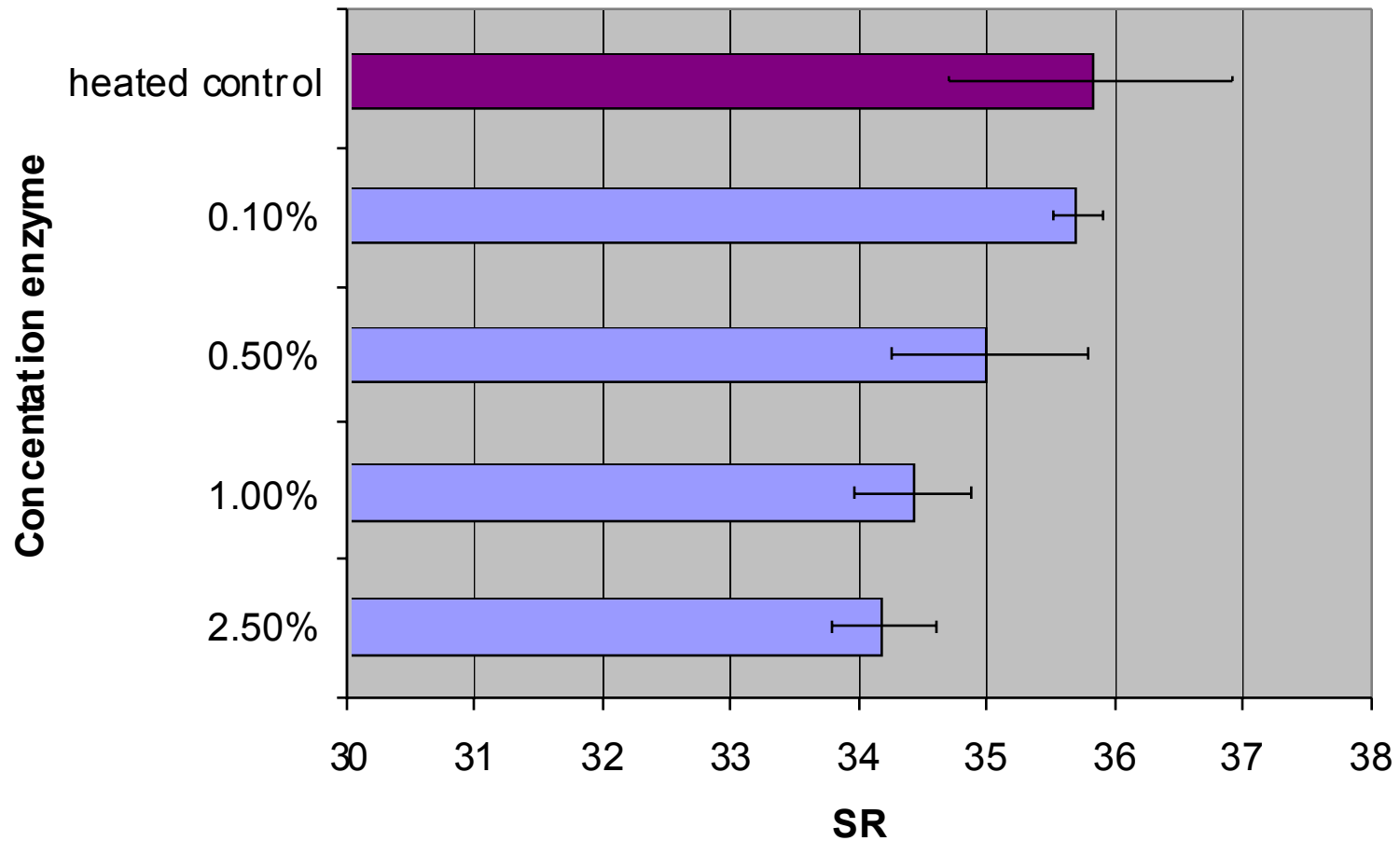
- What enzyme?
- What conditions?
- Residence, contact and life time?
- Concentration - Cost efficiency?



