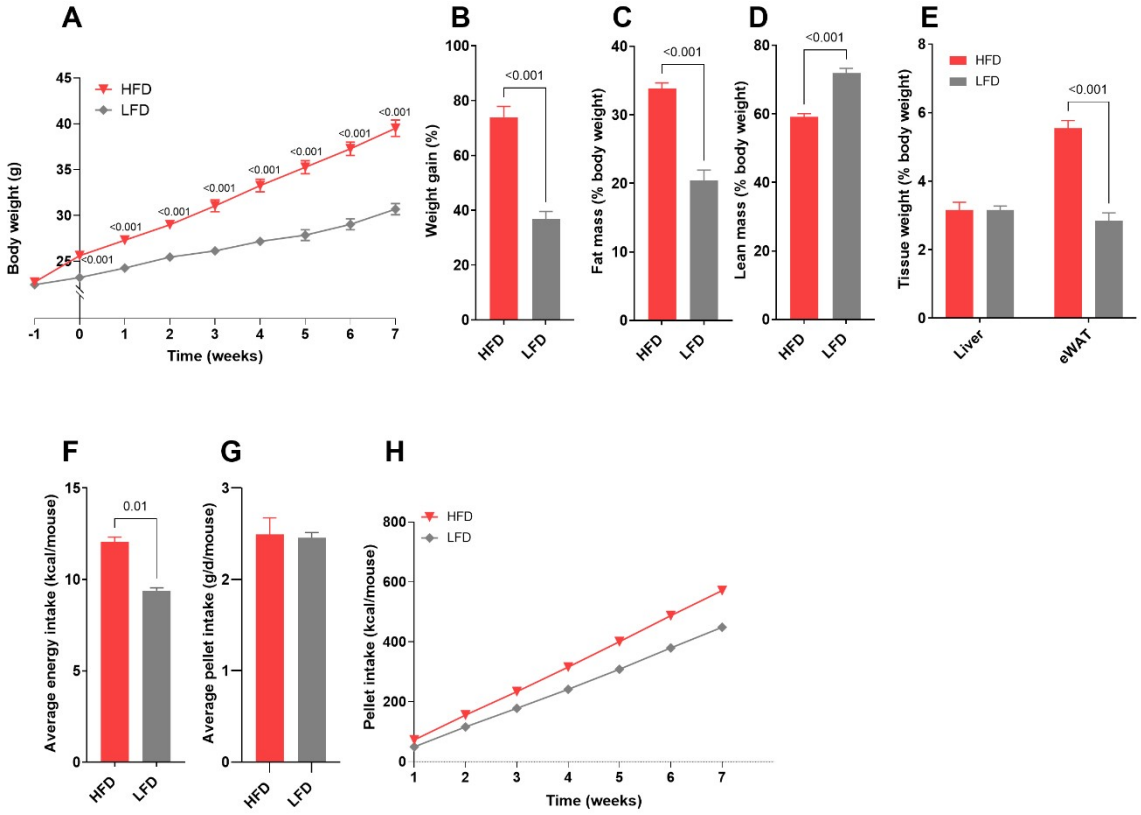
