

Supplementary Figures for:

Resistance to stress can be experimentally dissociated from longevity

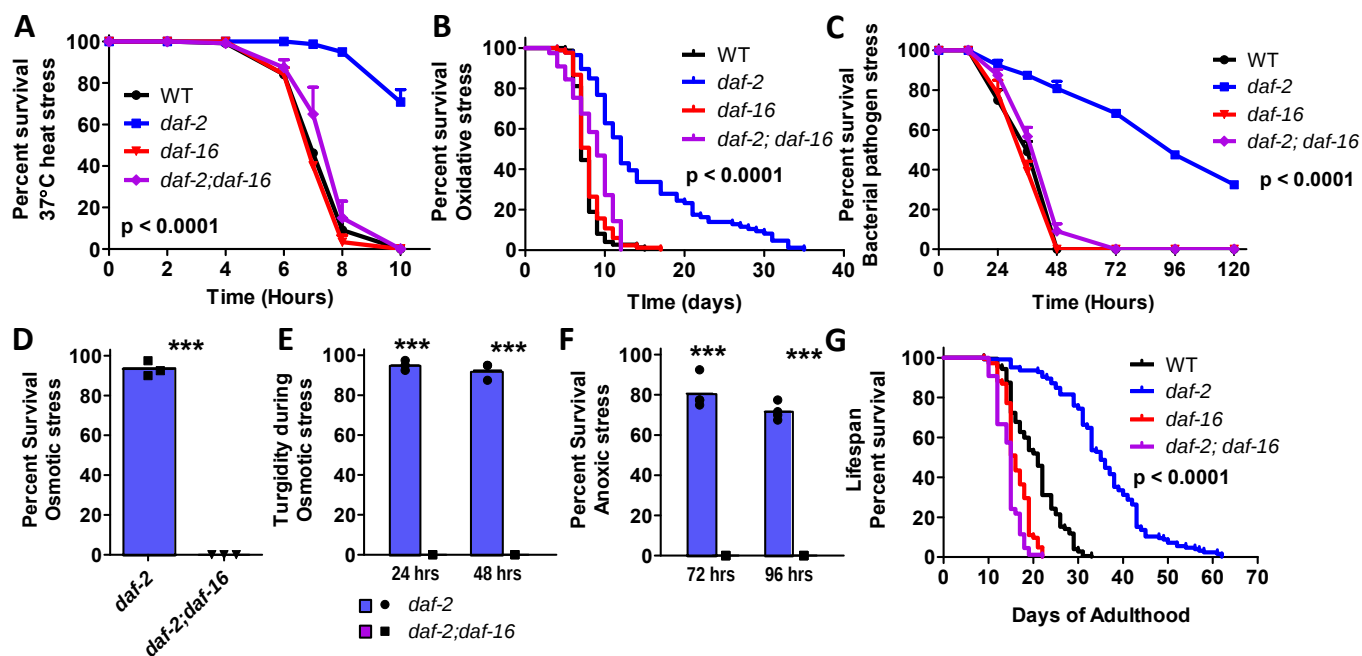
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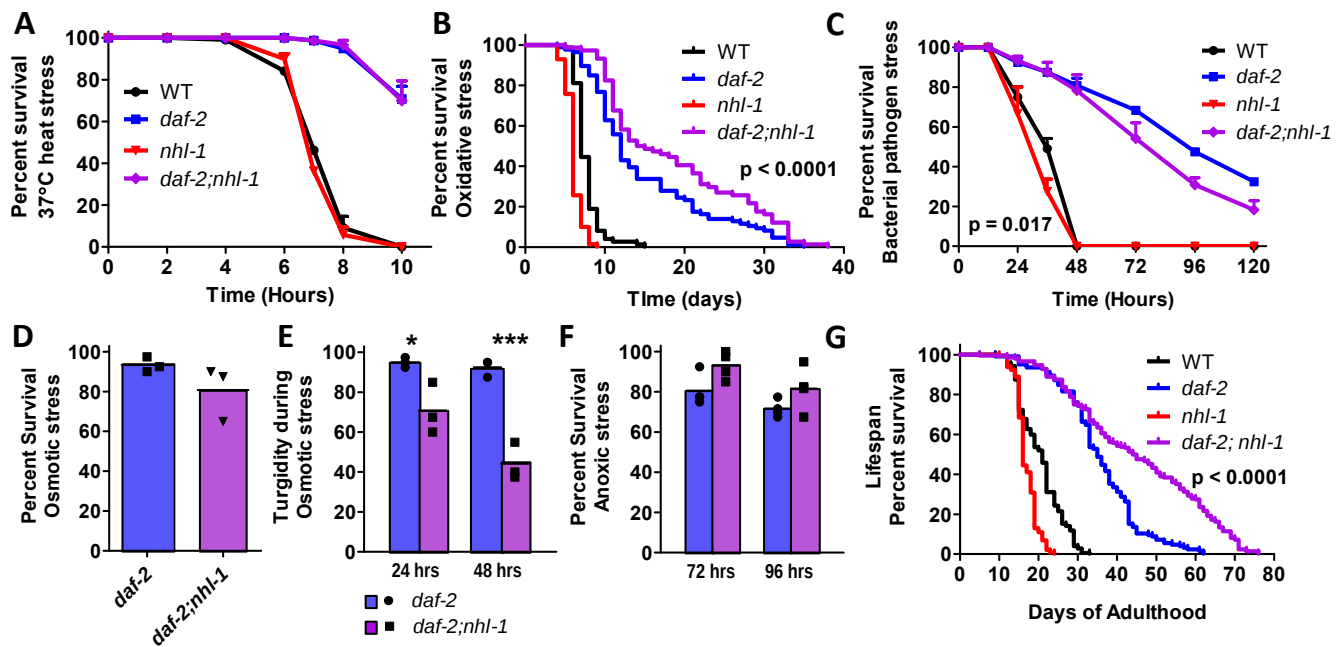
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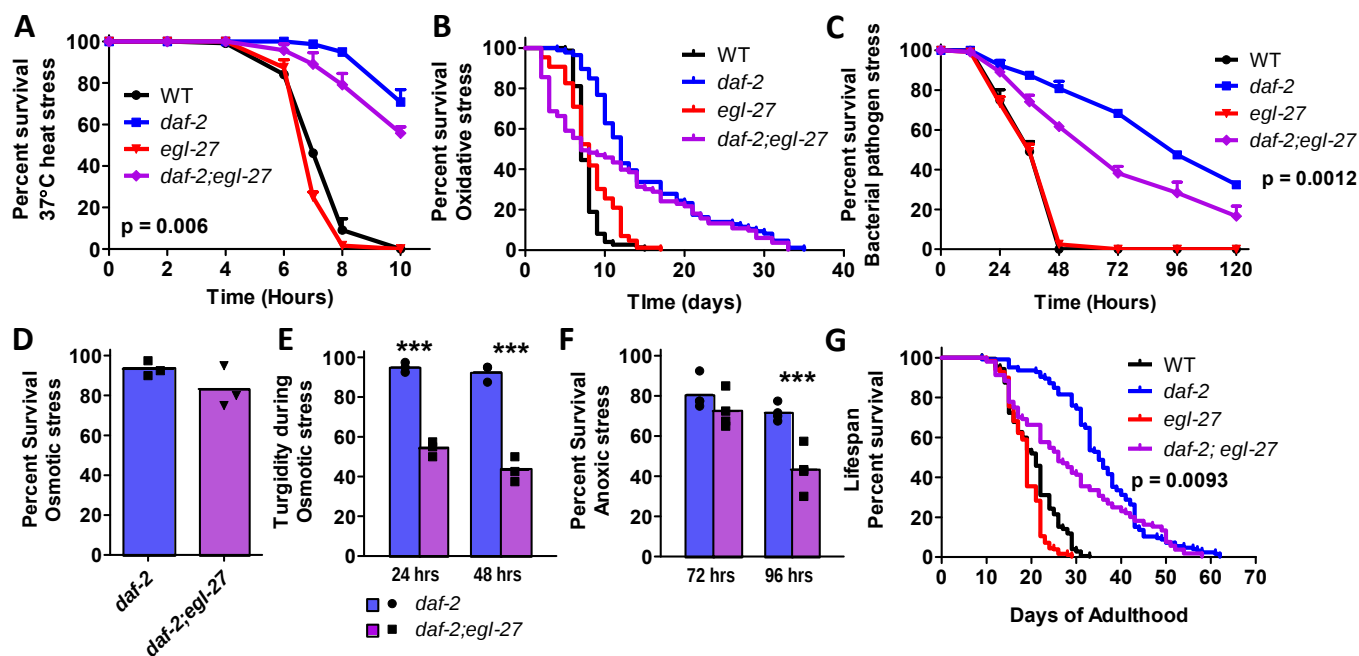
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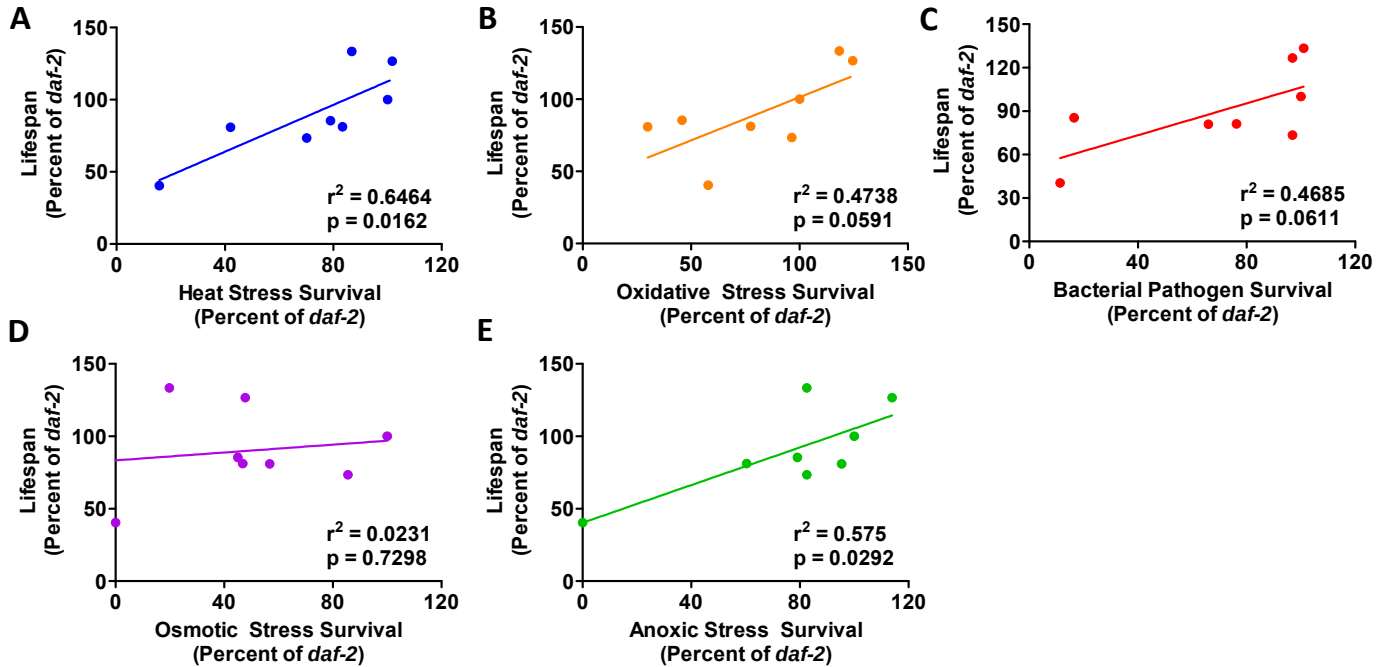
Supplementary Figure S1. Deletion of *daf-16* increases sensitivity to all stresses and reverts lifespan to WT in *daf-2* worms. Loss of *daf-16* abolishes the increased resistance of *daf-2* worms to heat stress at 37°C (A), oxidative stress induced by 4 mM paraquat (B), bacterial pathogen stress caused by exposure to *P. aeruginosa* (C), osmotic stress at 700 mM NaCl (D,E), and anoxic stress (F). The increased lifespan of *daf-2* worms is lost in the presence of a *daf-16* deletion (G). Error bars indicate standard error of the mean. *** $p < 0.001$. p-values indicate difference between *daf-2* and *daf-2; daf-16* worms.