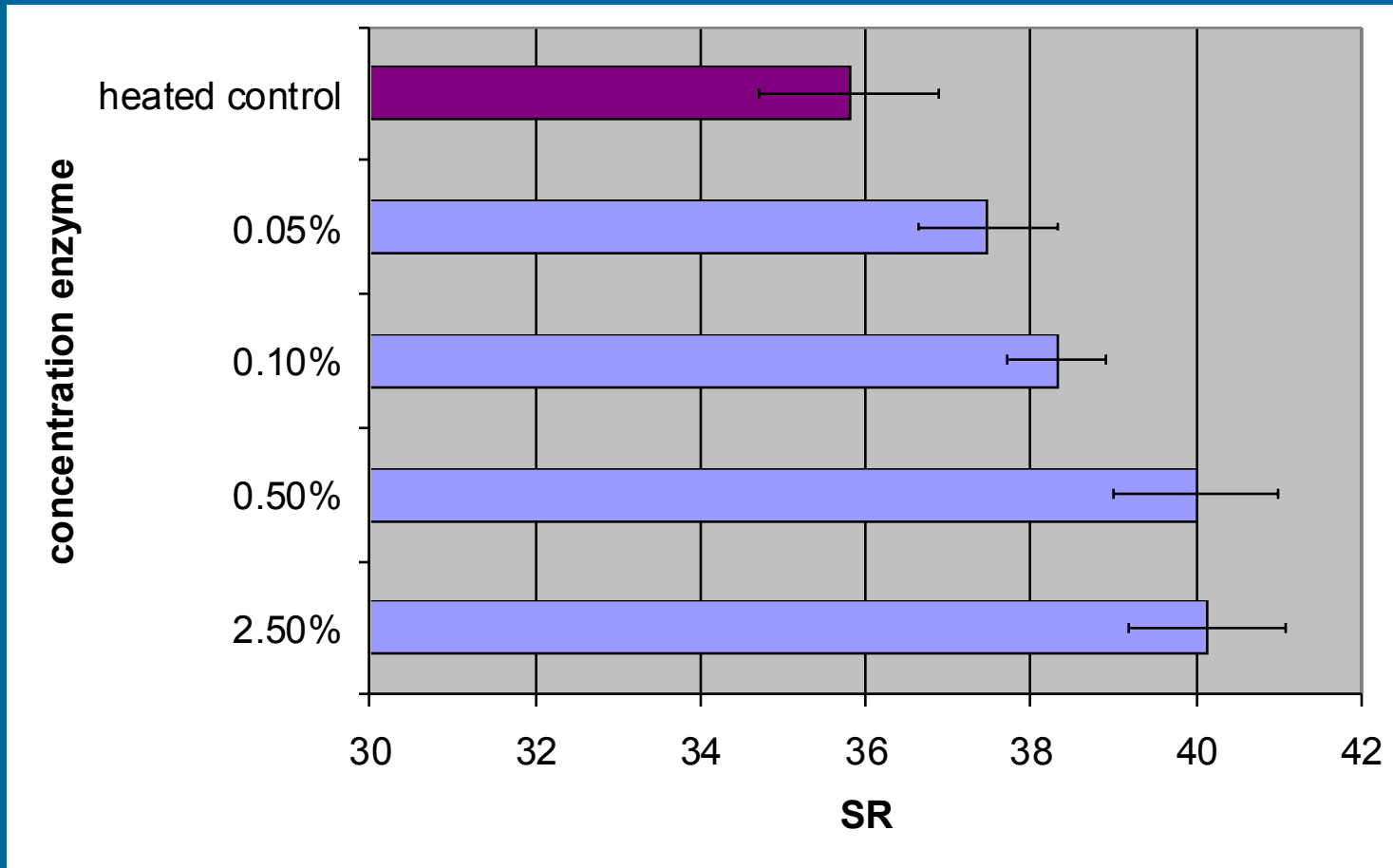
Endoglucanase V with CBD



Endoglucanase V without CBD

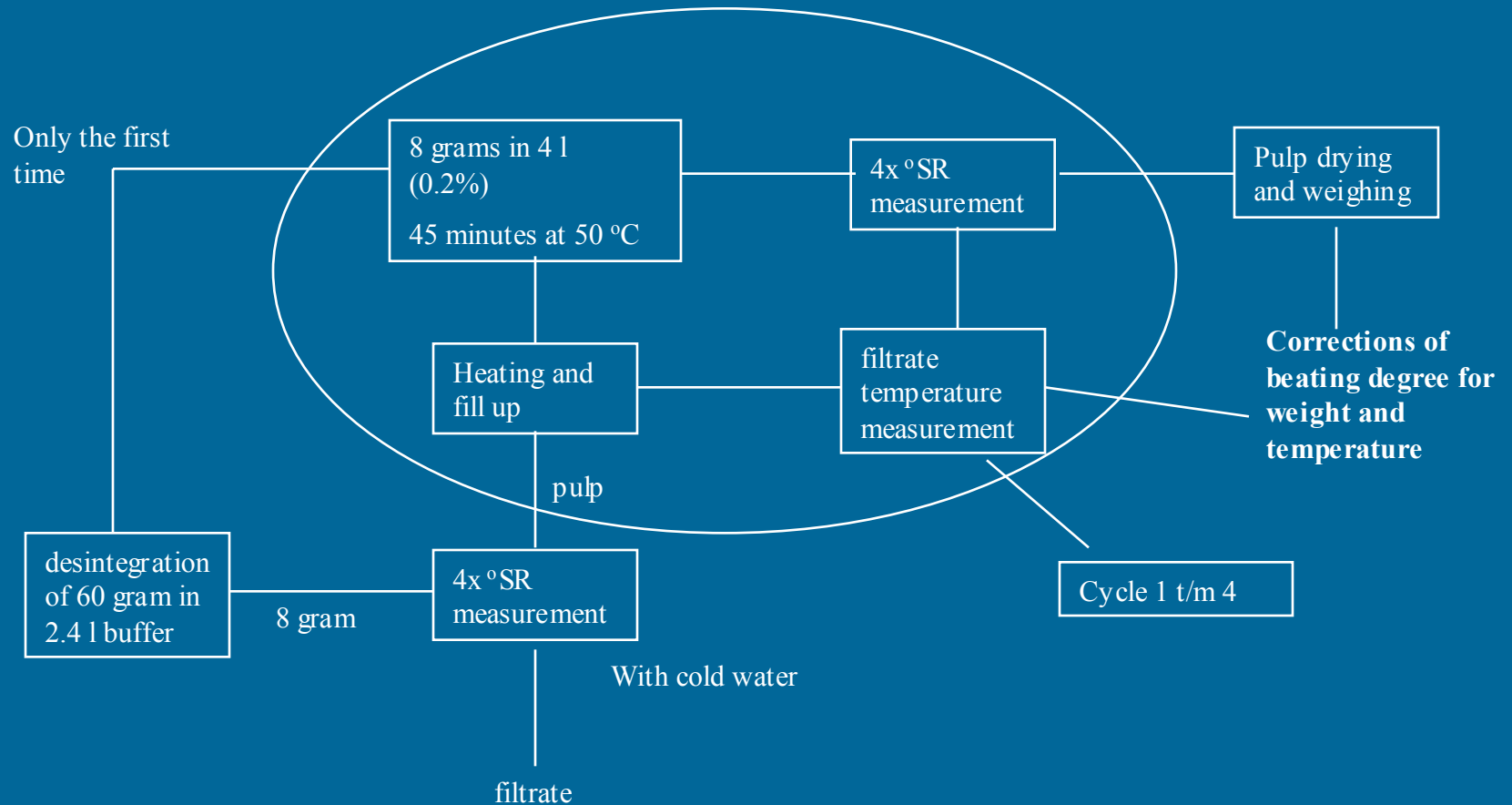


Endoglucanase I

