

## SUPPLEMENTARY INFORMATION

**Table S1:** Temperature management.

| Day | HF group | MF group | LF group |
|-----|----------|----------|----------|
| 1   | 36.5     | 33.5     | 30.5     |
| 2   | 36       | 33       | 30       |
| 3   | 35.5     | 32.5     | 29.5     |
| 4   | 35       | 32       | 29       |
| 5   | 34.5     | 31.5     | 28.5     |
| 6   | 34       | 31       | 28       |
| 7   | 33.5     | 30.5     | 27.5     |
| 8   | 33       | 30       | 27       |
| 9   | 32.5     | 29.5     | 26.5     |
| 10  | 32       | 29       | 26       |
| 11  | 32       | 29       | 26       |
| 12  | 31.5     | 28.5     | 25.5     |
| 13  | 31       | 28       | 25       |
| 14  | 31       | 28       | 25       |
| 15  | 30.5     | 27.5     | 24.5     |
| 16  | 30.5     | 27.5     | 24.5     |
| 17  | 30       | 27       | 24       |
| 18  | 30       | 27       | 24       |
| 19  | 29.5     | 26.5     | 24.5     |
| 20  | 29       | 26       | 23       |
| 21  | 29       | 26       | 23       |
| 22  | 28.5     | 25.5     | 22.5     |
| 23  | 28       | 25       | 22       |
| 24  | 28       | 25       | 22       |
| 25  | 27.5     | 24.5     | 21.5     |
| 26  | 27.5     | 24.5     | 21.5     |
| 27  | 27       | 24       | 21       |
| 28  | 27       | 24       | 21       |
| 29  | 26.5     | 23.5     | 20.5     |
| 30  | 26       | 23       | 20       |
| 31  | 26       | 23       | 20       |
| 32  | 25.5     | 22.5     | 19.5     |
| 33  | 25       | 22       | 19       |
| 34  | 25       | 22       | 19       |
| 35  | 24.5     | 21.5     | 18.5     |
| 36  | 24       | 21       | 18       |
| 37  | 24       | 21       | 18       |
| 38  | 23.5     | 20.5     | 17.5     |
| 39  | 23       | 20       | 17       |
| 40  | 23       | 20       | 17       |
| 41  | 22.5     | 19.5     | 16.5     |
| 42  | 22       | 19       | 16       |

When the temperature is 0.5 degree lower than the expected temperature, the heater is turned on and the fan is closed. When the heater is 0.5 degree higher, the heater is closed and the ventilator opens.

**Table S2:** Ingredient and nutrient composition (% , as feed) of the experimental diets.

| Ingredient (%)                 | Starter diet (%) 1 to 21d | Finisher diet (%) 22 to 42 d |
|--------------------------------|---------------------------|------------------------------|
| corn ( first )                 | 60.00                     | 66.40                        |
| Soybean meal 43                | 27.40                     | 20.00                        |
| corn protein flour             | 6.00                      | 8.00                         |
| Imported fish meal             | 1.00                      | 0.00                         |
| Soybean oil                    | 1.90                      | 1.60                         |
| Stone powder                   | 1.10                      | 1.20                         |
| Calcium hydrogen phosphate     | 1.10                      | 1.14                         |
| salt                           | 0.35                      | 0.35                         |
| Met                            | 0.07                      | 0.06                         |
| Lys                            | 0.08                      | 0.25                         |
| 1% broiler premix              | 1.00                      | 1.00                         |
| Calculated nutrients level (%) |                           |                              |
| ME ( Mcal/kg )                 | 2950                      | 3000                         |
| CP                             | 21.00                     | 19.00                        |
| Ca                             | 0.81                      | 0.80                         |
| P                              | 0.50                      | 0.50                         |
| Lys                            | 1.10                      | 1.00                         |
| Met                            | 0.50                      | 0.38                         |
| Met + Cys                      | 0.90                      | 0.72                         |
| Thr                            | 0.80                      | 0.74                         |
| Try                            | 0.20                      | 0.18                         |

ME: Metabolizable energy, CP: Crude protein, Lys: lysine, Met: Methionine, Cys: Cystine, Ca: Calcium, P:

Phosphorus, Thr: Threonine, Try: Tryptophan.