Supplementary Figure S2. Deletion of *nhl-1* increases sensitivity to osmotic and bacterial pathogen stress but increases lifespan and resistance to oxidative stress in *daf-2* worms. A deletion in *nhl-1* did not affect *daf-2* worms' survival during heat stress (A) but decreased survival under conditions of oxidative stress (B), bacterial pathogen stress (C), and osmotic stress (D,E). The *nhl-1* deletion did not affect *daf-2* worms' survival during anoxic stress (F). Although the *nhl-1* mutation resulted in decreased resistance to stress, it markedly increased *daf-2* lifespan. Error bars indicate standard error of the mean. * $p < 0.05$, *** $p < 0.001$. p-values indicate difference between *daf-2* and *daf-2;nhl-1* worms.

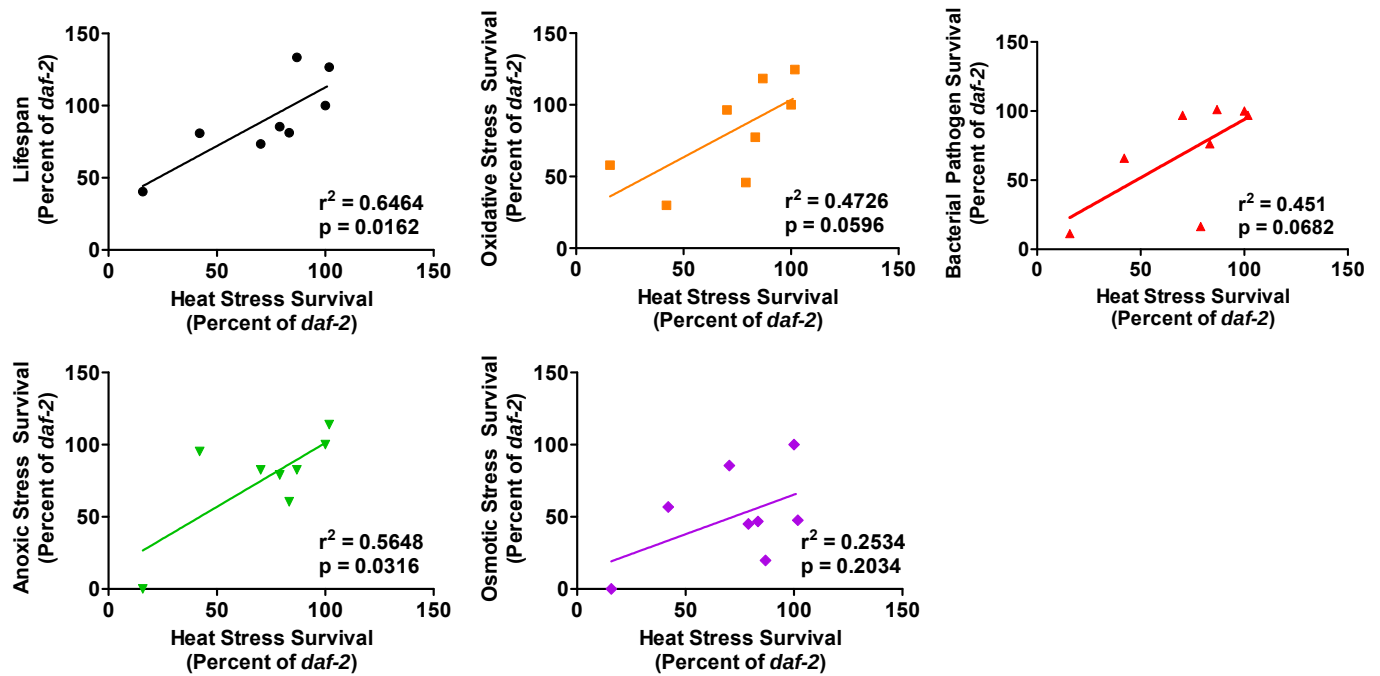


Supplementary Figure S3. Mutation of *egl-27* increases sensitivity to multiple stresses and mildly decreases lifespan in *daf-2* worms. A mutation in *egl-27* result in a small decrease in *daf-2* worms' survival under heat stress (A), did not significantly affect *daf-2* worms' survival during oxidative stress (B), and decreased *daf-2* worms' survival during bacterial pathogen stress (C), osmotic stress (D,E) and anoxic stress (F). The *egl-27* mutation reduced the mean lifespan of *daf-2* worms but not the maximum. Error bars indicate standard error of the mean. *** $p < 0.001$. p-values indicate difference between *daf-2* and *daf-2;egl-27* worms.

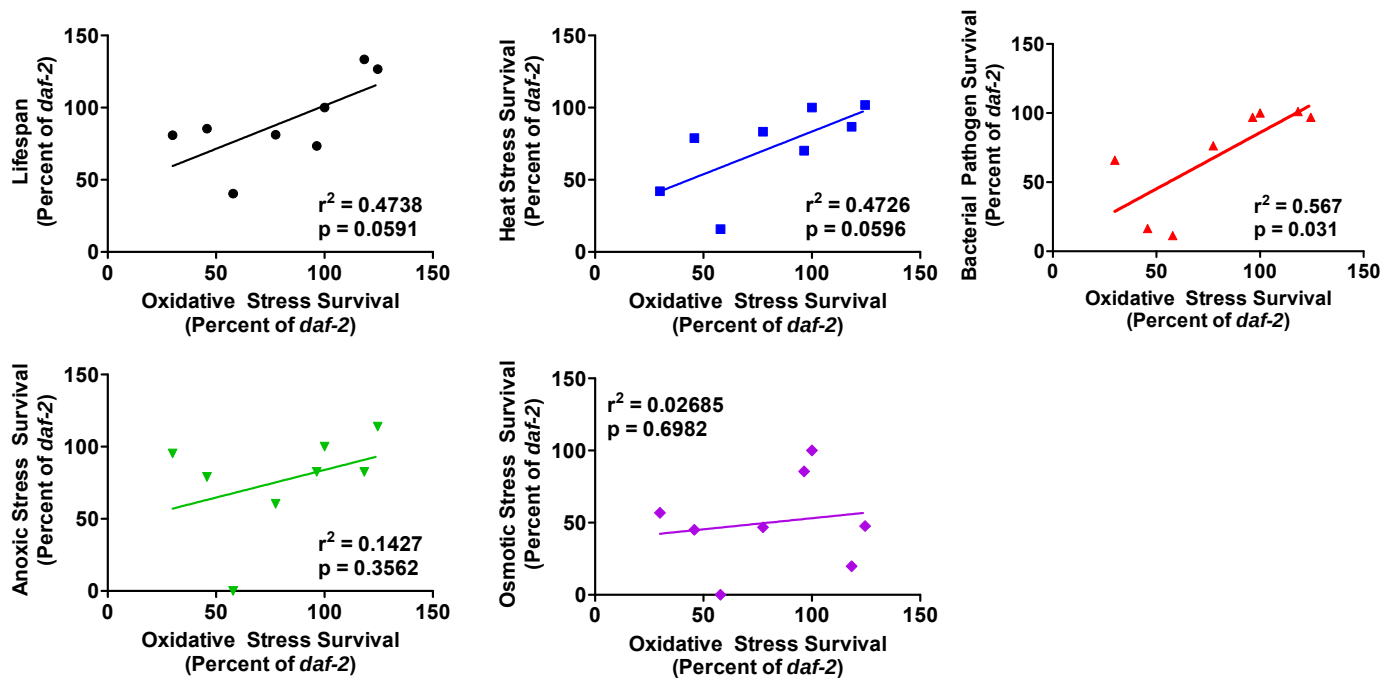


Supplementary Figure S4. Heat stress survival and anoxic stress survival are weakly correlated with lifespan.

