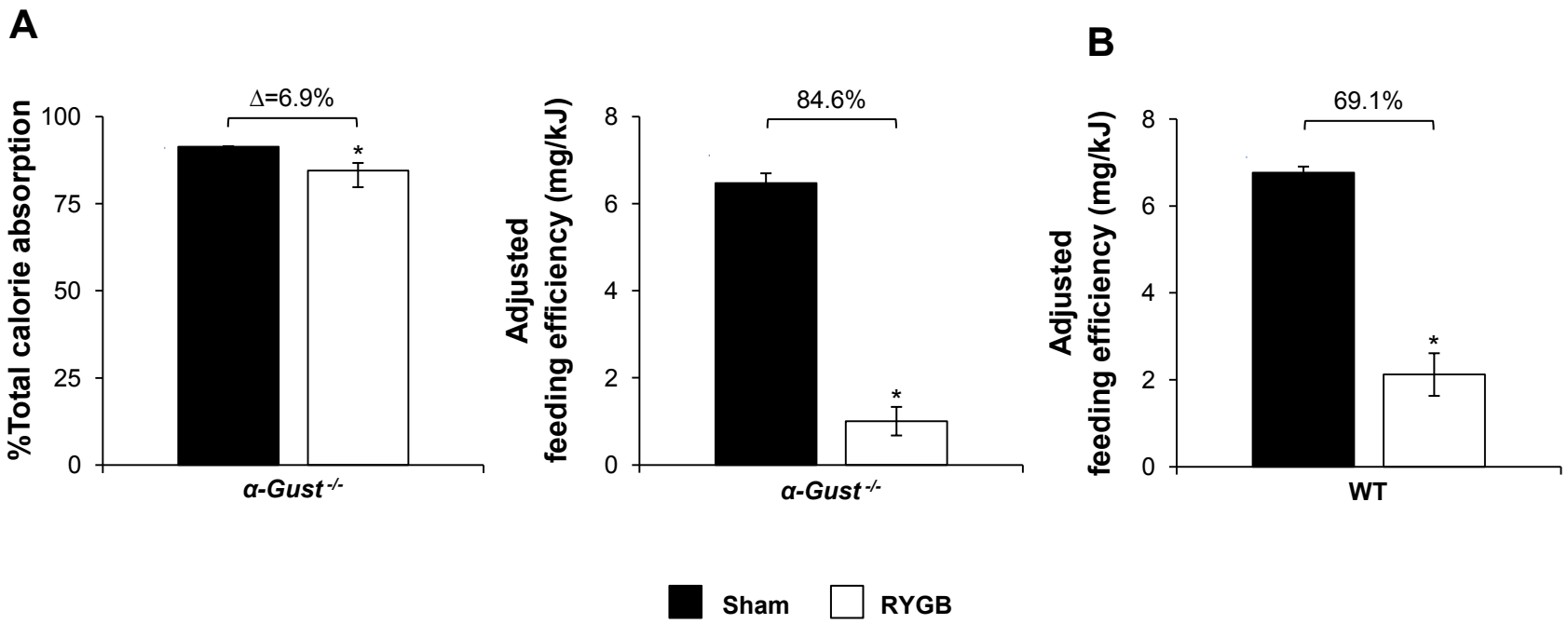
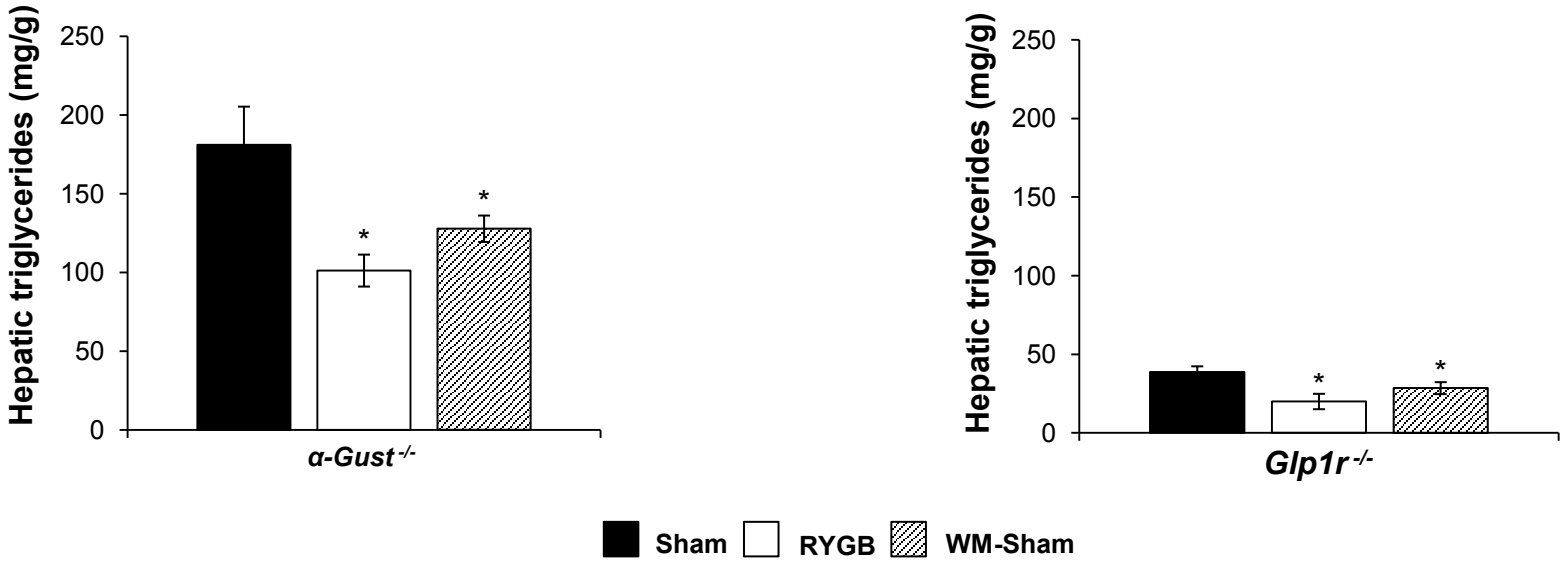
Supplementary Table 1