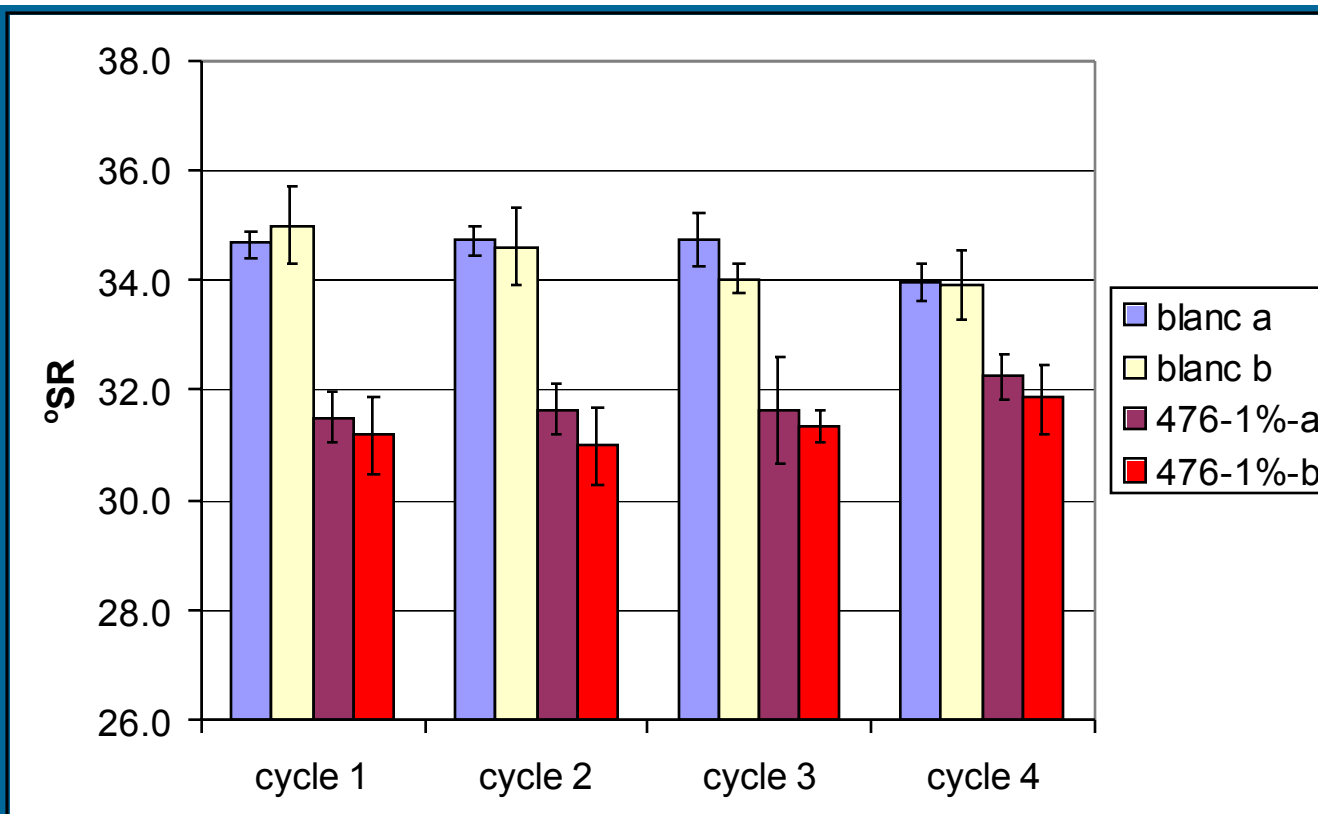


Recycling procedure

Enzyme addition, only in the first cycle



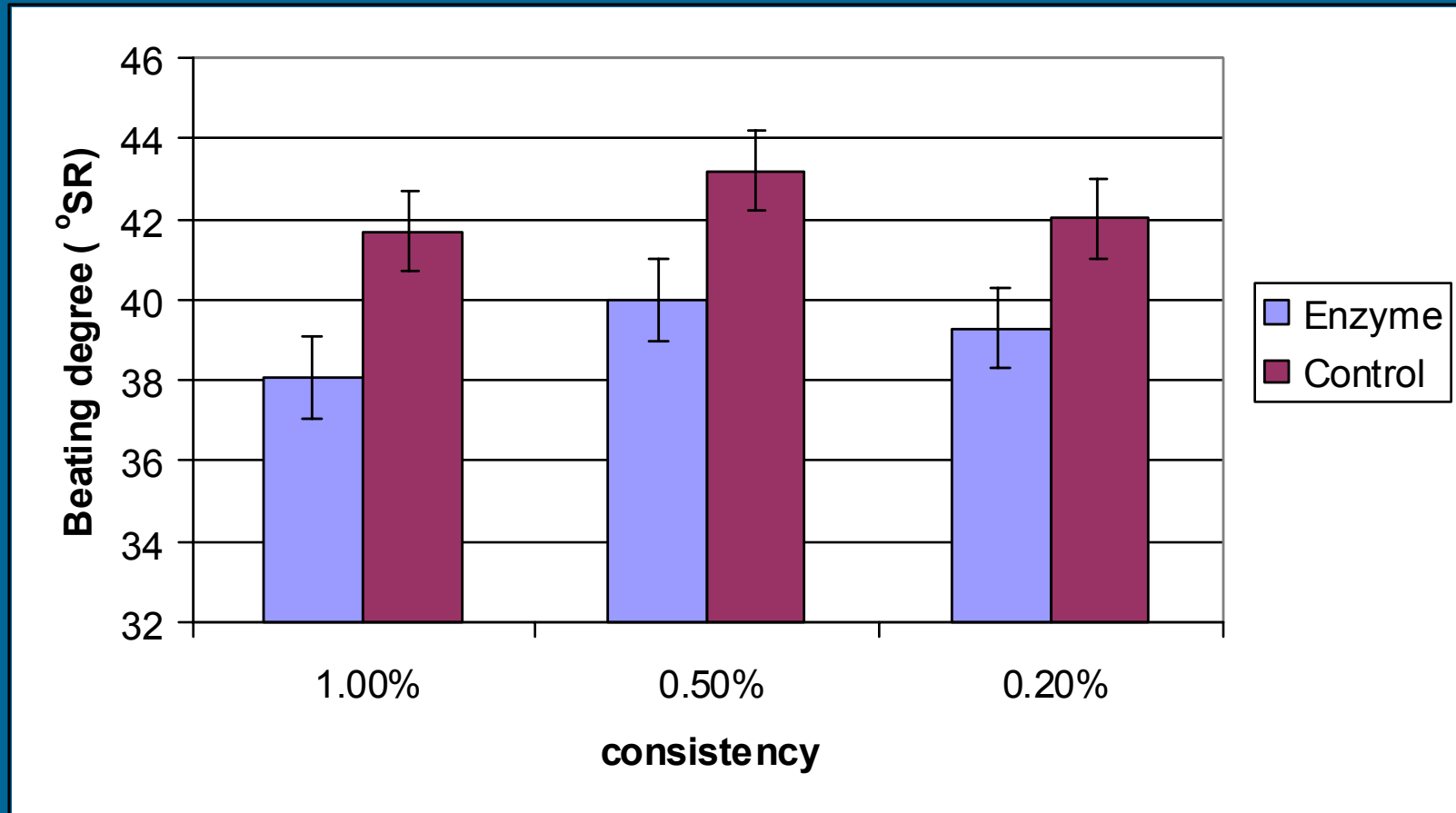
Effect of recirculation of enzymes on dewatering