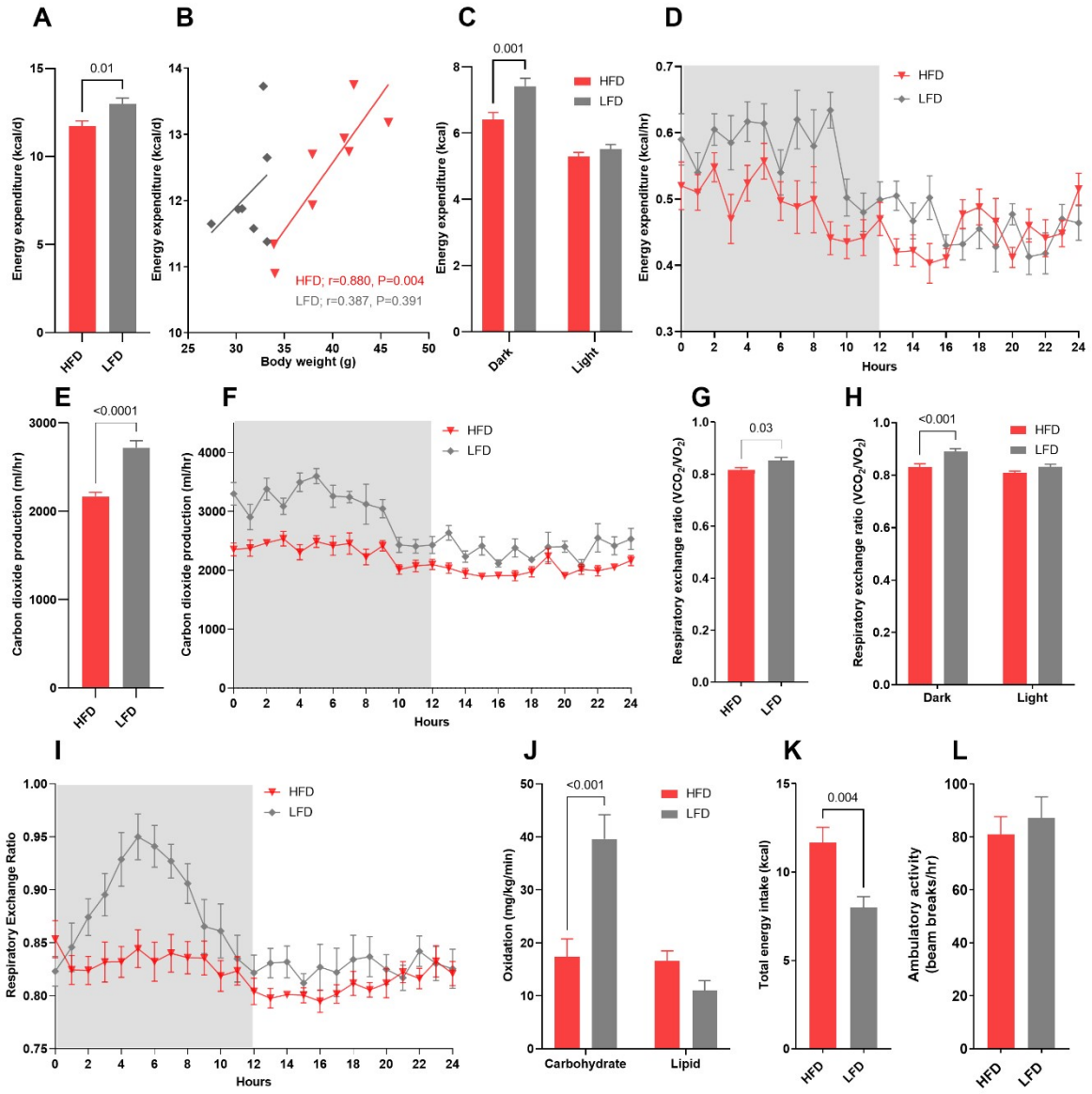