	Pre-Operative Body Weights (g)		
	WT	*α-Gust*$^{-/-}$	*Glp1r*$^{-/-}$
Sham	45.6 ± 0.2	45.9 ± 0.3	47.3 ± 0.6
RYGB	46.4 ± 0.5	46.1 ± 0.3	47.6 ± 0.5
PF-Sham	45.6 ± 0.1	46.0 ± 0.6	n/a

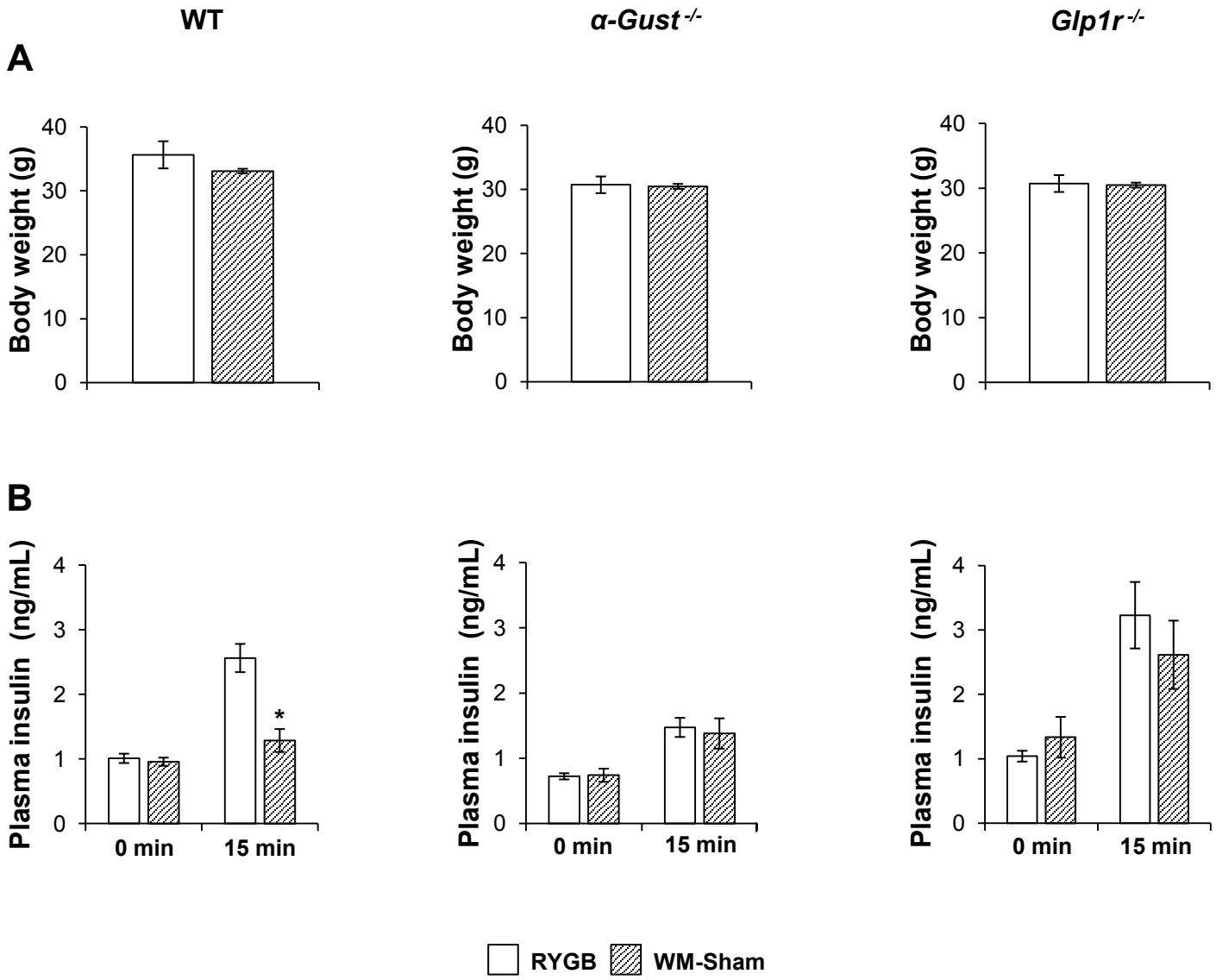
Supplementary Figure 1



Supplementary Figure 2



Supplementary Figure 3



Supplementary Table and Figure Legends

Supplementary Table 1. Pre-operative weights in WT, α-*Gust*$^{-/-}$, and *Glp1r*$^{-/-}$ mice. Values are expressed as mean ± SEM. One-way ANOVA or student's t-test was used to compare surgical interventions within a genotype. All comparisons are non-significant.

Supplementary Figure 1. RYGB reduces feeding efficiency even after accounting for reduced calorie absorption. (A) Total calorie absorption was slightly reduced after RYGB in *α-Gust*$^{-/-}$ mice. (B) Feeding efficiency remained substantially reduced after RYGB even after accounting for reduced calorie absorption in *α-Gust*$^{-/-}$ and WT mice. (n=6, sham; n=5-7, RYGB). Values are expressed as mean ± SEM. Student's t-test was used to compare surgical interventions within a genotype. *, $P < .05$ versus sham.

