

# Geriatric Flies on the Rise

Amanda Wilson<sup>1</sup>, Dacotah Melicher<sup>2</sup>, Julia Bowsher<sup>1</sup>, Joseph Rinehart<sup>2</sup>  
 Department of Biological Sciences North Dakota State University<sup>1</sup>, USDA-ARS-BRL Fargo, ND<sup>2</sup>

## Introduction

*Drosophila melanogaster*, also known as the fruit fly, are used across the United States in laboratory environments. Some companies specialize in rearing flies to sell to those laboratories.. My interest is to cut costs for these companies by trying to store fruit flies in a fluctuating temperature to keep them alive longer and to have less maintenance, but will still have the same abilities to reproduce (fecundity).

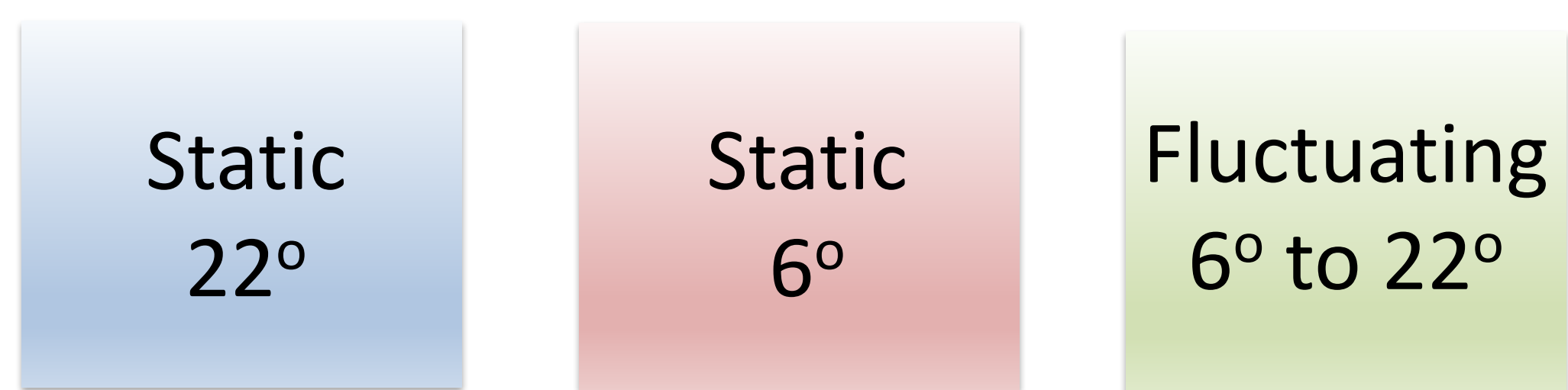
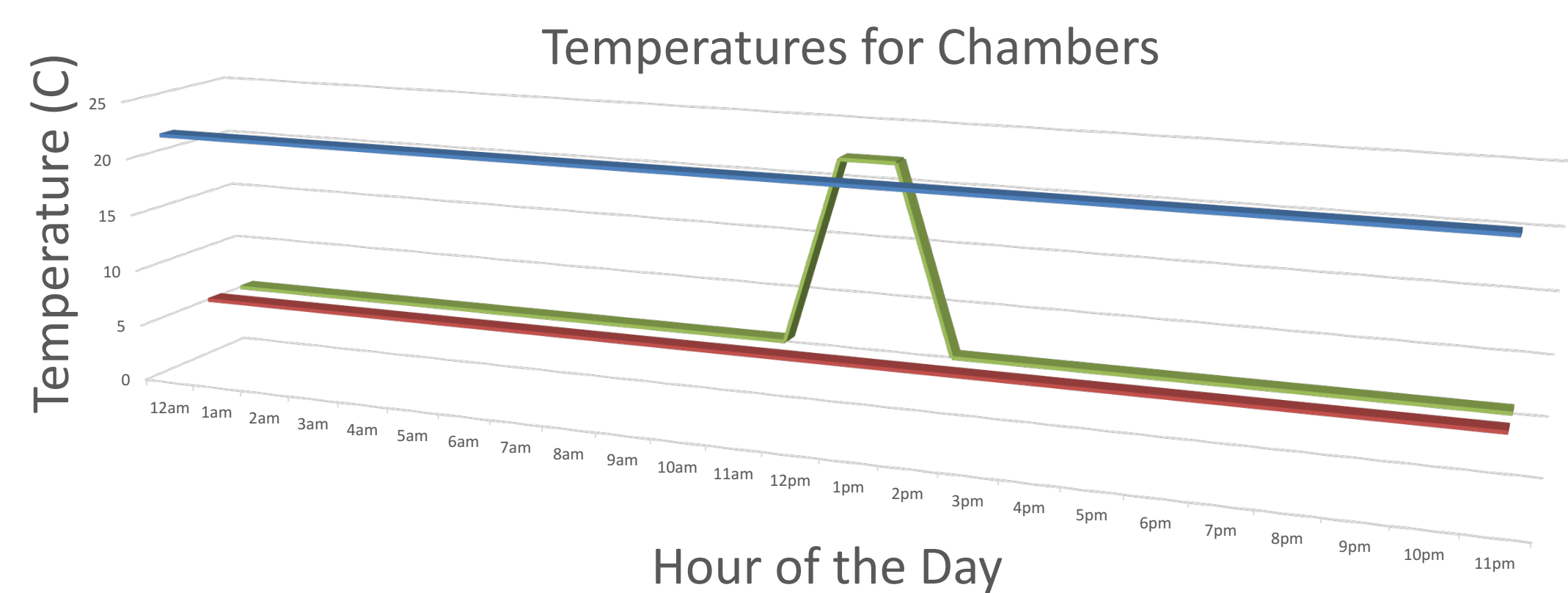
## Hypothesis