Supplemental Figure 1

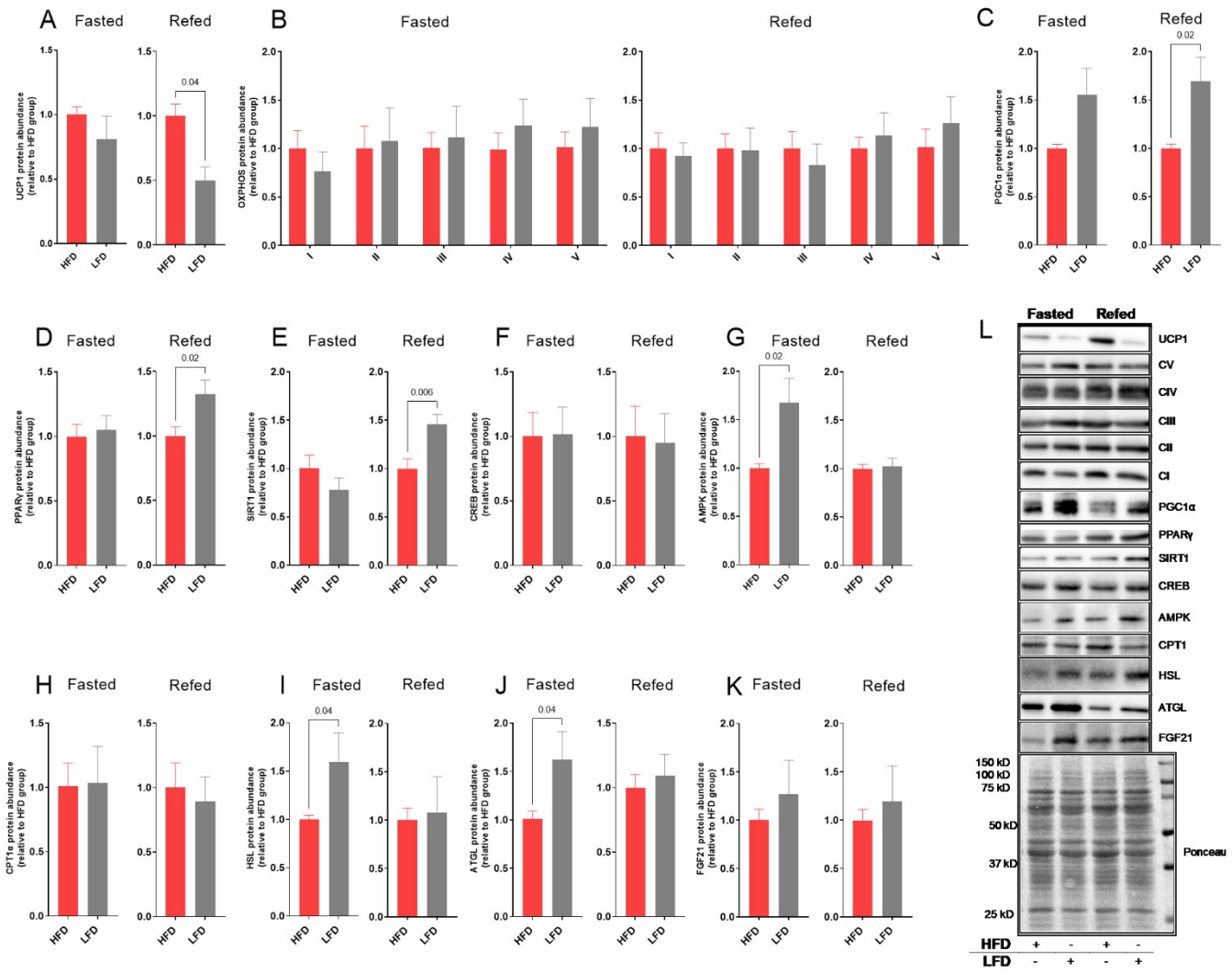
Body weight, body composition, and food intake of mice fed HFD vs LFD for 8 weeks (n=16 per group). (A) Body weight; (B) Weight gain as a percentage from baseline after 8 weeks; (C,D) Body fat mass and lean mass were assessed using EchoMRI technology and presented as a percentage of body weight; (E) Liver and epididymal white adipose tissues (eWAT) were harvested and weighed during necropsies; (F,G) Average energy consumption and daily intake of food pellets per mouse estimated from group-housed mice (4 mice/cage); (H) Cumulative food intake of mouse during 8 weeks of intervention. Data are expressed as the mean±SEM. Statistical analyses performed with (A, H) two-way repeated measures analysis of variance (ANOVA) with Tukey's post hoc test and (B-G) unpaired Student's t-test.



Supplemental Figure 2

Energy expenditure, oxygen consumption, and substrate utilization of mice following HFD vs LFD feeding for 8 weeks (n = 8 per group). (A) Body weight-adjusted total energy expenditure (EE) over a 24-h period; (B) Energy expenditure vs body weight plotted as a linear regression; (C) Body weight-adjusted EE during light and dark periods; (D) Average hourly body weight-adjusted EE during 12-h dark (grey)/12-h light (white) periods; (E) Whole-body carbon dioxide production (VCO_2) monitored continuously over a 24-h period; (F) Average hourly VCO_2 during 12-h dark (grey)/12-h light (white) periods); (G) Respiratory exchange ratio (RER) over a 24-h period; (H), Average RER during dark and light periods; (I) Average hourly RER during 12-h dark (grey)/12-h light (white) periods; (J), Average lipid and carbohydrate oxidation rate; (K) Caloric intake from food pellets over 24h; (L) Total ambulatory activity over a 24-h period. Results are shown as mean ± SEM. Statistical analyses in (A, C, E, G, H, J, K, and L) were performed with a two-tailed,

