

Fig. S1: n-Butanol production with different variants of acetoacetyl-CoA derived n-butanol pathways in *S. cerevisiae* strain CEN.PK113-5D. The n-butanol concentrations of semi-anaerobic fermentations in SMD medium within 100 h are shown. Six different variants are compared: pVS1 (diamond), pVS6 (cross), pVS7 (square), pVS8 (triangle), pVS9 (open square), pVS10 (circle), pVS11 (open triangle). Error bars represent the standard deviation of three independent replicates.

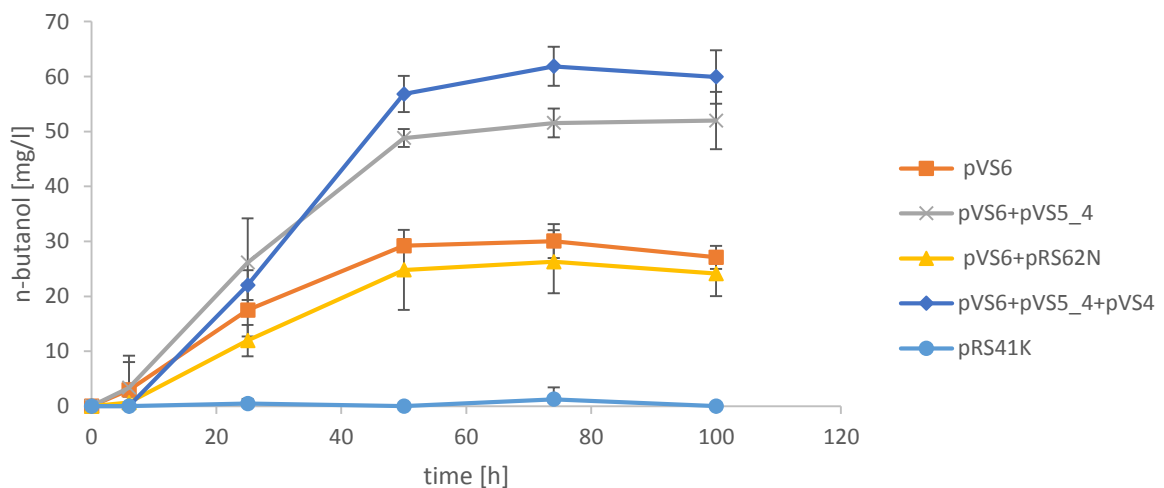


Fig. S2: Comparison of n-butanol production with and without overexpression of *coaA* (pVS5_4) and *adhE*^{A267T/E568K} (pVS4) in VSY0 ($\Delta adh1-5$). Different combinations of plasmids were used for fermentations in SMD medium: pVS6 (square), pVS6+pVS5_4 (cross), as a control pVS6 with an empty vector instead of pVS5_4 (triangle), pVS6+pVS5_4+pVS4 (diamond) and an empty vector (circle). Error bars represent the standard deviation of three independent replicates.

