

**Table S1**

The result of linear discriminant analysis (LDA). The nonparametric factorial Kruskal-Wallis (KW) sum rank test was used to find species with significant differences from the phylum to genus level ( $p < 0.05$ ), in which the value of LDA was greater than 2. p, c, o, f and g represent the taxonomic level, which were phylum, class, order, family and genus, respectively.

Species name	Group	Mean	LDA-value	p-value
<i>p__Firmicutes.c__Clostridia.o__unclassified.c__Clostridia.f__unclassified.c__Clostridia</i>	SSe	1.82	3.22	0.015
<i>p__Bacteroidota.c__Bacteroidia.o__Bacteroidales.f__Prevotellaceae.g__Prevotellaceae_UCG-001</i>	SeMet	3.74	3.40	0.019
<i>p__Firmicutes.c__Clostridia.o__Lachnospirales.f__Lachnospiraceae.g__Roseburia</i>	Blank	4.23	3.95	0.011
<i>p__Firmicutes.c__Clostridia.o__Peptostreptococcales-Tissierellales</i>	Control	3.44	3.08	0.001
<i>p__Firmicutes.c__Clostridia.o__Lachnospirales.f__Lachnospiraceae.g__Lachnospiraceae_UCG-001</i>	Control	3.70	3.35	0.002
<i>p__Firmicutes.c__Clostridia.o__Christensenellales.f__Christensenellaceae.g__norank.f__Christensenellaceae</i>	SSe	1.89	2.97	0.016
<i>p__Firmicutes.c__Clostridia.o__Oscillospirales.f__Ruminococcaceae.g__Negativibacillus</i>	SSe	3.22	2.93	0.000
<i>p__Firmicutes.c__Clostridia.o__Oscillospirales.f__Butyrivibrionaceae.g__UCG-009</i>	Control	3.25	3.01	0.000
<i>p__Bacteroidota.c__Bacteroidia.o__Bacteroidales.f__Prevotellaceae.g__unclassified.f__Prevotellaceae</i>	SeMet	3.00	3.01	0.003
<i>p__Firmicutes.c__Clostridia.o__Lachnospirales.f__Lachnospiraceae.g__Tuzzerella</i>	Control	3.08	2.84	0.018
<i>p__Proteobacteria.c__Alphaproteobacteria.o__Rhizobiales</i>	SeMet	2.32	3.29	0.006
<i>p__Firmicutes.c__Clostridia.o__Lachnospirales.f__Lachnospiraceae.g__Lachnospiraceae_NK4A136_group</i>	Control	4.90	4.50	0.007
<i>p__Campilobacterota.c__Campylobacteria.o__Campylobacteriales.f__Helicobacteraceae</i>	Blank	4.91	4.53	0.021
<i>p__Firmicutes.c__Clostridia.o__Oscillospirales.f__UCG-010</i>	SSe	2.96	2.71	0.008
<i>p__Actinobacteriota.c__Actinobacteria.o__Micrococcales.f__Micrococcaceae</i>	Blank	2.24	2.95	0.010
<i>p__Firmicutes.c__Bacilli.o__Erysipelotrichales.f__Erysipelotrichaceae.g__unclassified.f__Erysipelotrichaceae</i>	SSe	2.56	2.57	0.037
<i>p__Firmicutes.c__Clostridia.o__Monoglobales.f__Monoglobaceae.g__Monoglobus</i>	Control	3.26	2.98	0.002
<i>p__Proteobacteria.c__Alphaproteobacteria.o__Rhodospirillales.f__norank.o__Rhodospirillales.g__norank.f__norank.o__Rhodospirillales</i>	SSe	3.44	3.15	0.029

<i>p__Firmicutes.c__Clostridia.o__unclassified_c__Clostridia.f__unclassified_c__Clostridia.g__unclassified_c__Clostridia</i>	SSe	1.82	3.22	0.015
<i>p__Firmicutes.c__Clostridia.o__Peptostreptococcales-Tissierellales.f__Anaerovoracaceae.g__Eubacterium_nodatum_group</i>	Control	3.17	2.94	0.003
<i>p__Firmicutes.c__Clostridia.o__Christensenellales</i>	SSe	1.93	2.96	0.016
<i>p__Campilobacterota.c__Campylobacteria.o__Campylobacteriales</i>	Blank	4.91	4.53	0.021
<i>p__Bacteroidota.c__Bacteroidia.o__Bacteroidales.f__Muribaculaceae.g__Muribaculum</i>	SeMet	2.87	2.67	0.043
<i>p__Firmicutes.c__Clostridia.o__Lachnospirales.f__Lachnospiraceae.g__ASF356</i>	Control	3.79	3.48	0.012
<i>p__Firmicutes.c__Clostridia.o__Peptostreptococcales-Tissierellales.f__Anaerovoracaceae.g__Family_XIII_AD3011_group</i>	Control	2.94	3.02	0.000
<i>p__Firmicutes.c__Clostridia.o__Lachnospirales.f__Lachnospiraceae.g__Lachnoclostridium</i>	Control	3.96	3.60	0.010
<i>p__Proteobacteria.c__Gammaproteobacteria.o__Burkholderiales.f__Sutterellaceae.g__Parasutterella</i>	Control	3.20	2.97	0.002
<i>p__Firmicutes.c__Clostridia.o__Lachnospirales.f__Lachnospiraceae.g__A2</i>	Control	3.28	2.97	0.002
<i>p__Firmicutes.c__Clostridia.o__Oscillospirales.f__Ruminococcaceae.g__Ruminococcus</i>	SSe	3.44	3.18	0.013
<i>p__Bacteroidota.c__Bacteroidia.o__Bacteroidales.f__Tannerellaceae.g__Parabacteroides</i>	SeMet	3.84	3.46	0.024
<i>p__Proteobacteria.c__Alphaproteobacteria.o__Rhodospirillales</i>	SSe	3.44	3.15	0.029
<i>p__Proteobacteria.c__Gammaproteobacteria.o__Burkholderiales.f__Sutterellaceae</i>	Control	3.20	2.97	0.002
<i>p__Firmicutes.c__Clostridia.o__Monoglobales.f__Monoglobaceae</i>	Control	3.26	2.98	0.002
<i>p__Proteobacteria.c__Gammaproteobacteria.o__Pseudomonadales</i>	SeMet	2.65	2.70	0.007
<i>p__Firmicutes.c__Clostridia.o__Lachnospirales.f__Lachnospiraceae.g__Eubacterium_xylanophilum_group</i>	Blank	3.51	3.28	0.005
<i>p__Firmicutes.c__Clostridia.o__Clostridiales.f__Clostridiaceae</i>	SSe	2.65	2.56	0.008
<i>p__Campilobacterota.c__Campylobacteria</i>	Blank	4.91	4.53	0.021
<i>p__Bacteroidota.c__Bacteroidia.o__Bacteroidales.f__Rikenellaceae.g__norank_f__Rikenellaceae</i>	Blank	2.42	2.70	0.014
<i>p__Firmicutes.c__Clostridia.o__Peptostreptococcales-Tissierellales.f__Anaerovoracaceae</i>	Control	3.44	3.08	0.001