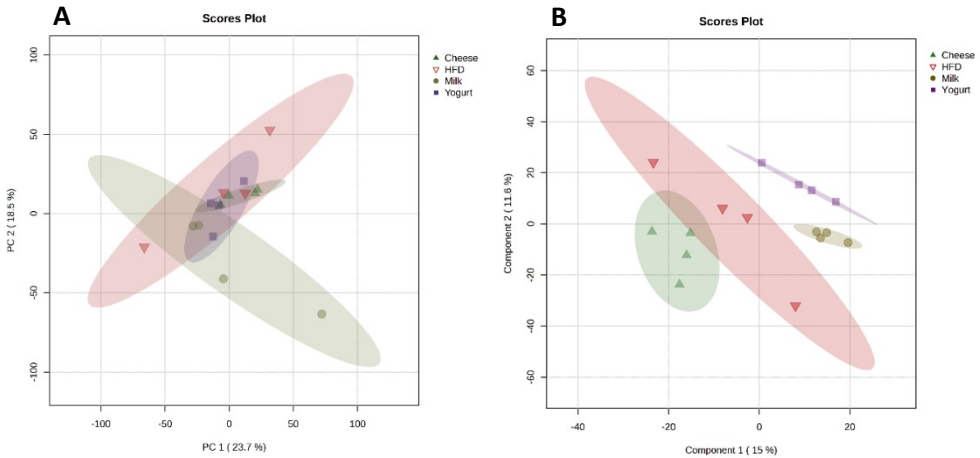
unpaired Student's t-test. Statistical analyses in (B) were performed using the Pearson correlation coefficient.

