

Supplementary Table 1 Volcano plot data with entire data set

Biochemical name	FC	Log2 (FC)	P value	-Log10 (P)
docosaheptaenoic acid (22:6n3)	1069.29	10.06	1.74E-01	0.76
eicosapentaenoic acid (20:5n3)	13.02	3.70	2.97E-01	0.53
cis-13-16-docosadienoic acid (22:2n6)	10.35	3.37	4.84E-02	1.31
adrenic acid (22:4n6)	9.17	3.20	3.81E-03	2.42
docosapentaenoic acid (22:5n3)	6.01	2.59	5.71E-03	2.24
eicosatetraenoic acid (20:4n3)	5.63	2.49	2.56E-01	0.59
dihomo-gamma-linolenic acid (20:3n6)	4.41	2.14	3.31E-02	1.48
erucic acid (22:1n9)	2.72	1.44	1.68E-01	0.77
vaccenic acid (18:1n7)	2.09	1.06	2.40E-01	0.62
alpha-linolenic acid (18:3n3)	2.06	1.04	2.88E-01	0.54
nervonic acid (24:1n9)	1.96	0.97	1.46E-01	0.83
palmitic acid (16:0)	1.94	0.96	7.98E-02	1.10
palmitoleic acid (16:1n7)	1.87	0.91	3.94E-01	0.40
margaric acid (17:0)	1.87	0.90	1.65E-01	0.78
linoleic acid (18:2n6)	1.65	0.73	5.31E-01	0.27
myristic acid (14:0)	1.59	0.67	3.99E-01	0.40
arachidonic acid (20:4n6)	1.46	0.54	1.03E-01	0.99
cis-11,14-eicosadienoic acid (20:2n6)	1.44	0.52	4.90E-01	0.31
arachidic acid (20:0)	1.32	0.40	4.95E-01	0.31
stearidonic acid (18:4n3)	1.29	0.36	8.52E-01	6.96E-02
cis-11-eicosaenoic acid (20:1n9)	1.26	0.34	6.59E-01	0.18
myristoleic acid (14:1n5)	1.25	0.32	7.72E-01	0.11
behenic acid (22:0)	1.06	9.03E-02	9.55E-01	2.01E-02
stearic acid (18:0)	1.05	6.62E-02	9.79E-01	9.28E-03
pentadecanoic acid (15:0)	1.04	5.54E-02	9.92E-01	3.51E-03
oleic acid (18:1n9)	0.98	-2.39E-02	9.01E-01	4.52E-02

lignoceric acid (24:0)	0.93	-0.11	7.22E-01	0.14
osbond acid (22:5n6)	0.54	-0.88	3.57E-01	0.45
gamma-linolenic acid (18:3n6)	3.61E-02	-4.79	7.57E-02	1.12
mead acid (20:3n9)	3.20E-02	-4.97	3.39E-01	0.47

Supplementary Table 2 Volcano plot data with high bacteroidetes

Biochemical name	FC	Log2 (FC)	P value	-Log10 (P)
docosahexaenoic acid (22:6n3)	2318.10	11.18	2.67E-01	0.57
eicosapentaenoic acid (20:5n3)	30.72	4.94	3.37E-01	0.47
eicosatetraenoic acid (20:4n3)	11.40	3.51	3.28E-01	0.48
adrenic acid (22:4n6)	9.33	3.22	1.01E-01	0.99
docosapentaenoic acid (22:5n3)	6.63	2.73	1.33E-01	0.88
dihomo-gamma-linolenic acid (20:3n6)	5.89	2.56	2.15E-01	0.67
cis-13-16-docosadienoic acid (22:2n6)	3.94	1.98	3.31E-01	0.48
stearidonic acid (18:4n3)	2.57	1.36	5.71E-01	0.24
arachidonic acid (20:4n6)	1.73	0.79	1.36E-01	0.87
alpha-linolenic acid (18:3n3)	1.65	0.72	5.73E-01	0.24
erucic acid (22:1n9)	1.31	0.39	6.61E-01	0.18
palmitic acid (16:0)	1.19	0.25	7.18E-01	0.14
myristoleic acid (14:1n5)	1.07	0.10	9.17E-01	3.78E-02
cis-11,14-eicosadienoic acid (20:2n6)	1.00	-7.00E-03	9.93E-01	3.18E-03
vaccenic acid (18:1n7)	0.92	-0.12	8.49E-01	7.09E-02
margaric acid (17:0)	0.92	-0.12	8.39E-01	7.61E-02
nervonic acid (24:1n9)	0.84	-0.26	5.94E-01	0.23
linoleic acid (18:2n6)	0.79	-0.33	6.39E-01	0.19
myristic acid (14:0)	0.74	-0.44	5.70E-01	0.24
palmitoleic acid (16:1n7)	0.72	-0.48	3.58E-01	0.45
arachidic acid (20:0)	0.71	-0.50	4.53E-01	0.34
stearic acid (18:0)	0.65	-0.61	4.22E-01	0.37
cis-11-eicosaenoic acid (20:1n9)	0.42	-1.24	2.24E-02	1.65
pentadecanoic acid (15:0)	0.40	-1.34	4.52E-02	1.35
behenic acid (22:0)	0.35	-1.50	7.07E-03	2.15
lignoceric acid (24:0)	0.30	-1.73	4.83E-03	2.32

