

Expanded View Figures

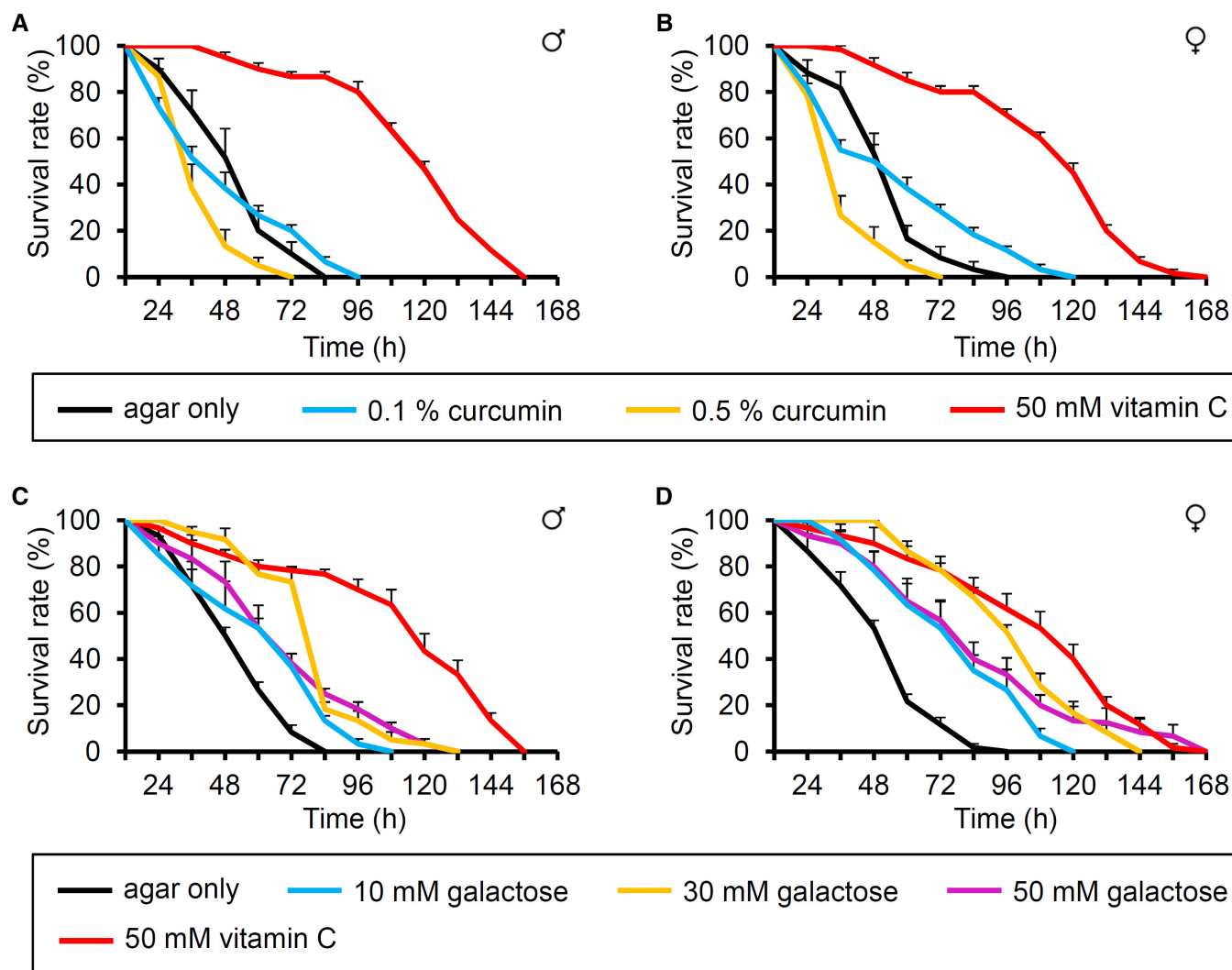


Figure EV1. Effect of curcumin and galactose food on starved flies.

- A, B Time-dependent starvation resistance properties of flies to 0.1% (~3 mM), 0.5% curcumin, and 50 mM vitamin C food without the supplement of other nutrition in wild-type control flies (w^{1118}) (A) males (B) females, $n = 6$.
- C, D Time-dependent starvation resistance properties of flies to 10 mM galactose, 30 mM galactose, 50 mM galactose, and 50 mM vitamin C food without the supplement of other nutrition in wild-type control flies (w^{1118}) (C) males (D) females, $n = 6$.

