

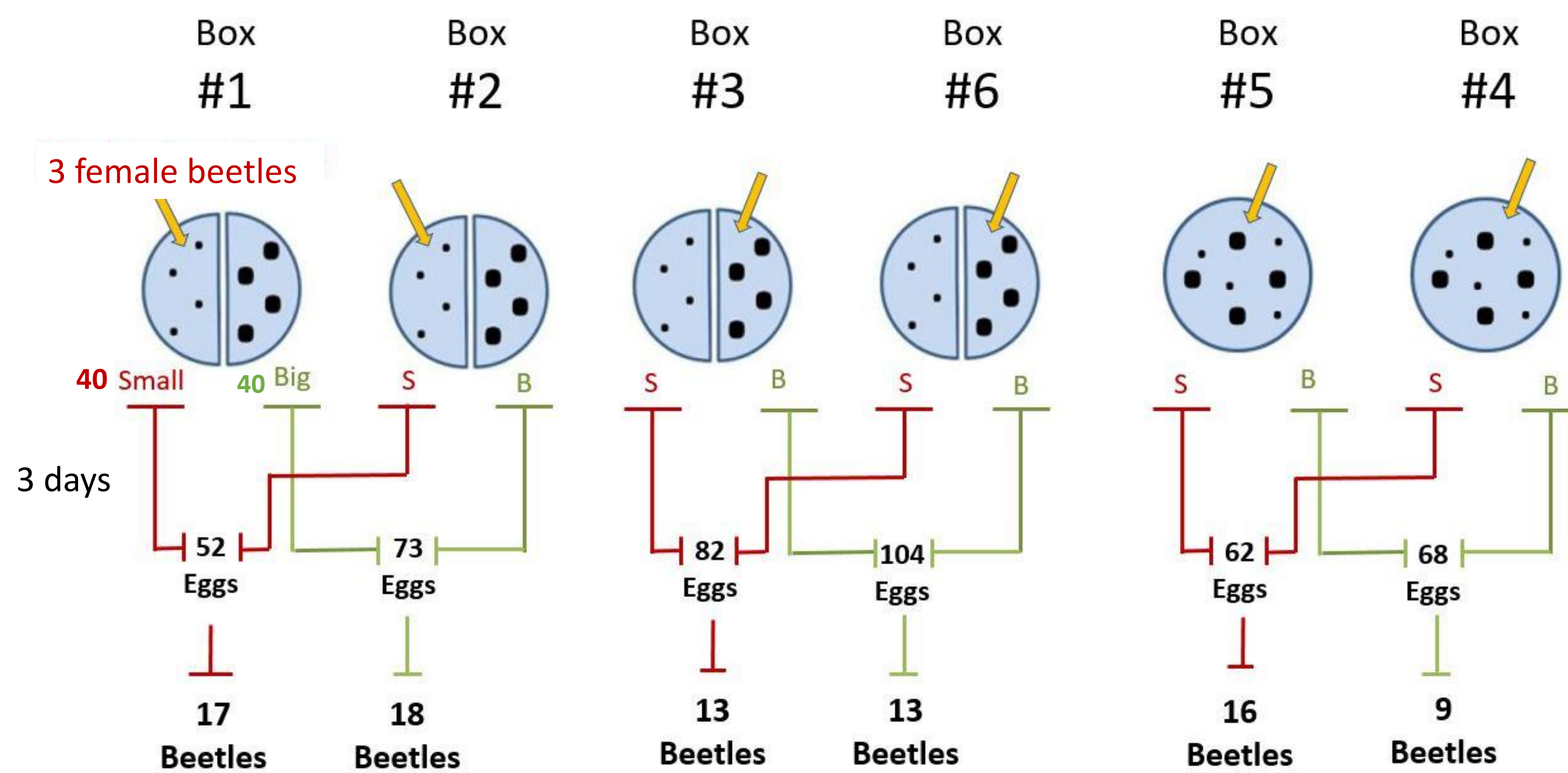
Bean Size Preferences for Egg-laying Bean Beetles

Bischoff, H. Johansen, S. M. Olsen, M. Winkler, L. 2017

Does the bean size have an impact on the quantity of bean beetle offspring?

There is not a statistically significant difference in beetle survival between large and small beans.

