Table S1: Total flux intake

| flux | D0, D15, D30 (mmol/day) | D45, D60 (mmol/day) | D75, D105 (mmol/day) |
|---|---|---|---|
| **EX_5mthf(e)** | 3.47E-04 | 2.16E-04 | 2.09E-04 |
| **EX_ala_D(e)** | 2.33E+01 | 1.34E+01 | 1.29E+01 |
| **EX_ala_L(e)** | 2.36E+01 | 1.37E+01 | 1.31E+01 |
| **EX_arach(e)** | 2.15E-01 | 1.97E-01 | 1.94E-01 |
| **EX_arg_L(e)** | 3.72E+01 | 2.15E+01 | 2.07E+01 |
| **EX_ascb_L(e)** | 1.18E+00 | 7.90E-01 | 7.67E-01 |
| **EX_asp_D(e)** | 3.32E+01 | 1.92E+01 | 1.84E+01 |
| **EX_asp_L(e)** | 3.34E+01 | 1.93E+01 | 1.85E+01 |
| **EX_avite1(e)** | 1.86E-02 | 1.26E-02 | 1.22E-02 |
| **EX_ca2(e)** | 1.33E+01 | 8.17E+00 | 7.88E+00 |
| **EX_caro(e)** | 2.25E-04 | 1.30E-04 | 1.25E-04 |
| **EX_CE2510(e)** | 7.41E+00 | 4.34E+00 | 4.17E+00 |
| **EX_chol(e)** | 1.43E+00 | 8.27E-01 | 7.94E-01 |
| **EX_cellul(e)** | 5.93E-02 | 3.43E-02 | 3.29E-02 |
| **EX_cu2(e)** | 6.55E-02 | 3.86E-02 | 3.71E-02 |
| **EX_cys_L(e)** | 2.63E-02 | 1.52E-02 | 1.46E-02 |
| **EX_dca(e)** | 1.95E-02 | 1.13E-02 | 1.08E-02 |
| **EX_ddca(e)** | 2.23E-01 | 1.29E-01 | 1.24E-01 |
| **EX_doco13ac(e)** | 5.77E-02 | 3.33E-02 | 3.20E-02 |
| **EX_docosac(e)** | 6.14E-02 | 5.62E-02 | 5.55E-02 |
| **EX_fe2(e)** | 4.54E-01 | 2.67E-01 | 2.57E-01 |
| **EX_fe3(e)** | 2.47E-01 | 1.47E-01 | 1.41E-01 |
| **EX_fol(e)** | 4.43E-04 | 2.72E-04 | 2.62E-04 |
| **EX_fru(e)** | 6.67E+01 | 3.86E+01 | 3.70E+01 |
| **EX_glc_D(e)** | 6.03E+01 | 3.48E+01 | 3.35E+01 |
| **EX_glu_L(e)** | 1.08E+02 | 6.27E+01 | 6.02E+01 |
| **EX_gly(e)** | 5.57E+01 | 3.22E+01 | 3.09E+01 |
| **EX_h2o(e)** | 2.60E+04 | 1.61E+04 | 1.56E+04 |
| **EX_hdca(e)** | 3.86E+01 | 2.47E+01 | 2.39E+01 |
| **EX_hdcea(e)** | 1.42E+00 | 1.09E+00 | 1.07E+00 |
| **EX_his_L(e)** | 1.36E+01 | 7.87E+00 | 7.56E+00 |
| **EX_hpdca(e)** | 2.08E+00 | 1.21E+00 | 1.16E+00 |
| **EX_ile_L(e)** | 2.62E+01 | 1.51E+01 | 1.45E+01 |
| **EX_k(e)** | 1.17E+02 | 7.09E+01 | 6.84E+01 |
| **EX_leu_L(e)** | 4.72E+01 | 2.73E+01 | 2.62E+01 |
| **EX_lgnc(e)** | 1.76E+00 | 1.01E+00 | 9.74E-01 |
| **EX_lnlc(e)** | 6.63E+01 | 4.04E+01 | 3.89E+01 |
| **EX_lys_L(e)** | 2.72E+01 | 1.57E+01 | 1.51E+01 |
| **EX_malt(e)** | 2.76E-01 | 1.60E-01 | 1.53E-01 |

