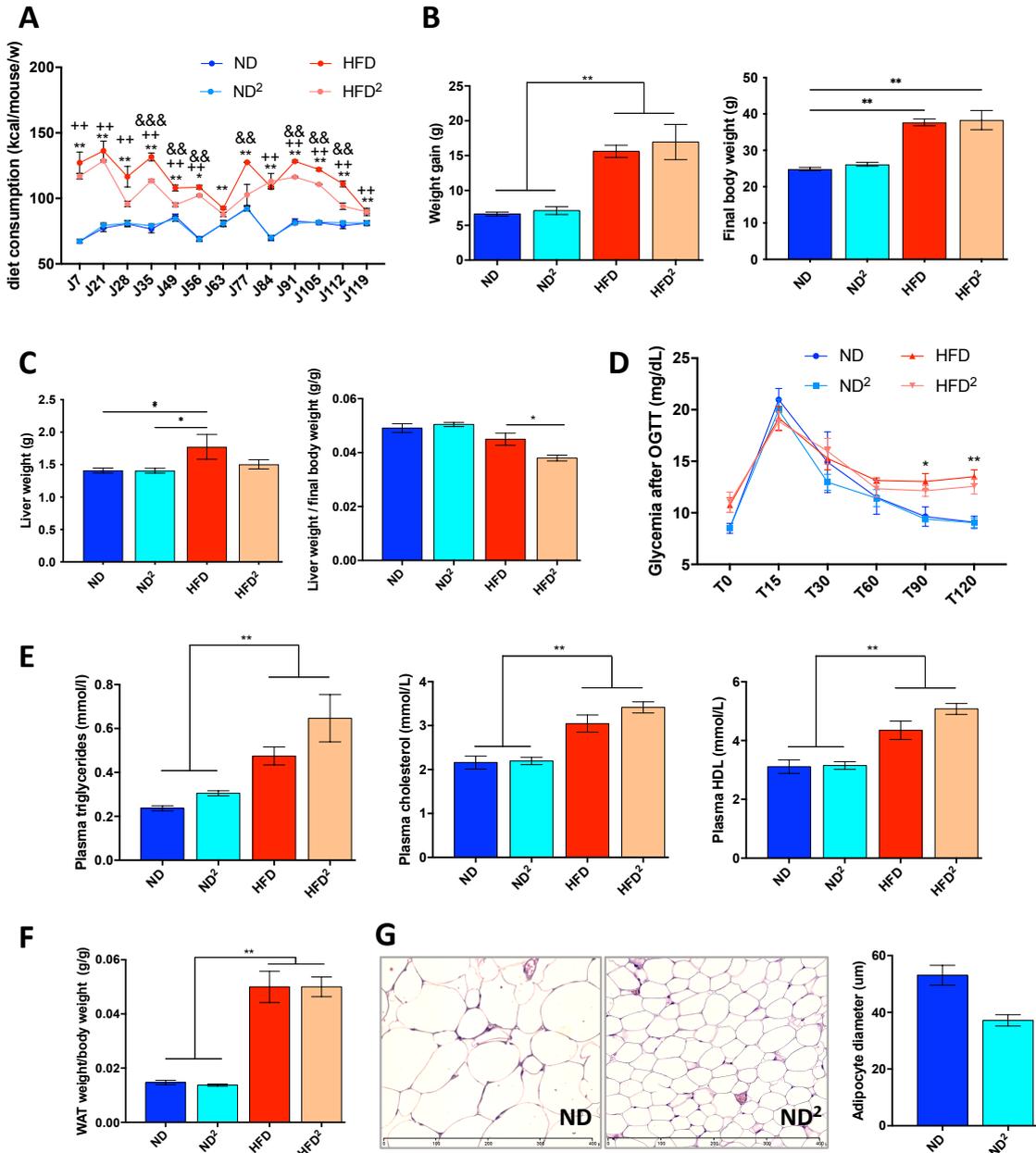


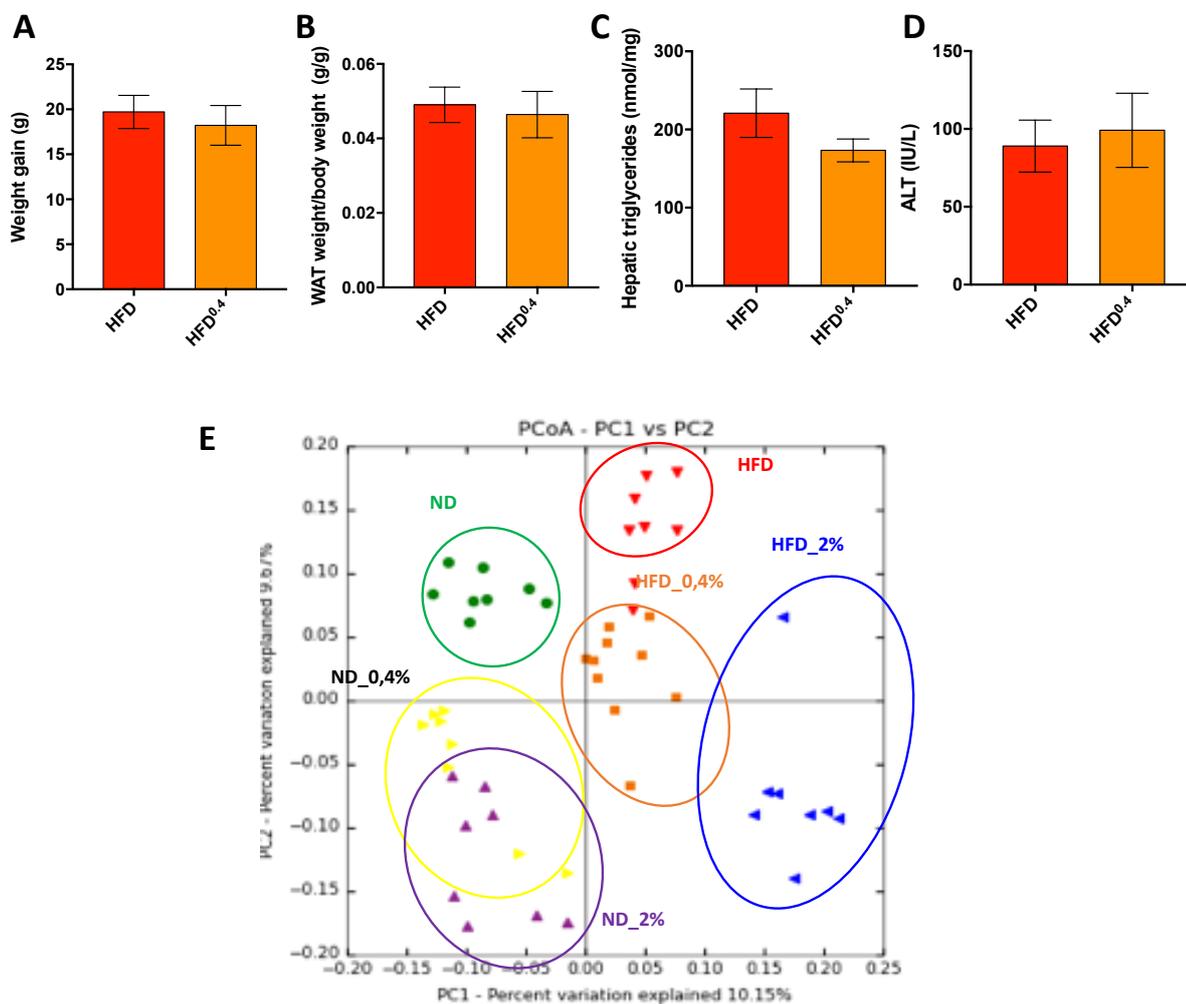
**Supplementary Materials:** Figure S1: Effect of pectin in normal diet and high fat diet fed mice, Figure S2: The preventive effect of pectin is dose dependent, Figure S3: IM diversity, Figure S4: FMT from mice fed with HFD and pectin is sufficient to induce browning of WAT in recipient HFD fed mice, Table 1: List of oligonucleotides used in qPCR, Table S2: GC/MS and quantitative parameters of SCFAs analysis.