**Table S3:** Description of the assembly results of fecal microbiota from chicken Broiler.

| Sample name | Clean Reads | Mapped reads | Mapped ratio(%) | Bases(bp) | Q20(%) | GC(%)  | Average length(bp) | OTUs |
|-------------|-------------|--------------|-----------------|-----------|--------|--------|--------------------|------|
| HF-1        | 57229       | 55938        | 97.7441507      | 24316291  | 95.33% | 52.80% | 424                | 213  |
| HF-2        | 60348       | 56162        | 93.0635647      | 25441189  | 95.12% | 53.49% | 421                | 113  |
| HF-3        | 63063       | 60040        | 95.2063809      | 26752715  | 95.31% | 53.23% | 424                | 131  |
| HF-4        | 63143       | 60918        | 96.4762523      | 26408619  | 95.48% | 52.79% | 418                | 102  |
| HF-5        | 61121       | 57590        | 94.2229348      | 25948347  | 95.23% | 53.20% | 424                | 87   |
| HF-6        | 60312       | 54833        | 90.9155724      | 25189154  | 95.27% | 51.62% | 417                | 321  |
| HF-7        | 58056       | 49323        | 84.9576271      | 24122611  | 94.92% | 50.81% | 415                | 342  |
| HF-8        | 56226       | 48675        | 86.57027        | 23236405  | 95.32% | 51.25% | 413                | 351  |
| HF-9        | 64622       | 62768        | 97.131008       | 27549784  | 95.32% | 51.26% | 426                | 175  |
| HF-10       | 64768       | 58113        | 89.7248641      | 26883001  | 95.49% | 51.68% | 415                | 339  |
| HF-11       | 61282       | 54027        | 88.1612872      | 25396973  | 95.35% | 51.73% | 414                | 266  |
| HF-12       | 63143       | 47971        | 75.9720001      | 26068943  | 91.72% | 52.64% | 412                | 376  |
| MF-1        | 61932       | 55344        | 89.3625266      | 25852679  | 95.24% | 52.41% | 417                | 306  |
| MF-2        | 60639       | 53160        | 87.6663533      | 25349383  | 95.14% | 51.68% | 418                | 355  |
| MF-3        | 54021       | 52024        | 96.3032895      | 23018797  | 95.16% | 52.88% | 426                | 168  |
| MF-4        | 57213       | 53690        | 93.8423086      | 23933030  | 94.29% | 52.07% | 418                | 333  |
| MF-5        | 62620       | 59270        | 94.6502715      | 25961389  | 95.51% | 52.69% | 414                | 128  |
| MF-6        | 64044       | 58329        | 91.0764474      | 26340549  | 95.90% | 52.24% | 411                | 313  |
| MF-7        | 63499       | 53085        | 83.5997417      | 26533098  | 92.92% | 52.53% | 417                | 362  |
| MF-8        | 37479       | 34618        | 92.3663919      | 15591324  | 94.36% | 52.53% | 416                | 379  |
| MF-9        | 61244       | 57732        | 94.2655607      | 25056626  | 95.71% | 53.21% | 409                | 227  |
| MF-10       | 48669       | 46473        | 95.4878876      | 20188152  | 95.29% | 52.98% | 414                | 344  |
| MF-11       | 55063       | 52862        | 96.0027605      | 23375888  | 95.14% | 52.09% | 424                | 242  |
| MF-12       | 64047       | 56066        | 87.5388387      | 26416592  | 95.26% | 52.58% | 412                | 354  |
| LF-1        | 57631       | 51524        | 89.4032725      | 23690755  | 95.78% | 51.65% | 411                | 342  |
| LF-2        | 63203       | 58144        | 91.9956331      | 26046261  | 95.44% | 51.61% | 412                | 318  |
| LF-3        | 55177       | 54377        | 98.5501205      | 22260059  | 96.57% | 53.10% | 403                | 257  |
| LF-4        | 57821       | 55081        | 95.2612373      | 23674067  | 95.89% | 50.98% | 409                | 368  |
| LF-5        | 55508       | 53562        | 96.494199       | 22746502  | 95.19% | 53.45% | 409                | 234  |
| LF-6        | 64250       | 61455        | 95.6498055      | 26370649  | 95.84% | 52.96% | 410                | 513  |
| LF-7        | 54829       | 53414        | 97.4192489      | 22204550  | 95.94% | 53.27% | 404                | 234  |
| LF-8        | 56336       | 53988        | 95.83215        | 23977622  | 94.45% | 53.60% | 425                | 86   |
| LF-9        | 60283       | 54942        | 91.1401224      | 25028373  | 95.15% | 50.30% | 415                | 252  |
| LF-10       | 56196       | 54277        | 96.5851662      | 23631671  | 94.54% | 51.21% | 420                | 323  |
| LF-11       | 63483       | 60273        | 94.9435282      | 26709185  | 94.95% | 51.78% | 420                | 331  |
| LF-12       | 56045       | 51245        | 91.4354537      | 23550718  | 95.04% | 53.42% | 420                | 344  |