Data information: Error bars represent SEMs. Kaplan–Meier survival analyses were performed to compare the survival rates of agar only and fed conditions with the indicated concentrations of curcumin and galactose (Appendix Tables S2 and S3).

Figure EV2. Behavioral and electrophysiological analyses of Vitamin C.

- A Tip recording of w^{1118} (control) flies at the indicated concentrations of vitamin C from L6 and S6 sensilla, $n = 10-12$.
- B Neuronal firings from L4, L6, and S6 sensilla to folic acid and riboflavin at the indicated concentrations, $n = 10-18$.
- C PER assays were given stimuli to the indicated organs: forelegs or labellum, $n = 6-8$.
- D Dose-dependent binary food choice assays at different concentrations of vitamin C (1, 5, 10, 30, and 50 mM) versus 1 mM, $n = 6-7$.
- E Binary food choice assays with different organ-ablated flies in the presence of 50 mM vitamin C versus 1 mM, $n = 6$.
- F Binary food choice assays of specific GRN-ablated flies and control. +/- indicate the presence or absence of each transgene, respectively, $n = 6$.

Data information: All error bars represent the SEM. Multiple sets of data were compared using single-factor ANOVA coupled with the Scheffe's *post hoc* test. Asterisks indicate statistical significance compared with the control. $**p < 0.01$.