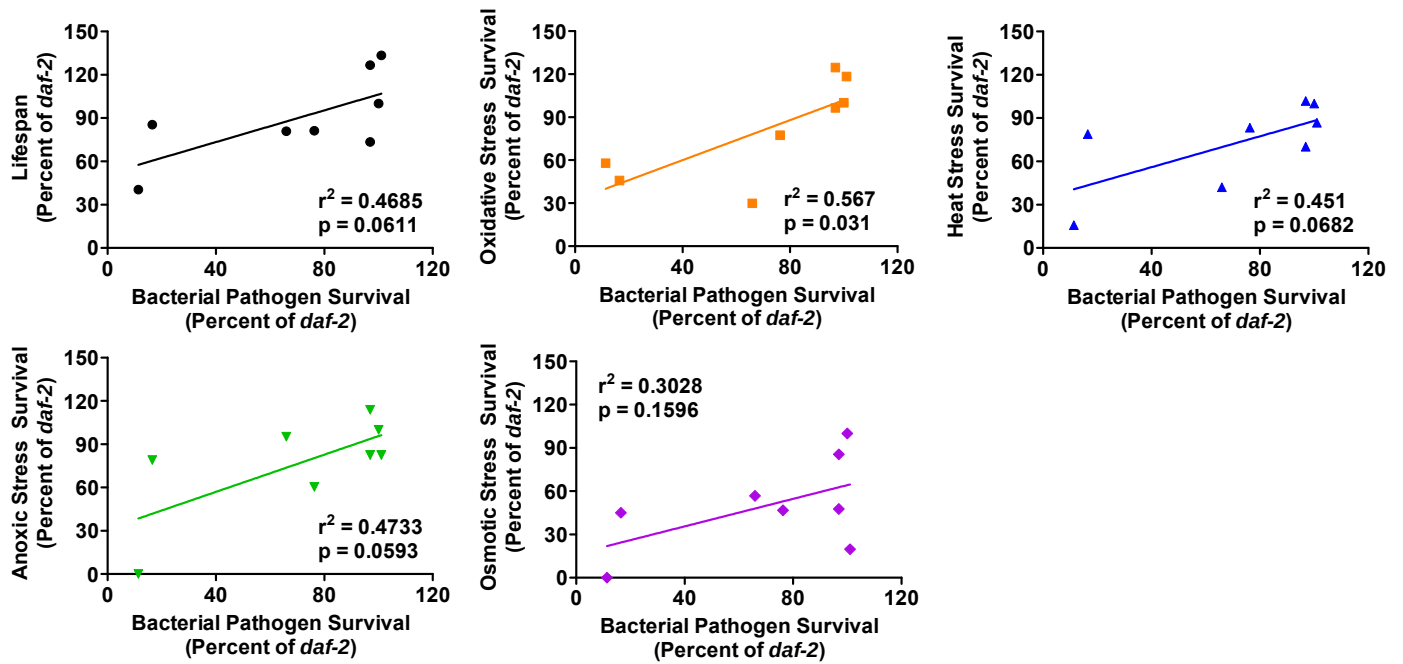
To explore the relationship between stress resistance and lifespan, we graphed lifespan and resistance to each type of stress as a percentage of *daf-2*. For most types of stress resistance there appeared to be a positive relationship with lifespan but the correlation was only significant for heat stress and anoxic stress. In contrast, osmotic stress resistance appeared to be a poor predictor of lifespan.



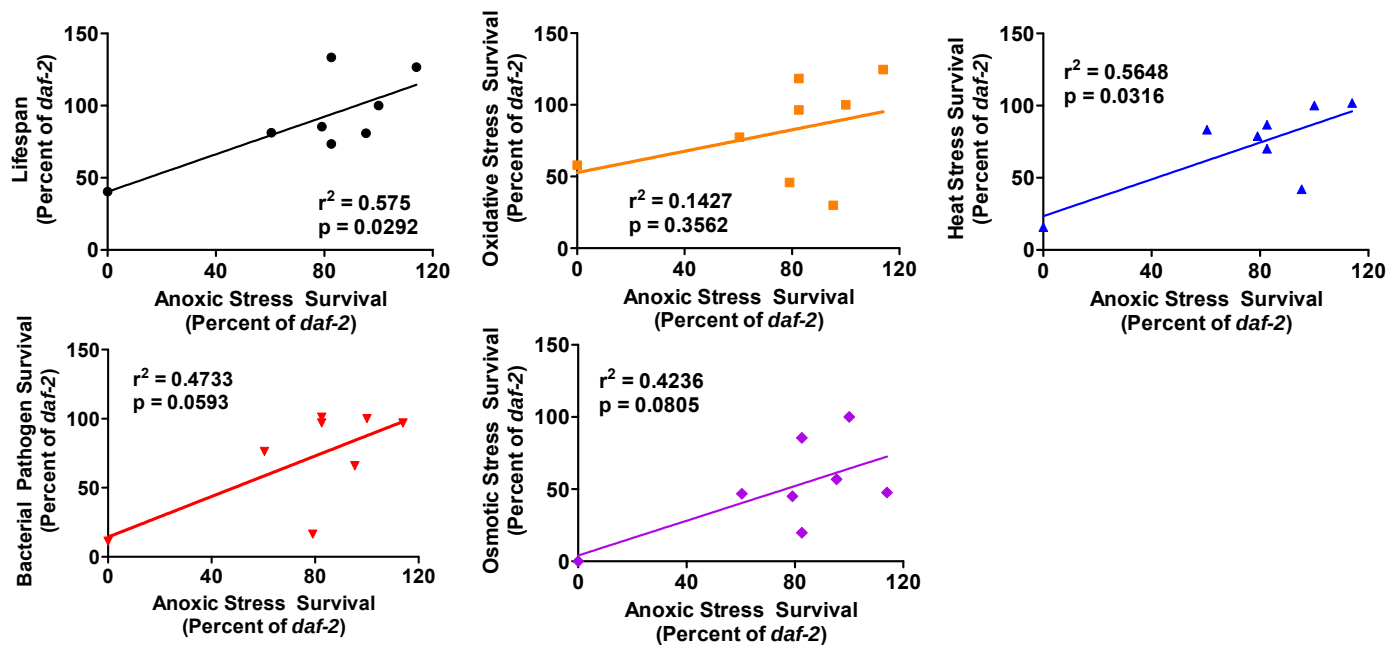
Supplementary Figure S5. Heat stress survival shows a significant positive correlation with anoxic stress survival.



