

Table VIII. Kinetic parameters (initial values and optimized values).

Enzyme activities	Parameters	Parameter values before optimization [ref]	Optimized parameter values
PTS	$K_{PTS,a1}$	1 mM [arbitrary]	3082.3 mM
	$K_{PTS,a2}$	0.01 mM ^a	0.01 mM
	$K_{PTS,a3}$	1 [arbitrary]	245.3
	$K_{PTS,g6p}$	0.5 mM ^b	2.15 mM
	$n_{PTS,g6p}$	4 [arbitrary]	3.66
PGI	$K_{PGI,g6p}$	2.46 mM ^c	2.9 mM
	$K_{PGI,f6p}$	0.2 mM ^d	0.266 mM
	$K_{PGI,eq}$	0.43 ^c [index]	0.1725
	$K_{PGI,g6p,6pginh}$	0.2 mM ^f	0.2 mM
	$K_{PGI,f6p,6pginh}$	0.2 mM ^f	0.2 mM
PFK	$K_{PFK,g6p,s}$	0.14 mM ^g	0.325 mM
	$K_{PFK,atp,s}$	0.16 mM ^g	0.123 mM
	$K_{PFK,adp,a}$	239 mM ^h	128 mM
	$K_{PFK,adp,b}$	0.25 mM ^h	3.89 mM
	$K_{PFK,adp,c}$	0.36 mM ^h	4.14 mM
	$K_{PFK,amp,a}$	8.74 mM ^h	19.1 mM
	$K_{PFK,amp,b}$	0.01 mM ^h	3.2 mM
	L_{PFK}	4,000,000 ⁱ	5629067
	n_{PFK}	4 ⁱ	11.1
ALDO	$K_{ALDO,fdp}$	0.133 mM ^j	1.75 mM
	$K_{ALDO,dhap}$	0.088 mM ^j	0.088 mM
	$K_{ALDO,gap}$	0.088 mM ^j	0.088 mM
	$K_{ALDO,gap,inh}$	0.6 mM ^j	0.6 mM
	$V_{ALDO,bif}$	2 ^j	2
	$K_{ALDO,eq}$	0.1–0.14 mM ^{j,c}	0.144 mM
TIS	$K_{TIS,dhap}$	2.8 mM ^j	2.8 mM
	$K_{TIS,gap}$	0.3 mM ^j	0.3 mM
	$K_{TIS,eq}$	0.04 ^j	1.39
GAPDH	$K_{GAPDH,gap}$	0.15 mM ^k	0.683 mM
	$K_{GAPDH,pgp}$	0.1 mM ^k	0.0000104 mM
	$K_{GAPDH,nad}$	0.45 mM ^k	0.252 mM
	$K_{GAPDH,nadh}$	0.02 mM ^k	1.09 mM
	$K_{GAPDH,eq}$	0.63 ^c	0.63