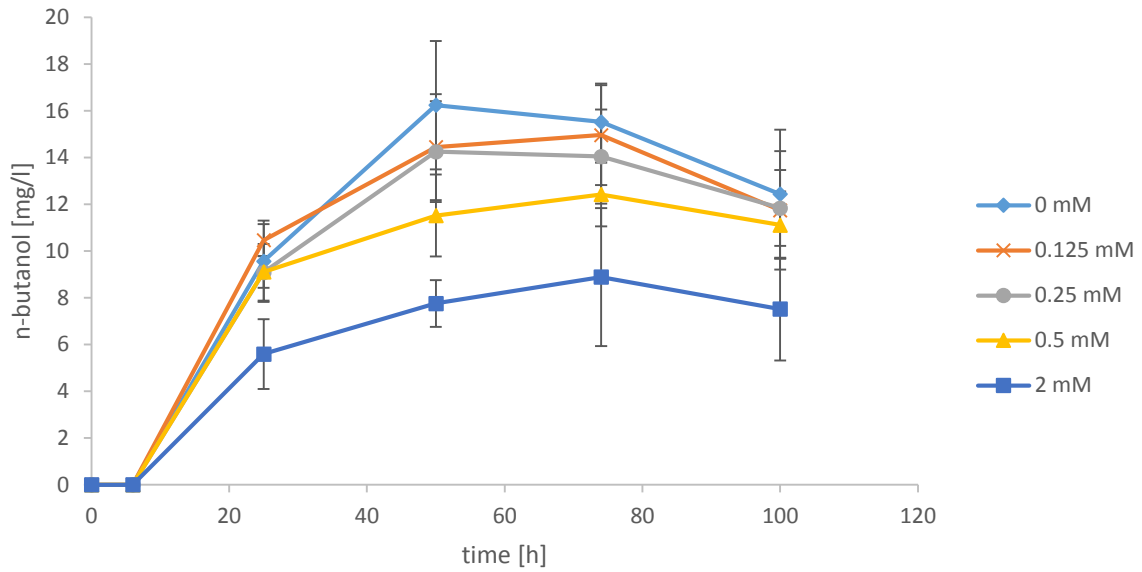


Fig. S3: n-Butanol production with n-butanol pathway (pVS6) and *FEN2* overexpression behind the *MET25* promoter (pVS5_6) in CEN.PK113-5D with addition of methionine. Five different concentrations of methionine were added to SMD medium: 0 mM (diamond), 0.125 mM (cross), 0.25 mM (circle), 0.5 mM (triangle), 2 mM (square). Error bars represent the standard deviation of three independent replicates.