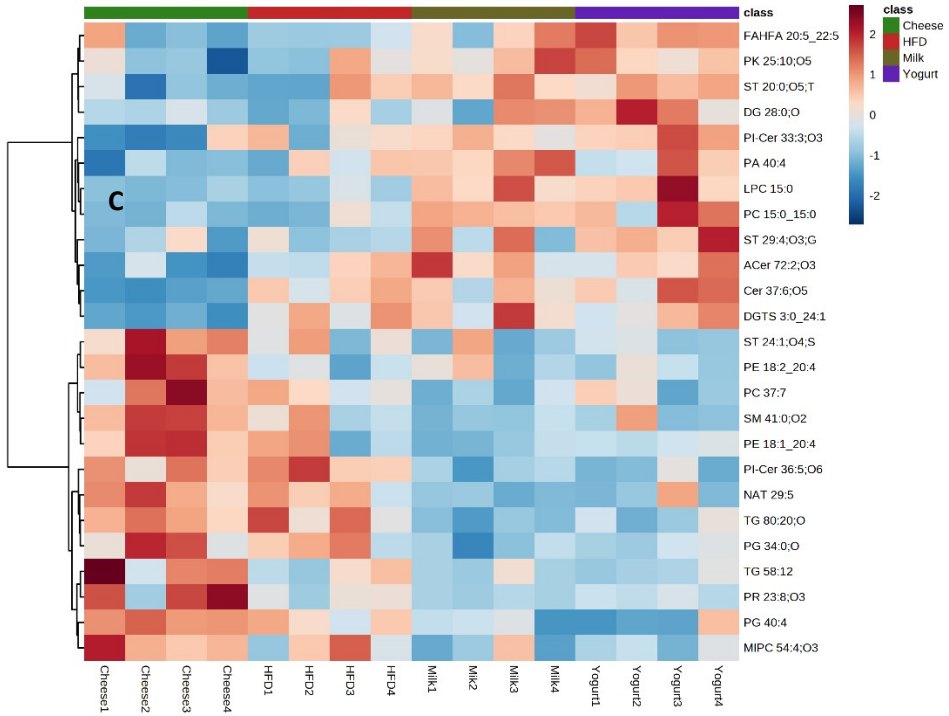


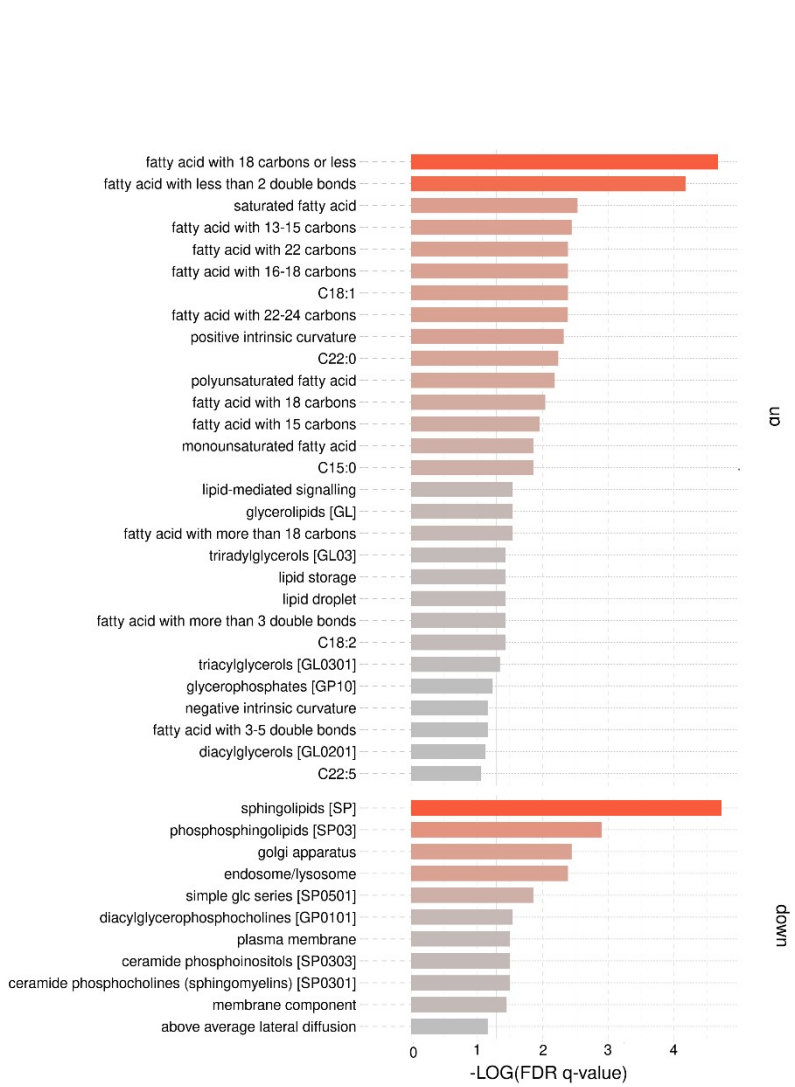
Supplemental Figure 3

The relative abundance of proteins associated with adaptive thermogenesis in brown adipose tissue of mice fed HFD and LFD for 8 weeks. Before collecting the tissues, mice were fasted for 12-h, or were refed with HFD for 4-h immediately before sample collection after 12-h of fasting. Western blots were run using n = 6-8/group and normalized to total protein (Ponceau S). (A) UCP1; (B) oxidative phosphorylation (OXPHOS) complex; (C) PGC1α; (D) PPARγ; (E) SIRT1; (F) CREB; (G) total AMPK; (H) CPT1A; (I) total HSL; (J) total ATGL; (K) FGF21. (L) Representative Western blot images (corresponding Ponceau S stain shown below the blots). Data were analyzed using an unpaired Student's *t*-test and presented as mean ± SEM relative to the HFD group.