Enzyme activities	Parameters	Parameter values before optimization [ref]	Optimized parameters values
PGK	$K_{PGK,pgp}$	0.006 mM ^l	0.0468 mM
	$K_{PGK,3pg}$	0.17 mM ^m	0.473 mM
	$K_{PGK,adp}$	0.18 mM ⁿ	0.185 mM
	$K_{PGK,atp}$	0.24 mM ^o	0.653 mM
	$K_{PGK,eq}$	1800 ^p	1934.4
PGluMu	$K_{PGluMu,3pg}$	0.2 mM ^q	0.2 mM
	$K_{PGluMu,2pg}$	0.369 mM ^r	0.369 mM
	$K_{PGluMu,eq}$	0.1–0.187 ^{c,k}	0.188
ENO	$K_{ENO,2pg}$	0.1 mM ^s	0.1 mM
	$K_{ENO,pep}$	0.135 mM ^t	0.135 mM
	$K_{ENO,eq}$	4–6.7 ^{k,t}	6.73 mM
PK	$K_{PK,pep}$	0.31 mM ^u	0.31 mM
	$K_{PK,adp}$	0.26 mM ^u	0.26 mM
	$K_{PK,atp}$	22.5 mM ^u	22.5 mM
	$K_{PK,fdp}$	0.19 mM ^u	0.19 mM
	$K_{PK,amp}$	0.2 mM [arbitrary]	0.2 mM
	L_{PK}	1000 ^u	1000
	n_{PK}	4 ^u	4
PDH	$K_{PDH,pyr}$	0.11 mM ^v	1159 mM
	n_{PDH}	1 ^v	3.68
PepCxylase	$K_{PepCxylase,pep}$	1 mM [arbitrary]	4.07 mM
	$K_{PepCxylase,fdp}$	1 mM [arbitrary]	0.7 mM
	$n_{PepCxylase,fdp}$	4 [arbitrary]	4.21
PGM	$K_{PGM,g6p}$	0.02 mM ^w	1.038 mM
	$K_{PGM,g1p}$	0.008 mM ^w	0.0136 mM
	$K_{PGM,eq}$	0.142 mM ^w	0.196
G1PAT	$K_{G1PAT,g1p}$	0.12 mM ^x	3.2 mM
	$K_{G1PAT,atp}$	1.3 mM ^x	4.42 mM
	$K_{G1PAT,fdp}$	0.068 mM ^x	0.119 mM
	$n_{G1PAT,fdp}$	2 ^x	1.20
RPPK	$K_{RPPK,rib5p}$	0.1 mM [arbitrary]	0.1 mM
G3PDH	$K_{G3PDH,dhap}$	1 mM [arbitrary]	1 mM
SerSynth	$K_{SerSynth,3pg}$	1 mM [arbitrary]	1 mM
Synth1	$K_{Synth1,pep}$	1 mM [arbitrary]	1 mM
Synth2	$K_{Synth2,pyr}$	1 mM [arbitrary]	1 mM
DAHPS	$K_{DAHPS,e4p}$	0.035 mM ^y	0.035 mM
	$K_{DAHPS,pep}$	0.0053 mM ^y	0.0053 mM
	$n_{DAHPS,e4p}$	2.6 ^y	2.6
	$n_{DAHPS,pep}$	2.2 ^y	2.2
G6PDH	$K_{G6PDH,g6p}$	0.07 mM ^z	14.4 mM
	$K_{G6PDH,nadp}$	0.015 mM ^z	0.0246 mM
	$K_{G6PDH,nadph,nadphinh}$	0.01 mM ^z	0.01 mM
	$K_{G6PDH,nadph,g6p,inh}$	0.18 mM ^z	6.43 mM
PGDH	$K_{PGDH,6pg}$	0.1 mM ^{aa}	37.5 mM
	$K_{PGDH,nadp}$	0.028 mM ^{aa}	0.0506 mM
	$K_{PGDH,nadph,inh}$	0.01 mM ^{aa}	0.0138 mM
	$K_{PGDH,atp,inh}$	3 mM ^{aa}	208 mM
Ru5P	$K_{Ru5P,eq}$	1.4 ^{ab}	1.4
R5PI	$K_{R5PI,eq}$	4.0 ^{ab}	4.0
TKa	$K_{TKa,eq}$	1.2 ^{ab}	1.2
TKb	$K_{TKb,eq}$	10.0 ^{ab}	10.0
TA	$K_{TA,eq}$	1.05 ^{ab}	1.05

^aNotley-McRobb et al. (1997); ^bKaback (1969); ^cTakama and Nosoh (1980); ^dDykhuizen and Hartl (1983); ^ePetterson (1990); ^fSchreyer and Bock (1980); ^gDeville-Bonne et al., (1991); ^hRizzi et al. (1997); ⁱDiag Ricci (1999); ^jBabul et al. (1993); ^kBakker et al. (1997); ^lLavoine et al. (1983); ^mSchmidt et al. (1995); ⁿMolnar and Vas (1993); ^oFifis and Scopes (1978); ^pNi and Savageau, (1996); ^qBritton et al. (1972); ^rGrana et al. (1989); ^sSpring and Wold (1971); ^tDuggleby, (1994); ^uBoiteux et al. (1983); ^vYi et al. (1996); ^wLowry and Passonneau (1969); ^xPreiss et al. (1975); ^yAkowski and Bauerle (1970); ^zSanwal (1970); ^{aa}Orozco de Silva (1979); ^{ab}Vaseghi et al. (1999).

Enzymes

AlaSynth	alanine synthesis
ALDO	aldolase
ChoSynth	chorismate synthesis
DAHPS	DAHPS synthases
DipimSynth	diaminopimelate synthesis
ENO	enolase
G1PAT	glucose-1-phosphate adenylyltransferase
G3PDH	glycerol-3-phosphate dehydrogenase
G6PDH	glucose-6-phosphate dehydrogenase
GAPDH	glyceraldehyde-3-phosphate dehydrogenase
IleSynth	isoleucine synthesis
MetSynth	methionine synthesis
MurSynth	mureine synthesis
PFK	phosphofructokinase
PGDH	6-phosphogluconate dehydrogenase
PGI	glucose-6-phosphate isomerase
PGK	phosphoglycerate kinase
PGluMu	phosphoglycerate mutase
PDH	pyruvate dehydrogenase
PEPCxylase	PEP carboxylase
PGM	phosphoglucomutase
PK	pyruvate kinase
ppp	pentose-phosphate pathway
PTS	phosphotransferase system
R5PI	ribose-phosphate isomerase
RPPK	ribose-phosphate pyrophosphokinase
Ru5P	ribulose-phosphate epimerase
Synth1	synthesis 1
Synth2	synthesis 2
TA	transaldolase
TIS	triosephosphate isomerase
TKa	transketolase, reaction a
TKb	transketolase, reaction b
TrpSynth	tryptophan synthesis