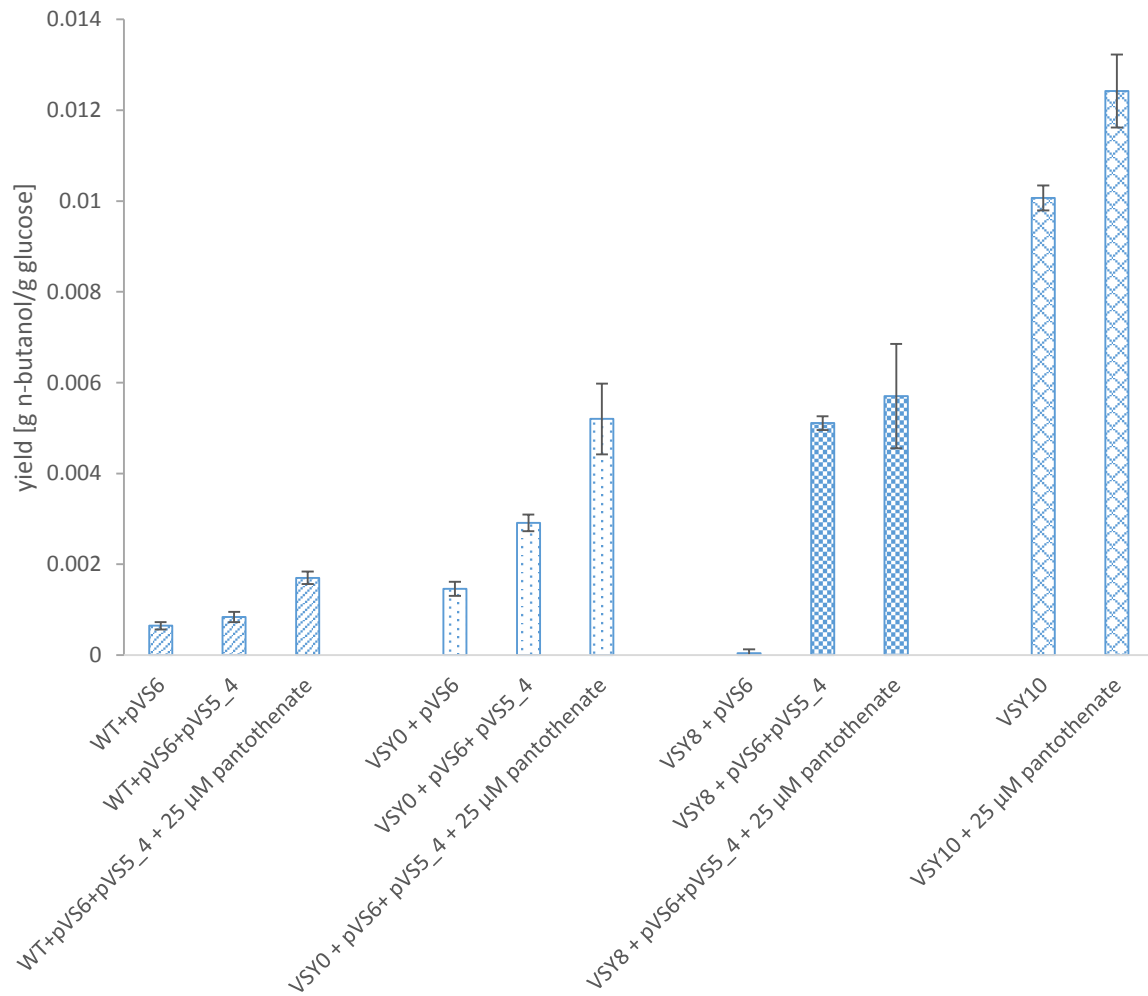


Fig. S4: Comparison of n-butanol yields of different strains. The amount of n-butanol after 74 h is calculated per g consumed glucose after 74 h of semi-anaerobic fermentations in SMD medium. Compared are fermentations of the wildtype CEN.PK113-5D, VSY0 ($\Delta adh1-5$), and VSY8 ($\Delta adh1-5$ *sfa1* with *adhE*^{A267T/E568K}) with plasmid pVS6 (n-butanol pathway), with or without *coaA* overexpression (pVS5_4), and strain VSY10 ($\Delta adh1-6$ *sfa1* *gpd2*, with n-butanol pathway genes of pVS6, *coaA* and *adhE*^{A267T/E568K}), in the absence or presence of additional 25 µM pantothenate, in SMD medium. Error bars represent the standard deviation of three independent replicates and a statistical analysis is shown in Tab. S4.