**Table S4:** Statistical analysis of bacterial alpha diversity in the samples.

| Alpha name | chao1    | Observed species | PD whole tree | shannon  | simpson  | Goods coverage |
|------------|----------|------------------|---------------|----------|----------|----------------|
| HF-1       | 251.8077 | 186              | 16.37256      | 2.729092 | 0.778543 | 0.998033       |
| HF-2       | 133.4615 | 85               | 7.80973       | 2.511034 | 0.736755 | 0.9988         |
| HF-3       | 141.5714 | 94               | 9.17244       | 2.187594 | 0.715671 | 0.998767       |
| HF-4       | 158.75   | 80               | 7.62351       | 2.37364  | 0.75884  | 0.9988         |
| HF-5       | 122      | 64               | 7.05308       | 2.25208  | 0.733048 | 0.999033       |
| HF-6       | 338.5    | 289              | 18.0648       | 4.584943 | 0.891813 | 0.998167       |
| HF-7       | 346.0294 | 310              | 19.35494      | 5.21685  | 0.924309 | 0.998333       |
| HF-8       | 368.8857 | 328              | 19.08529      | 5.705228 | 0.950089 | 0.9982         |
| HF-9       | 179.0435 | 130              | 11.53518      | 1.258219 | 0.304391 | 0.9984         |
| HF-10      | 377.7241 | 306              | 18.99568      | 4.981735 | 0.922444 | 0.997833       |
| HF-11      | 260.2857 | 231              | 16.3588       | 5.059324 | 0.945591 | 0.998633       |
| HF-12      | 400.25   | 346              | 20.23938      | 5.694349 | 0.944359 | 0.9979         |
| MF-1       | 325.3333 | 272              | 17.94219      | 4.146771 | 0.892648 | 0.997833       |
| MF-2       | 394      | 321              | 19.70437      | 4.398385 | 0.859757 | 0.997533       |
| MF-3       | 179.3571 | 132              | 13.44918      | 2.446185 | 0.732617 | 0.998267       |
| MF-4       | 339.2    | 295              | 20.23233      | 3.846655 | 0.768098 | 0.998267       |
| MF-5       | 174.25   | 88               | 9.99403       | 2.359785 | 0.755974 | 0.998467       |
| MF-6       | 319.875  | 289              | 18.51471      | 5.598725 | 0.954983 | 0.9987         |
| MF-7       | 388.0294 | 323              | 19.28001      | 4.200025 | 0.812867 | 0.997767       |
| MF-8       | 429.62   | 368              | 24.71251      | 5.029593 | 0.924521 | 0.997367       |
| MF-9       | 314.4    | 183              | 15.11882      | 2.321112 | 0.575816 | 0.997567       |
| MF-10      | 480.6667 | 301              | 22.36378      | 3.703119 | 0.823089 | 0.9967         |
| MF-11      | 266.2778 | 203              | 19.37017      | 2.535721 | 0.627914 | 0.997733       |
| MF-12      | 350.2941 | 305              | 19.46692      | 5.119045 | 0.938738 | 0.998133       |
| LF-1       | 383.3125 | 310              | 20.75772      | 5.29659  | 0.939276 | 0.9977         |
| LF-2       | 346.037  | 295              | 18.67032      | 5.326801 | 0.939082 | 0.998233       |
| LF-3       | 304.1    | 204              | 17.7466       | 0.907081 | 0.179359 | 0.9974         |
| LF-4       | 374.303  | 353              | 27.25716      | 4.017897 | 0.69477  | 0.998733       |
| LF-5       | 245.3571 | 198              | 15.84687      | 2.435011 | 0.60787  | 0.998267       |
| LF-6       | 520.8971 | 451              | 32.55745      | 3.492315 | 0.693468 | 0.996733       |
| LF-7       | 297.2188 | 183              | 15.55139      | 1.020899 | 0.237733 | 0.997133       |
| LF-8       | 122      | 83               | 9.06309       | 2.320504 | 0.590193 | 0.999567       |
| LF-9       | 311.7143 | 233              | 15.39086      | 4.137256 | 0.878445 | 0.998067       |
| LF-10      | 355.0732 | 268              | 22.55042      | 3.681013 | 0.842476 | 0.997167       |
| LF-11      | 331.8    | 300              | 21.14476      | 3.704149 | 0.812076 | 0.9982         |
| LF-12      | 345.8846 | 323              | 23.83526      | 4.544589 | 0.826577 | 0.998833       |

