**Table S2 Genetic and phenotypic correlations for line LW**

#: upper side triangle are phenotypic correlations, lower side triangle are genetic correlations with heritabilities on the diagonal. \*: p<0.05, \*\*: P<0.01

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **56-day body weight** | ***Methanocorpusculaceae*** | ***Burkholderiaceae*** | ***Comamonadaceae*** | ***Campylobacteraceae*** | ***Helicobacteraceae*** | ***Acetobacteraceae*** | ***Bifidobacteriaceae*** | ***Rikenellaceae*** | ***Flavobacteriaceae*** | ***Deinococcaceae*** | ***Acidaminococcaceae*** | ***Paenibacillaceae*** | ***Bacillaceae*** | ***Aerococcaceae*** | ***Enterococcaceae*** | ***Lactobacillaceae*** | ***Streptococcaceae*** |
| **56-day body weight** |  **0.263** | -0.034 | -0.103 | -0.003 | -0.253 |  0.288 | -0.038 |  0.000 |  0.215 |  0.058 |  0.030 | -0.018 | -0.136 | -0.167 | -0.219 | -0.306 |  0.141 | -0.002 |
| ***Methanocorpusculaceae*** | -0.185 |  **0.210** | -0.127 | -0.062 | -0.236 |  0.218 | -0.066 | -0.052 |  0.239 | -0.213 |  0.000 |  0.044 | -0.016 |  0.002 | -0.224 | -0.125 |  0.032 | -0.319 |
| ***Burkholderiaceae*** |  0.583 | -0.496 |  **0.277** | -0.136 |  0.017 | -0.147 |  0.102 | -0.164 |  0.005 | -0.081 |  0.000 | -0.141 |  0.104 |  0.272 |  0.061 | -0.115 |  0.000 |  0.049 |
| ***Comamonadaceae*** | -0.375 |  0.618 | -0.941\*\* |  **0.530\*** |  0.041 | -0.054 |  0.086 |  0.026 | -0.125 | -0.168 | -0.229 | -0.067 |  0.361 |  0.105 |  0.066 |  0.214 | -0.158 | -0.050 |
| ***Campylobacteraceae*** |  0.038 | -0.854 |  0.076 |  0.012 |  **0.234** | -0.635 | -0.007 | -0.261 |  0.000 |  0.000 |  0.145 | -0.265 | -0.108 | -0.176 |  0.000 |  0.428 | -0.161 |  0.000 |
| ***Helicobacteraceae*** | -0.034 |  0.234 |  0.020 |  0.193 | -0.782\*\* |  **0.429\*\*** |  0.030 |  0.214 |  0.607 | -0.451 | -0.149 |  0.152 |  0.000 |  0.018 |  0.000 | -0.552 |  0.057 | -0.722 |
| ***Acetobacteraceae*** | -0.606 |  0.347 |  0.608 |  0.183 |  0.393 | -0.246 |  **0.216** | -0.094 |  0.061 | -0.149 | -0.210 | -0.017 |  0.157 |  0.105 | -0.051 |  0.135 |  0.055 | -0.059 |
| ***Bifidobacteriaceae*** |  0.000 |  0.053 | -0.506 |  0.449 | -0.382 |  0.605 | -0.787 |  **0.233** |  0.121 | -0.050 | -0.206 |  0.138 | -0.003 | -0.040 | -0.330 | -0.181 |  0.213 | -0.245 |
| ***Rikenellaceae*** |  0.599 |  0.939 |  0.412 | -0.180 |  0.000 |  0.728\*\* | -0.200 |  0.851 |  **0.248** | -0.405 | -0.151 |  0.136 | -0.028 | -0.010 |  0.000 | -0.560 | -0.041 |  0.000 |
| ***Flavobacteriaceae*** |  0.603 | -0.759\*\* | -0.034 | -0.586\*\* |  0.000 | -0.742\*\* | -0.175 | -0.445 | -0.258 |  **0.400\*** |  0.211 | -0.211 | -0.412 | -0.400 |  0.000 |  0.264 |  0.132 |  0.000 |
| ***Deinococcaceae*** |  0.886 |  0.000 |  0.000 | -0.732 |  0.452 | -0.157 |  0.431 | -0.519 | -0.386 |  0.705 |  **0.280** | -0.023 | -0.329 | -0.237 |  0.126 |  0.029 | -0.010 |  0.339 |
| ***Acidaminococcaceae*** |  0.008 |  0.000 | -0.805 | -0.353 | -0.973 |  0.269 | -0.600 |  0.435 |  0.747 | -0.201 | -0.064 |  **0.202** |  0.069 |  0.102 | -0.208 |  0.021 |  0.212 | -0.253 |
| ***Paenibacillaceae*** | -0.747\*\* |  0.919 | -0.442 |  0.947\*\* | -0.877 |  0.000 | -0.112 |  0.841 |  0.365 | -0.921 | -0.471 | -0.060 |  **0.238** |  0.722 |  0.000 |  0.250 | -0.261 |  0.000 |
| ***Bacillaceae*** | -0.618 |  0.785 |  0.066 |  0.438 | -0.050 |  0.102 |  0.085 |  0.685 | -0.009 | -0.297 | -0.171 |  0.114 |  0.763\*\* |  **0.409\*** |  0.050 |  0.191 | -0.280 | -0.260 |
| ***Aerococcaceae*** | -0.469 | -0.571 | -0.343 |  0.291 |  0.000 |  0.000 |  0.512 | -0.290 |  0.000 |  0.000 |  0.299 | -0.456 |  0.000 | -0.297 |  **0.310** |  0.000 | -0.121 |  0.000 |
| ***Enterococcaceae*** | -0.519 |  0.166 | -0.799\*\* |  0.421 |  0.753\*\* | -0.545\*\* |  0.246 | -0.340 | -0.911\*\* |  0.680 | -0.353 | -0.047 | -0.358 |  0.055 |  0.000 |  **0.473\*\*** | -0.016 |  0.487 |
| ***Lactobacillaceae*** |  0.134 | -0.224 |  0.000 | -0.173 |  0.165 | -0.367 | -0.297 |  0.018 | -0.154 |  0.569 |  0.042 |  0.740 | -0.638 | -0.737\*\* |  0.713 |  0.678 |  **0.402** |  0.015 |
| ***Streptococcaceae*** |  0.079 | -0.707 |  0.007 | -0.446 |  0.000 | -0.805\*\* |  0.253 | -0.612 |  0.000 |  0.000 |  0.386 | -0.521 |  0.000 | -0.372 |  0.000 |  0.478 |  0.342 |  **0.360\*** |