**Figure S1**



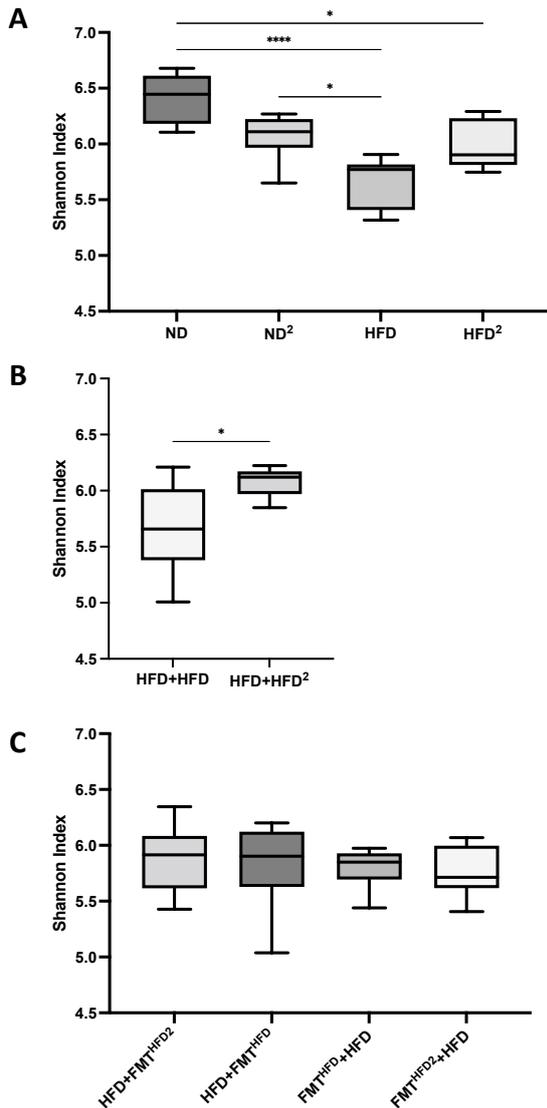
**Figure S1. Effect of pectin in normal diet and high fat diet fed mice.** Mice were fed with normal diet (ND), ND with pectin 2% (ND<sup>2</sup>), high fat diet (HFD) and HFD with pectin 2% (HFD<sup>2</sup>) diets for 16 weeks. **(A)** Diet consumption throughout the 16 weeks. **(B)** Total body weight gain after 16 weeks of diet and final body weight. **(C)** Liver weight and Liver weight / body weight ratio. **(D)** Curves of glycemia after an oral glucose tolerance test. **(E)** Post-prandial plasma triglycerides, HDL-cholesterol and total cholesterol. **(F)** White adipose tissue (WAT) weight/body weight ratio. **(G)** WAT sections of ND or ND<sup>2</sup> mice stained with hematoxylin-eosin (scale 400 µm) and histomorphometric analysis of adipocyte diameter. Data represent the mean±SEM of 8 mice, \*: p<0.05, \*\*: p<0.01.

