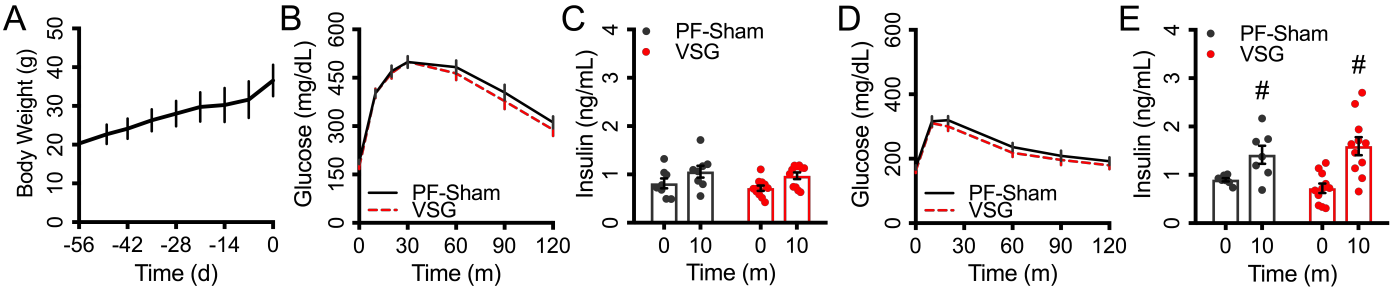
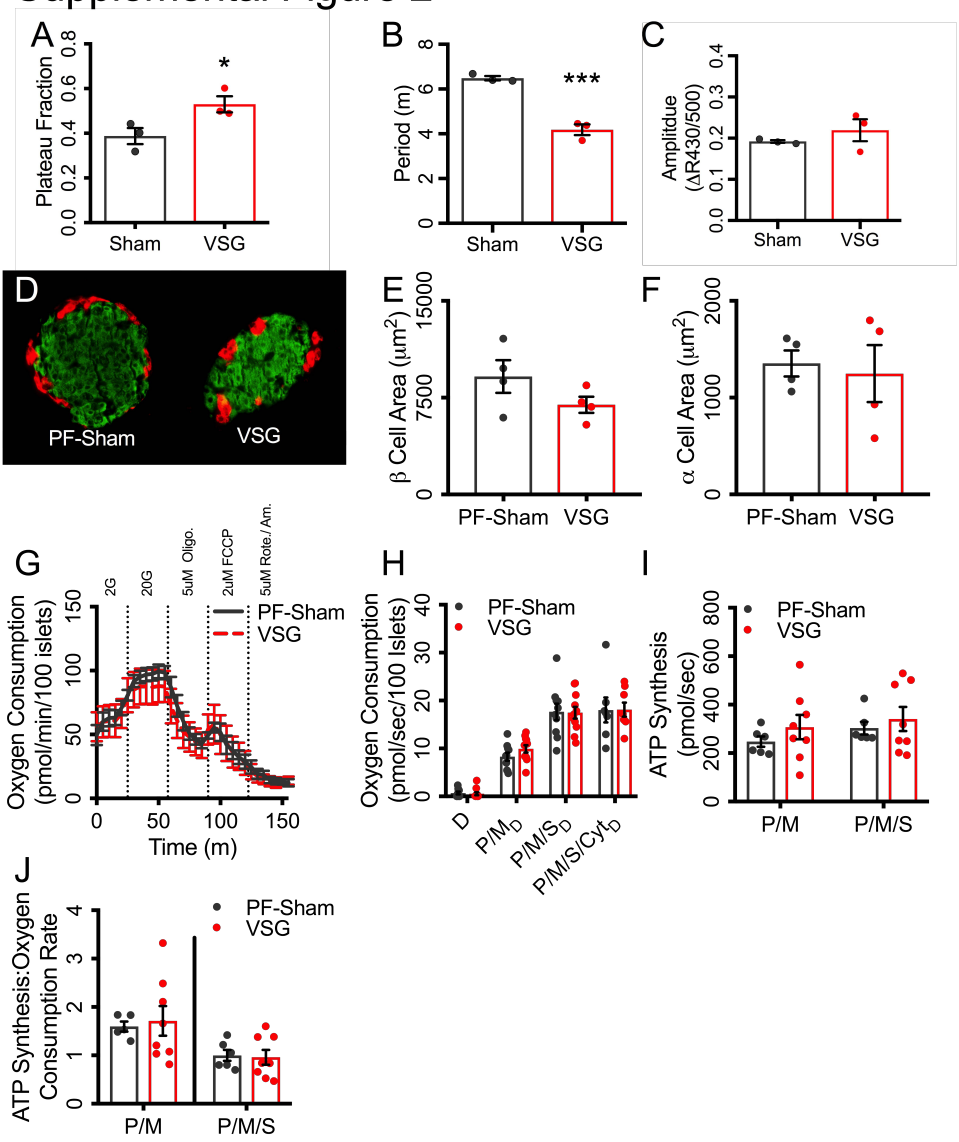
Supplemental Figure 1