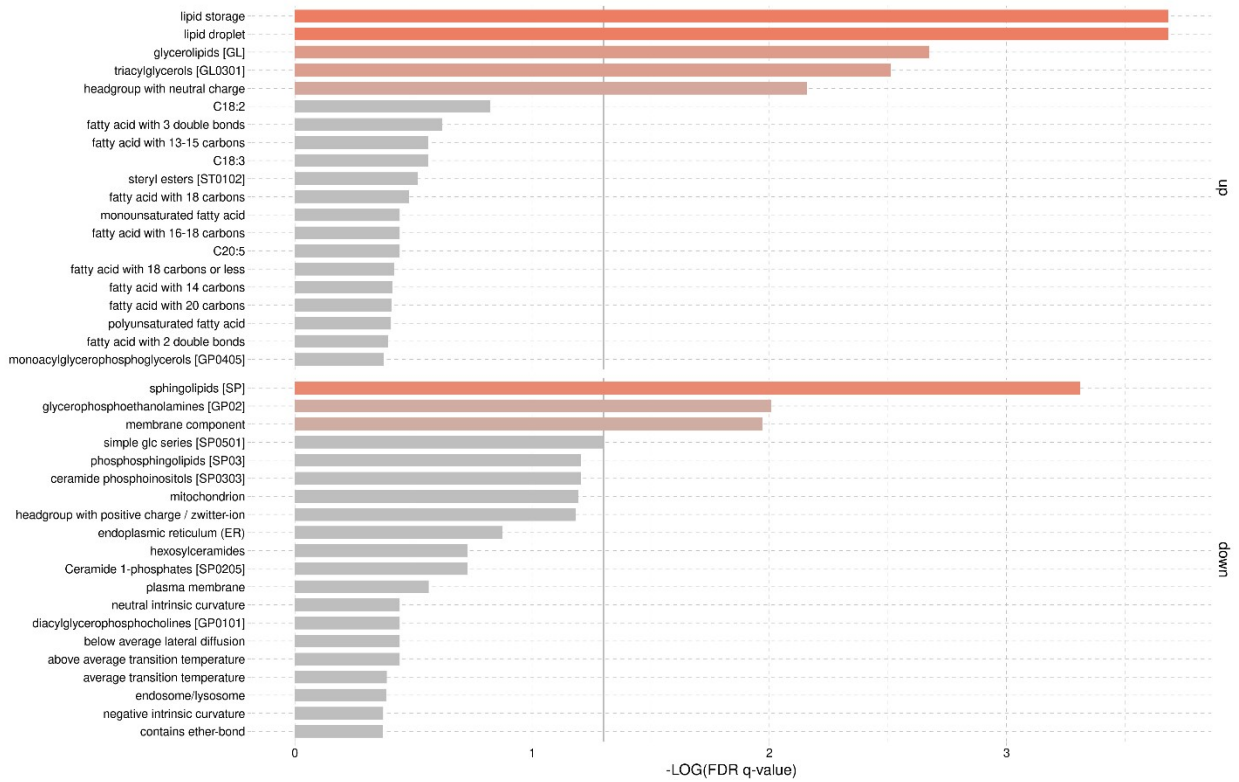
data ranking mode.


A
Scores Plot
Cheese
HFD
Milk
Yogurt
PC 2 (18.5 %)
PC 1 (23.7 %)
B
Scores Plot
Component 2 (11.6 %)
Component 1 (15 %)


C
class
Cheese
HFD
Milk
Yogurt
FAHFA 20:5_22:5
PK 25:10;O5
ST 20:0;O5;T
DG 28:0;O
PI-Cer 33:3;O3
PA 40:4
LPC 15:0
PC 15:0_15:0
ST 29:4;O3;G
ACer 72:2;O3
Cer 37:6;O5
DGTS 3:0_24:1
ST 24:1;O4;S
PE 18:2_20:4
PC 37:7
SM 41:0;O2
PE 18:1_20:4
PI-Cer 36:5;O6
NAT 29:5
TG 80:20;O
PG 34:0;O
TG 58:12
PR 23:8;O3
PG 40:4
MIPC 54:4;O3
Cheese1
Cheese2
Cheese3
Cheese4
HFD1
HFD2
HFD3
HFD4
Milk1
Milk2
Milk3
Milk4
Yogurt1
Yogurt2
Yogurt3
Yogurt4