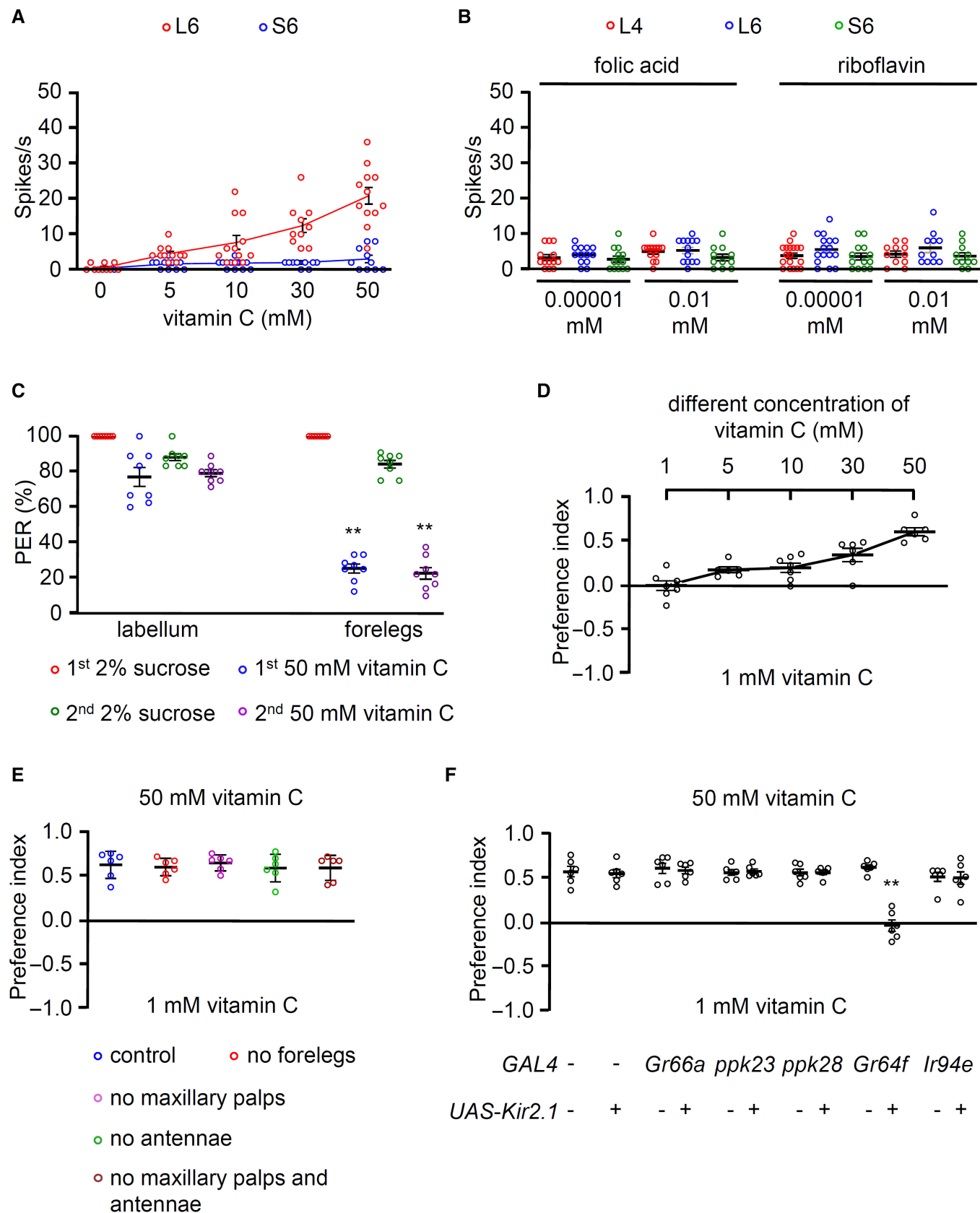


Figure EV2.

Figure EV3. Oviposition preference assays on vitamin C.

- A Photograph of egg-laying plate to show the differentiating behavior of females in the presence of 50 mM vitamin C. Higher number of eggs were seen on the side of 50 mM vitamin C than 1 mM.
- B Oviposition preference assays of specific GRN-ablated flies and control with the indicated concentrations of vitamin C, $n = 6$.
- C Oviposition preference assays with $Ir25a^2$, $Ir76b^1$, $Gr5a^{Δ5}$, $Gr61a^1$, $Gr64b^{LexA}$, $Gr64c^{LexA}$, and $Gr64e^{LexA}$, $n = 6-7$.
- D Oviposition preference assays to rescue $Ir25a^2$ and $Ir76b^1$ defects by expression of wild-type cDNA, $Ir25a^+$ and $Ir76b^+$, driven by its own $GAL4s$ and $Gr64f-GAL4$, $n = 6$.
- E Rescue of the oviposition defects of $Gr5a^{Δ5}$, $Gr61a^1$, $Gr64b^{LexA}$, $Gr64c^{LexA}$, and $Gr64e^{LexA}$ using $GAL4/UAS$ system with the indicated $GAL4s$, $n = 6$. +/- indicate the presence or absence of the transgene, respectively.

Data information: All error bars represent the SEM. Multiple sets of data were compared using single-factor ANOVA coupled with the Scheffe's *post hoc* test. Asterisks indicate statistical significance compared with the control. $**P < 0.01$.