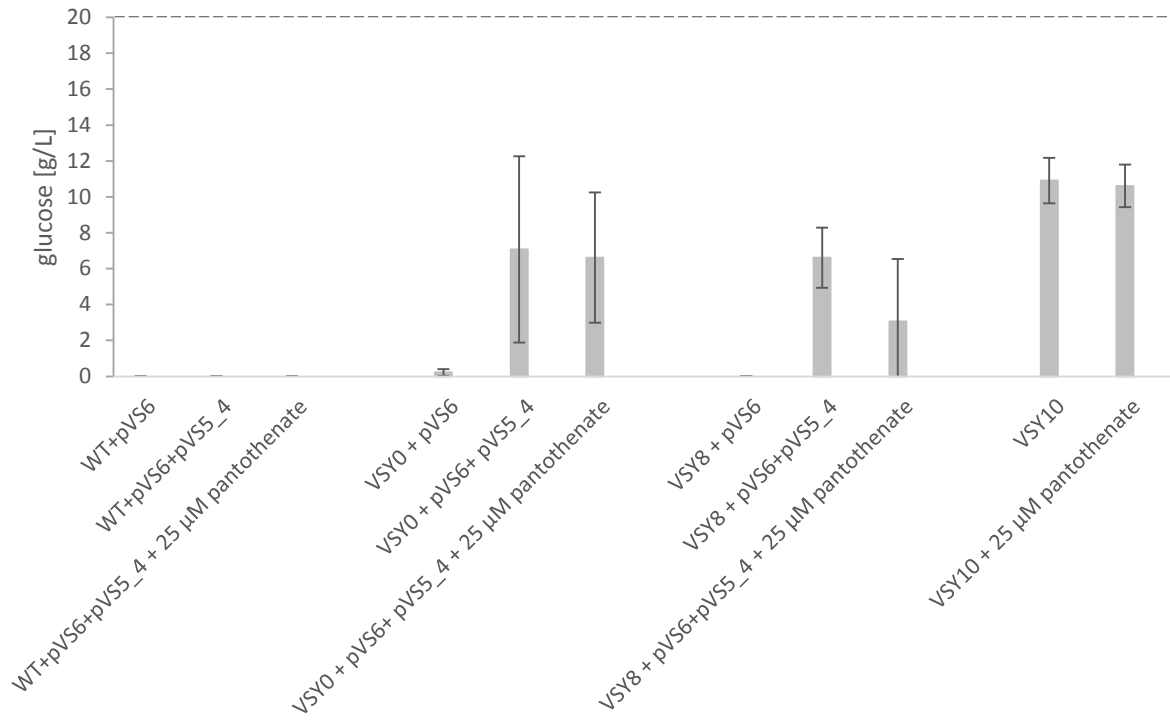


Fig. S5: Consumption of glucose in semi-anaerobic fermentations started with 20 g/L glucose. Residual glucose after 74 h fermentations in SMD medium is shown. Compared are fermentations of the wildtype CEN.PK113-5D, VSY0 ($\Delta adh1-5$), and VSY8 ($\Delta adh1-5 sfa1$ with $adhE^{A267T/E568K}$) with plasmid pVS6 (n-butanol pathway), with or without *coaA* overexpression (pVS5_4), and strain VSY10 ($\Delta adh1-6 sfa1 gpd2$, with n-butanol pathway genes of pVS6, *coaA* and $adhE^{A267T/E568K}$), in the absence or presence of additional 25 µM pantothenate, in SMD medium. Error bars represent the standard deviation of three independent replicates.

