

Supplementary figure legends

Supplementary Figure 1 Representative high magnification microphotographs of the arcuate nucleus of the hypothalamus showing *in situ* hybridization for PPAR γ mRNA (panels A and D) and POMC immunostaining (green, panels B and F) in control (panels A-C) and POMC::Cre-PPAR $\gamma^{fl/fl}$ mice (panels D-F). Note the colocalization of PPAR γ mRNA and POMC neurons in the control (panel C) compared to the POMC::Cre-PPAR $\gamma^{fl/fl}$ (panel F). Bar scale in F (for all panels) represents 15 μ m.

Supplementary Figure 2 Analysis of body weight (panels A), fat mass (panels B) and lean mass (panels C) showed no difference between female POMC::Cre-PPAR $\gamma^{fl/fl}$, control (PPAR $\gamma^{fl/fl}$) and POMC::Cre-PPAR $\gamma^{fl/+}$ mice fed on a standard chow diet (n=6-9 per group). No differences were observed in energy expenditure (EE; Panels D and E), O₂ consumption (panel F), CO₂ production (panel G) and respiratory quotient (panel H) between POMC::Cre-PPAR $\gamma^{fl/fl}$ and control mice (4-6 per group). Data in all graphs are shown as mean \pm s.e.m.

Supplementary Figure 3 Analysis of body weight (panels A), fat mass (panels B) and lean mass (panels C) showed no difference between male POMC::Cre-PPAR $\gamma^{fl/fl}$ control (PPAR $\gamma^{fl/fl}$) and POMC::Cre-PPAR $\gamma^{fl/+}$ mice fed on a standard chow diet (n=8-11 per group). No differences were observed in energy expenditure (EE; Panels D and E), O₂ consumption (panel F), CO₂ production (panel G) and respiratory quotient (panel H) between POMC::Cre-PPAR $\gamma^{fl/fl}$ and control mice (n=4-6 per group). Data in all graphs are shown as mean \pm s.e.m.

Supplementary Figure 4 Graph showing the body weights of male controls (PPAR $\gamma^{fl/fl}$), POMC::Cre-PPAR $\gamma^{fl/+}$ and male POMC::Cre-PPAR $\gamma^{fl/fl}$ after 9 weeks on HFD (n=6-10 per group). POMC::Cre-PPAR $\gamma^{fl/fl}$ mice were significantly lighter than either the POMC::Cre-PPAR $\gamma^{fl/+}$ mice or the PPAR $\gamma^{fl/fl}$ control mice. These latter two groups were not different from each other. Data in all graphs are shown as mean \pm s.e.m. **=P<0.01 compared to controls; #=P<0.05 compared to POMC::Cre-PPAR $\gamma^{fl/+}$.

Supplementary Figure 5 Panels A and B show the energy expenditure (EE) of female POMC::Cre-PPAR $\gamma^{\text{fl/fl}}$ and control mice on HFD after either normalization by lean mass (panel A) or ANCOVA analysis (panel B; n = 5-6 per group). Panels C and D show levels of VO₂ (C) and VCO₂ (D) in female POMC::Cre-PPAR $\gamma^{\text{fl/fl}}$ and control mice (n=5-6 per group). No difference in respiratory quotient (RQ) was found between the 2 groups (Panel E). Panel F show increased locomotor activity during both dark and light cycles of female POMC::Cre-PPAR $\gamma^{\text{fl/fl}}$ mice compared to female controls. Data in all graphs are shown as mean \pm s.e.m. * $P < 0.05$ compared to controls.