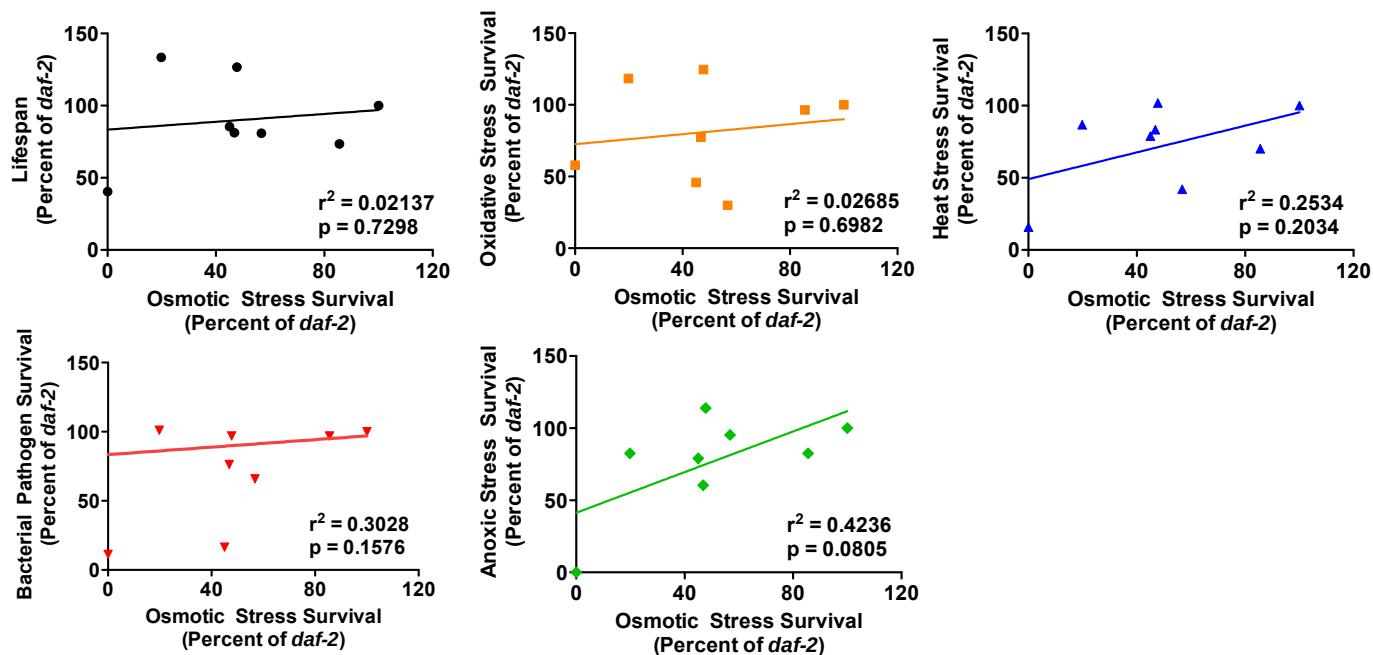
Supplementary Figure S6. Oxidative stress survival shows a significant positive correlation with bacterial pathogen stress survival.



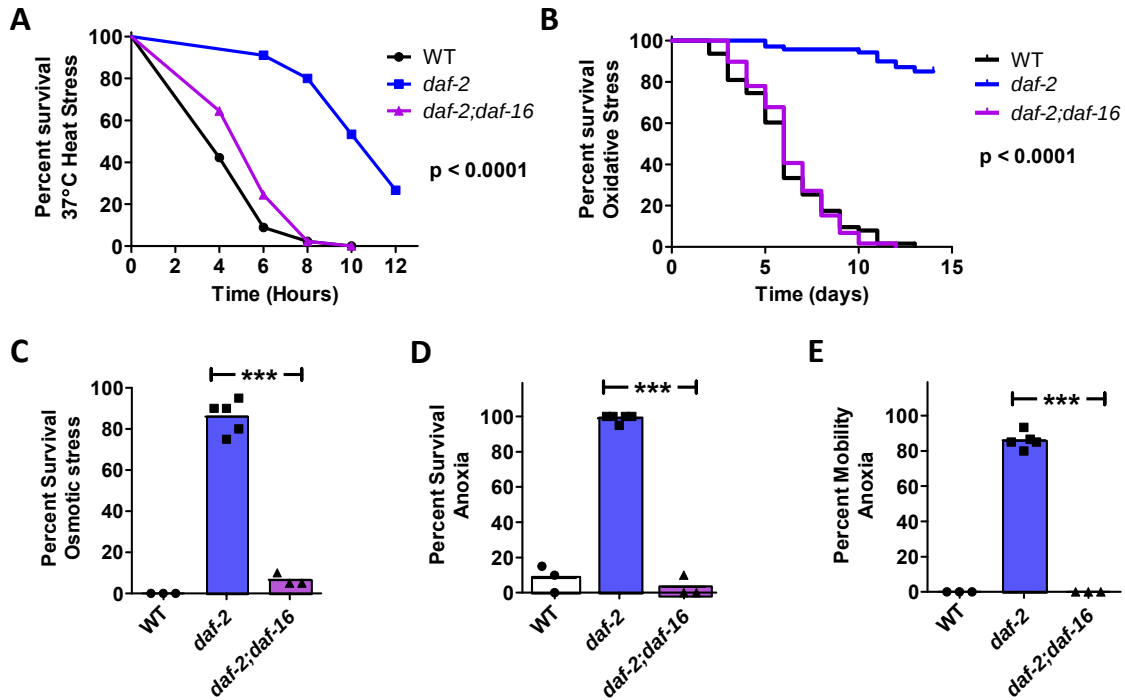
Supplementary Figure S7. bacterial pathogen stress survival shows a significant positive correlation with oxidative stress survival.



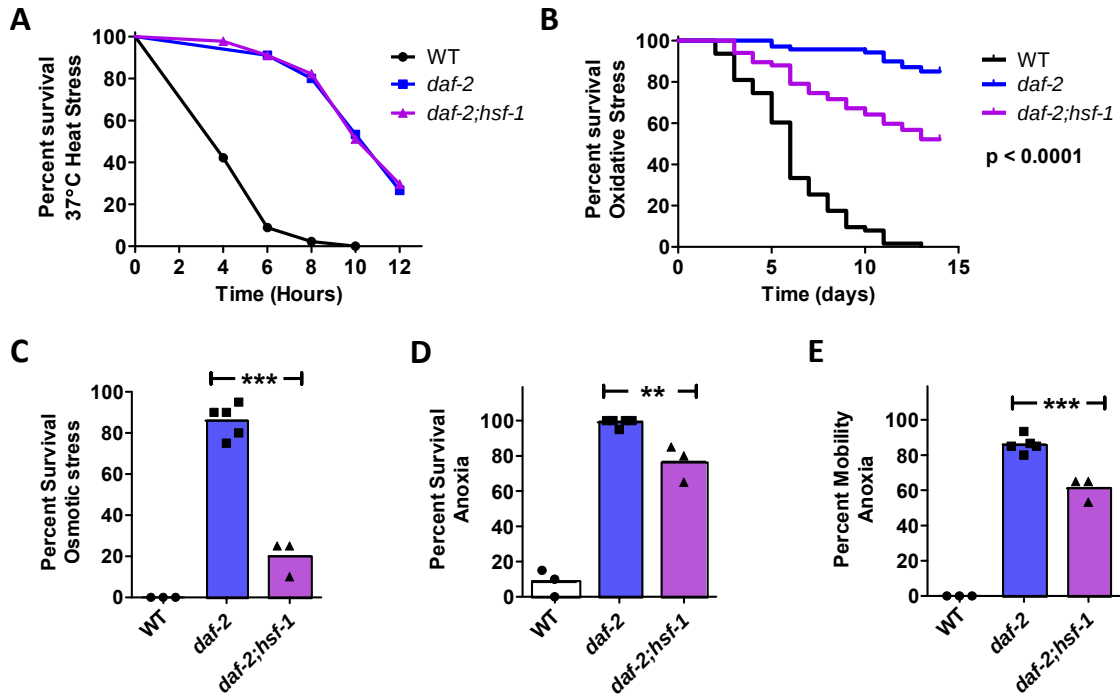
Supplementary Figure S8. Anoxia survival shows a significant positive correlation with heat stress survival.