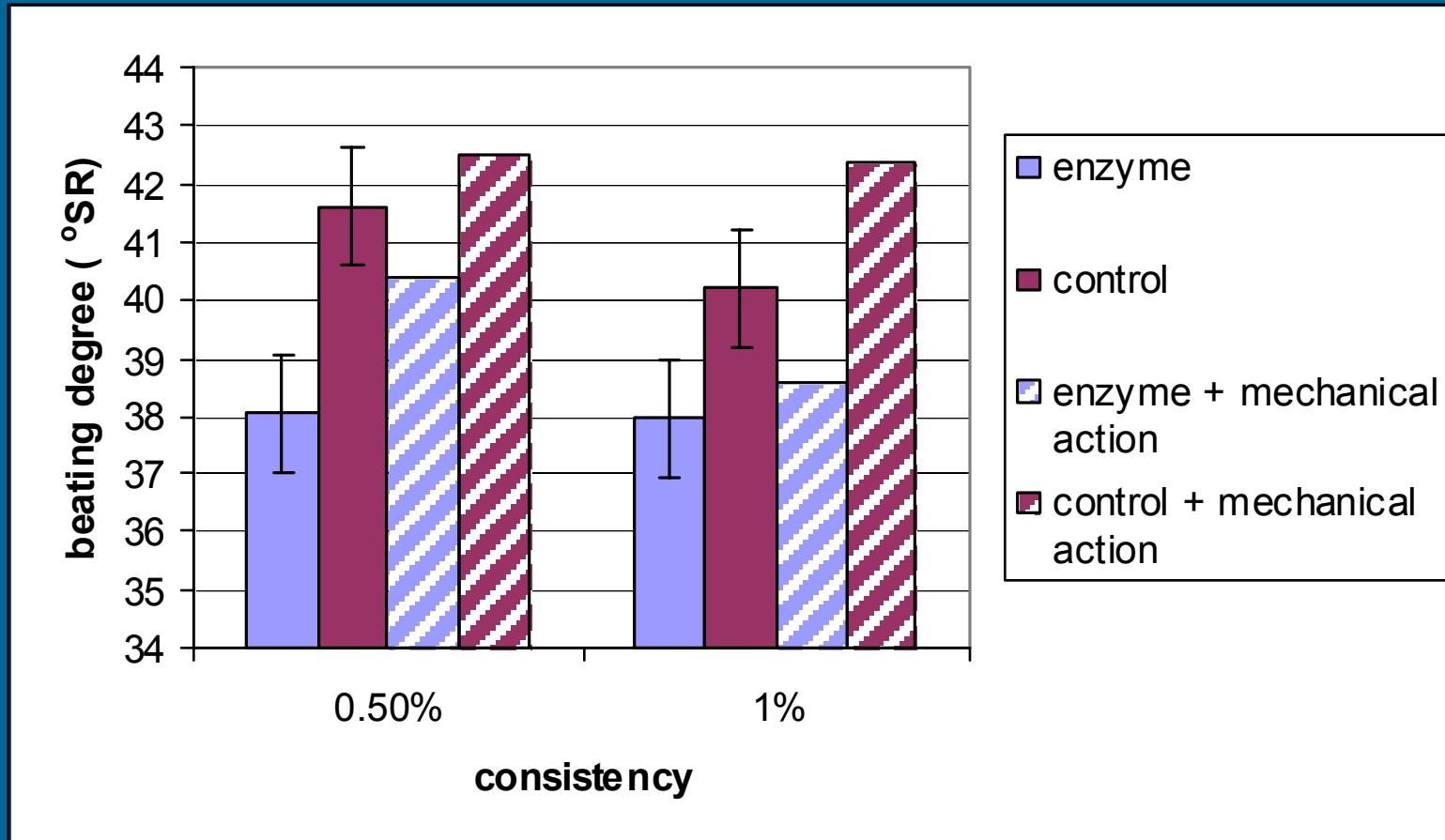
Effect of 1% Novozym (476 v/w) on mixed waste pulp after 4 repetitive treatments of the same enzyme-incubation mixture.

