REACTION 1: ATP + GLC → ADP + G6P

REACTION 2: G6P ↔ F6P

REACTION 3: ATP + F6P → ADP + 2 GA3P

REACTION 4: G6P + 2 NADP → CO_2 + 2 NADPH + RU5P

REACTION 5: RU5P ↔ X5P

REACTION 6: RU5P ↔ R5P

REACTION 7: R5P + X5P ↔ GA3P + S7P

REACTION 8: GA3P + S7P ↔ E4P + F6P

REACTION 9: E4P + X5P ↔ F6P + GA3P

REACTION 10: ADP + GA3P + NAD ↔ ATP + NADH G

REACTION 11: PG ↔ PEP

REACTION 12: ADP + PEP → ATP + PYR

REACTION 13: COA + NAD + PYR → ACCOA + CO_2 + NADH

REACTION 14: ATP + CO_2 + PYR → ADP + OAA

REACTION 15: ACCOA + OAA → COA + ICI

REACTION 16: ICI + NAD → AKG + CO_2 + NADH

REACTION 17: AKG + COA + NAD → CO_2 + NADH + SUCCOA

REACTION 18: ADP +SUCCOA ↔ ATP + COA + SUC

REACTION 19: FAD + SUC ↔ FADH2 + FUM

REACTION 20: FUM ↔ MAL

REACTION 21: MAL + NAD ↔ NADH + OAA

REACTION 22: 2 ATP + RU5P → 2 ADP + PRPP

REACTION 23: GLU + NAD G → AKG + NADH + SER

REACTION 24: ACCOA + 4 NADPH + SER → COA + CYS + 4 NADP

REACTION 25: SER + THF → GLY + METHF

REACTION 26: ATP + E4P + NADPH + 2 PEP → ADP + CHR + NADP

REACTION 27: CHR + GLU + NAD → AKG + CO2 + NADH + TYR

REACTION 28: CHR + GLU → AKG + CO_2 + PHE

REACTION 29: CHR + GLN + PRPP + SER → GA3P + GLU + 2 PYR + TRP

REACTION 30: GLU + PYR → AKG + ALA

REACTION 31: NADPH + 2 PYR → CO_2 + KVAL + NADP

REACTION 32: GLU + KVAL → AKG + VAL

REACTION 33: ACCOA + ATP + GLU + KVAL + NAD → ADP + AKG + CO_2 + COA + LEU + NADH

REACTION 34: AKG + NADH ↔ GLU + NAD

REACTION 35: ATP + GLU + 2 NADPH → ADP + 2 NADP + PRO

REACTION 36: ATP + GLU → ADP + GLN

REACTION 37: ACCOA + ASP + 4 ATP + 2 GLU + NADPH → 4 ADP + AKG + ARG + COA + FUM + NADP

REACTION 38: GLU + OAA → AKG + ASP

REACTION 39: ASP + 2 ATP → 2 ADP + ASN

REACTION 40: ASP + ATP + NADPH → ADP + ASPSA + NADP

REACTION 41: ASPSA + NADPH → HSER + NADP

REACTION 42: ATP + HSER → ADP + THR

REACTION 43: GLU + NADPH YR + THR ↔ AKG + ILE + NADP
REACTION 44: ASP + 4 ATP + CO2 + 2 FTHF + 2 GLN + GLY + PRPP → 4 ADP + FUM + 2 GLU + IMP +2 THF
REACTION 45: ASP + ATP + IMP → ADP + AMP + FUM
REACTION 46: 2 ATP + GLN + IMP + NAD → 2 ADP + GLU + GMP + NADH
REACTION 47: ASP + 2 ATP + GLN + NAD + PRPP → 2 ADP + GLU + NADH + UMP
REACTION 48: 2 ATP + UMP → 2 ADP + UTP
REACTION 49: ATP + GLN + UTP → ADP + CTP + GLU
REACTION 50: 2 ADP + CTP → 2 ATP + CMP
REACTION 51: 8 ACCOA + 15 ATP + 15 NADPH → 15 ADP + 8 COA + 15 NADP + PAL
REACTION 52: 9 ACCOA + 17 ATP + 17 NADPH → 17 ADP + 9 COA + 17 NADP + OL
REACTION 53: GA3P + NADH → GOH + NAD
REACTION 54: 1.5 ADP + NADH + 0.5 O_2 → 1.5 ATP + NAD
REACTION 55: ADP + FADH2 + 0.5 O_2 → ATP + FAD
REACTION 56: ATP → ADP
REACTION 57: METHF + NADP ↔ FTHF + NADPH
REACTION 58: METHF + NADPH → MTHF + NADP
REACTION 59: GLY + NAD + THF → CO_2 + METHF + NADH
REACTION 60: Biomass Formulation
REACTION 61: ATP + NAD + NADPH + X → ADP + NADH + NADP + X5P
REACTION 62: MTHF + NAD + S7P → GAD + NADH + THF
REACTION 63: SUG(E) ↔ SUG
REACTION 64: SUG → 5.55 GLC
REACTION 65: SUG → 6.66 X

Biomass = 0.524 PROT + 0.07 RNA + 0.371 PSAC + 0.0172 LIP + 0.0178 OTHERS

RNA = 9.539 ADP + 0.68853 AMP – 9.539 ATP + 0.67376 CMP + 0.68853 GMP + 0.90426 UMP

PROT = 36.3 ADP + 1.1327 ALA + 0.39727 ARG + 0.25182 ASN + 0.73273 ASP – 36.3 ATP + 0.017273 CYS + 0.25909 GLN + 0.74545 GLU + 0.71545 GLY + 0.16273 HIS + 0.47636 ILE + 0.73 LEU + 0.70545 LYS + 0.12545 MET + 0.33091 PHE + 0.40727 PRO + 0.45636 SER + 0.47091 THR + 0.069091 TRP + 0.25182 TYR + 0.65364 VAL

LIP = 3.5715 ADP – 3.5715 ATP + 1.1905 GOH + 1.7857 OL + 1.7857 PAL

PSAC = 9.9226 ADP – 9.9226 ATP + 9.9226 G6P

OTH = 100 MTHF + 100 NADP - 100 NADPH – 100 THF

In this list the following things have g/ (L*72 h) in unit: biomass, RNA, PROT, LIP, PSACH, sug/sug (extracellular), OTH. Others are mmol/ (L*72 h).

Besides, our yeast is auxotroph which needs lys, his, met, so we didn't write them here.