<i>p__Actinobacteriota.c__Actinobacteria.o__Micrococcales.f__Micrococcaceae.g__Arthrobacter</i>	Blank	2.23	2.99	0.038
<i>p__Firmicutes.c__Clostridia.o__Oscillospirales.f__Butyriricoccaceae</i>	Control	3.43	3.12	0.001
<i>p__Actinobacteriota.c__Coriobacteriia.o__Coriobacteriales.f__Eggerthellaceae.g__unclassified.f__Eggerthellaceae</i>	Blank	2.30	3.25	0.015
<i>p__Firmicutes.c__Clostridia.o__Peptostreptococcales-Tissierellales.f__Anaerovoracaceae.g__Anaerovorax</i>	SSe	2.01	3.22	0.002
<i>p__Proteobacteria.c__Alphaproteobacteria.o__Rhodospirillales.f__norank.o__Rhodospirillales</i>	SSe	3.44	3.15	0.029
<i>p__Actinobacteriota.c__Actinobacteria.o__Micrococcales</i>	Blank	2.36	2.92	0.002
<i>p__Campilobacterota.c__Campylobacteria.o__Campylobacteriales.f__Helicobacteraceae.g__Helicobacter</i>	Blank	4.91	4.53	0.021
<i>p__Proteobacteria.c__Gammaproteobacteria.o__Enterobacteriales.f__Enterobacteriaceae.g__Klebsiella</i>	Control	3.40	3.13	0.026
<i>p__Firmicutes.c__Clostridia.o__Lachnospirales.f__Lachnospiraceae</i>	Control	5.24	4.78	0.020
<i>p__Firmicutes.c__Clostridia.o__Oscillospirales.f__Ruminococcaceae.g__Harryflintia</i>	SSe	2.52	2.78	0.019
<i>p__Firmicutes.c__Clostridia.o__unclassified.c__Clostridia</i>	SSe	1.82	3.21	0.015
<i>p__Proteobacteria.c__Gammaproteobacteria.o__Burkholderiales.f__Burkholderiaceae.g__Burkholderia-Caballeronia-Paraburkholderia</i>	SSe	2.44	2.88	0.000
<i>p__Firmicutes.c__Clostridia.o__Clostridiales</i>	SSe	2.65	2.56	0.008
<i>p__Proteobacteria.c__Gammaproteobacteria.o__Burkholderiales.f__Burkholderiaceae</i>	SSe	2.44	2.92	0.003
<i>p__Bacteroidota.c__Bacteroidia.o__Bacteroidales.f__Tannerellaceae</i>	SeMet	3.84	3.46	0.024
<i>p__Firmicutes.c__Clostridia.o__Lachnospirales.f__Lachnospiraceae.g__Lachnospiraceae_UCG-010</i>	Control	1.96	3.27	0.013
<i>p__Firmicutes.c__Clostridia.o__Monoglobales</i>	Control	3.26	2.98	0.002
<i>p__Firmicutes.c__Clostridia.o__Lachnospirales</i>	Control	5.24	4.78	0.020
<i>p__Proteobacteria.c__Gammaproteobacteria.o__Enterobacteriales.f__Enterobacteriaceae.g__Escherichia-Shigella</i>	Blank	4.54	4.22	0.041
<i>p__Campilobacterota</i>	Blank	4.91	4.53	0.021
<i>p__Firmicutes.c__Bacilli.o__Lactobacillales.f__Streptococcaceae.g__Lactococcus</i>	Blank	3.86	3.63	0.010
<i>p__Firmicutes.c__Clostridia.o__Christensenellales.f__Christensenellaceae</i>	SSe	1.93	2.95	0.016

<i>p__Firmicutes.c__Clostridia.o__Oscillospirales.f__UC</i>	SSe	2.96	2.71	0.008
<i>G-010.g__norank.f__UCG-010</i>				

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