Figure S1. Obesity decreases DNA hydroxymethylation and TET2 levels in white adipose tissue

(A-B) Genomic 5-hmC (A) and 5-mC (B) levels in iWAT and eWAT from the C57BL/6 male mice fed either ND or HFD for 12 weeks (n = 3 mice/group).

(C) mRNA levels of *Tet1*, *Tet2*, and *Tet3* relative to *β-actin* in iWAT and eWAT from the mice shown in A (n = 6 mice/group).

(D) mRNA levels of *Tet1*, *Tet2*, and *Tet3* in iWAT and eWAT from the C57BL/6 male mice fed with ND (Published microarray data: GSE44000; n = 6 mice/group).

(E) Representative immunoblot images of TET2 in iWAT and eWAT from the mice shown in A and densitometry analysis. β-actin was used as a loading control (n = 3 mice/group).

(F) Representative immunohistochemistry images of TET2 in iWAT and eWAT from the mice shown in A (the arrows represent TET2 positive expression, scale bars, 100 μm) and integral optical density (IOD) analysis. (n = 4-5 mice/group).

(G) *Tet2* mRNA levels relative to *β-actin* in SVF of iWAT and eWAT from the mice shown in A (n = 4 ND/HFD, 1 ND sample was obtained by pooling samples from two mice).

(H) Representative immunoblot images of TET2 in SVF of iWAT and eWAT from the mice shown in A and densitometry analysis. β-actin was used as a loading control (n = 3 mice/group). All data are presented as mean ± SEM. *P* values are indicated on the graph. Statistical values are determined by two-tailed unpaired Student's t-test.

Figure S2. Leptin inhibits adipocyte *Tet2* expression in primary adipocyte and differentiated adipocyte

(A) *Tet2* expression in mature adipocytes from iWAT and eWAT treated with vehicle or leptin for 24 h (n = 4-5).

(B) *Jak2* expression in differentiated 3T3-L1 adipocytes treated with Ctrl-siRNA or JAK2-siRNA for 24 h (n = 3-4).

(C) *Stat3* expression in differentiated 3T3-L1 adipocytes treated with Ctrl-siRNA or STAT3-siRNA for 24 h (n = 3-4). All data are presented as mean ± SEM. *P* values are indicated on the graph. Statistical values are determined by two-tailed unpaired Student's t-test.

Figure S3: *Tet2* deficiency has no effect on insulin sensitivity and glucose tolerance under ND-fed condition

(A) Body weight progression in $Tet2^{+/+}$ and $Tet2^{-/-}$ mice fed ND for 18 weeks (n = 9 $Tet2^{+/+}$; n = 9 $Tet2^{-/-}$).

(B) Insulin tolerance test (ITT) at week 18 of life (n = 9 $Tet2^{+/+}$; n = 8 $Tet2^{-/-}$).

(C) Glucose tolerance test (GTT) at week 18 of life (n = 9 $Tet2^{+/+}$; n = 8 $Tet2^{-/-}$). All data are presented as mean ± SEM. Statistical values are determined by two-tailed unpaired Student's t-test.

Figure S4: *Tet2* deficiency attenuates HFD-induced fat expansion
(A) Representative images of *Tet2*$^{+/+}$ and *Tet2*$^{-/-}$ mice fed HFD for 12 weeks, starting at 6 weeks of age.
(B) Representative images of fat pads and liver collected from *Tet2*$^{+/+}$ and *Tet2*$^{-/-}$ mice fed HFD for 12 weeks.
(C) Histological analyses with H&E stain of iWAT, eWAT, BAT and liver were assessed. Scale bars: 50 μm.
(D) mRNA levels of *Tet1* and *Tet3* relative to β-actin in iWAT and eWAT from *Tet2*$^{+/+}$ and *Tet2*$^{-/-}$ mice fed with ND (n = 6 *Tet2*$^{+/+}$; n = 4 *Tet2*$^{-/-}$). All data are presented as mean ± SEM. Statistical values are determined by two-tailed unpaired Student's t-test.

Figure S5: Adipocyte-specific *Tet2* deficiency has no effect on insulin sensitivity and glucose tolerance under ND-fed condition
(A) PCR genotyping approach.
(B) *Tet2* mRNA levels relative to *β-actin* in iWAT, eWAT, BAT, liver, and spleen from the WT and AKO mice fed ND for 18 weeks (n = 7 mice/group).
(C) *Tet2* mRNA levels relative to *36b4* in adipocytes and relative to *β-actin* in SVF of iWAT and eWAT from the mice shown in B (n = 6 mice/group).
(D) Body weight progression in WT and AKO mice fed ND for 18 weeks (n = 5 WT; n = 7 AKO).
(E) ITT at week 18 of life (n = 5 WT; n = 7 AKO).
(F) GTT at week 18 of life (n = 5 WT; n = 7 AKO). All data are presented as mean ± SEM. *P* values are indicated on the graph. Statistical values are determined by two-tailed unpaired Student's t-test.

Figure S6: Adipocyte-specific *Tet2* deficiency protects against HFD-induced fat expansion

(A) Representative images of WT and AKO mice fed HFD for 12 weeks, starting at 6 weeks of age.

(B) Representative images of fat pads and liver collected from WT and AKO mice fed HFD for 12 weeks.

(C) Histological analyses with H&E stain of iWAT, eWAT, BAT and liver were asses sed. Scale bars: 100 μm.

Figure S7: TET2 deficiency has no effect on HFD-induced fat expansion and energy expenditure in ob/ob mice

(A) Representative images of *Tet2*$^{+/+}$ *ob/ob* and *Tet2*$^{-/-}$ *ob/ob* mice fed HFD for 14 weeks, starting at 5 weeks of age.

(B) Representative images of fat pads and liver collected from *Tet2*$^{+/+}$ *ob/ob* and *Tet2*$^{-/-}$ *ob/ob* mice fed HFD for 14 weeks.

(C-F) (C) Changes in oxygen consumption at different time points, (D) oxygen consumption and (E) energy expenditure during light, dark hours, and full day, and (F) daily food intake after 10 weeks of HFD feeding (n = 6 *Tet2*$^{+/+}$ *ob/ob*; n = 3 *Tet2*$^{-/-}$ *ob/ob*). All data are presented as mean ± SEM. Statistical values are determined by ANCOVA test in D and E, two-tailed unpaired Student's t-test in F.

Figure S8: Adipocyte-specific *Tet2* deficiency has no effect on HFD-induced fat expansion after leptin supplementation

(A) Representative images of fat pads and liver collected from HFD-fed WT and AKO mice supplemented with PBS or leptin for 10 weeks, starting at 5 weeks of HFD.

(B) Relative tissue weights of iWAT, eWAT, BAT, and liver mass after 10 weeks of PBS or leptin supplementation (n = 6 WT-PBS; n = 4 AKO-Leptin). All data are presented as mean ± SEM. Statistical values are determined by two-tailed unpaired Student's t-test.