Supplementary Materials:





Fig. S1. Lean mass of wild type mice. Lean mass (g) of wild type, chow fed mice receiving Sham surgery (Chow, black), high-fat diet fed mice receiving Sham surgery ("Chow", n = 10, black bars), high-fat fed mice receiving Sham surgery ("HFD", n = 14, blue bars), high-fat fed mice receiving vertical sleeve gastrectomy surgery ("VSG", n = 14, green bars), and high-fat diet pair-fed mice receiving calories equivalent to VSG group ("Pair-fed", n = 16, dotted green bars). Different letters indicate significant differences (P < 0.05) between groups. P values indicate Tukey's post-hoc comparisons from one-way ANOVA. Data expressed as mean \pm SEM.



Fig. S2. Ventilation during room air conditions in WT mice. Frequency (bpm) (A), tidal volume (ml) (B), minute ventilation (ml/min) (C), and the Hypercapnic Ventilatory Response, HCVR (ml/min/%CO₂) (D) of wild type, chow fed mice receiving Sham surgery ("Chow", n = 10, black lines/bars), high-fat fed mice receiving Sham surgery ("HFD", n = 15, blue lines/bars), high-fat fed mice receiving surgery ("VSG", n = 14, green lines/bars), and high-fat diet pair-fed mice receiving calories equivalent to VSG group ("Pair-fed", n = 16, dotted green lines/bars). * P < 0.05, ** P < 0.01 versus Chow at similar timepoint. versus all other groups at similar timepoint. † P < 0.05 versus VSG. P values indicate Tukey's post-hoc comparisons from one-way ANOVA. Data expressed as mean ± SEM.



Fig. S3. Lean mass of ob/ob mice. Lean mass (g) of chow fed *ob/ob* mice receiving Sham surgery ("Sham Control", n = 11, light blue bars), daily leptin treatment ("Leptin", n = 10, orange bars), pair-feeding yoked to Leptin group ("Pair-fed", n = 11, dotted orange bars), or VSG surgery ("VSG", n = 6, light green bars). * P < 0.05 versus all other groups at similar timepoint. *P* values indicate Tukey's post-hoc comparisons from one-way ANOVA. Data expressed as mean \pm SEM.



Fig. S4. Ventilation during room air conditions in ob/ob mice. Frequency (bpm) (A), tidal volume (ml) (B), minute ventilation (ml/min) (C), and the Hypercapnic Ventilatory Response,

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HCVR (ml/min/%CO₂) (**D**) of chow fed *ob/ob* mice receiving Sham surgery ("Sham Control", n = 11, light blue bars), daily leptin treatment ("Leptin", n = 10, orange bars), pair-feeding yoked to Leptin group ("Pair-fed", n = 11, dotted orange bars), or VSG surgery ("VSG", n = 6, light green bars). * P < 0.05, ** P < 0.01 versus marked groups at similar timepoint. **** P < 0.01versus all other groups at similar timepoint. Different letters indicate significant differences (P <0.05) between groups. P values indicate Tukey's post-hoc comparisons from one-way ANOVA. Data expressed as mean \pm SEM.