oleic acid (18:1n9)	0.30	-1.74	3.35E-02	1.48
osbond acid (22:5n6)	0.20	-2.33	1.08E-01	0.97
gamma-linolenic acid (18:3n6)	8.78E-02	-3.51	9.36E-02	1.03
mead acid (20:3n9)	3.20E-02	-4.97	3.39E-01	0.47

Supplementary Table 3 Volcano plot data with high Firmicutes

Biochemical name	FC	Log2 (FC)	P value	-Log10 (P)
cis-13-16-docosadienoic acid (22:2n6)	35.81	5.16	6.32E-02	1.20
erucic acid (22:1n9)	7.42	2.89	2.67E-01	0.57
nervonic acid (24:1n9)	4.27	2.09	2.35E-01	0.63
alpha-linolenic acid (18:3n3)	4.20	2.07	4.21E-01	0.38
docosapentaenoic acid (22:5n3)	4.20	2.07	1.89E-01	0.72
myristic acid (14:0)	2.89	1.53	4.32E-01	0.36
margaric acid (17:0)	2.71	1.44	3.74E-01	0.43
cis-11-eicosaenoic acid (20:1n9)	2.55	1.35	2.99E-01	0.52
palmitic acid (16:0)	2.52	1.33	2.80E-01	0.55
behenic acid (22:0)	2.48	1.31	1.69E-01	0.77
vaccenic acid (18:1n7)	2.44	1.29	2.41E-01	0.62
adrenic acid (22:4n6)	2.37	1.24	2.26E-01	0.65
pentadecanoic acid (15:0)	2.36	1.24	3.58E-01	0.45
lignoceric acid (24:0)	2.34	1.22	1.61E-01	0.79
arachidic acid (20:0)	2.29	1.19	2.08E-01	0.68
myristoleic acid (14:1n5)	2.12	1.08	6.25E-01	0.20
cis-11,14-eicosadienoic acid (20:2n6)	1.95	0.97	6.09E-01	0.22
stearic acid (18:0)	1.75	0.81	4.73E-01	0.33
oleic acid (18:1n9)	1.72	0.78	3.68E-01	0.43
linoleic acid (18:2n6)	1.40	0.48	6.50E-01	0.19
dihomo-gamma-linolenic acid (20:3n6)	1.37	0.45	4.87E-01	0.31
palmitoleic acid (16:1n7)	1.31	0.39	7.16E-01	0.15
arachidonic acid (20:4n6)	1.21	0.28	7.72E-01	0.11
docosahexaenoic acid (22:6n3)	1.00	-3.20E-16	6.87E-03	2.16
osbond acid (22:5n6)	0.72	-0.47	6.21E-01	0.21
mead acid (20:3n9)	3.20E-02	-4.97	3.39E-01	0.47

stearidonic acid (18:4n3)	2.23E-02	-5.49	1.76E-01	0.76
eicosapentaenoic acid (20:5n3)	1.12E-02	-6.48	1.68E-01	0.77
eicosatetraenoic acid (20:4n3)	9.13E-03	-6.78	1.18E-02	1.93
gamma-linolenic acid (18:3n6)	9.37E-05	-13.38	6.70E-02	1.17