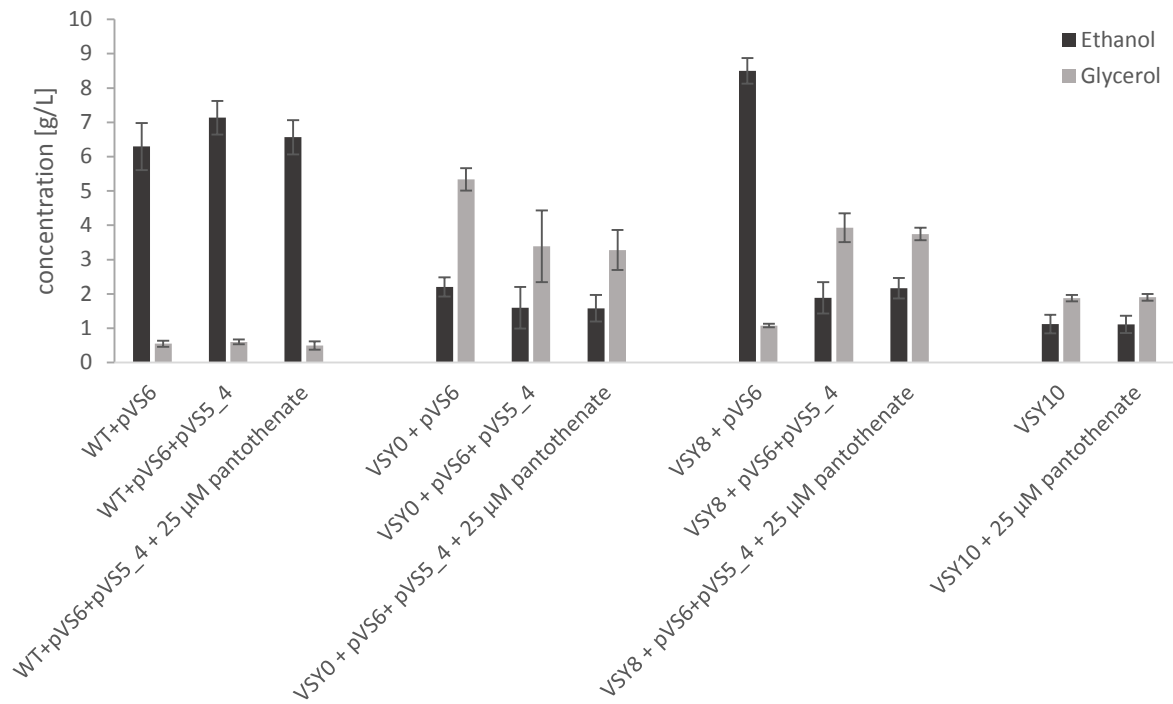


Fig. S6: Ethanol and glycerol production in semi-anaerobic fermentations. The amounts of ethanol and glycerol after 74 h fermentations in SMD medium are shown. Compared are fermentations of the wildtype CEN.PK113-5D, VSY0 ($\Delta adh1-5$), and VSY8 ($\Delta adh1-5$ *sfa1* with *adhE*^{A267T/E568K}) with plasmid pVS6 (n-butanol pathway), with or without *coaA* overexpression (pVS5_4), and strain VSY10 ($\Delta adh1-6$ *sfa1* *gpd2*, with n-butanol pathway genes of pVS6, *coaA* and *adhE*^{A267T/E568K}), in the absence or presence of additional 25 µM pantothenate, in SMD medium. Error bars represent the standard deviation of three independent replicates.

