

Table S1 Metabolic investment for the production of amino acids from precursors. The number of moles of precursors, energy containing metabolites and other compounds that are consumed to produce one mole of each amino acid is indicated. Negative numbers indicate production. The last column (“ATP cons.”) indicates the overall ATP consumption when assuming 2 ATP = 2 FADH = 1 NADH = 1 NADPH and starting biosynthesis from the precursors. For a list of abbreviations of precursors see Table S6. Abbreviations: AA, amino acid.

AA	Precursors								Energy			Others			ATP cons.
	Ru5P	E4P	PEP	PG	Pyr	AcCoA	AKG	OAA	ATP	NADH	NADPH	NH ₃	Mithf	CO ₂	
Ala	0	0	0	0	1	0	0	0	0	0	1	1	0	0	2
Arg	0	0	0	0	0	0	1	0	5	-1	3	4	0	1	9
Asn	0	0	0	0	0	0	0	1	2	0	1	2	0	0	4
Asp	0	0	0	0	0	0	0	1	0	0	1	1	0	0	2
Cys	0	0	0	1	0	0	0	0	6	-1	3	1	0	0	10
Glu	0	0	0	0	0	0	1	0	0	0	1	1	0	0	2
Gln	0	0	0	0	0	0	1	0	1	0	1	2	0	0	3
Gly	0	0	0	1	0	0	0	0	0	-1	1	1	-1	0	0
His	1	0	0	0	0	0	0	0	6	-2	2	3	1	0	6
Ile	0	0	0	0	1	0	0	1	2	0	5	1	0	-1	10
Leu	0	0	0	0	2	1	0	0	0	-1	2	1	0	-2	2
Lys	0	0	0	0	1	0	0	1	2	0	4	2	0	-1	10
Met	0	0	0	0	0	0	0	1	10	-1	6	1	1	0	20
Phe	0	1	2	0	0	0	0	0	1	0	2	1	0	-1	5
Pro	0	0	0	0	0	0	1	0	1	0	3	1	0	0	7
Ser	0	0	0	1	0	0	0	0	0	-1	1	1	0	0	0
Thr	0	0	0	0	0	0	0	1	2	0	3	1	0	0	8
Trp	1	1	1	0	0	0	0	0	5	-1	1	2	0	-1	5
Tyr	0	1	2	0	0	0	0	0	1	-1	2	1	0	-1	3
Val	0	0	0	0	2	0	0	0	0	0	2	1	0	-1	4

Table S6 Abbreviations.

Abbr.	Metabolite	Abbr.	Metabolite
2PG	2-phosphoglycerate	Glyc(ex)	extra-cellular glycerol
Ac(ex)	extra-cellular acetate	Icit	Isocitrate
AcCoA	acetyl-Coenzym A	Mal	L-malate
AKG	2-oxoglutarate	OAA	Oxaloacetate
DHAP	dihydroxyacetonephosphate	PEP	Phosphoenolpyruvate
E4P	D-Erythrose-4-phosphate	Pyr	Pyruvate
F6P	D-fructose-6-phosphate	Ru5P	ribulose-5-phosphate
FDP	D-Fructose-1,6-bisphosphate	S7P	sedoheptulose-7-phosphate
G3P	glyceraldehyde-3-phosphate	Succ	Succinate
G6P	glucose-6-phosphate	Xu5P	xylulose-5-phosphate
Glc(ex)	extra-cellular D-glucose		