A fluctuating temperature will change the life expectancy and the fecundity of *drosophila melanogaster* compared to keeping them in a static chamber.

## Predictions

- The fluctuating temperature will extend the lives of the *drosophila melanogaster*.
- The fecundity for the flies will decrease because of their extended lives.

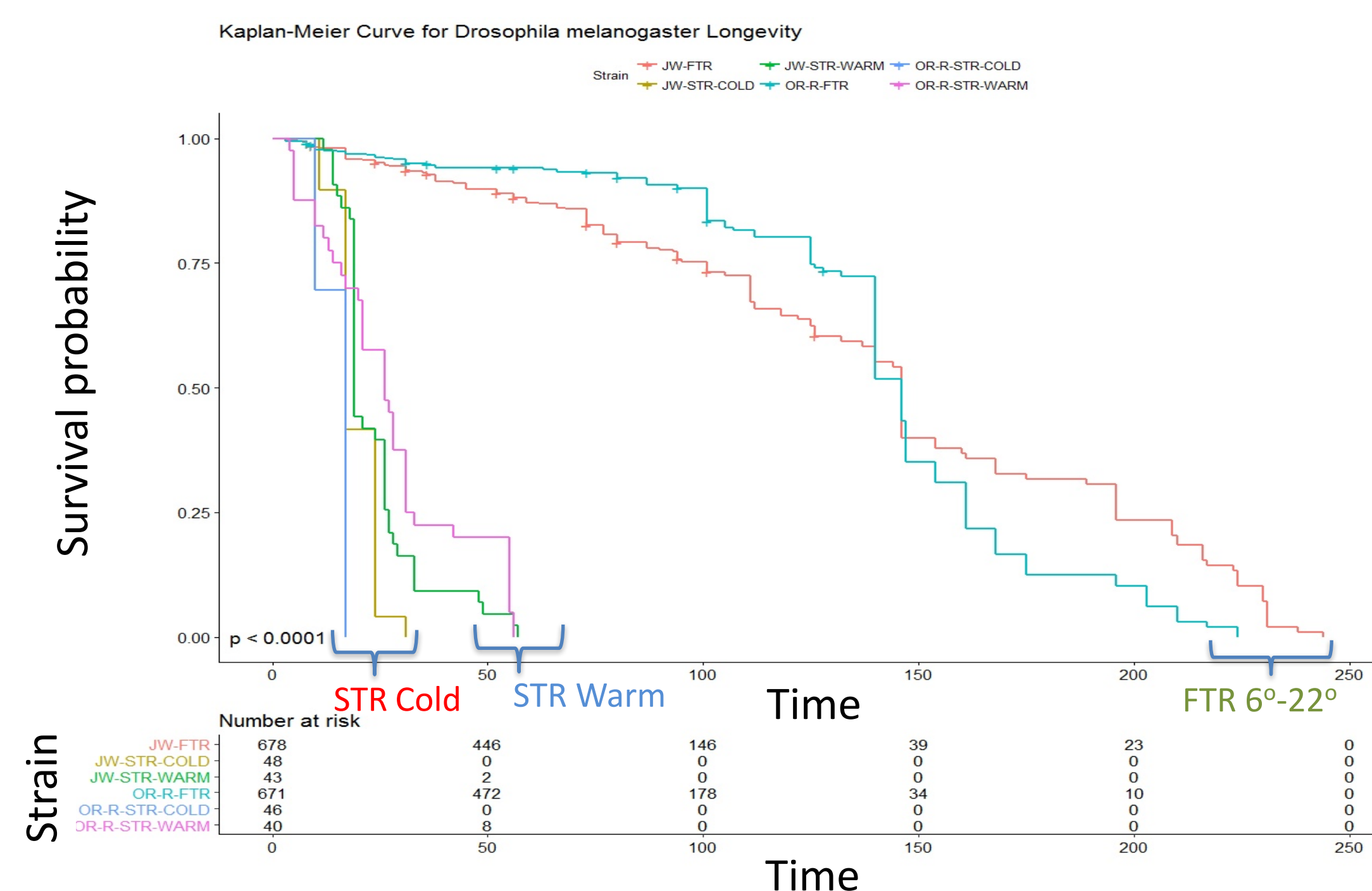
## Methods



- survival was recorded weekly.
- Flies were removed at 20-day intervals to measure fecundity and extract mRNA.
- Fecundity was measured by pairing male and female FTR flies with two opposite sex flies. Total F and F2 adult emergence was recorded.