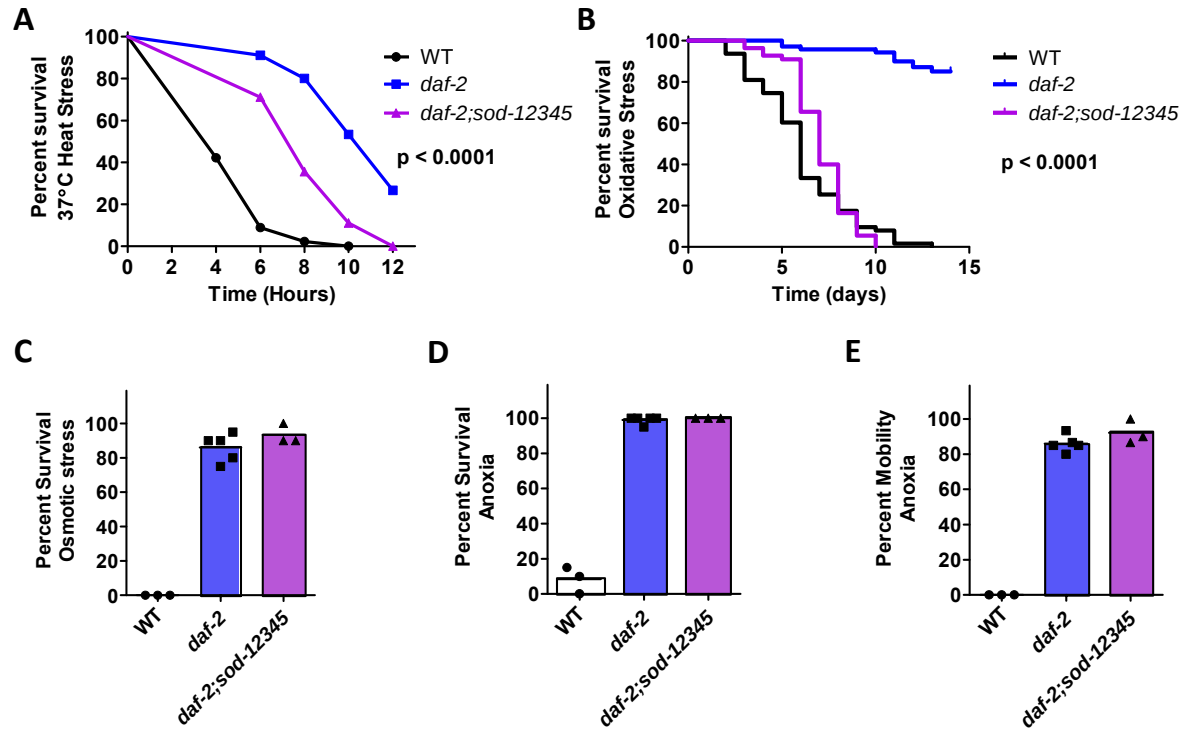
Supplementary Figure S9. Osmotic stress survival does not show a significant correlation with any other type of stress survival.



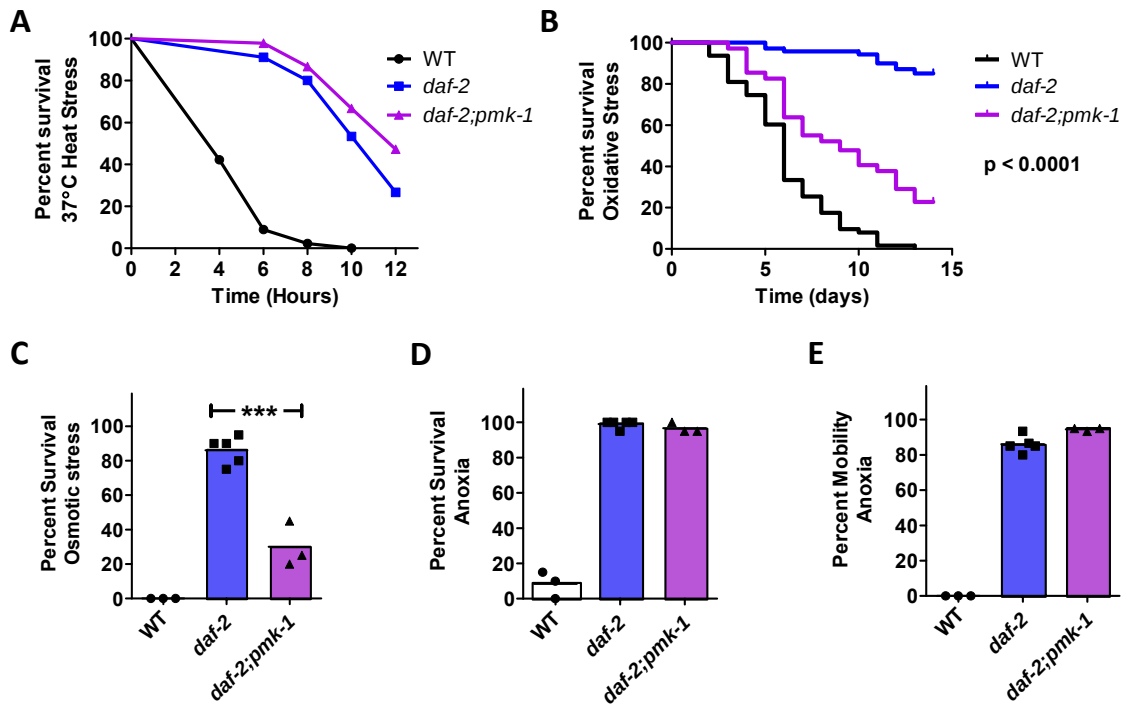
Supplementary Figure S10. Deletion of *daf-16* reverts *daf-2* stress resistance to wild-type in day 10 adult worms. **A.** Survival during heat stress at 37°C. **B.** Oxidative stress survival on 4 mM paraquat plates. **C.** Survival under conditions of osmotic stress on 600 mM NaCl plates. **D.** Survival after 96 hours of anoxia. **E.** Percentage of worms that remain mobile after 96 hours of anoxia followed by a 24 hour recovery. Each data point represents the survival of a population of at least 20 worms (one biological replicate). P-values and stars indicate significant differences between *daf-2* (blue) and *daf-2;daf-16* double mutant (purple). $***p < 0.0001$.