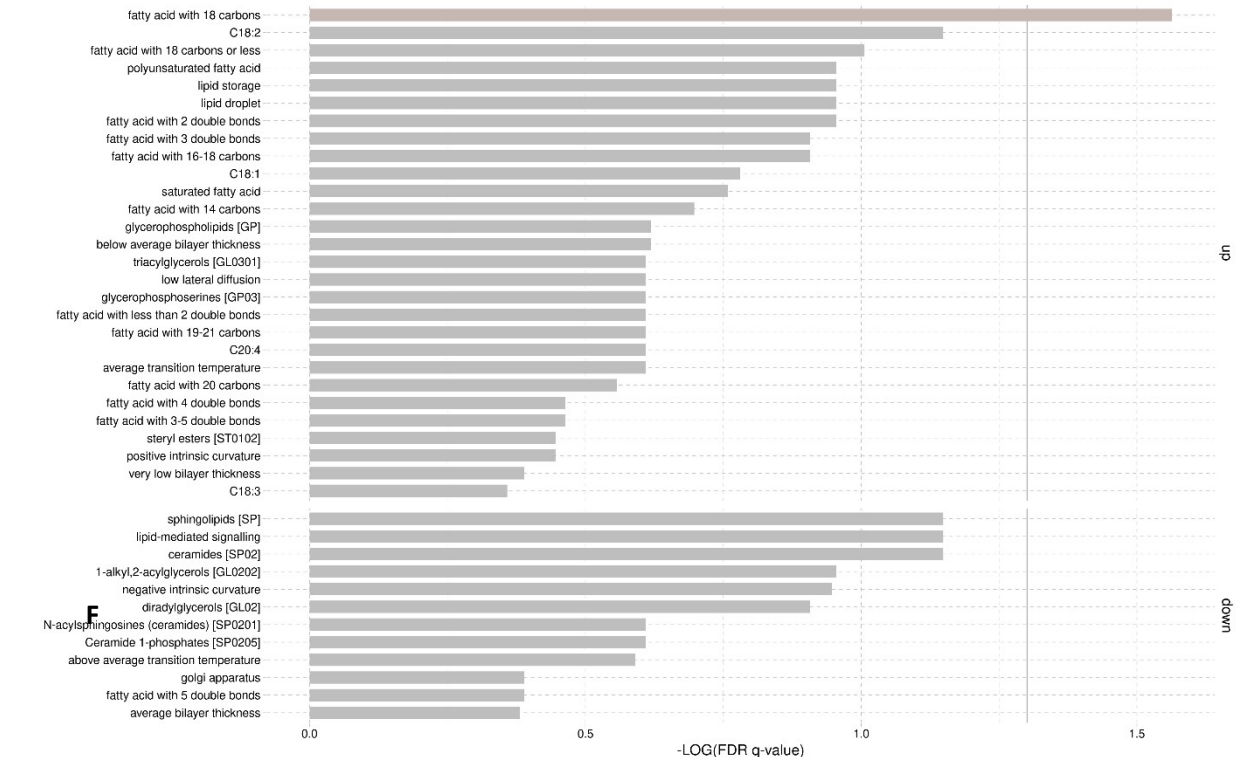

D
fatty acid with 18 carbons or less
fatty acid with less than 2 double bonds
saturated fatty acid
fatty acid with 13-15 carbons
fatty acid with 22 carbons
fatty acid with 16-18 carbons
C18:1
fatty acid with 22-24 carbons
positive intrinsic curvature
C22:0
polyunsaturated fatty acid
fatty acid with 18 carbons
fatty acid with 15 carbons
monounsaturated fatty acid
C15:0
lipid-mediated signalling
glycerolipids [GL]
fatty acid with more than 18 carbons
triradylglycerols [GL03]
lipid storage
lipid droplet
fatty acid with more than 3 double bonds
C18:2
triacylglycerols [GL0301]
glycerophosphates [GP10]
negative intrinsic curvature
fatty acid with 3-5 double bonds
diacylglycerols [GL0201]
C22:5
sphingolipids [SP]
phosphosphingolipids [SP03]
golgi apparatus
endosome/lysosome
simple glc series [SP0501]
diacylglycerophosphocholines [GP0101]
plasma membrane
ceramide phosphoinositols [SP0303]
ceramide phosphocholines (sphingomyelins) [SP0301]
membrane component
above average lateral diffusion
up
down
0
1
2
3
4
-LOG(FDR q-value)