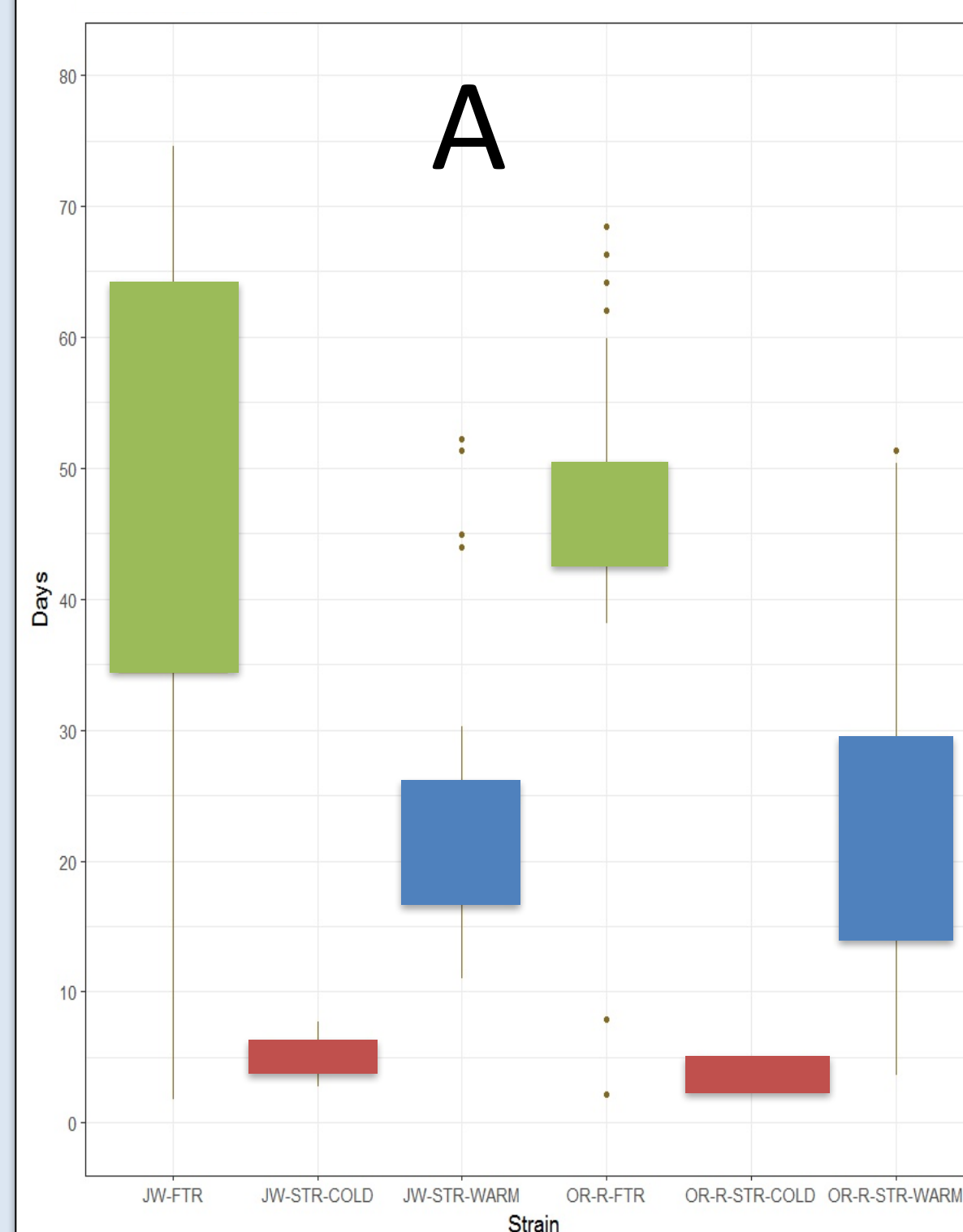
## Results

Will *drosophila melanogaster* live longer in a fluctuating chamber compared to a static chamber?