Effect of consistency on enzyme activity

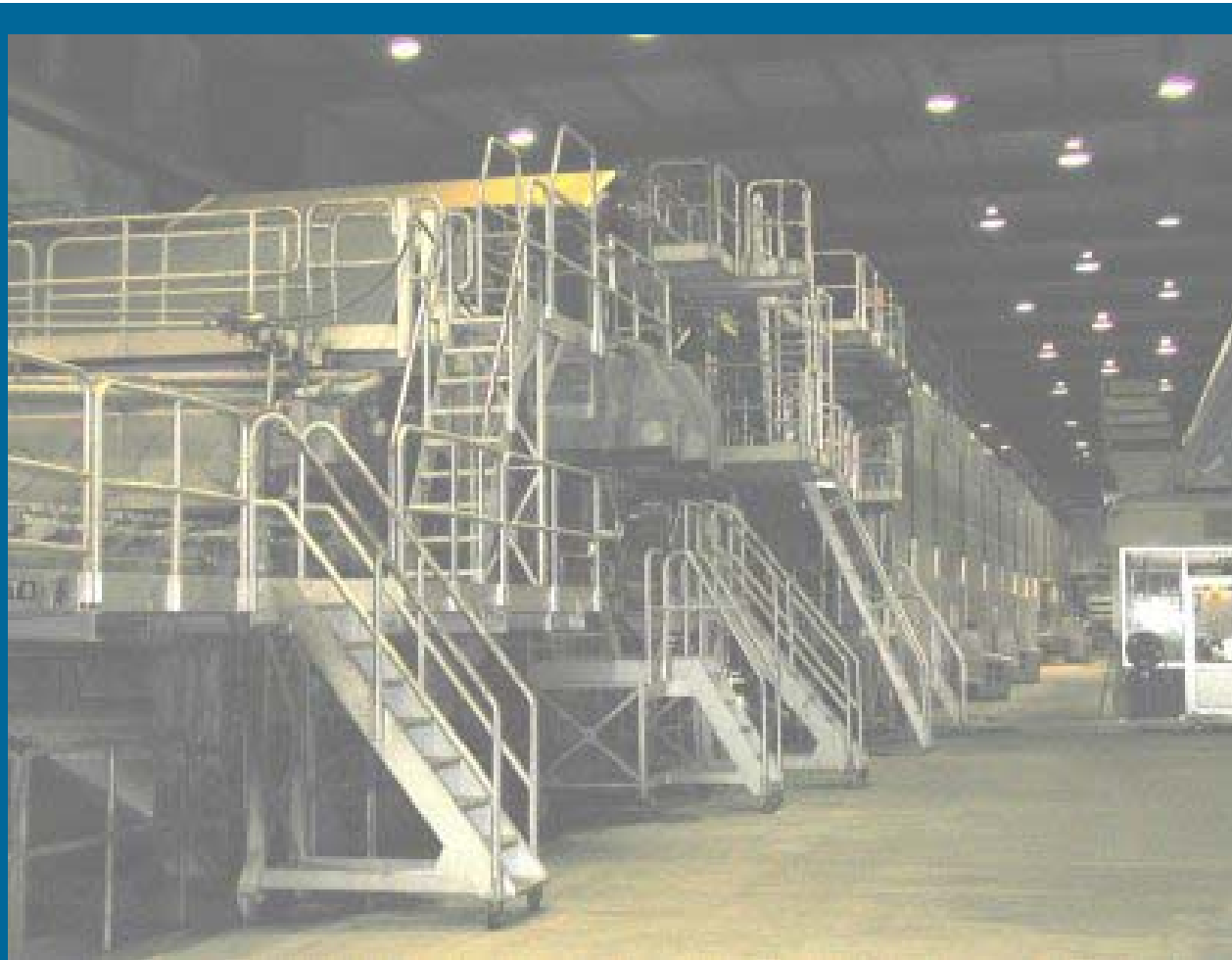
with constant enzyme/pulp ratio



