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ESI Fig.1 Effects of supplementing citrus flavonoids extract (CFE) on rumen bacterial cell-wall components. (A) Lipopolysaccharide (LPS) and (B) lipoteichoic acid (LTA). T, treatment; L, linear; Q, quadratic.



ESI Fig. 2 Composition of the rumen microbes at the domain level between CON and CFE150 samples.



ESI Fig. 3 Composition of the rumen microbes at the phylum level between CON and CFE150 samples. (A) Bacteria. (B) Eukaryota. (C) Archaea. (D) Viruses.



ESI Fig. 4 Composition of the rumen microbes at the genus level between CON and CFE150 samples. (A) Bacteria. (B) Eukaryota. (C) Archaea. (D) Viruses.



Fig. 5 Composition of the ratio of Firmicutes to Bacteroidetes between CON and CFE150 samples.



ESI Fig. 6 Functional features profiling at KEGG pathway level 2 and 3. (A) KEGG barplot analysis at pathway level 2 level. (B) PCoA plot of functional features at pathway level 3. (C) Barplot of top 10 phyla and top 10 functional contribution analysis.



ESI Fig. 7 Differential KEGG functions at pathway level 3 within "Cellular Processes", "Environmental Information Processing", and "Genetic Information Processing.



ESI Fig. 8 Rumen CAZymes composition analyses. (A) CAZy barplot analysis at the class level. (B) Differential CAZymes at the class level. (C) PCoA plot at the family level.



ESI Fig. 9 The PCA plot and OPLS-DA modelling evaluation for rumen metabolome. PCA plot in positive model (**A**) and in negative mode (**B**). OPLS-DA plot in positive model (**C**) and in negative mode (**D**). OPLS-DA permutation in positive model (**E**) and in negative mode (**F**).



ESI Fig. 10 Effects of supplementing citrus flavonoids extract (CFE) on serum antioxidant indices. (A) Total antioxidant capacity (T-AOC). (B) Malonaldehyde (MDA). (C) Glutathione peroxidase (GSH-Px). (D) Total superoxide dismutase (T-SOD). T, treatment; L, linear; Q, quadratic.