**Figure S2**



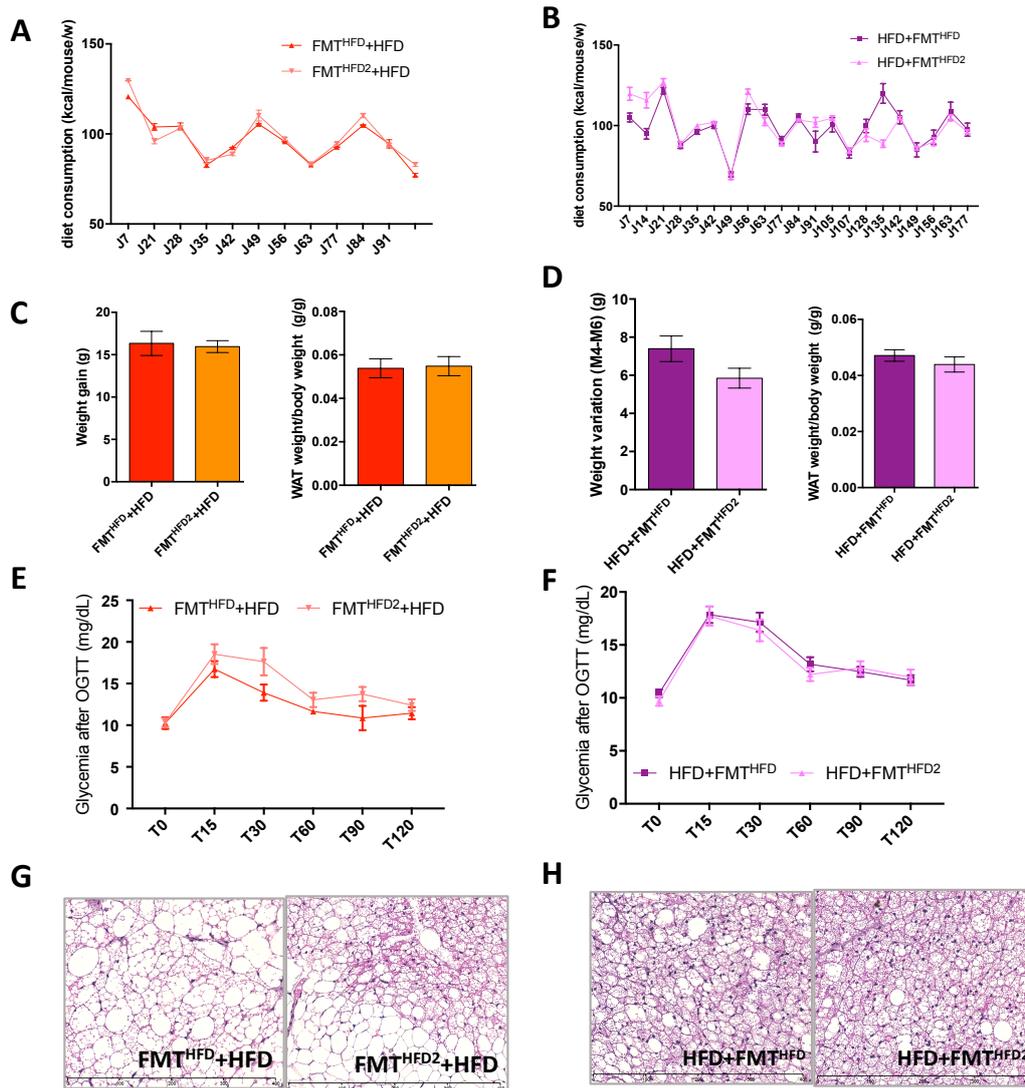
**Figure S2. The preventive effect of pectin is dose dependent.** Mice were fed with a high-fat diet with or without 0.4% of pectin (HFD, HFD<sup>0.4</sup>) for 16 weeks. **(A)** Total body weight gain at 16 weeks. **(B)** White adipose tissue weight / body weight ratio. **(C)** Hepatic triglycerides content. **(D)** Plasma ALT. **(E)** Unweighted Unifrac distances showing differences of the intestinal microbiota composition even with a low dose of pectin; green=ND, yellow=ND<sup>0.4</sup>, purple=ND<sup>2</sup>, red=HFD, orange= HFD<sup>0.4</sup>, blue= HFD<sup>2</sup>. Data represent the mean±SEM of 8 mice.

**Figure S3**



**Figure S3. Intestinal microbiota diversity.** Box plots showing alpha diversity based on the Shannon Index. **(A)** Mice were fed with normal diet (ND), ND with pectin 2% (ND<sup>2</sup>), high fat diet (HFD) and HFD with pectin 2% (HFD<sup>2</sup>) diets for 16 weeks. **(B)** Mice were fed with HFD for 16 weeks and received pectin supplementation in the HFD (2%) from week 16 to week 24 as curative treatment (HFD+HFD<sup>2</sup>) compared to mice who did not received pectin (HFD+HFD). **(C)** Mice received a preventive FMT before 16 weeks of HFD from donor mice fed a HFD (FMT<sup>HFD</sup>+HFD) or from donor mice fed a HFD<sup>2</sup> (FMT<sup>HFD2</sup>+HFD). Obese mice received a curative FMT before 8 supplementary weeks of HFD from donor mice fed a HFD (HFD+FMT<sup>HFD</sup>) or from donor mice fed a HFD<sup>2</sup> (HFD+FMT<sup>HFD2</sup>). The non parametric Kruskal-Wallis test with Dunn's multiple comparison post-hoc test (A,C) or the Mann-Whitney (B) test were used, \*p < 0.05.

