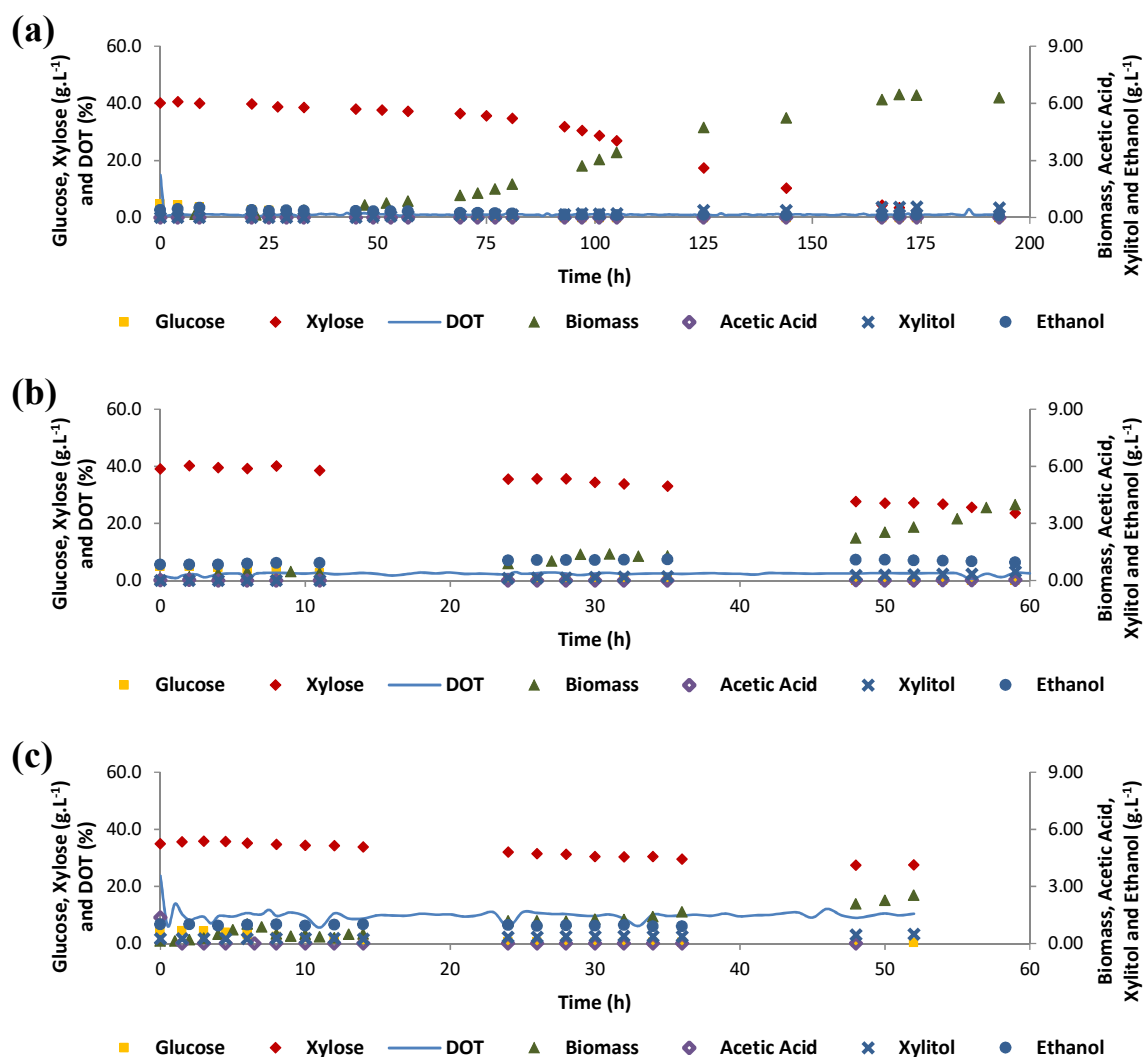


Figure S1 shows the evolution of concentration of glucose, xylose, biomass, acetic acid, xylitol, and ethanol in the single-aeration-stage.



