**Artificial Selection Lab Report Description**

**Background Information:**

What is artificial selection and what is natural selection; how is natural selection like artificial selection? How are they different?

Research and give a documented example (since 1940) of natural selection using a real organism.

Research and give a documented example of an organism for which artificial selection was used to “create” it.

*Cite your sources using internal citations (Campbell, et al, 2011) and a bibliography (alphabetical).*

**Purpose:**

What is the research question for this investigation? Be sure to name the trait that was quantified. (One sentence)

What is the experimental hypothesis for this investigation? Be sure that the hypothesis makes a testable prediction. (One sentence; long form hypothesis. See Banana Lab.)

**Method: Briefly, describe the steps in the entirety of the method used (one paragraph).**

**What are the key results?**

1) Histogram of the initial “parent” population of *Brassica rapa* “Fast Plants.”

Figure 1. Title, axes labeled, etc. Briefly, using your graph’s quantities, what does the histogram show (range, mode, median; average). How is this graph used in your analysis?

2) Histogram of the F1 “control population.” Figure 2. Title, axes labeled, (give range, mode, median; average).

3) Histogram of the F1 “experimental, selected population.” Figure 3. Title, axes labeled, (give range, mode, median; average).

Briefly, compare Figures 1, 2 and 3; what do their comparisons show?

4) Add a summary data table of averages, range, mode, median to make data analysis more clear (Table 1, Title, column headers, etc.).

5) Data analysis: Summarize in a table (Table 2. Title, column headers, etc) the statistics done: the populations and averages compared (give the numbers!), the \*percent difference between them, calculated p values, and the outcomes in terms of a levels of significant difference or not, and meaning of the difference or lack thereof.

\*Percent difference is:

(1) the percent increase (+) or decrease (-) from a starting population to a later population (P to F1; F1 to F2) = Final-Initial/Initial \* 100 or (2) the percentage between a larger vs smaller population metric (P vs P, or F1 vs F1 ) = larger-smaller/smaller \* 100.

**Conclusion and Discussion**

1. Restate your research question.

2. What “quantified” conclusion do you draw about the research question based on your statistical analysis of averages (give the averages, “quantify” the effect of selection, and base the conclusion on T test results). One sentence.

3. Explain how you arrived at your conclusion based upon: (A) the changes shown in your histograms (describe the changes using specific descriptive statistics from each histogram you compare), and the (B) the p values/calculated T Test values (also include averages compared and their percent differences). Several sentences.

4. (A) What do your findings mean in terms of the measured effect of artificial selection on the trait assessed in the initial parental population in this investigation; quantify somehow what artificial selection accomplished in one generation in this investigation. (B) Then quantitatively predict what three or more additional rounds of artificial selection might accomplish for each subsequent generation; explain your speculation based upon plausible justification rooted in this lab’s outcome. (Idea: create a table of predictions and explain it.)

5. (A) If this investigation were natural selection, what type of natural selection would this be (see text section 16.2), and why?

(B) How does the process in this investigation compare to what natural selection might be in the wild for a population of the same species and the same trait being selected – what would be similar or difference about (i) the populations involved? (ii) the selection process itself? (iii) the ultimate impact on the populations involved? Refer back to the natural selection example used in your Background Information, but generalize beyond that specific example based on what you have learned about the two types of selection.

C) Can the process of artificial selection be compared to natural selection? Why and why not?