Figure S1 Characterization of MET-SSPS-NPs: (A) Size, (C) PDI, and (E) Zata-potential of MET-SSPS-NPs prepared under different pH; (B) Size, (D) PDI, and (F) Zata-potential of MET-SSPS-NPs prepared under different pH of different SSPS/MET ratio.
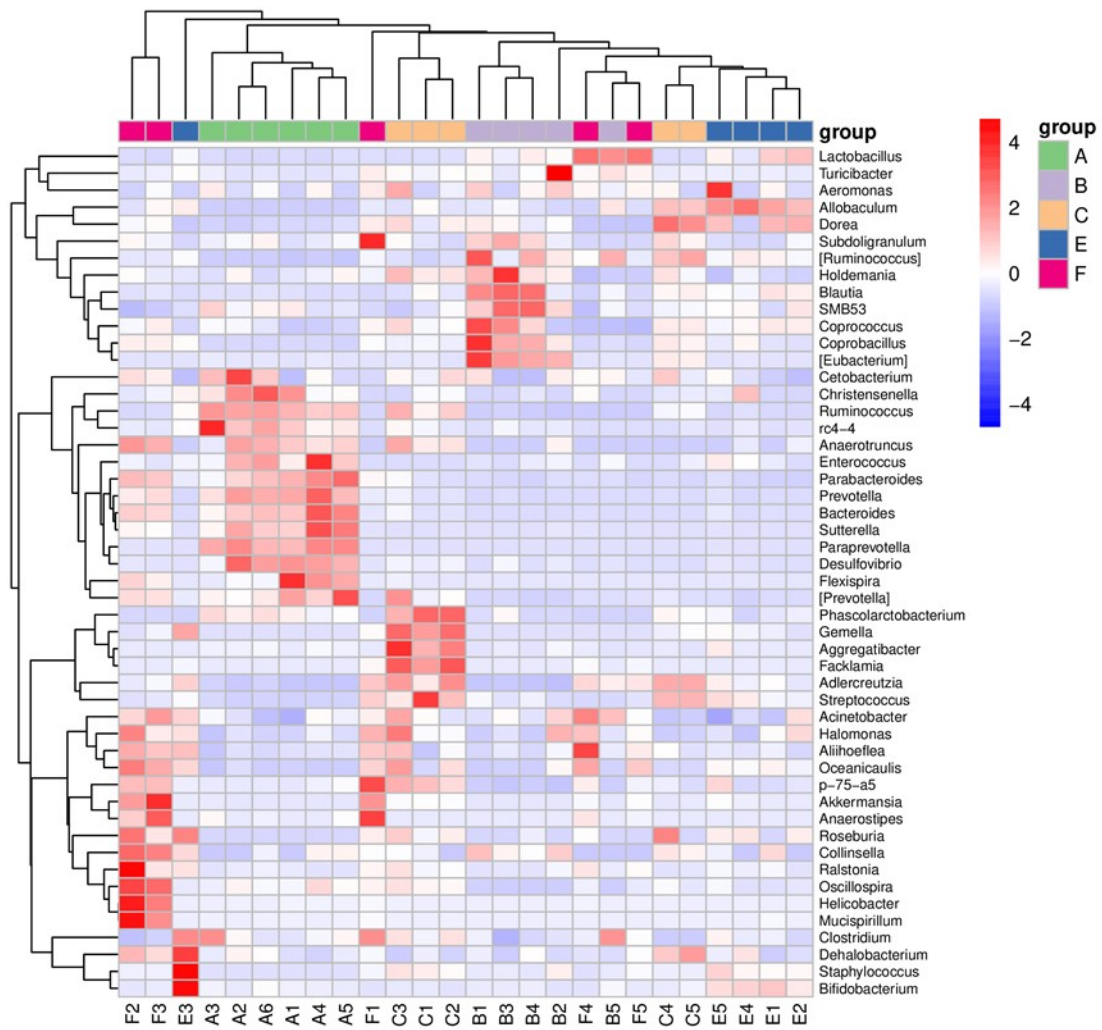
Figure S2 Different gut microbiota traits between groups: (A) Control, (B) HFD, (C) HFD+MET, (E) HFD+<10K and (F) HFD+<10K/MET.
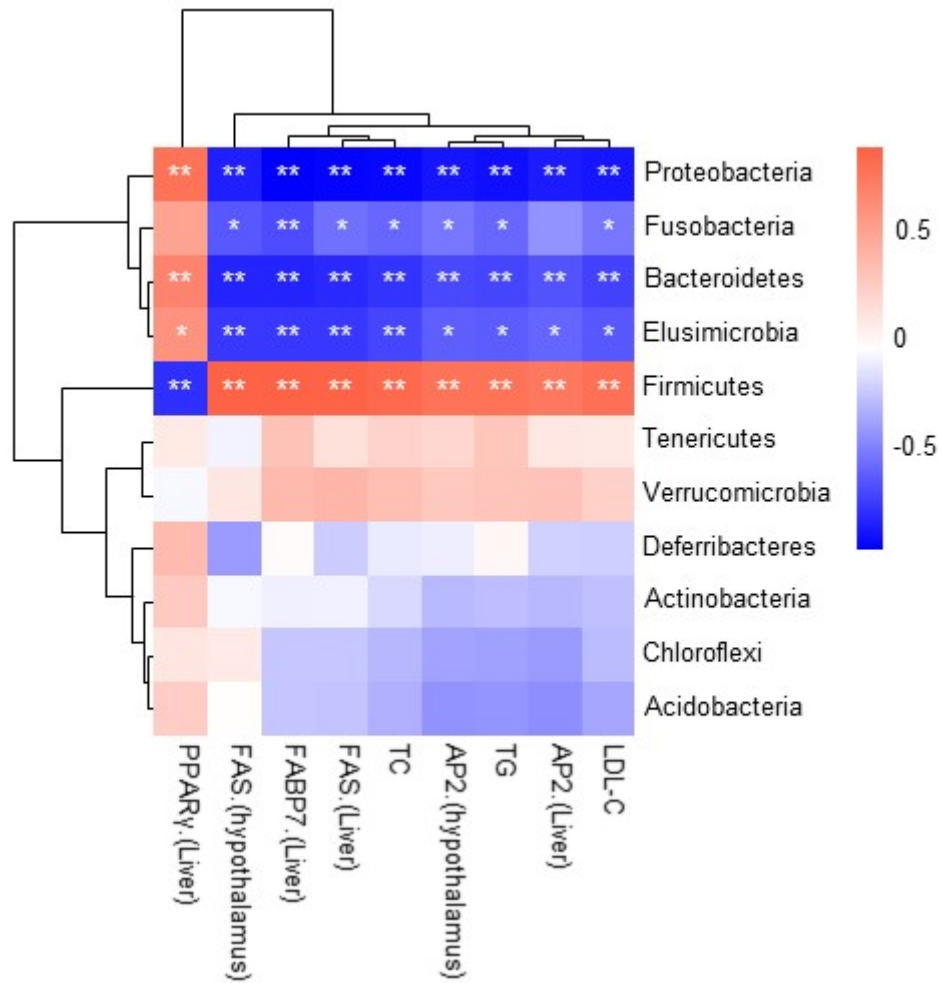
Figure S3 Correlation analysis between intestinal flora at the phylum level and obesity-related indicators.

Table S1 Composition of SPSS

Composition of SPSS	Content (%)
Fucose	24.46
Rhamnose	4.10
Arabinose	11.23
Xylose	18.44
Glucose	15.66
Xylose	26.11