

## 7.5: Try It!

### ? Exercise 7.5.1

A poultry experiment was run to investigate the effect of diet and antibiotics on egg production. They evaluated 2 diets of interest and 2 specific antibiotics that are on the market. The feed and antibiotic were combined and used to fill the feeding trays in barns. They chose 3 poultry farms at random and randomly assigned the combinations of diet and antibiotic to 4 barns within each farm. Total egg production by the chickens was recorded after 4 weeks.

- What is the experimental design (hint: think about the randomization process)?
- Identify which factors are fixed and which are random.

#### Show Solution

- RCBD
- Fixed factors: Diet and Antibiotic; Random factor: Farms

### ? Exercise 7.5.2

A commercial farmer is studying the corn yield of two fertilizer types at 2 different temperature levels. He strips his cornfield into 20 strips. Each fertilizer type and temperature level combination is then assigned to 5 of the randomly chosen strips.

- What is the Treatment design?
- What is the Randomization design?

#### Show Solution

- $2 \times 2$  factorial with fertilizer types and temperature levels, each having 2 levels
- CRD with 5 replicates

### ? Exercise 7.5.3

An investigator wants to run an experiment in a Latin square design evaluating 5 levels of a treatment (labeled A, B, C, D, and E) and included the layout in a research proposal that you are reviewing. Identify any problems you see and suggest how to revise the design.

A	B	C	D	E
B	C	D	<b>B</b>	A
C	D	E	A	B
D	E	A	B	C
E	A	B	C	D

#### Show Solution

Column 4, row 2, **B** should be **E** to satisfy the property that *each treatment occurs only once in each row and once in each column*. In addition, the rows and columns need to be independently randomized to produce the actual layout of the Latin square for the experimental plan.