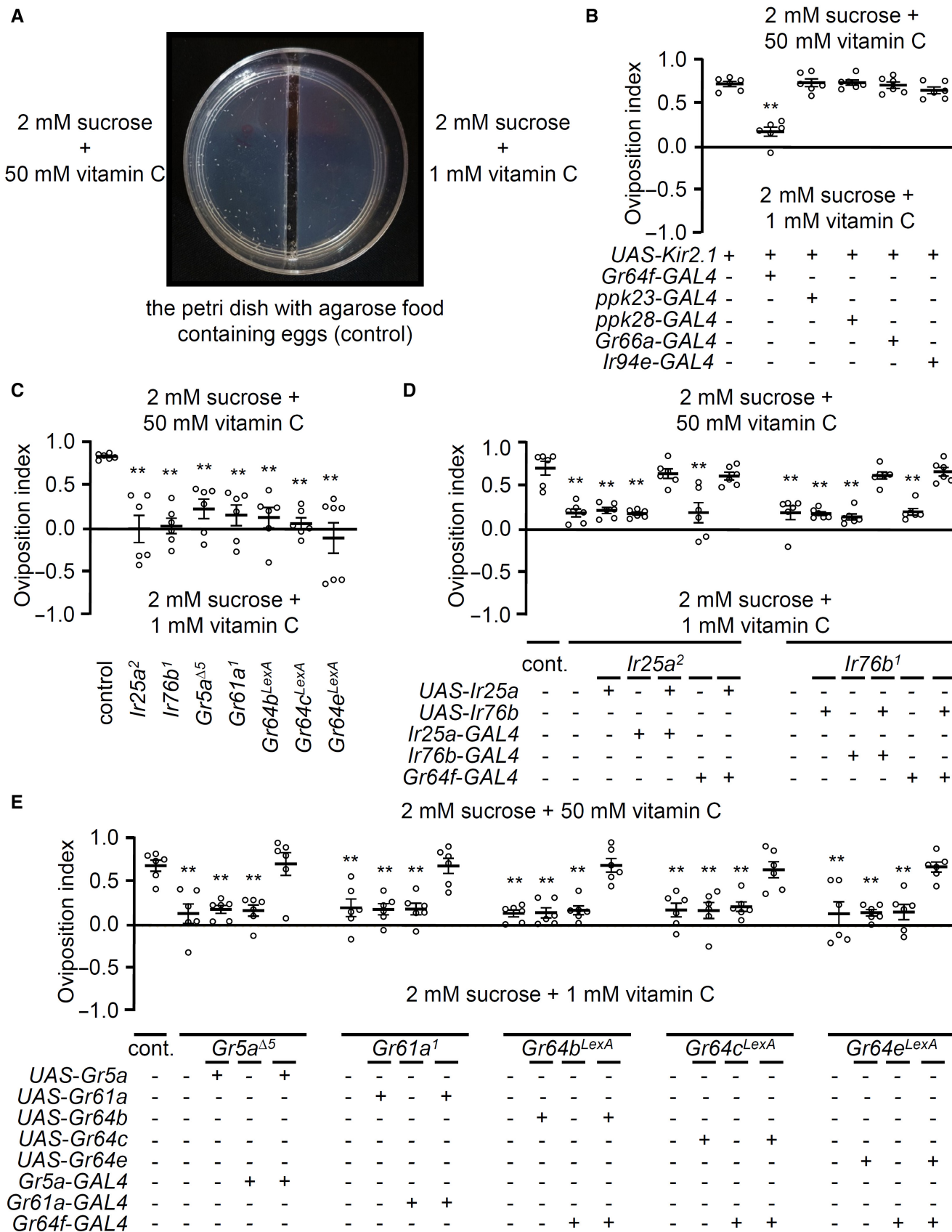


Figure EV3.