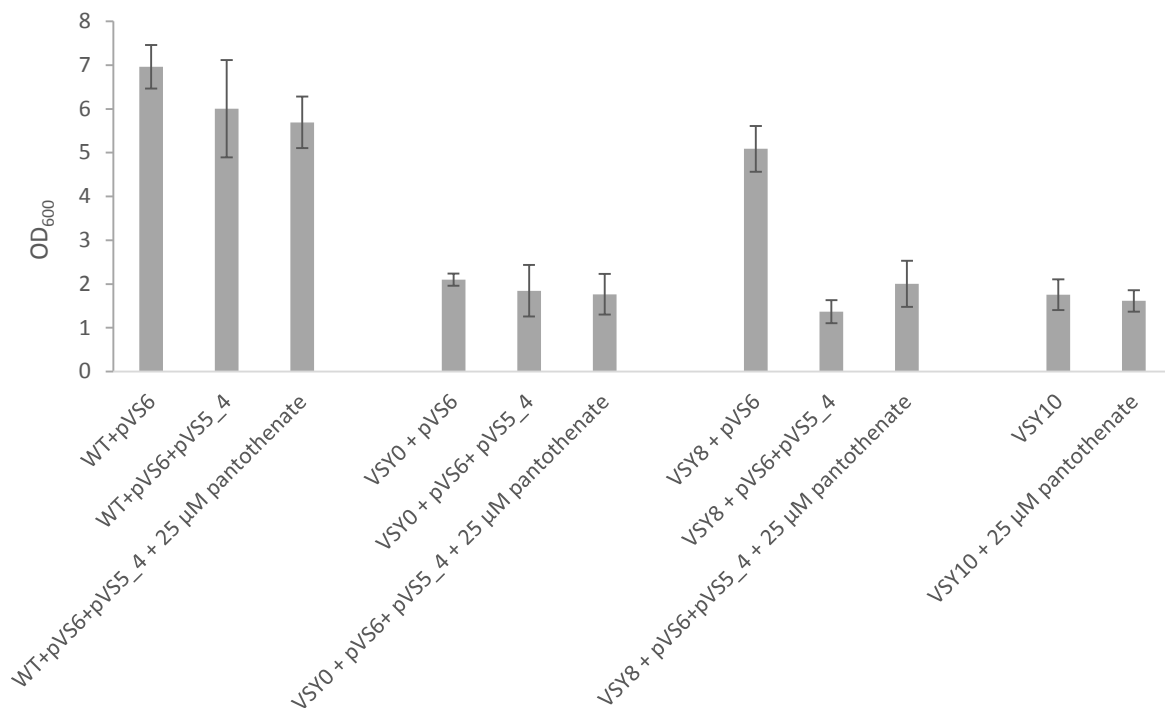


Fig. S7: OD₆₀₀ after 74 h in semi-aerobic fermentations. The OD₆₀₀ after 74 h fermentations, that were started with an OD₆₀₀ of 0.3 in SMD medium are shown. Compared are fermentations of the wildtype CEN.PK113-5D, VSY0 ($\Delta adh1-5$), and VSY8 ($\Delta adh1-5 sfa1$ with $adhE^{A267T/E568K}$) with plasmid pVS6 (n-butanol pathway), with or without *coaA* overexpression (pVS5_4), and strain VSY10 ($\Delta adh1-6 sfa1 gpd2$, with n-butanol pathway genes of pVS6, *coaA* and $adhE^{A267T/E568K}$), in the absence or presence of additional 25 μM pantothenate, in SMD medium. Error bars represent the standard deviation of three independent replicates.

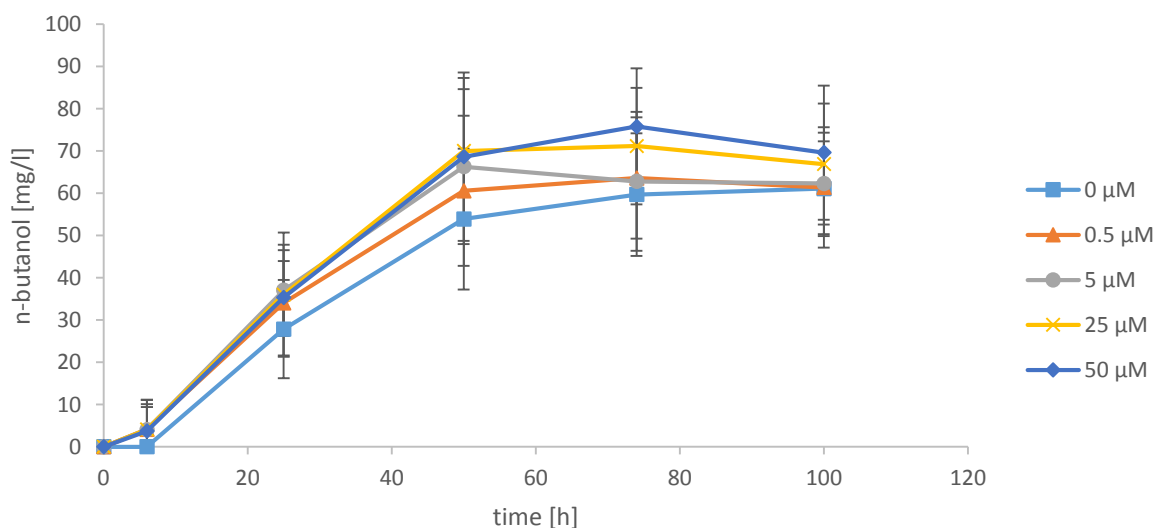


Fig. S8: n-Butanol production with n-butanol pathway (pVS6) and *coaA* overexpression (pVS5_4) in VSY0 ($\Delta adh1-5$) with addition of pantothenate. Five different concentrations of pantothenate were added to SMD medium: 0 μM (square), 0.5 μM (triangle), 5 μM (circle), 25 μM (cross), 50 μM (diamond). Error bars represent the standard deviation of three independent replicates.