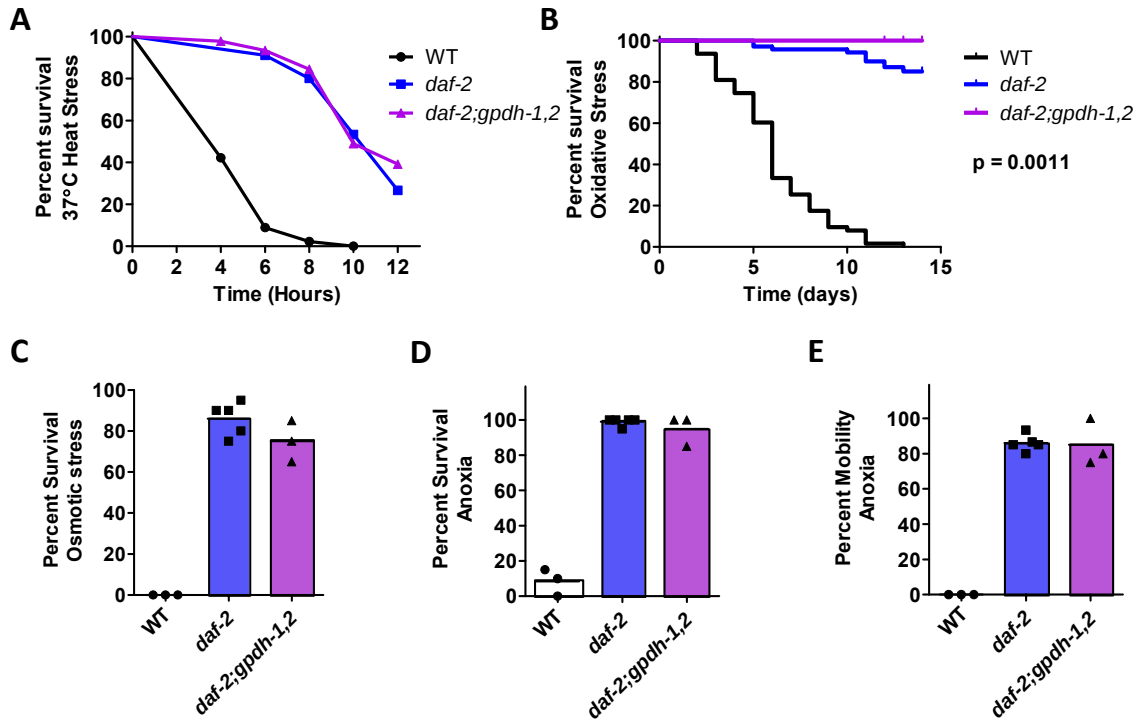
Supplementary Figure S11. Mutation of *hsf-1* decreases resistance to oxidative, osmotic and anoxic stress in day 10 *daf-2* worms. **A.** Survival during heat stress at 37°C . **B.** Oxidative stress survival on 4 mM paraquat plates. **C.** Survival under conditions of osmotic stress on 600 mM NaCl plates. **D.** Survival after 96 hours of anoxia. **E.** Percentage of worms that remain mobile after 96 hours of anoxia followed by a 24 hour recovery. Each data point represents the survival of a population of at least 20 worms (one biological replicate). P-values and stars indicate significant differences between *daf-2* (blue) and *daf-2;hsf-1* double mutant (purple). ** $p < 0.01$, *** $p < 0.0001$.



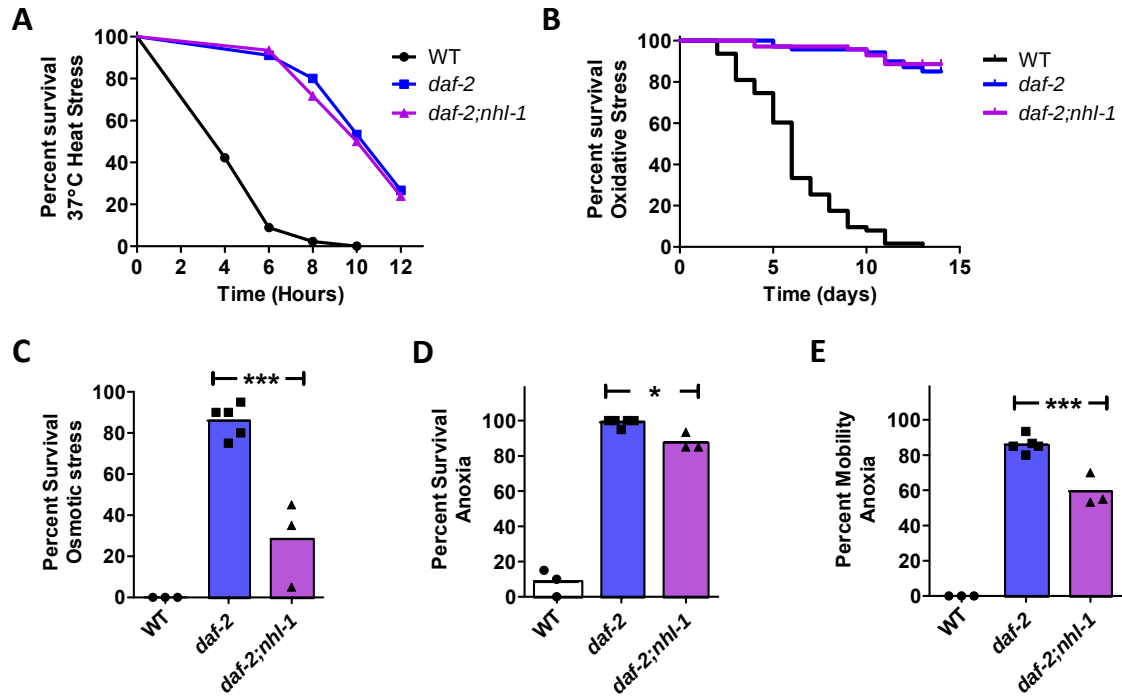
Supplementary Figure S12. Disruption of superoxide dismutase genes decreases resistance to heat stress and oxidative stress in day 10 *daf-2* worms. **A.** Survival during heat stress at 37°C. **B.** Oxidative stress survival on 4 mM paraquat plates. **C.** Survival under conditions of osmotic stress on 600 mM NaCl plates. **D.** Survival after 96 hours of anoxia. **E.** Percentage of worms that remain mobile after 96 hours of anoxia followed by a 24 hour recovery. Each data point represents the survival of a population of at least 20 worms (one biological replicate). P-values and stars indicate significant differences between *daf-2* (blue) and *daf-2;sod-12345* mutant (purple).