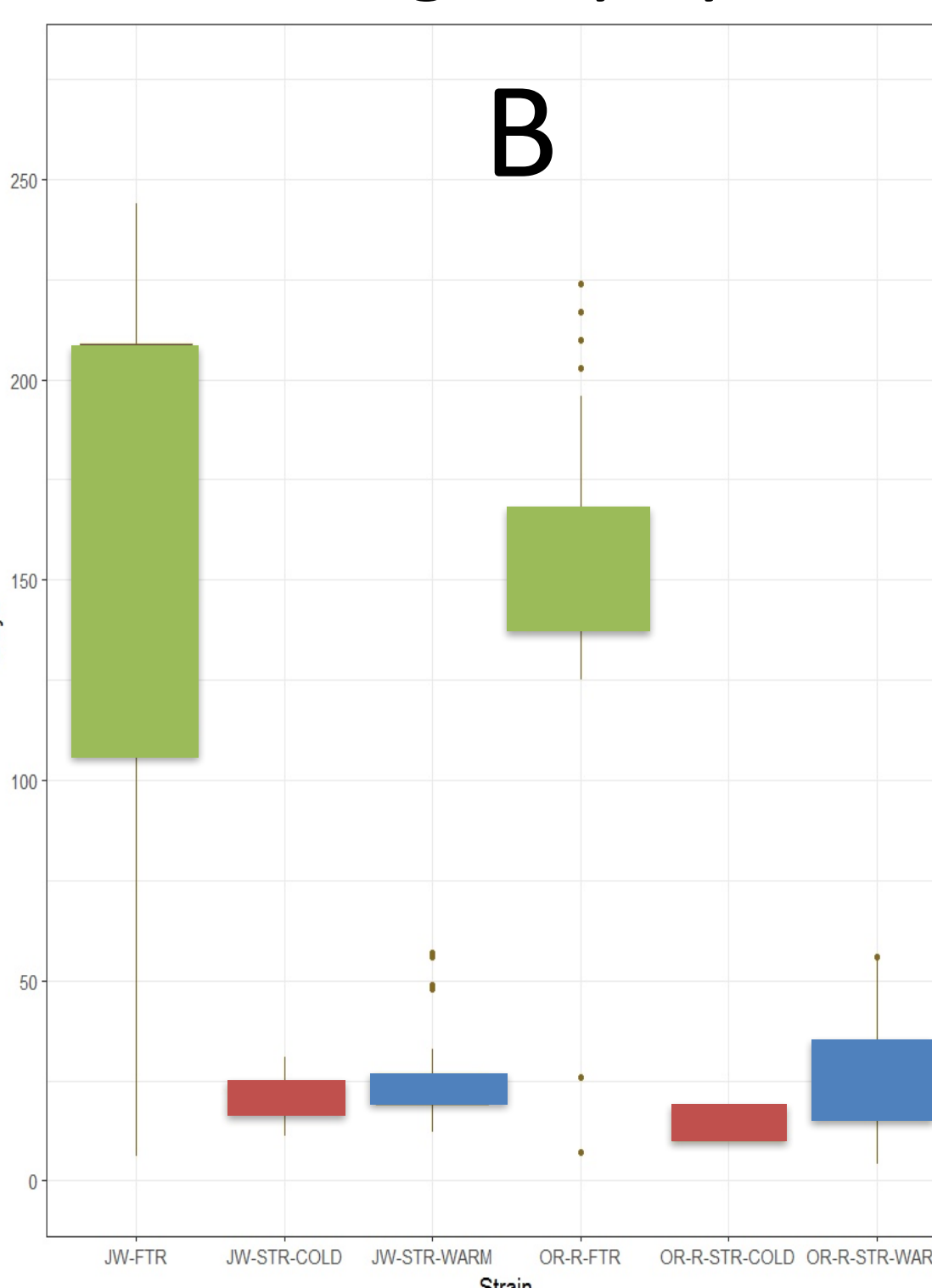


This graph shows the longevity of the *drosophila melanogaster* in fluctuating temperatures is extended compared to the static chambers of 6° and 22°.

