



Activity 4: Statistical Designs and Analysis

For each of the following examples, identify the experimental unit (i.e., the unit that is randomly assigned to a treatment) and differences in the design that needs to be addressed in the analysis.

Example 1: A researcher wants to test whether 3 different experimental treatments affect the glycogen levels in rat's livers. To test that, duplicate readings were made on each of three preparations of rat livers from each of two rats for the three different treatments.

Example 2: To determine diet quality, male rats were fed diets with 3 protein levels. Fifteen rats were randomly assigned to one of the three diets and the weight gain was recorded.

Example 3: An experimenter investigating the effect of different food for a species of fish places the food in tanks containing the fish. The weight increase of the fish is the response. Three food types were tested, 4 tanks per diet, and 6 fish per tank.

Example 4: The effectiveness of three anticoagulant drugs in dissolving blood clots was studied. Each of five subjects received all 3 drugs, in random order with adequate washout time in between, and the length of time required of a cut of specified size to stop bleeding was recorded.

Example 5: To investigate the effect of sulfur and nitrogen on the growth of red clover, a plant scientist conducted a greenhouse experiment. The sulfur levels were applied at rates 0, 3, 6, and 9 pounds /acre, and the rate of nitrogen application was either 0 or 20 pounds/acre. Greenhouse pots were prepared with uniform soil, allowing 3 pots per treatment combination.