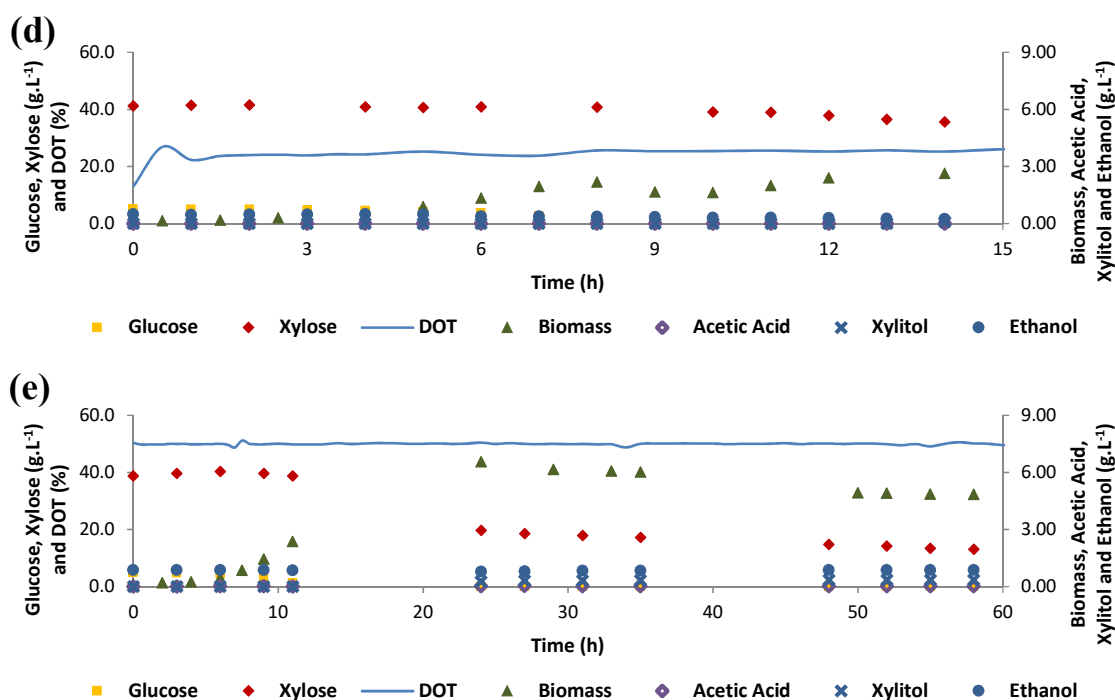


Figure S1. Single-aeration-stage experiments in synthetic medium: (a) DOT 1%; (b) DOT 2.5%; (c) DOT 10%; (d) DOT 25%; (e) DOT 50%.

Figure S2 shows the fitting of Monod kinetic equation (2) to the experimental data of μ (h⁻¹) versus DOT (%). The maximum specific growth rate as function of DOT, μ_{MAX} (h⁻¹) was 0.45 ± 0.01 h⁻¹ and the saturation constant for oxygen, K_{O_2} (%), was $0.67 \pm 0.13\%$, with a correlation coefficient (R^2) of 0.95. The μ_{MAX} corresponded to the maximum specific growth rate when the system is saturated with oxygen [S1], thereby corresponded, under the culture conditions studied, to the highest specific growth rate that can be obtained for *S. stipitis* C4. In turn, K_{O_2} is an indicator of *S. stipitis* C4 affinity for oxygen [S1], thus it shows a high affinity of *S. stipitis* C4 for oxygen, because even at a DOT value so reduced as $0.67 \pm 0.13\%$ half of the μ_{MAX} is obtained. Slininger et al. [S2] studied the variation of the specific growth rate of *S. stipitis* as function of dissolved oxygen concentration and obtained a μ_{MAX} of 0.54 h⁻¹, which was higher than the value of μ_{MAX} obtained in the present study. However, the higher μ_{MAX} obtained by these authors is probably owing to the fact that their study was conducted in 40 g.L⁻¹ of xylose, instead of 5 g.L⁻¹ of glucose and 40 g.L⁻¹ of xylose, since maximum specific growth rate depends on both the number of substrates used and its respective concentration [S2–S5]. In the DOT 50% experiment a μ_{max} of 0.44 h⁻¹ was obtained, which was close to the μ_{MAX} value. Thus, the DOT value of 50% was high enough to obtain a μ very close to the highest specific growth rate that can be achieved under the culture conditions studied.

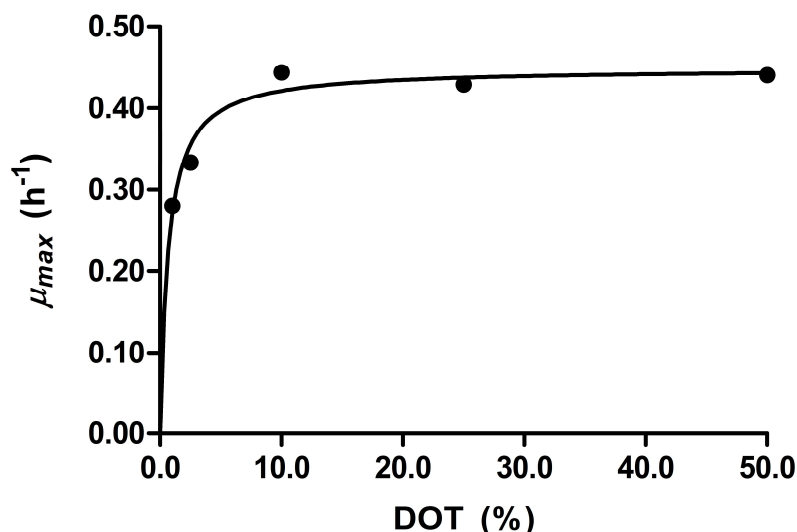


Figure S2. Fitting of Monod model to experimental data of μ (h⁻¹) versus DOT (%) by non-linear regression using GraphPad Prism® 5 software. The correlation coefficient (R^2) was 0.95.

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