**Table S5:** The *P*-value between amino acids and bacterial.

|                          | Ala  | Gly  | Pro  | Ser  | Arg  | His  | Ile  | leu  | Lys  | Val  | Phe  | Tyr  | ASP  | Glu  | Cys  | Met  | Thr  | CP   | Total AA |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|
| <i>Turcibacter</i>       | 0.06 | 0.06 | 0.23 | 0.12 | 0.06 | 0.24 | 0.22 | 0.09 | 0.08 | 0.22 | 0.29 | 0.03 | 0.04 | 0.10 | 0.18 | 0.26 | 0.13 | 0.24 | 0.09     |
| <i>Parabacteroides</i>   | 0.69 | 0.05 | 0.95 | 0.40 | 0.69 | 0.07 | 0.75 | 0.13 | 0.24 | 0.71 | 0.92 | 0.01 | 0.69 | 0.98 | 0.25 | 0.00 | 0.95 | 0.66 | 0.61     |
| <i>Brevibacterium</i>    | 0.15 | 0.72 | 0.55 | 0.67 | 0.03 | 0.78 | 0.03 | 0.33 | 0.06 | 0.05 | 0.04 | 0.49 | 0.14 | 0.11 | 0.83 | 0.10 | 0.11 | 0.28 | 0.11     |
| <i>Facklamia</i>         | 0.28 | 0.66 | 0.50 | 0.48 | 0.02 | 0.11 | 0.12 | 0.28 | 0.03 | 0.11 | 0.01 | 0.21 | 0.28 | 0.38 | 0.19 | 0.82 | 0.65 | 0.09 | 0.19     |
| <i>Aquamicrobium</i>     | 0.34 | 0.87 | 0.76 | 0.37 | 0.02 | 0.18 | 0.15 | 0.13 | 0.10 | 0.18 | 0.07 | 0.08 | 0.36 | 0.36 | 0.45 | 0.48 | 0.20 | 0.11 | 0.20     |
| <i>Devosia</i>           | 0.29 | 0.79 | 0.21 | 0.12 | 0.04 | 0.05 | 0.35 | 0.57 | 0.16 | 0.14 | 0.22 | 0.23 | 0.10 | 0.15 | 0.87 | 0.26 | 0.39 | 0.43 | 0.17     |
| <i>Dietzia</i>           | 0.24 | 0.64 | 0.50 | 0.04 | 0.01 | 0.03 | 0.11 | 0.03 | 0.03 | 0.60 | 0.14 | 0.01 | 0.28 | 0.27 | 0.00 | 0.13 | 0.57 | 0.21 | 0.13     |
| <i>Enterococcus</i>      | 0.06 | 0.67 | 0.09 | 0.12 | 0.00 | 0.07 | 0.01 | 0.08 | 0.03 | 0.18 | 0.03 | 0.09 | 0.03 | 0.05 | 0.06 | 0.44 | 0.07 | 0.07 | 0.02     |
| <i>Veillonella</i>       | 0.07 | 0.37 | 0.03 | 0.01 | 0.63 | 0.72 | 0.27 | 0.52 | 0.84 | 0.68 | 0.81 | 0.68 | 0.08 | 0.09 | 0.29 | 0.71 | 0.04 | 0.03 | 0.14     |
| <i>Peptococcus</i>       | 0.34 | 0.12 | 0.55 | 0.18 | 0.66 | 0.66 | 0.68 | 0.21 | 0.36 | 0.93 | 0.48 | 0.15 | 0.51 | 0.59 | 0.70 | 0.53 | 0.59 | 0.13 | 0.40     |
| <i>Pandoraea</i>         | 0.90 | 0.90 | 0.90 | 0.72 | 0.14 | 0.47 | 0.22 | 0.39 | 0.11 | 0.50 | 0.06 | 0.13 | 0.67 | 0.92 | 0.29 | 0.13 | 0.53 | 0.11 | 0.70     |
| <i>Achromobacter</i>     | 0.65 | 0.59 | 0.80 | 0.57 | 0.01 | 0.55 | 0.01 | 0.22 | 0.05 | 0.73 | 0.07 | 0.02 | 0.52 | 0.93 | 0.07 | 0.88 | 0.81 | 0.06 | 0.34     |
| <i>Variovorax</i>        | 0.79 | 0.72 | 0.90 | 0.51 | 0.07 | 0.59 | 0.09 | 0.42 | 0.31 | 0.84 | 0.03 | 0.17 | 0.81 | 0.69 | 0.06 | 0.50 | 0.81 | 0.09 | 0.76     |
| <i>Prevotella</i>        | 0.25 | 0.85 | 0.10 | 0.22 | 0.55 | 0.56 | 0.91 | 0.57 | 0.59 | 0.77 | 0.05 | 0.19 | 0.30 | 0.30 | 0.00 | 0.45 | 0.33 | 0.03 | 0.67     |
| <i>Brevundimonas</i>     | 0.33 | 0.96 | 0.29 | 0.20 | 0.34 | 0.56 | 0.50 | 0.76 | 0.77 | 0.63 | 0.13 | 0.41 | 0.33 | 0.26 | 0.01 | 0.20 | 0.32 | 0.08 | 0.63     |
| <i>Stenotrophomonas</i>  | 0.21 | 0.80 | 0.26 | 0.05 | 0.53 | 0.48 | 0.59 | 0.90 | 0.90 | 0.47 | 0.32 | 0.46 | 0.27 | 0.10 | 0.02 | 0.26 | 0.14 | 0.11 | 0.38     |
| <i>Subdoligranulum</i>   | 0.30 | 0.48 | 0.67 | 0.97 | 0.11 | 0.55 | 0.26 | 0.49 | 0.20 | 0.40 | 0.06 | 0.62 | 0.30 | 0.21 | 0.78 | 0.11 | 0.49 | 0.09 | 0.28     |
| <i>Propionibacterium</i> | 0.04 | 0.14 | 0.02 | 0.00 | 0.99 | 0.85 | 0.82 | 0.95 | 0.68 | 0.16 | 0.33 | 0.94 | 0.05 | 0.03 | 0.04 | 0.68 | 0.03 | 0.01 | 0.13     |
| <i>Enhydrobacter</i>     | 0.91 | 0.36 | 0.57 | 0.12 | 0.59 | 0.44 | 0.58 | 0.82 | 0.34 | 0.80 | 0.15 | 0.09 | 0.98 | 0.73 | 0.03 | 0.30 | 0.48 | 0.00 | 0.93     |
| <i>Acinetobacter</i>     | 0.01 | 0.15 | 0.00 | 0.02 | 0.42 | 0.64 | 0.65 | 0.45 | 0.15 | 0.05 | 0.58 | 0.65 | 0.02 | 0.01 | 0.14 | 0.90 | 0.04 | 0.21 | 0.04     |
| <i>Pseudomonas</i>       | 0.14 | 0.63 | 0.11 | 0.04 | 0.88 | 0.40 | 0.86 | 0.85 | 0.77 | 0.17 | 0.22 | 0.78 | 0.28 | 0.27 | 0.01 | 0.76 | 0.09 | 0.09 | 0.35     |