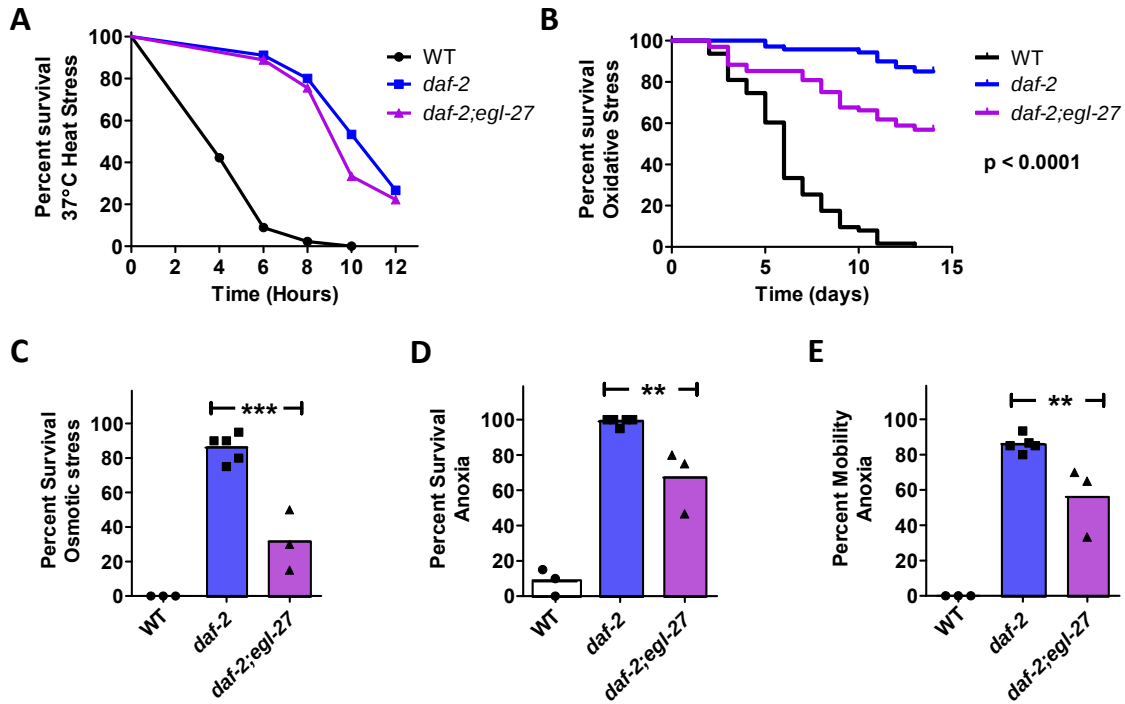
Supplementary Figure S13. Deletion of *pmk-1* decreases resistance to oxidative stress and osmotic stress in day 10 *daf-2* worms. **A.** Survival during heat stress at 37°C . **B.** Oxidative stress survival on 4 mM paraquat plates. **C.** Survival under conditions of osmotic stress on 600 mM NaCl plates. **D.** Survival after 96 hours of anoxia. **E.** Percentage of worms that remain mobile after 96 hours of anoxia followed by a 24 hour recovery. Each data point represents the survival of a population of at least 20 worms (one biological replicate). P-values and stars indicate significant differences between *daf-2* (blue) and *daf-2;pmk-1* double mutant (purple). *** $p < 0.0001$.



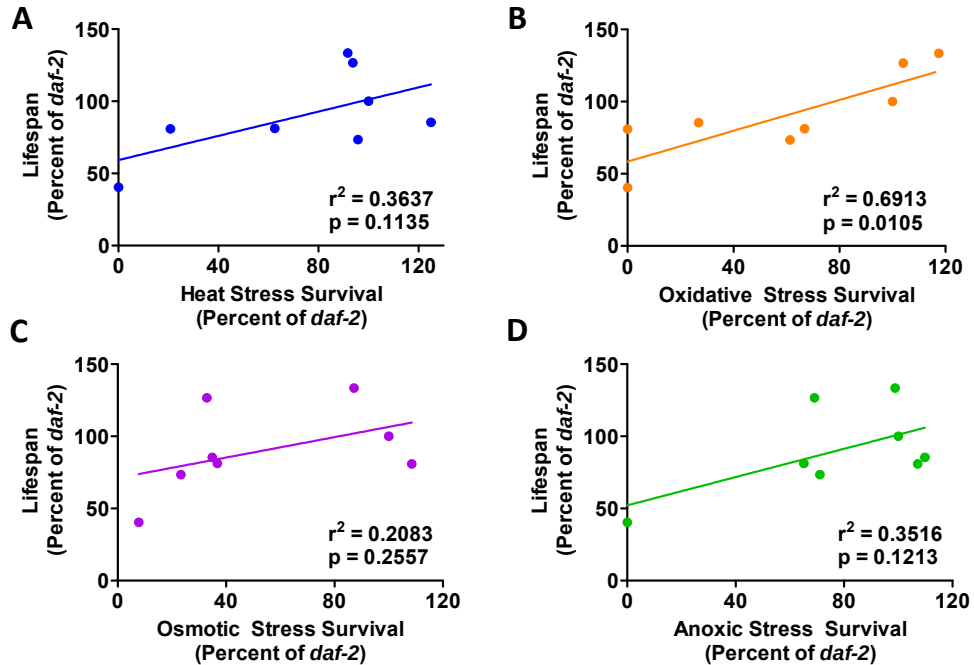
Supplementary Figure S14. Deletion of *gpdh* genes increases resistance to oxidative stress in day 10 *daf-2* worms. **A.** Survival during heat stress at 37°C. **B.** Oxidative stress survival on 4 mM paraquat plates. **C.** Survival under conditions of osmotic stress on 600 mM NaCl plates. **D.** Survival after 96 hours of anoxia. **E.** Percentage of worms that remain mobile after 96 hours of anoxia followed by a 24 hour recovery. Each data point represents the survival of a population of at least 20 worms (one biological replicate). P-value indicates significant difference between *daf-2* (blue) and *daf-2;gpdh-1,2* mutant (purple).



Supplementary Figure S15. Deletion of *nhl-1* decreases resistance to osmotic stress and anoxia in day 10 *daf-2* worms. **A.** Survival during heat stress at 37°C. **B.** Oxidative stress survival on 4 mM paraquat plates. **C.** Survival under conditions of osmotic stress on 600 mM NaCl plates. **D.** Survival after 96 hours of anoxia. **E.** Percentage of worms that remain mobile after 96 hours of anoxia followed by a 24 hour recovery. Each data point represents the survival of a population of at least 20 worms (one biological replicate). P-values and stars indicate significant differences between *daf-2* (blue) and *daf-2;nhl-1* double mutant (purple). *p<0.05, ***p<0.0001.



Supplementary Figure S16. Mutation of *egl-27* decreases resistance to oxidative, osmotic and anoxic stress in day10 *daf-2* worms. **A.** Survival during heat stress at 37°C . **B.** Oxidative stress survival on 4 mM paraquat plates. **C.** Survival under conditions of osmotic stress on 600 mM NaCl plates. **D.** Survival after 96 hours of anoxia. **E.** Percentage of worms that remain mobile after 96 hours of anoxia followed by a 24 hour recovery. Each data point represents the survival of a population of at least 20 worms (one biological replicate). P-values and stars indicate significant differences between *daf-2* (blue) and *daf-2;egl-27* double mutant (purple). $**p < 0.01$, $***p < 0.0001$.



Supplementary Figure S17. Oxidative stress survival is weakly correlated with lifespan in day 10 adult worms. To explore the relationship between stress resistance and lifespan in day 10 adult worms, we graphed lifespan and resistance to each type of stress as a percentage of *daf-2*. For most types of stress resistance there appeared to be a positive relationship with lifespan but the correlation was only significant for oxidative stress.