**Figure S4**



**Figure S4. FMT from mice fed with HFD and pectin is sufficient to induce browning of WAT in recipient HFD fed mice.** Mice received a preventive FMT along with 16 weeks of HFD from donor mice fed a HFD (FMT<sup>HFD</sup>+HFD) or from donor mice fed a HFD2 (FMT<sup>HFD2</sup>+HFD). Obese mice received a curative FMT during 8 supplementary weeks of HFD from donor mice fed a HFD (HFD+FMT<sup>HFD</sup>) or from donor mice fed a HFD2 (HFD+FMT<sup>HFD2</sup>). **(A)** 16 weeks evolution of diet consumption of mice fed with HFD and receiving FMT as preventive treatment. **(B)** 24 weeks evolution of diet consumption of mice fed with HFD and receiving from 16 weeks to 24 weeks FMT as curative treatment. **(C)** Weight gain of FMT<sup>HFD</sup>+HFD or FMT<sup>HFD2</sup>+HFD mice (left panel) and white adipose tissue weight/body weight ratio (right panel). **(D)** weight variation between 16 and 24 weeks of HFD+FMT<sup>HFD</sup> or HFD+FMT<sup>HFD2</sup> mice (left panel) and white adipose tissue weight/body weight ratio (right panel). **(E)** Curves of glycemia after an oral glucose tolerance test in FMT<sup>HFD</sup>+HFD or FMT<sup>HFD2</sup>+HFD mice at 16weeks and **(F)** in HFD+FMT<sup>HFD</sup> or HFD+FMT<sup>HFD2</sup> mice at 24 weeks. **(G)** Brown adipose tissue sections stained with hematoxylin-eosin (scale 400  $\mu$ m) in FMT<sup>HFD</sup>+HFD or FMT<sup>HFD2</sup>+HFD mice and in **(H)** HFD+FMT<sup>HFD</sup> or HFD+FMT<sup>HFD2</sup> mice. Data represent the mean $\pm$ SEM of 9 or 12 mice.

**Table S1. List of oligonucleotides used in qPCR.**

Target	5' Forward 3'	5' Reverse 3'
18s	GTA-ACC-CGT-TGA-ACC-CCA-TT	CCA-TCC-AAT-CGG-TAG-TAG-CG
Ccl2	AGG-TCC-CTG-TCA-TGC-TTC-TG	TCT-GGA-CCC-ATT-CCT-TCT-TG
Cidea	GCA-GCC-TGC-AGG-AAC-TTA-TC	TCA-TGA-AAT-GCG-TGT-TGT-CC
CPT1	TCT-TGC-AGT-CGA-CTC-ACC-TT	TCC-ACA-GGA-CAC-ATA-GTC-AGG
F4/80	CTT-TGG-CTA-TGG-GCT-TCC-AGT-C	GCA-AGG-AGG-ACA-GAG-TTT-ATC-GTC
Gapdh	GTG-GAC-CTC-ATG-GCC-TAC-AT	TGT-GAG-GGA-GAT-GCT-CAG-TG
GPR41	CTG-GCG-GAG-CTA-CGT-GCT	GGG-GTC-GAT-ACA-AGA-GT
GPR43	CAC-GGC-CTA-CAT-CCT-CAT-CT	TTG-GTA-GGT-ACC-AGC-GGA-AG
UCP1	GCT-ACA-CGG-GGA-CCT-ACA-ATG	CGT-CAT-CTG-CCA-GTA-TTT-TGT-T

**Table S2. GC/MS and quantitative parameters of SCFAs analysis.** Linearity, calibration equation, limit of detection (LOD) and limit of quantification (LOQ).

SCFA species	Mass (m/z)	Retention time (min)	Internal standards	Calibration equation (y=Ax+B)	R2	Linearity range (μM)	LOD (μM)*	LOQ (μM)*
Acetate	43, 60	4.5	Acetate-D3	y = 0.008x + 0.003	0.993	2.3-500	2.3	2.39
Propionate	57, 75	5.9	Propionate-D2	y = 0.013x + 0.267	0.997	1.2-200	1.09	1.23
Isobutyrate	43, 71	6.9	Butyrate-13C2	y = 0.017x + 0.021	0.994	0.3-100	0.23	0.35
Butyrate	43, 71	7.7	Butyrate-13C2	y = 0.003x + 0.013	0.973	1.3-200	0.69	1.3
Isovalerate	73, 85	8.6	Valerate-D9	y = 0.035x + 0.001	0.998	0.2-100	0.15	0.26
Valerate	73, 85	9.2	Valerate-D9	y = 0.036x + 0.009	0.998	0.2-100	0.11	0.22

\*LOD= $M_b + 3 \times SD_b$ ; LOQ= $M_{blank} + 10 \times SD_{blank}$ ; where  $M_b$  is the mean concentration of the blank and  $SD_b$  is the standard deviation of the blank