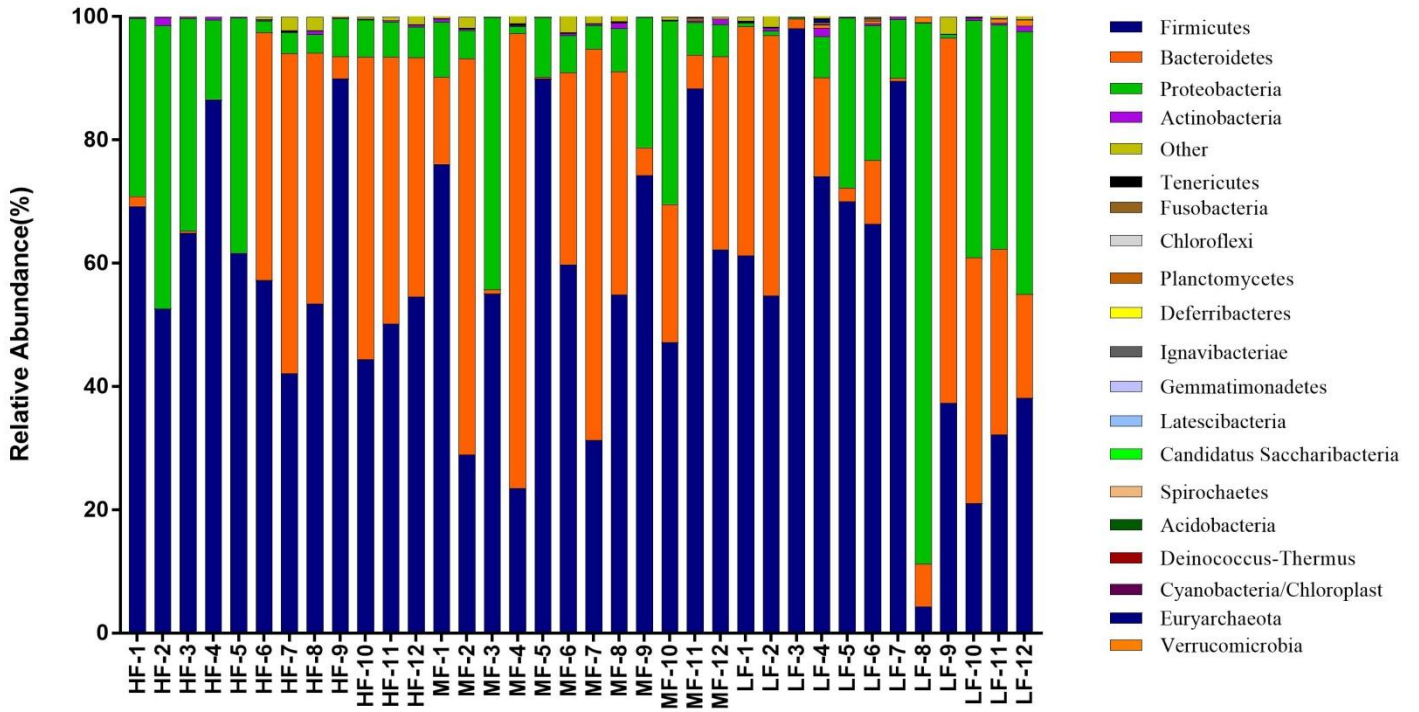
*P* < 0.05 is marked with blue color, *P* < 0.01 is marked with red color.