### Mean Degree Days



### Mean Longevity by Strain



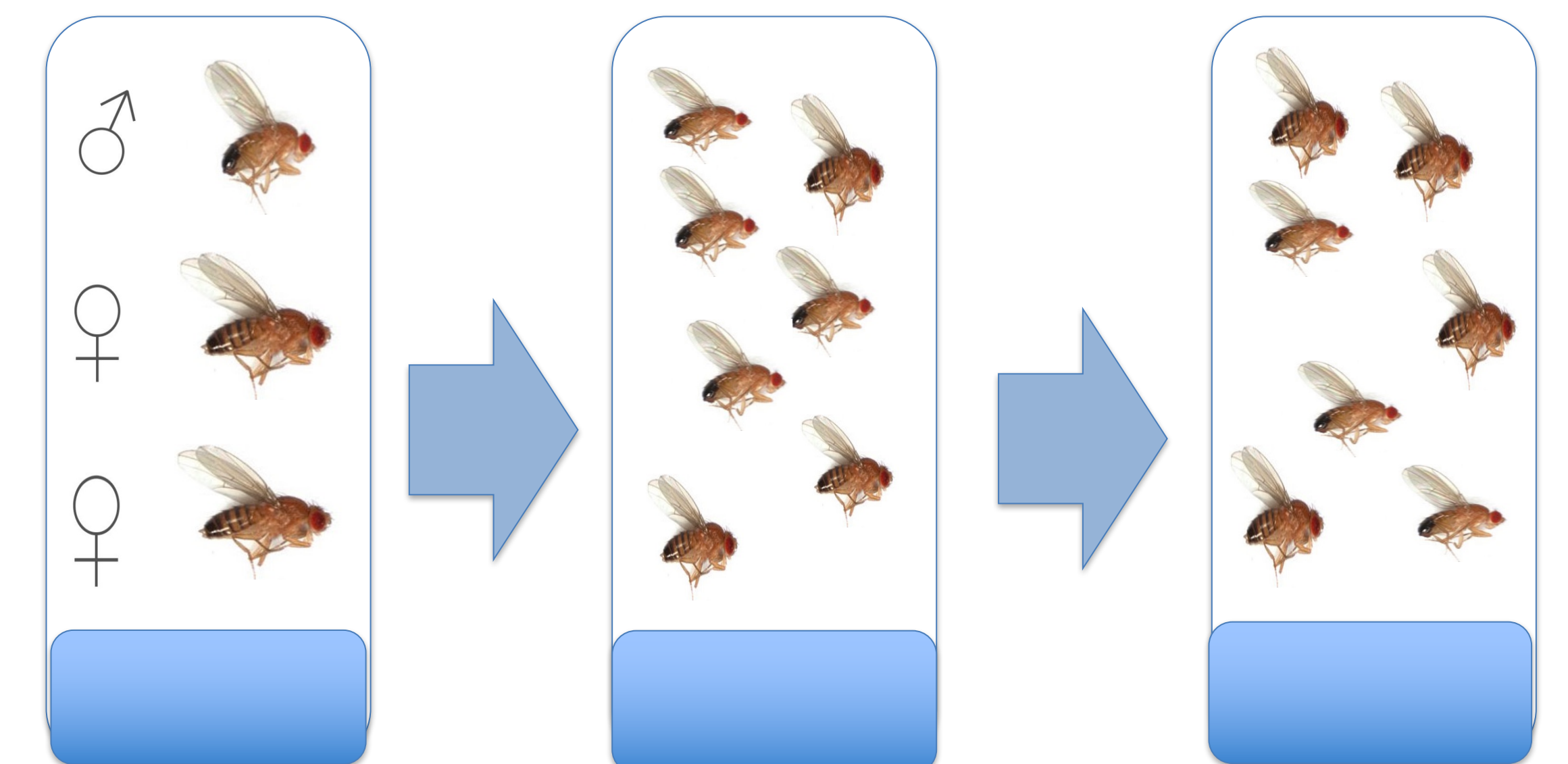
Graph A shows the average temperature. It refers to the pace of life. Living 1 hour at 10° = 10 hours at 1°. Graph B shows the longevity by strain and treatment they received.

## Conclusions

- We can conclude from our data that putting *drosophila melanogaster* in a fluctuating temperature can extend the lives beyond its average span.
- The data also shows that the average temperature of the chamber does have an effect on the *drosophila melanogaster* and can extend their lives.
- Mortality rate is lower in the fluctuating chambers compared to the static chambers.

## Future Directions

Parent from FTR      F<sub>1</sub> Emergence      F<sub>2</sub> Emergence



- Currently working on fecundity. The data collection is not complete.
- Control the humidity to see if that will prevent fatalities from the condensation.
- Test if there is a difference in mortality between male and female *drosophila*.
- qPCR and RNA-Sequencing to find differentially expressed genes and to test expression of genes identified in other systems associated with longevity.

## Acknowledgments

I would like to thank Dr. Bowsher, Dacotah Melicher, Micki Palmersheim, all the members of the USDA, and everyone in the Pollination Nation who helped take care of my *drosophila*.