

# STAT 113: HW8

Spring 2022

Due Monday April 25th by 11:59 P.M.

## Specific Learning Objectives

C1: Distinguishing Between the Data and the Phenomenon

C3: Formulating and Interpreting Statistical Hypotheses

**Red Wine and Weight Loss** Resveratrol, a compound in grapes and red wine, has been shown to promote weight loss in rodents and now in a primate. Lemurs fed a resveratrol supplement for four weeks had decreased food intake, increased metabolic rate, and a reduction in seasonal body mass gain compared to a control group.

Suppose a hypothetical study is done for a different primate species, with one group given a resveratrol supplement and the other group given a placebo. We wish to see if there is evidence that resveratrol increases the mean metabolism rate for this species.

1. Define the relevant **parameter(s)**, being clear about the context in which it applies (or they apply)

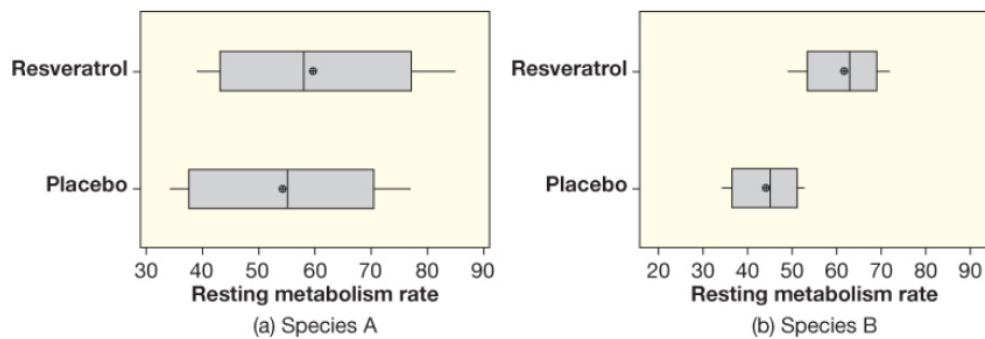


Figure 1: Does red wine boost metabolism rates?

2. State the **null and alternative hypotheses** in words, and then as mathematical equations or inequalities involving the parameter of interest.
  
3. Possible sample results for species A are shown in Fig. 1(a) with the mean indicated by a circle on the boxplots. In the sample, is the mean greater for the resveratrol group?
  
4. Can we necessarily conclude on the basis of this data that resveratrol increases the metabolism rate for this species? Why or why not?

5. Possible sample results for species B are shown in Fig. 1(b). The sample sizes are the same as for species A. For which of the two species, A or B, is the evidence stronger that resveratrol increases the metabolism rate for this species? Explain your reasoning.