**Table S6:** The R-value between amino acids and bacterial.

|                          | Ala   | Gly   | Pro   | Ser   | Arg   | His   | Ile   | leu   | Lys   | Val   | Phe   | Tyr   | ASP   | Glu   | Cys   | Met   | Thr   | CP    | Total AA |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| <i>Turicibacter</i>      | -0.32 | -0.32 | -0.21 | -0.26 | -0.32 | -0.20 | -0.21 | -0.29 | -0.30 | -0.21 | -0.18 | -0.36 | -0.34 | -0.28 | -0.23 | 0.19  | -0.26 | -0.20 | -0.28    |
| <i>Parabacteroides</i>   | -0.07 | -0.33 | -0.01 | -0.14 | -0.07 | -0.31 | 0.06  | -0.26 | -0.20 | -0.06 | 0.02  | -0.42 | -0.07 | 0.00  | -0.20 | 0.50  | 0.01  | -0.08 | -0.09    |
| <i>Brevibacterium</i>    | -0.24 | 0.06  | -0.10 | -0.07 | -0.37 | -0.05 | -0.36 | -0.17 | -0.31 | -0.33 | -0.34 | -0.12 | -0.25 | -0.27 | 0.04  | -0.28 | -0.27 | -0.18 | -0.27    |
| <i>Facklamia</i>         | -0.19 | 0.08  | -0.12 | -0.12 | -0.39 | -0.27 | -0.26 | -0.18 | -0.35 | -0.27 | -0.41 | -0.21 | -0.18 | -0.15 | -0.22 | -0.04 | -0.08 | -0.29 | -0.22    |
| <i>Aquamicrobium</i>     | -0.16 | -0.03 | -0.05 | -0.15 | -0.39 | -0.23 | -0.24 | -0.26 | -0.28 | -0.23 | -0.31 | -0.29 | -0.16 | -0.16 | -0.13 | -0.12 | -0.22 | -0.27 | -0.22    |
| <i>Devosia</i>           | -0.18 | -0.05 | -0.22 | -0.26 | -0.35 | -0.33 | -0.16 | -0.10 | -0.24 | -0.25 | -0.21 | -0.21 | -0.28 | -0.25 | -0.03 | -0.19 | -0.15 | -0.13 | -0.24    |
| <i>Dietzia</i>           | -0.20 | 0.08  | -0.12 | -0.34 | -0.41 | -0.36 | -0.27 | -0.36 | -0.37 | -0.09 | -0.25 | -0.41 | -0.18 | -0.19 | -0.53 | 0.26  | -0.10 | -0.21 | -0.26    |
| <i>Enterococcus</i>      | -0.32 | -0.07 | -0.29 | -0.27 | -0.57 | -0.30 | -0.46 | -0.30 | -0.37 | -0.23 | -0.36 | -0.29 | -0.36 | -0.33 | -0.32 | -0.13 | -0.31 | -0.30 | -0.40    |
| <i>Veillonella</i>       | -0.30 | -0.15 | -0.36 | -0.41 | -0.08 | -0.06 | -0.19 | -0.11 | -0.03 | -0.07 | 0.04  | 0.07  | -0.30 | -0.29 | 0.18  | -0.06 | -0.35 | 0.35  | -0.25    |
| <i>Peptococcus</i>       | 0.16  | 0.27  | 0.10  | 0.23  | 0.08  | 0.08  | 0.07  | 0.22  | 0.16  | 0.02  | 0.12  | 0.25  | 0.11  | 0.09  | 0.07  | -0.11 | 0.09  | -0.25 | 0.15     |
