For purposes of the following exercises, you may make these assumptions:

- the farmer lives on 1 hen/day for a year
- 1 hen eats 25 grasshoppers/day
- 1,000 grasshoppers have a mass of 1 kg
- 1 grasshopper requires about 30 g of soy/yr
- 1 human requires about 600 grasshoppers/day
- dry soybeans have about 3.3 cal/g

➤ Show all your math using *proper* units.

1. Calculate the number of grasshoppers a hen needs per year.

2. How many grasshoppers are needed for a year's supply of hens for the farmer each year?

3. What is the total mass, in kilograms, of the grasshoppers needed to feed all the hens for one year?

4. How many kilograms of soybeans are needed to feed all the grasshoppers for one year?

5. Estimates of early Native American hunter-gather societies indicate that a person could collect about 90 kg (200 lb) of grasshoppers per hour, when they are abundant. Now suppose the farmer chose to eat grasshoppers instead of hens. How many people could the grasshoppers feed, compared to the one person that the hen fed?

Exercises