Effect of extra disintegration after treatment



Paper machine



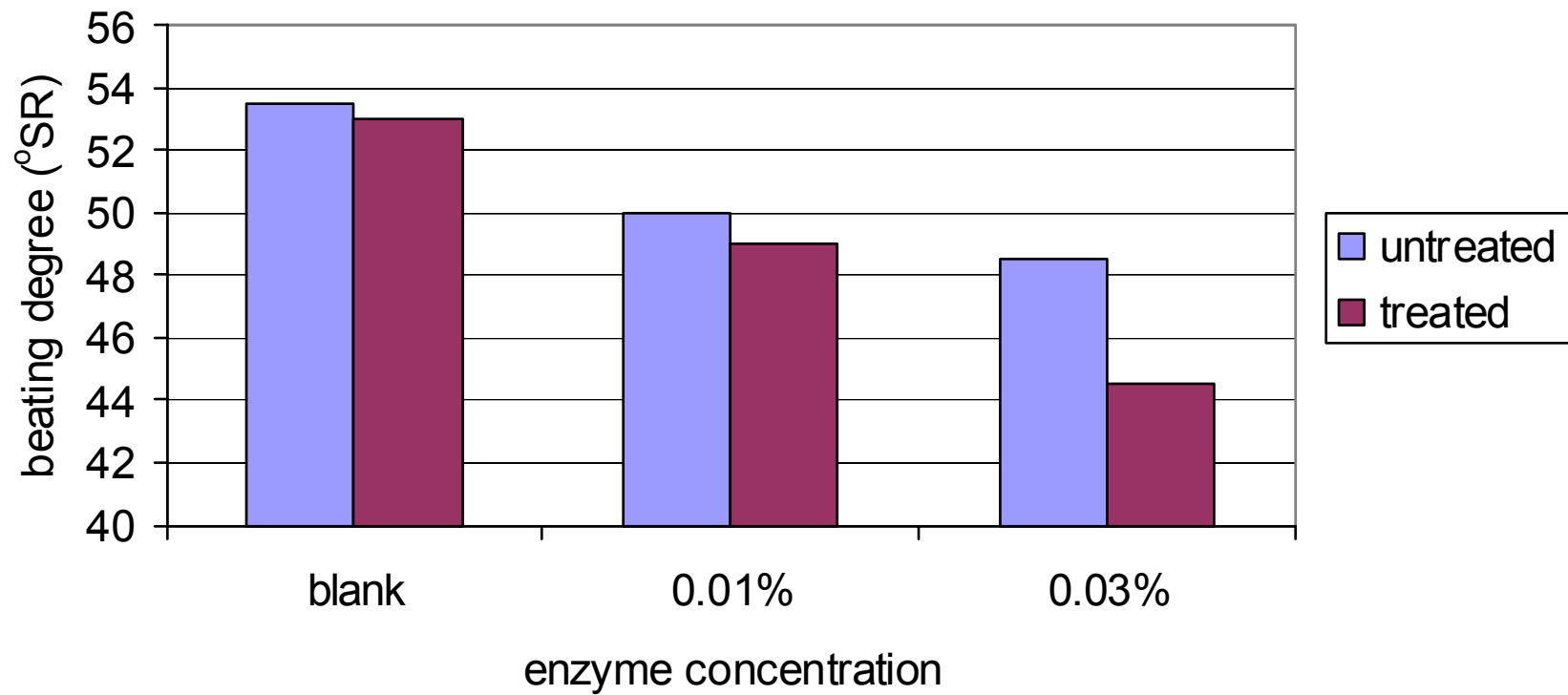
Sampling point



