Table III. Influence of the NAD/NADH ratio on the thermodynamic feasibility of glycolysis.

	CEN.PK 113-7A:mtlD, aerobic, glucose-limited, $D = 0.1\ h^{-1}$	
Strain and conditions	With total NAD/NADH	With cytosolic free NAD/NADH
FBP (mM)	0.23	
3PG (mM)	0.41[a]	
ATP (mM)	3.06[b]	
ADP (mM)	0.72[b]	
Pi (mM)	43[b]	
Total NAD/NADH	7.5	
Cytosolic free NAD/NADH assuming cytosolic pH 7.0/6.5		101/320
$\Delta_r G'$ (kJ/mol) at pH′ 7.0/6.5	+12/+17	−1.3/−1.4

Concentrations were converted to mM using the factor 2.38 mL_{cell}/g_{DW} (Theobald et al., 1997). The cytosolic free NAD/NADH was calculated from the steady-state NAD/NADH $\times 10^{pH-7.0}$ ratio of 101, assuming the cytosolic pH is between 6.5 and 7.0 (see Results Section). Gibbs energies of formation of the metabolites at pH′ 7.0 and 6.5, $T = 25°C$ and $I = 0.25$ M were obtained from Alberty (2003). The Gibbs energy of reaction was calculated for the overall reaction: FBP + 2 NAD + 2 ADP + 2 Pi → 2 3PG + 2 ATP + 2 NADH. A reaction is feasible if $\Delta_r G' \leq 0$.

[a]Calculated from the concentration of 2PG + 3PG assuming equilibrium of phosphoglycerate mutase, with $\Delta_r G'^{\circ} = 5.9$ kJ/mol (Alberty, 2003).

[b]Taken from Wu et al. (2006).