RCBD Concepts

Cheese

Name: _____

Entry/Exit tickets will be graded for intellectual engagement only, not correctness.

Scenario:

An experiment is to be conducted to evaluate the effect of citric acid on the moisture content of mozzarella cheese. Blocks of mozzarella cheese will be made by using 4 different amounts of citric acid (1 tsp, 1.25 tsp, 1.5 tsp, 1.75 tsp). (Mozzarella cheese can be made by mixing 1 gallon of milk, 1/4 tsp of liquid rennet, 1 tsp of cheese salt and the citric acid.) After storage in a cooler for 3 months, the moisture content of each block will be measured at two different random locations within the block of cheese.

The researchers would like to include different types of milk as a blocking factor in their study. They will use three types of organic cow's milk (O1, O2, O3) and three types of non-organic cow's milk (NO1, NO2, NO3) and will run a randomized complete block design making 4 blocks of cheese from each type of milk one block from each level of citric acid. The order of mixing/making each block of cheese will be randomized within each milk type.

a. Sketch a design blueprint

- Clearly indicate the experimental units *and* measurement units
- Clearly indicate the blocking factor (show grouping)
- Show how treatments are assigned within blocks

b. In one sentence, explain why blocking is preferable to using milk type as an inclusion criterion.

c. For the RCBD analysis in this module, how should the researchers use the two measurements from each cheese block?

d. Provide the skeleton of the ANOVA table for the analysis of this experiment.

Source of Variation	DF: Total =

e. Suppose the researchers were also interested in whether the effect of citric acid depends on milk type. Why would this be difficult or impossible to assess using the current design?