| <i>Pandoraea</i>         | 0.02  | 0.02  | -0.02 | -0.06 | 0.25  | 0.12  | 0.21  | 0.15  | 0.27  | 0.12  | 0.31  | 0.26  | 0.07  | -0.02 | 0.18  | -0.26 | -0.11 | 0.27  | 0.07     |
| <i>Achromobacter</i>     | 0.08  | 0.09  | 0.04  | -0.10 | 0.43  | 0.10  | 0.41  | 0.21  | 0.33  | 0.06  | 0.31  | 0.37  | 0.11  | 0.01  | 0.31  | 0.03  | 0.04  | 0.31  | 0.16     |
| <i>Variovorax</i>        | -0.05 | 0.06  | -0.02 | -0.11 | 0.31  | 0.09  | 0.28  | 0.14  | 0.17  | -0.04 | 0.36  | 0.23  | 0.04  | -0.07 | 0.31  | -0.12 | -0.04 | 0.29  | 0.05     |
| <i>Prevotella</i>        | -0.20 | -0.03 | -0.28 | -0.21 | 0.10  | 0.10  | -0.02 | 0.10  | 0.09  | -0.05 | 0.33  | 0.22  | -0.18 | -0.18 | 0.47  | -0.13 | -0.17 | 0.36  | -0.07    |
| <i>Brevundimonas</i>     | -0.17 | -0.01 | -0.18 | -0.22 | 0.16  | 0.10  | 0.12  | 0.05  | 0.05  | -0.08 | 0.26  | 0.14  | -0.17 | -0.19 | 0.45  | -0.22 | -0.17 | 0.29  | -0.08    |
| <i>Stenotrophomonas</i>  | -0.22 | 0.04  | -0.19 | -0.33 | 0.11  | -0.12 | 0.09  | -0.02 | 0.02  | -0.13 | 0.17  | 0.13  | -0.19 | -0.28 | 0.39  | -0.19 | -0.25 | 0.27  | -0.15    |
| <i>Subdoligranulum</i>   | 0.18  | -0.12 | 0.07  | -0.01 | 0.27  | 0.10  | 0.19  | 0.12  | 0.22  | 0.14  | 0.32  | 0.09  | 0.18  | 0.22  | -0.05 | 0.27  | 0.12  | 0.29  | 0.18     |
| <i>Propionibacterium</i> | -0.34 | -0.25 | -0.38 | -0.46 | 0.00  | 0.03  | 0.04  | 0.01  | -0.07 | -0.24 | 0.17  | -0.01 | -0.33 | -0.37 | 0.34  | -0.07 | -0.37 | 0.42  | -0.26    |
| <i>Enhydrobacter</i>     | -0.02 | 0.16  | -0.10 | -0.26 | 0.09  | -0.13 | -0.09 | 0.04  | 0.16  | 0.04  | 0.25  | 0.29  | 0.00  | -0.06 | 0.37  | -0.18 | -0.12 | 0.46  | 0.02     |
| <i>Acinetobacter</i>     | -0.41 | -0.24 | -0.46 | -0.40 | -0.14 | -0.08 | -0.08 | -0.13 | -0.24 | -0.33 | 0.10  | -0.08 | -0.40 | -0.44 | 0.25  | 0.02  | -0.34 | 0.21  | -0.35    |
| <i>Pseudomonas</i>       | -0.25 | -0.08 | -0.27 | -0.34 | 0.03  | -0.15 | 0.03  | 0.03  | -0.05 | -0.24 | 0.21  | 0.05  | -0.19 | -0.19 | 0.42  | -0.05 | -0.29 | 0.29  | -0.16    |

$P < 0.05$  is marked with blue color,  $P < 0.01$  is marked with red color.