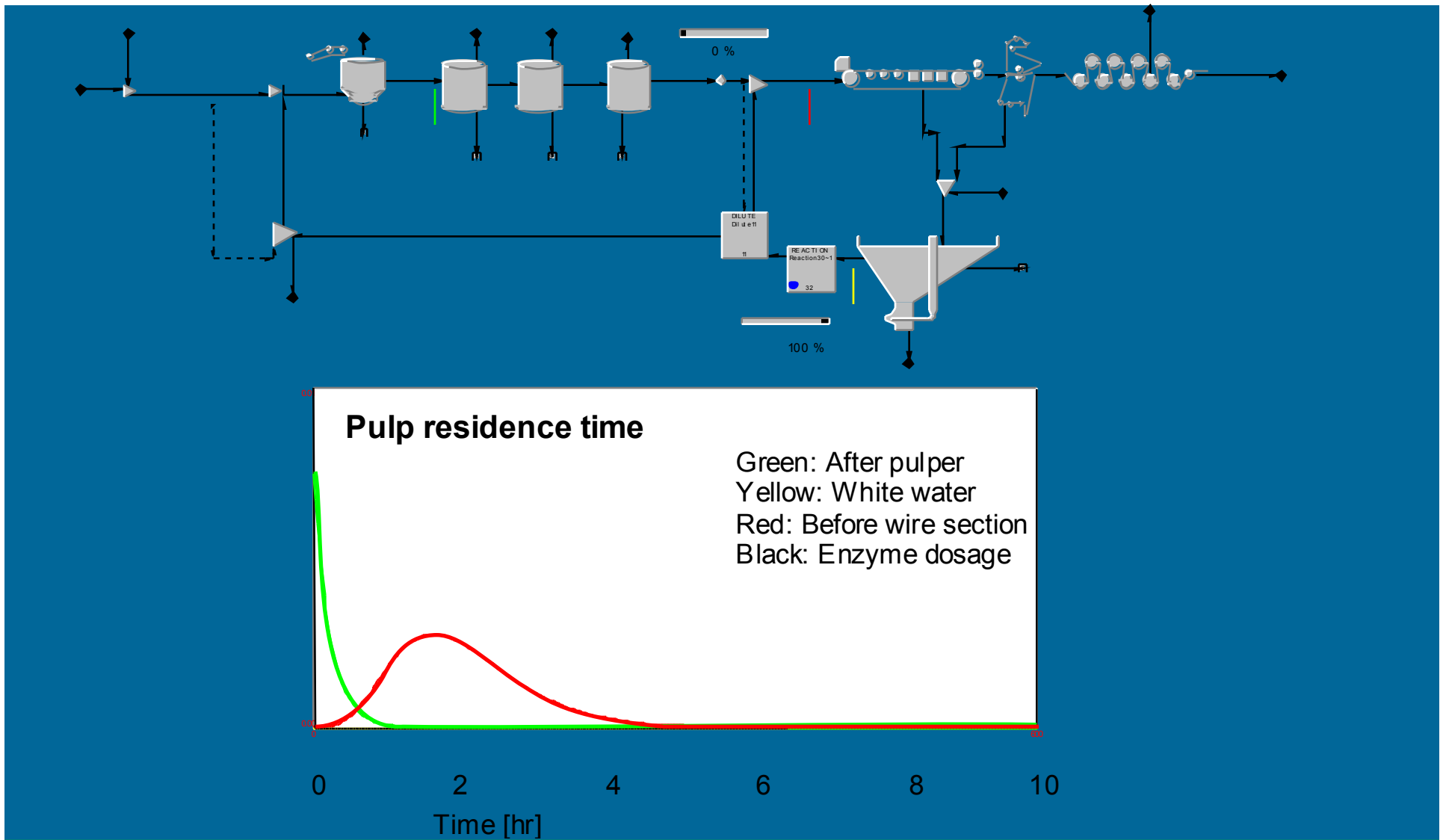
Dosing of enzymes



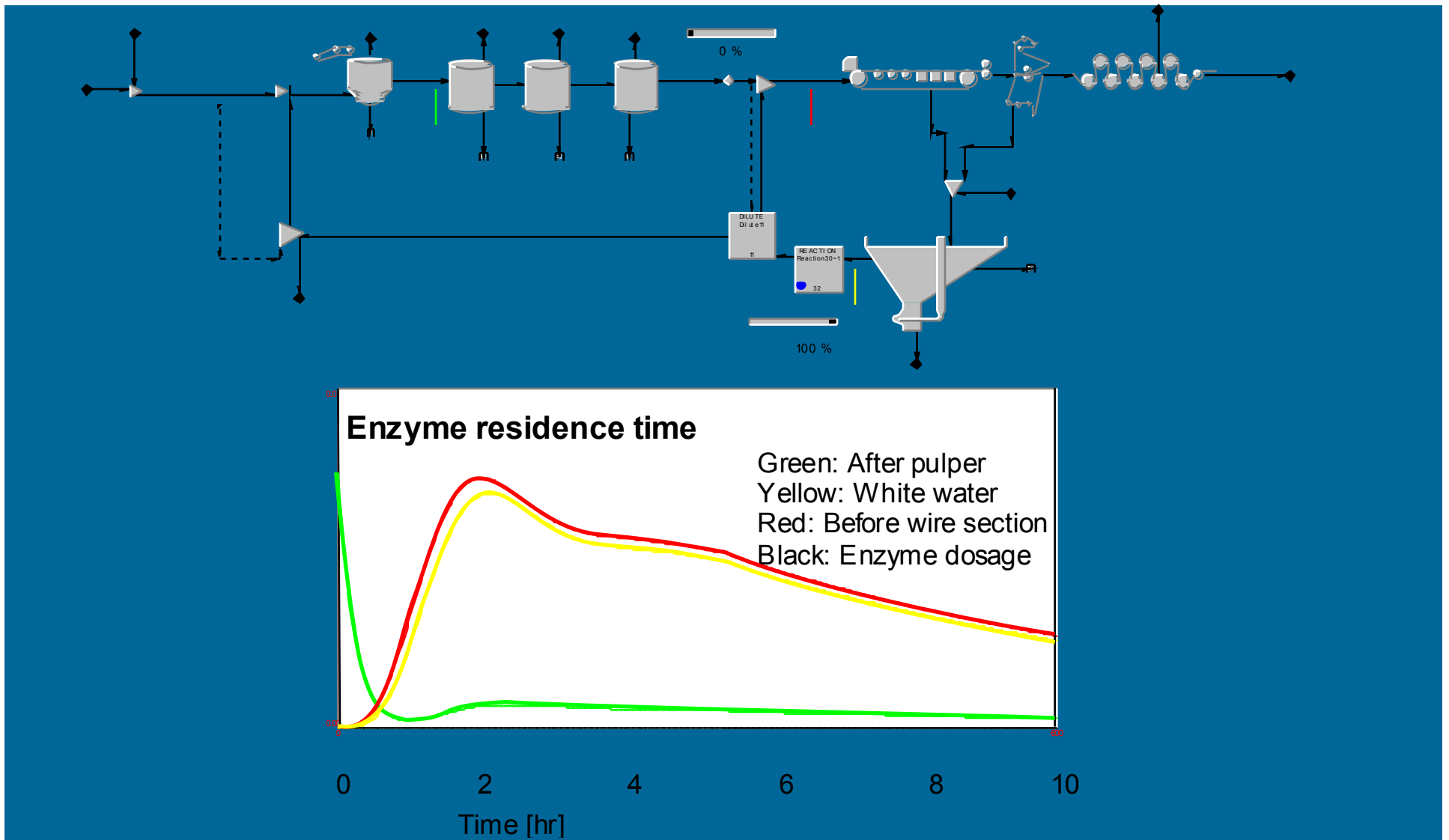
Effect of enzyme concentration in the mill