E



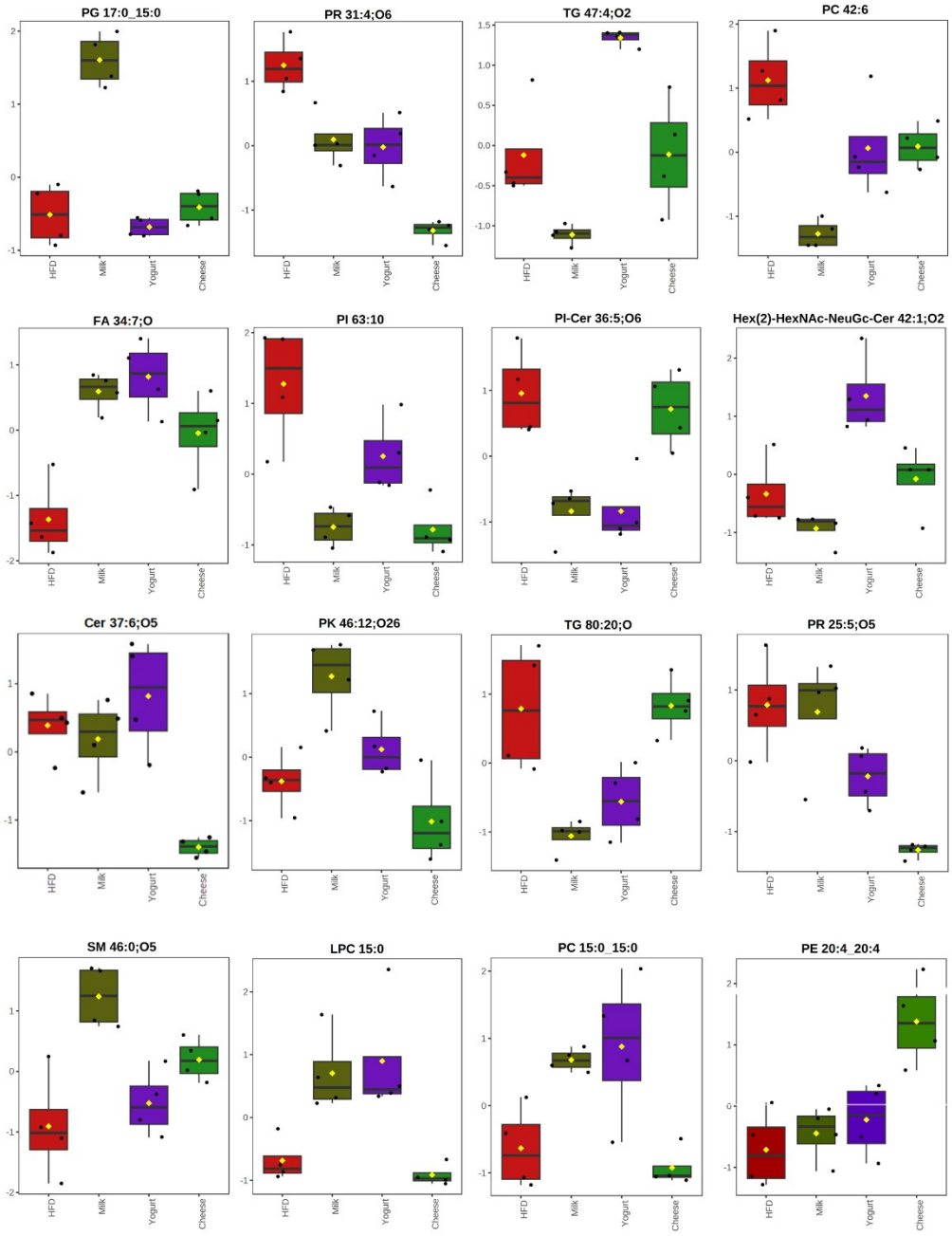
Supplemental Figure 4

Visualization of the mouse serum lipidomics dataset. (A) Principal component analysis (PCA) plot; (B) Partial least squares-discriminant analysis (PLS-DA) plot; (C) Heatmap of 25 lipid



F

species selected by the highest PLS-DA VIP. Lipid ontology enrichment analysis (LION) was performed using the ranking mode, in which input lipids are ranked by numeric values and compared between two groups which included (D) Milk vs HFD; (E) Yogurt vs HFD; (F) Cheese vs HFD. The gray vertical lines imply the cut-off value of significant enrichments ($p < 0.05$).



Supplemental Figure 5

Boxplots of 14 lipid molecular species in plasma with the lowest q-values (0.001 to 0.200) of the ANOVA test. LPC 15:0 (p=0.002) and PC 15:0_15:0 (p=003) are also shown as putative biomarkers of dairy consumption.