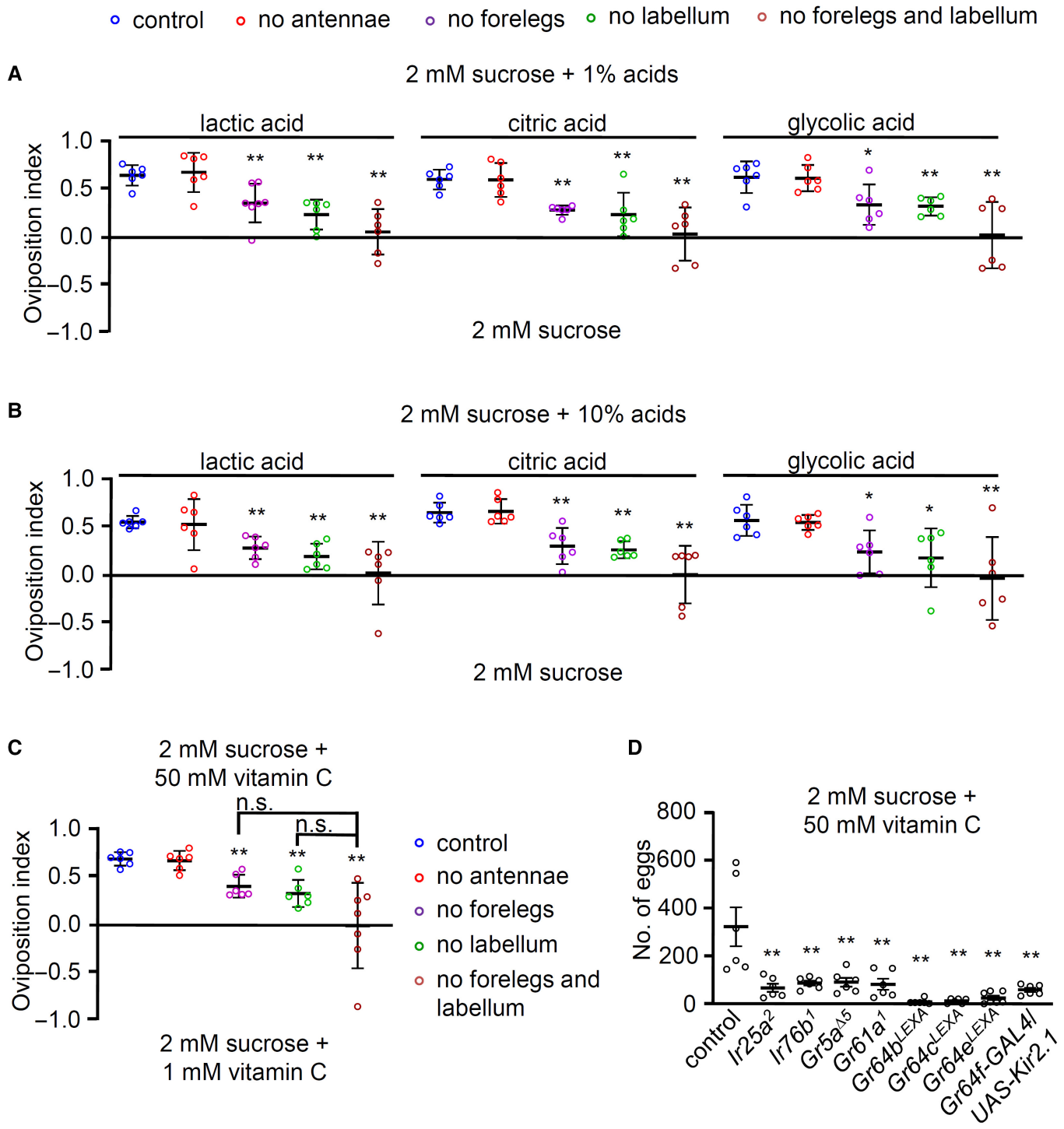


Figure EV4. Oviposition preference assays on acids.

A Oviposition assays of indicated organ-ablated flies and control at 1% carboxylic acids (lactic acid, citric acid, and glycolic acid), *n* = 6.
 B Oviposition assays of indicated organ-ablated flies and control at 10% carboxylic acids (lactic acid, citric acid, and glycolic acid), *n* = 6.
 C Oviposition assays of specific organ-ablated flies and control at 50 mM vitamin C versus 1 mM, *n* = 6.
 D Number of eggs laid at 50 mM vitamin C mixed with 2 mM sucrose by *Ir25a²*, *Ir76b¹*, *Gr5a^{Δ5}*, *Gr61a¹*, *Gr64b^{LexA}*, *Gr64c^{LexA}*, *Gr64e^{LexA}*, and vitamin C insensitive flies (*Gr64f-GAL4/UAS-Kir2.1*), *n* = 6.

Data information: All error bars represent the SEM. Multiple sets of data were compared using single-factor ANOVA coupled with the Scheffe's *post hoc* test. Asterisks indicate statistical significance compared with the control. **P* < 0.05, ***P* < 0.01.

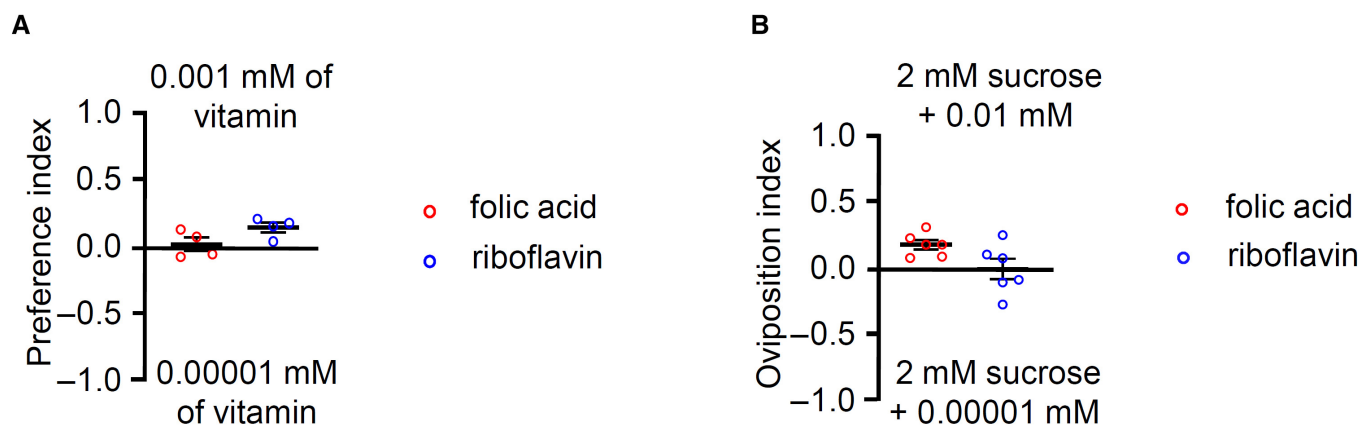


Figure EV5. Binary food choice assay and oviposition preference assay with vitamin B2 and B9.

A Binary food choice assays performed with wild-type flies in the presence of 0.001 mM versus 0.00001 mM riboflavin (vitamin B2) and folic acid (vitamin B9), $n = 4$.
B Oviposition assays performed with wild-type flies, $n = 6$.

Data information: All error bars represent the SEM.