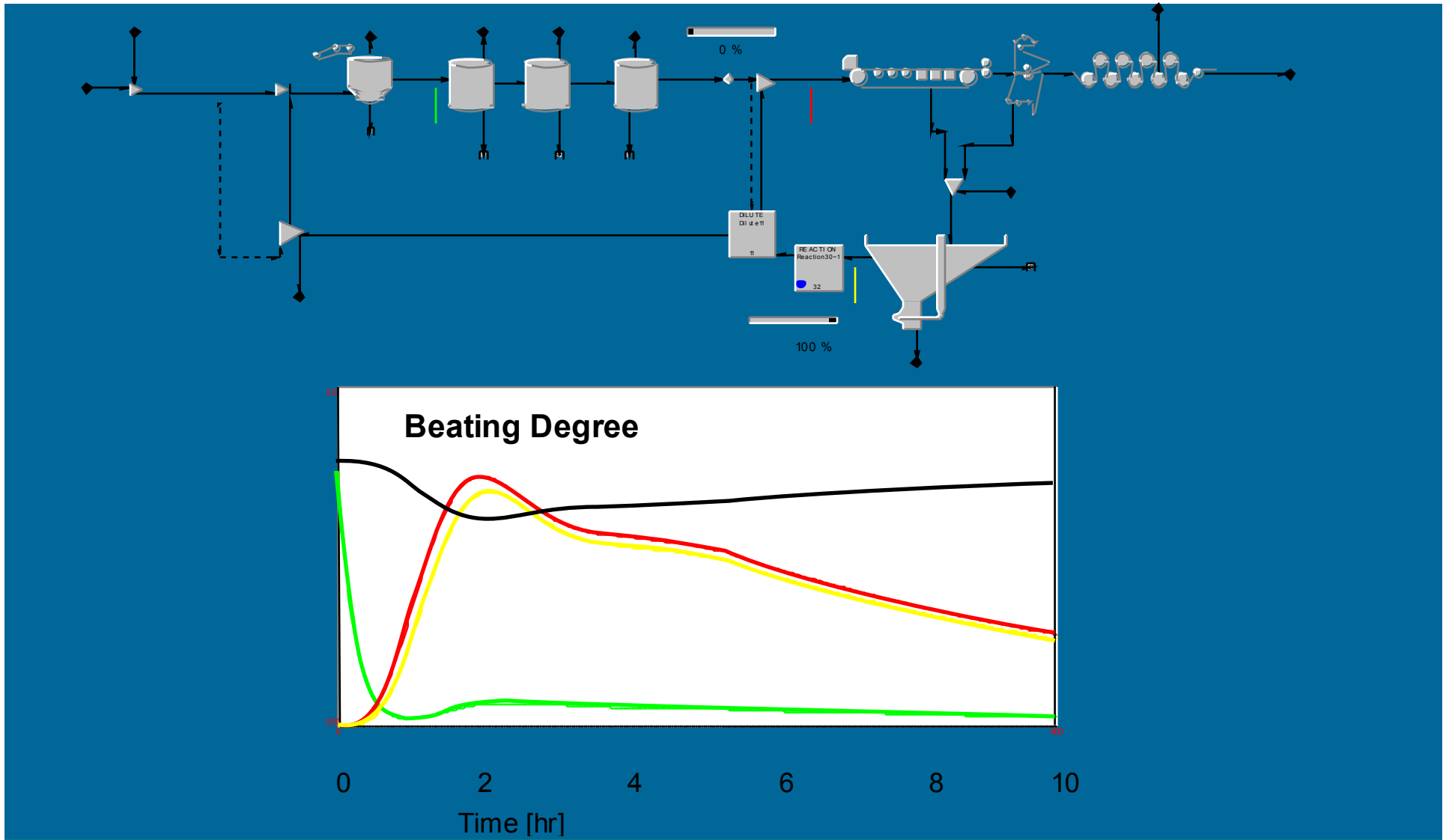
Wingems Simulation



Wingems Simulation



Wingems Simulation



Conclusions

✓ De-watering

✓ Porosity

✓ Active in white-water

(✓) Commercial dosis

✓ Re-use

Where to add?

Residence time and life time