Supplemental Table 1

Table S1. Composition of diets fed to mice

Ingredient	MD10% Fat	MD 60% Fat
Casein	18.96	25.85
L-cystein	0.28	0.39
Corn starch	29.86	0
Maltodextrin	3.32	16.15
Sucrose	33.17	8.89
Cellulose	4.74	6.46
Soybean oil	2.37	3.23
Lard	1.9	31.66
Mineral Mix	4.24	5.79
Choline bitartrate	1.14	1.55
Total	99.98	99.97
Energy Composition	100	100
Protein	20	20
Carbohydrate	70	20
Fat	10	60

Supplemental Table 2

Table S2. Correlation between liver metabolism and gut microbiota in phylum level

Metabolite	Actinobacteria	Firmicutes	Proteobacteria	Bacteroidetes
Palmitoyl Ethanolamide	-0.7714	0.6	0.0286	-0.1429
PS (18:1(9Z)/0:0)	-0.4857	0.8857	0.0286	0.0857
Riboflavin (Vitamin B2)	0.0286	0.9429	-0.2571	0.1429
myo-Inositol	0.5429	-0.2571	-0.0286	-0.4857
Glycerophosphocholine	0.3714	-0.3143	-0.1429	-0.4286
PC (18:2(9Z,12Z)/20:4(5Z,8Z,11Z,14Z))	0.4857	-0.3143	-0.8286	0.4857
Panose	0.4857	-0.8857	-0.0286	-0.0857
LysoPC (20:0)	0.4286	-0.6	-0.0857	-0.0857
LysoPC (20:0/0:0)	0.4286	-0.6	-0.0857	-0.0857
Maltose	0.6	-0.5429	0.0286	-0.1429
D-Glucose	0.6571	-0.4286	0.0857	0.0286
PC (16:0/20:3(5Z,8Z,11Z))	0.8286	-0.4857	-0.4286	0.0286
Maltotriose	0.6	-0.6571	-0.3714	0.1429
Trehalulose	0.7714	-0.6	-0.2571	0.0857

Supplemental Table 3

Table S3. Correlation between liver metabolism and gut microbiota in genus level

Metabolite	Pygmaiobacter	Intestinimonas	Anaerosporobacter	Enterorhabdus	Faecalibaculum	Bifidobacterium	Negativibacillus
Riboflavin (Vitamin B2)	0.8197	0.0857	0.2704	-0.7143	0.7714	0.7714	-0.7247
PS (18:1(9Z)/0:0)	0.8804	0.6	0.6761	-0.6571	0.6	0.3714	-0.5508
Palmitoyl Ethanolamide	0.5161	0.7143	0.8452	-0.3714	0.5429	0.2571	-0.3479
myo-Inositol	-0.6983	-0.7143	-0.7775	0.6	-0.0286	0.2571	-0.116
Glycerophosphocholine	-0.759	-0.6	-0.5409	0.5429	0.0857	0.2	-0.2029
PC (18:2(9Z,12Z)/20:4(5Z,8Z,11Z,14Z))	-0.3947	-0.6	-0.0676	-0.2571	0.4286	0.2	-0.4928
LysoPC (20:0)	-0.759	-0.5429	-0.5409	0.4857	-0.2571	-0.2571	0.029
LysoPC (20:0/0:0)	-0.759	-0.5429	-0.5409	0.4857	-0.2571	-0.2571	0.029
Maltose	-0.6983	-0.6571	-0.7775	0.5429	-0.3714	-0.2	0.116
D-Glucose	-0.4554	-0.6	-0.7775	0.3714	-0.4286	-0.2571	0.116
LysoPC (20:3(5Z,8Z,11Z))	-0.759	-0.7143	-0.5409	0.3143	-0.1429	-0.1429	-0.029
Trehalulose	-0.6983	-0.8286	-0.7775	0.3714	-0.2571	-0.0857	0.058