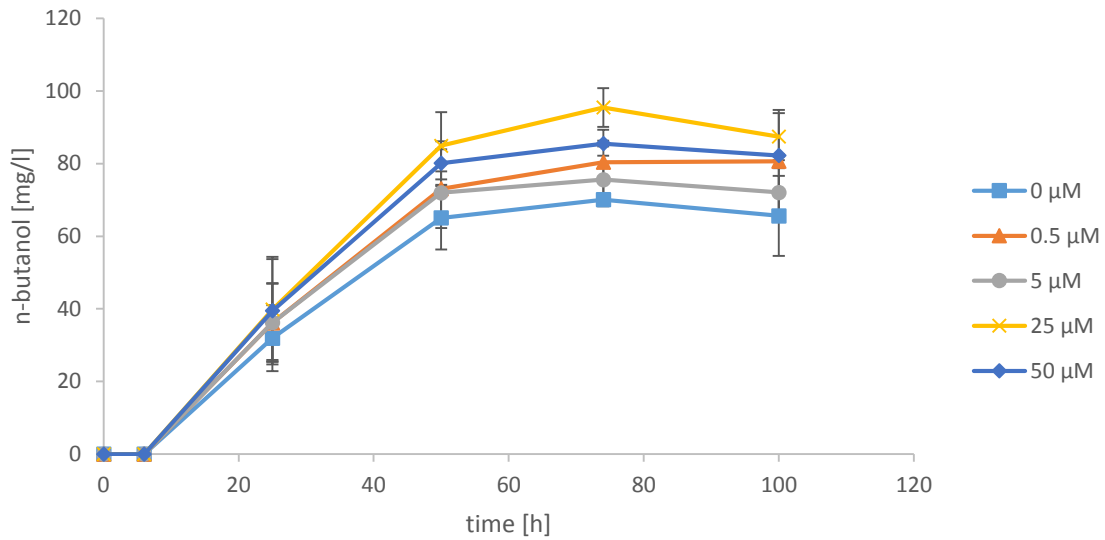


Fig. S9: n-Butanol production with n-butanol pathway (pVS6) and *coaA* overexpression (pVS5_4) in VSY8 ($\Delta adh1-5 sfa1$, integrated $adhE^{A267T/E568K}$) with addition of pantothenate. Five different concentrations of pantothenate were added to SMD medium: 0 μM (square), 0.5 μM (triangle), 5 μM (circle), 25 μM (cross), 50 μM (diamond). Error bars represent the standard deviation of three independent replicates.

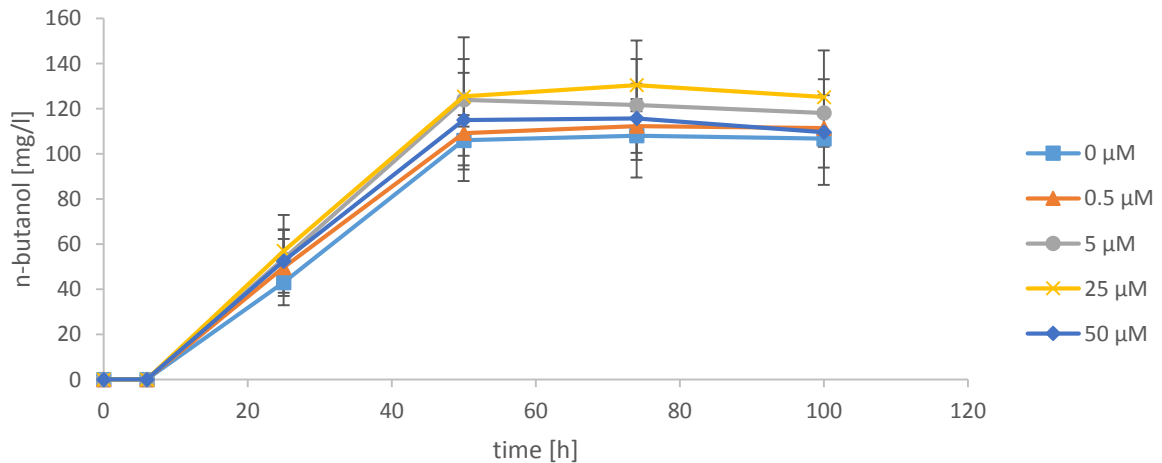


Fig. S10: n-Butanol production of strain VSY10 ($\Delta adh1-5 sfa1 adh6 gpd2$ with integrated $adhE^{A267T/E568K}$, *coaA* and n-butanol pathway) with addition of pantothenate. Five different concentrations of pantothenate were added to SMD medium: 0 μM (square), 0.5 μM (triangle), 5 μM (circle), 25 μM (cross), 50 μM (diamond). Error bars represent the standard deviation of three independent replicates.