### Phylum Level Barplot



**Figure S1:** Taxonomy profile of microbiota composition at the phylum level.

Tax Assignment Tree  
 HF ● LF ● MF ●

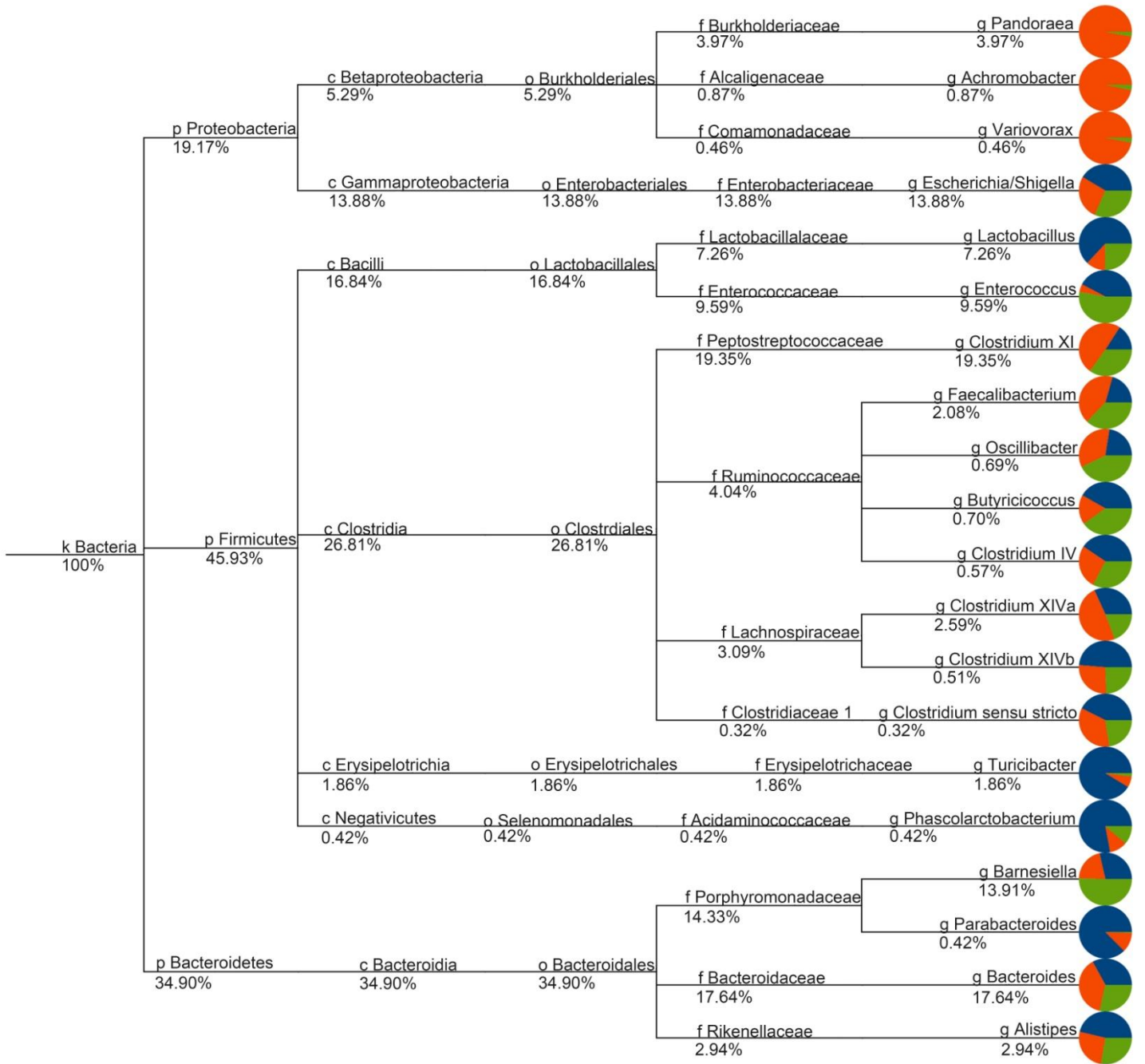


Figure S2: Taxonomy profile of microbiota composition at the genus level.