| | | | |
|---|---|---|---|
| **EX_met_L(e)** | 8.31E+00 | 4.80E+00 | 4.61E+00 |
| **EX_mg2(e)** | 4.52E+01 | 2.69E+01 | 2.59E+01 |
| **EX_mn2(e)** | 6.48E-01 | 3.76E-01 | 3.62E-01 |
| **EX_na1(e)** | 1.00E+01 | 5.90E+00 | 5.67E+00 |
| **EX_nac(e)** | 5.52E-02 | 3.29E-02 | 3.17E-02 |
| **EX_ncam(e)** | 5.52E-02 | 3.29E-02 | 3.17E-02 |
| **EX_ocdca(e)** | 7.26E+00 | 4.57E+00 | 4.42E+00 |
| **EX_ocdcea(e)** | 1.46E+02 | 9.80E+01 | 9.51E+01 |
| **EX_octa(e)** | 4.66E-02 | 2.69E-02 | 2.59E-02 |
| **EX_phe_L(e)** | 2.47E+01 | 1.43E+01 | 1.37E+01 |
| **EX_phyQ(e)** | 6.31E-05 | 4.37E-05 | 4.25E-05 |
| **EX_pi(e)** | 2.76E+01 | 1.62E+01 | 1.55E+01 |
| **EX_pnto_R(e)** | 2.88E-02 | 1.67E-02 | 1.60E-02 |
| **EX_pro_D(e)** | 1.90E+01 | 1.10E+01 | 1.06E+01 |
| **EX_pro_L(e)** | 1.92E+01 | 1.11E+01 | 1.07E+01 |
| **EX_pydam(e)** | 3.10E-03 | 2.14E-03 | 2.08E-03 |
| **EX_pydx(e)** | 3.14E-03 | 2.16E-03 | 2.11E-03 |
| **EX_pydxn(e)** | 3.10E-03 | 2.14E-03 | 2.08E-03 |
| **EX_ribflv(e)** | 2.88E-03 | 1.88E-03 | 1.82E-03 |
| **EX_ser_L(e)** | 3.95E+01 | 2.28E+01 | 2.19E+01 |
| **EX_starch1200(e)** | 7.06E-01 | 4.08E-01 | 3.92E-01 |
| **EX_strch1(e)** | 7.38E-01 | 4.27E-01 | 4.10E-01 |
| **EX_strch2(e)** | 2.64E+00 | 1.52E+00 | 1.46E+00 |
| **EX_sucr(e)** | 1.98E+01 | 1.14E+01 | 1.10E+01 |
| **EX_thf(e)** | 3.59E-04 | 2.23E-04 | 2.16E-04 |
| **EX_thm(e)** | 9.61E-03 | 5.70E-03 | 5.49E-03 |
| **EX_thr_L(e)** | 2.61E+01 | 1.51E+01 | 1.45E+01 |
| **EX_trp_L(e)** | 4.54E+00 | 2.62E+00 | 2.52E+00 |
| **EX_ttdca(e)** | 3.19E-01 | 1.84E-01 | 1.77E-01 |
| **EX_tyr_L(e)** | 1.48E+01 | 8.54E+00 | 8.20E+00 |
| **EX_val_L(e)** | 3.61E+01 | 2.09E+01 | 2.01E+01 |
| **EX_zn2(e)** | 3.37E-01 | 1.96E-01 | 1.88E-01 |
| **EX_HC00229(e)** | 2.26E+01 | 2.31E+01 | 6.88E+01 |
| **EX_dextrin(e)** | 1.87E+01 | 1.91E+01 | 5.70E+01 |
| **EX_kesto(e)** | 3.06E+00 | 3.13E+00 | 9.33E+00 |
| **EX_kestopt(e)** | 1.86E+00 | 1.91E+00 | 5.68E+00 |
| **EX_kestottr(e)** | 2.32E+00 | 2.37E+00 | 7.06E+00 |

Table S2: Manually added flux for adlay

| metabolites in flux | adlay composition (g metabolites/100g adlay) | D0, D15, D30 (mmol/day) | D45, D60 (mmol/day) | D75, D105 (mmol/day) |
|---|---|---|---|---|
| **EX_etoh[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_h2o[e]** | 8.79E+00 | 1.09E+03 | 6.28E+02 | 6.03E+02 |
| **EX_caro[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_retinol[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_thm[e]** | 2.00E-05 | 1.68E-04 | 9.69E-05 | 9.31E-05 |
| **EX_adpcbl[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_ribflv[e]** | 5.00E-05 | 2.96E-04 | 1.71E-04 | 1.64E-04 |
| **EX_nac[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_ncam[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_pnto_R[e]** | 5.00E-04 | 5.10E-03 | 2.95E-03 | 2.83E-03 |
| **EX_pydam[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_pydxn[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_pydx[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_btn[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_10fthf[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_5mthf[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_thf[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_ascb_L[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_vitd3[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_avite1[e]** | 1.00E-04 | 5.17E-04 | 2.99E-04 | 2.87E-04 |
| **EX_phyQ[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_ca2[e]** | 1.05E-02 | 5.85E-01 | 3.38E-01 | 3.25E-01 |
| **EX_cl[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_k[e]** | 2.74E-01 | 1.56E+01 | 9.03E+00 | 8.67E+00 |
| **EX_mg2[e]** | 1.73E-01 | 1.58E+01 | 9.15E+00 | 8.78E+00 |
| **EX_na1[e]** | 9.00E-03 | 8.71E-01 | 5.03E-01 | 4.83E-01 |
| **EX_pi[e]** | 3.62E-01 | 8.40E+00 | 4.85E+00 | 4.66E+00 |
| **EX_cu2[e]** | 5.39E-04 | 1.89E-02 | 1.09E-02 | 1.05E-02 |
| **EX_fe2[e]** | 5.21E-03 | 2.08E-01 | 1.20E-01 | 1.15E-01 |
| **EX_fe3[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_mn2(e)** | 2.79E-03 | 1.13E-01 | 6.53E-02 | 6.27E-02 |
| **EX_zn2(e)** | 4.14E-03 | 1.41E-01 | 8.15E-02 | 7.83E-02 |
| **EX_mnl(e)** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_xylt[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_lcts[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_malt[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_sucr[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |

| | | | | |
|---|---|---|---|---|
| **EX_fru[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_gal[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_cellul(e)** | 2.16E+00 | 5.93E-02 | 3.43E-02 | 3.29E-02 |
| **EX_ala_L[e]** | 1.54E-02 | 3.83E-01 | 2.22E-01 | 2.13E-01 |
| **EX_arg_L[e]** | 6.20E-03 | 7.87E-02 | 4.55E-02 | 4.37E-02 |
| **EX_asp_L[e]** | 9.44E-03 | 1.59E-01 | 9.19E-02 | 8.83E-02 |
| **EX_cys_L[e]** | 1.43E-03 | 2.63E-02 | 1.52E-02 | 1.46E-02 |
| **EX_glu_L[e]** | 3.56E-02 | 5.42E-01 | 3.13E-01 | 3.01E-01 |
| **EX_gly[e]** | 3.53E-03 | 1.05E-01 | 6.05E-02 | 5.81E-02 |
| **EX_urate[e]** | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_his_L[e]** | 4.85E-03 | 6.96E-02 | 4.02E-02 | 3.86E-02 |
| **EX_ile_L[e]** | 5.90E-03 | 1.00E-01 | 5.79E-02 | 5.56E-02 |
| **EX_leu_L[e]** | 2.19E-02 | 3.71E-01 | 2.15E-01 | 2.06E-01 |
| **EX_lys_L[e]** | 2.54E-03 | 3.84E-02 | 2.22E-02 | 2.13E-02 |
| **EX_met_L[e]** | 1.30E-03 | 1.94E-02 | 1.12E-02 | 1.08E-02 |
| **EX_phe_L[e]** | 8.16E-03 | 1.10E-01 | 6.35E-02 | 6.10E-02 |
| **EX_pro_L[e]** | 1.09E-02 | 2.11E-01 | 1.22E-01 | 1.17E-01 |
| **EX_ser_L[e]** | 6.86E-03 | 1.45E-01 | 8.40E-02 | 8.06E-02 |
| **EX_thr_L[e]** | 4.48E-03 | 8.37E-02 | 4.84E-02 | 4.65E-02 |
| **EX_trp_L[e]** | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_tyr_L[e]** | 6.11E-03 | 7.50E-02 | 4.34E-02 | 4.17E-02 |
| **EX_val_L[e]** | 7.90E-03 | 1.50E-01 | 8.67E-02 | 8.33E-02 |
| **EX_dca[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_ddca[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_ttdca[e]** | 4.60E-03 | 4.50E-02 | 2.60E-02 | 2.50E-02 |
| **EX_ttdcea[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_ptdca[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_hdca[e]** | 1.12E+00 | 9.76E+00 | 5.64E+00 | 5.42E+00 |
| **EX_hpdca[e]** | 2.50E-01 | 2.06E+00 | 1.19E+00 | 1.15E+00 |
| **EX_ocdca[e]** | 3.60E-01 | 2.83E+00 | 1.63E+00 | 1.57E+00 |
| **EX_ocdcea[e]** | 4.91E+00 | 3.88E+01 | 2.24E+01 | 2.16E+01 |
| **EX_lnlc[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_lnlnca[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_strdnc[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_arach[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_CE2510[e]** | 8.40E-01 | 6.04E+00 | 3.49E+00 | 3.35E+00 |
| **EX_CE4843[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_arachd[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_docosac[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_doco13ac[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_adrn[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_clpnd[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_crvnc[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_but[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |

| | | | | |
|---|---|---|---|---|
| **EX_octa[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_chsterol[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_sbt_D[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_glc_D[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_hdcea[e]** | 5.00E-02 | 4.39E-01 | 2.54E-01 | 2.44E-01 |
| **EX_lgnc[e]** | 2.90E-01 | 1.76E+00 | 1.01E+00 | 9.74E-01 |
| **EX_fol[e]** | 1.60E-05 | 8.08E-05 | 4.67E-05 | 4.49E-05 |
| **EX_strch1[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_i[e]** | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **EX_starch1200(e)** | 6.12E+01 | 6.99E-01 | 4.04E-01 | 3.88E-01 |

Table S3: Manually added flux for other nutritions

| other metabolites | D0, D15, D30 (mmol/day) | D45, D60 (mmol/day) | D75, D105 (mmol/day) |
|---|---|---|---|
| **isomaltose** | 22.56 | 23.08 | 68.77 |
| **dxtrin** | 18.70 | 19.13 | 57.01 |
| **kestose** | 3.06 | 3.13 | 9.33 |
| **kestopentaose** | 1.86 | 1.91 | 5.68 |
| **kestotetraose** | 2.32 | 2.37 | 7.06 |