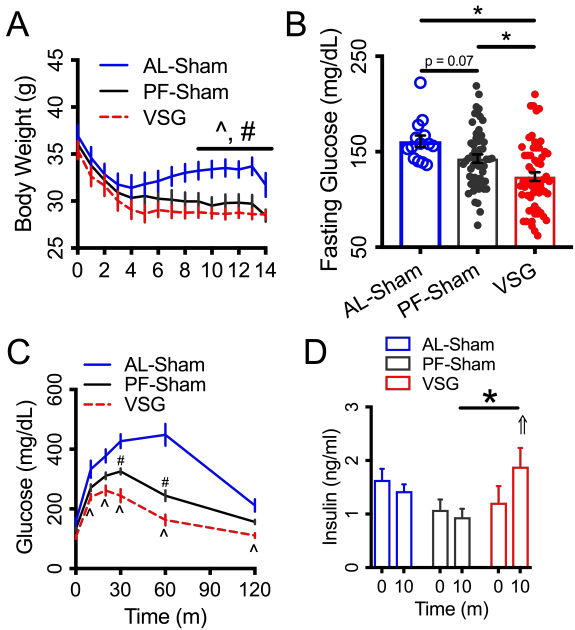
Supplemental Figure 1: Preoperative *in vivo* physiology was not different between groups (A) Presurgical body weight for a single representative cohort over 8 weeks high fat diet feeding (45% kcal from lipid; n = 15). (B, D) Blood glucose and (C, E) circulating insulin during preoperative intraperitoneal glucose tolerance test (B, C) or mixed meal tolerance test (D, E). Animals receiving sham surgery and pair feeding shown with a grey solid line or grey circles (n = 8); animals receiving VSG shown with a red dashed line or red circles (n = 11). Data represent mean SEM. There are no statistically significant differences between groups; # represent $p < 0.05$ between time points within groups.

Supplemental Figure 2

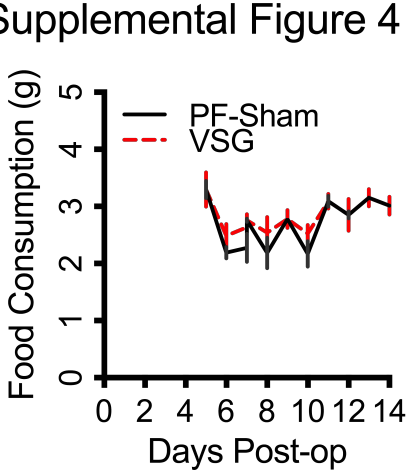


Supplemental Figure 2: Islet energetics and morphology were unchanged in the early postoperative period. (A) Plateau fraction, (B) period, (C) amplitude of Ca^{2+} oscillations from islets isolated from PF-Sham or VSG mice. (D) Representative images of islets from a PF-Sham or VSG mouse, (E) β-cell area, and (F) -cell area for PF-Sham and VSG mice (n = 4 per group). Oxygen consumption (OCR) rate as determined by (G) Seahorse in whole islets (n = 6 per group) or (H) Oroboros in permeabilized islets (n =10-11 per group) isolated from PF-Sham or VSG mice. (I) ATP Synthesis and (J) ATP sythesis:OCR ratio in permeabilized islets (n =5-8 per group). PF-Sham animals are shown with a solid grey line or grey circles; VSG animals are shown with a dashed red line or red circles. Data represent mean SEM; there are no statistically significant differences between groups.

Supplemental Figure 3



Supplemental Figure 3: Weight-loss contributes to, but does not fully explain, improved glucose control after VSG. (A) Body-weight, (B) 6h fasting blood glucose, and IPGTT (C) glucose-curve, and (D) insulin secretion for *ad libitum* fed, sham operated (AL-Sham, blue), pair-fed, sham operated (PF-Sham, black), and VSG (red) groups. Data represent mean SEM; * represents $p < 0.05$ as denoted; ^ represents $p < 0.05$ AL-Sham and VSG, # represents $p < 0.05$ AL-Sham and PF-Sham. represent $p < 0.05$ between time points within groups.



Supplemental Figure 4: Food consumption does not differ between VSG and PF-Sham groups. Food consumption for the PF-Sham (solid grey line) and VSG (dashed red line) over the pair-feeding time course from post-operative days 5 to 14. Data represent mean SEM; there are no statistically significant differences between groups.