

Supplemental Table 1. Primer sequences used for RT-PCR in mice.

Gene	Forward primer (5'-3')	Reverse primer (5'-3')
FXR	TGTGAGGGCTGCAAAGGTTT	ACATCCCCATCTCTCTGCAC
FGF15	GAGGACCAAAACGAACGAAATT	ACGTCCTTGATGGCAATCG
ASBT	ACCACTTGCTCCACACTGCTT	CGTTCCTGAGTCAACCCACAT
IBABP	CCCCAACTATCACCAGACTTC	ACATCCCCGATGGTGGAGAT
OST- β	GATGCGGCTCCTTGGAATTA	GGAGGAACATGCTTGTCATGAC
β -actin	CTGAGAGGGGAAATCGTGCGT	AGGGTGTAACACGCAGCTCAG

Supplemental Table 2. Identification BAs (top 20) differential metabolites in the compositional analysis of the postbiotics and vehicle.

No.	Metabolites	Foremula	VIP	Log2FC	FDR	<i>P</i> value
						P/V
1	Dehydrolithocholic acid	C24H38O3	1.28	1.40	0.09	0.02
2	23-Nordeoxycholic acid	C23H38O4	1.22	0.21	0.12	0.04
3	12-Ketolithocholic acid	C24H38O4	1.14	-0.29	0.18	0.07
4	Taurohyocholic acid	C26H45NO7S	1.14	0.34	0.18	0.07
5	Taurocholic acid	C26H45NO7S	1.03	0.31	0.26	0.12
6	Glycolithocholic acid	C26H43NO4	0.98	0.35	0.30	0.15
7	Deoxycholic acid	C24H40O4	0.94	-0.95	0.33	0.17
8	3alpha-Hydroxy-12 Ketolithocholic Acid sulfate	C24H38O7S	0.93	0.23	0.34	0.18
9	Taurodeoxycholic acid Pool	C26H45NO6S	0.87	-0.41	0.39	0.21
10	Lithocholenic acid sulfate	C24H38O6S	0.81	-0.60	0.45	0.26
11	Lithocholic acid	C24H40O3	0.80	1.01	0.46	0.27
12	Cholic acid	C24H40O5	0.77	0.56	0.48	0.28
13	Chenodeoxycholic Acid sulfate	C24H40O7S	0.77	-0.51	0.49	0.29
14	Tauro-Tetrahydroxy-5beta- cholanoic acid	C26H43NO7S	0.69	0.50	0.55	0.35
15	Allocholic acid	C24H40O5	0.68	0.23	0.55	0.35
16	Alloisolithocholic acid	C24H40O3	0.63	0.49	0.59	0.39
17	Glyco-ursocholanic Acid	C26H43NO3	0.62	-0.16	0.59	0.40
18	Glycochenodeoxycholic acid	C26H43NO5	0.55	-0.18	0.64	0.46
19	Glycodeoxycholic acid	C26H43NO5	0.54	-0.10	0.65	0.47
20	9(11), (5p)-Cholenic Acid-3a- ol-12-one sulfate	C24H36O7S	0.54	-0.36	0.65	0.48

VIP: variable importance in the projection; P/V: postbiotics compared with vehicle.

Supplemental Table 3. Abbreviations in the study.

Abbreviations	Full name
<i>L. reuteri</i>	<i>Lactobacillus reuteri</i>
FXR/NR1H4	farnesoid x receptor
SHP	short heterodimer partner
SREBP-1c	sterol regulatory element binding protein-1c
FGF15	fibroblast growth factor 15
CD36	Cluster of differentiation 36
ChREBP	carbohydrate-responsive element-binding protein
FASN	fatty acid synthase
PPAR α	peroxisome proliferators-activated receptors α
ASBT	sodium-dependent bile acid transporter
IBABP	ileal bile acid binding protein
OST- β	organic solute transporter beta
Gly- β -MCA	glycine- β -muricholic acid
AB-PAS staining	alcian blue-periodic acidSchiff staining
LC/MS	liquid chromatograph mass spectrometer
BAs	bile acids
CA	cholic acid
TCA	taurocholic acid
DCA	deoxycholic acid
TDCA	taurodeoxycholic acid
CDCA	chenodeoxycholic acid
HDCA	hyodeoxycholic acid
TDCDA	taurochenodeoxycholic acid
MCA	muricholic acid
TMCA	taumuricholic acid
NorDCA	23-nordeoxycholic acid
LCA	lithocholic acid
alpha-MCA	α -muricholic acid
T-alpha-MCA	tauro- α - muricholic acid sodium salt
beta-MCA	β -Muricholic acid
T-beta-MCA	tauro- β - muricholic acid sodium salt