Supplementary Figure 2. RYGB reduces hepatic triglyceride content in *α-Gust*$^{-/-}$ and *Glp1r*$^{-/-}$ mice. Total hepatic triglyceride content was reduced after RYGB in *α-Gust*$^{-/-}$ and *Glp1r*$^{-/-}$ mice and comparable to WM-shams. (n=5-6, RYGB; n=5, sham; n=5, WM-sham). Values are expressed as means ± SEM. One-way ANOVA was used to compare surgical interventions within a genotype.*, $P < .05$ versus sham.

Supplementary Figure 3. RYGB-enhanced glucose-stimulated plasma insulin is α-gustducin and GLP-1R-dependent. (A) Body weights of RYGB and WM-sham mice of each genotype (WT, *α-Gust*$^{-/-}$ and *Glp1r*$^{-/-}$) were equivalent during evaluation of glucose homeostasis. (B) Plasma insulin measured 15 minutes after administration of oral glucose was enhanced in RYGB-treated WT mice compared to WM-sham. This effect did not occur in RYGB-treated *α-Gust*$^{-/-}$ or *Glp1r*$^{-/-}$ mice. (n=6-8, RYGB; n=4-6, WM-sham). Values are expressed as means ± SEM. Student's t-test was used to compare means between two interventions within the same genotype. *, $P < .05$ versus RYGB.