The beetle used for this project is *Callosobruchus maculatus*. *C. maculatus* is a good model species because they have a short generation time, and do not need food or water as adults. They lay their eggs on beans, which serve as nutrition for the larvae to be able to grow into adults. Adzuki beans were used in this experiment. The larva grows within the bean and undergoes metamorphosis before it emerges as a winged adult. We wanted to figure out whether the bean beetles have a specific size preference for where they lay their eggs, since the bean is the only nutrition the beetle gets throughout its life cycle.



Two *C. maculatus* eggs on an adzuki bean



Adult female *C. maculatus*. Photo: L. Buss



Emergence hole in an adzuki bean.

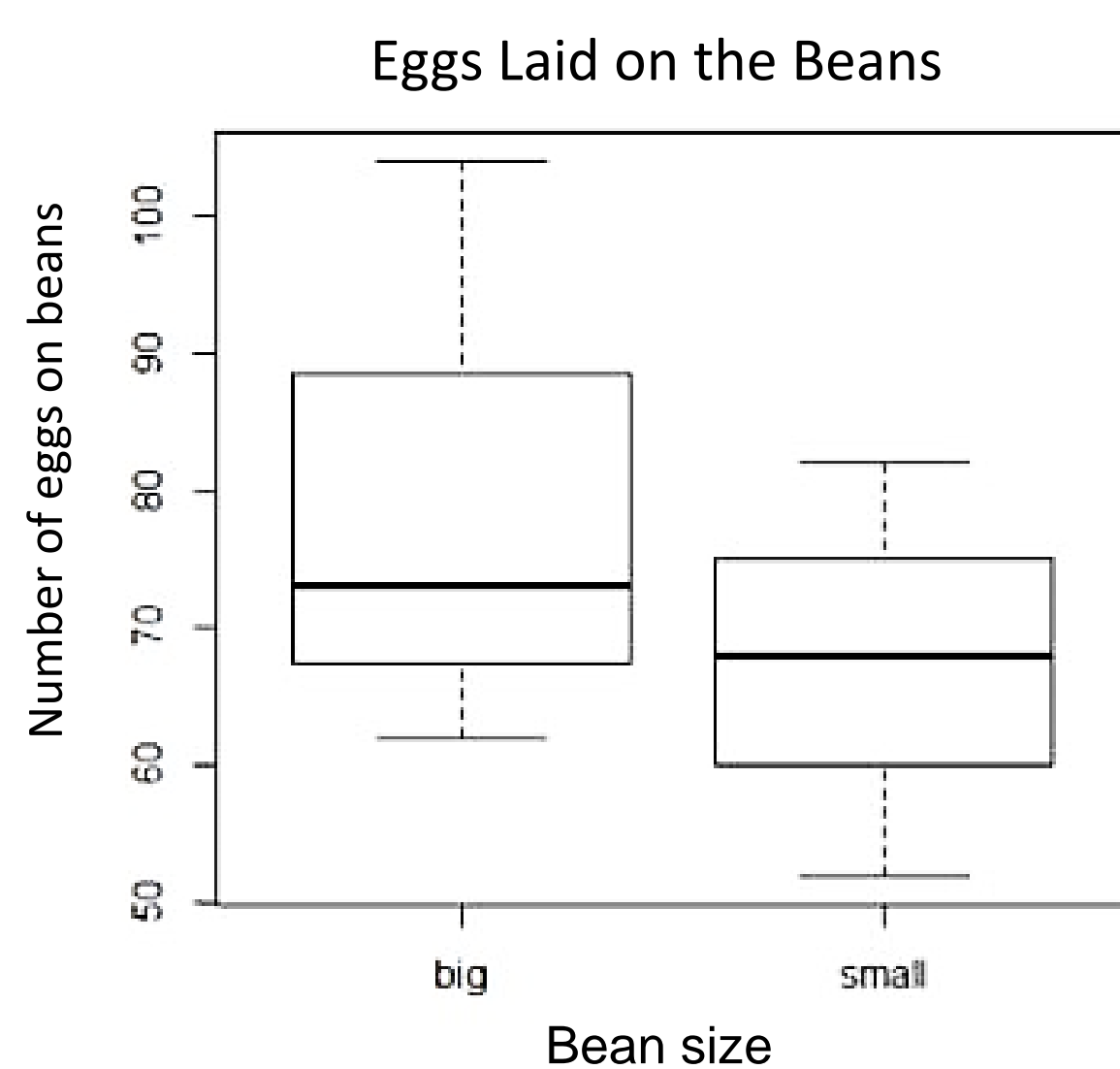


Figure 1: Number of eggs laid on big and small beans

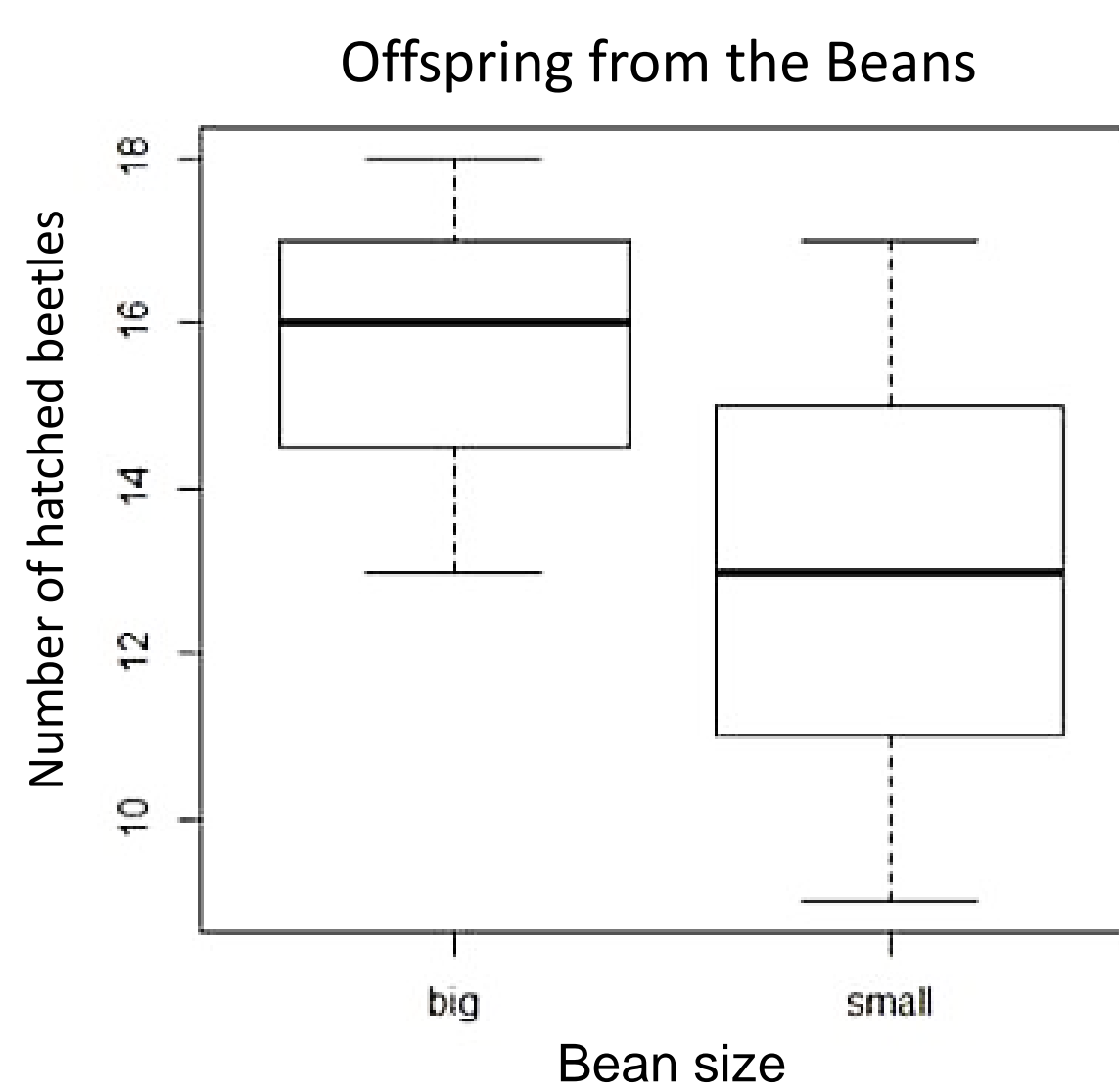


Figure 2: Number of hatched beetles from big and small beans

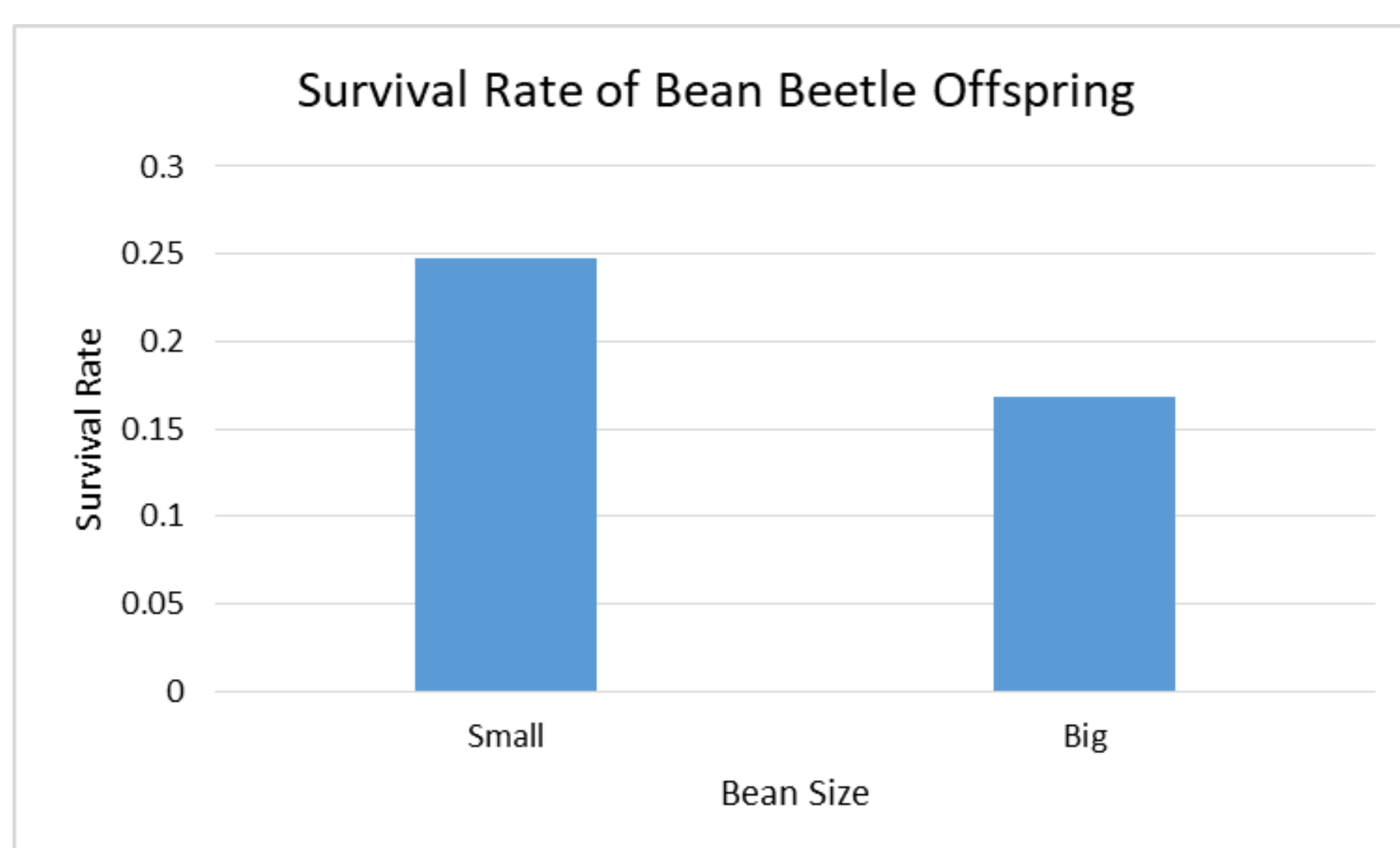


Figure 3: Survival rate (number of hatched divided by number of eggs laid). The trend indicates that the success of hatching is on average lower in the big beans.

Results:

- There is not enough data for the results to be statistically significant, but our data suggest that small beans have a larger proportion of adult beetle offspring than the big beans when compared to the number of eggs laid.
- The p-value for small and big beans is respectively 0.058 for small beans and 0.96 for big beans. Since both the p-values > 0.05 ($\alpha = 0.05$), it can be concluded that there is no significant relationship between the number of hatched beetles and the number of eggs laid.
- One limiting factor would be that the small beans are the same size as the mung beans the original females were raised on, so these beans most likely did not seem small to the egg-laying beetles.

