

1. All raw milk contains a certain strain of bacteria. Uncontaminated milk has a bacteria count per milliliter of milk that is *normally* distributed with a mean of 2500 bacteria and a standard deviation of 300 bacteria.

Let the random variable $x =$ _____ .

(a). If only *one* 1 ml of milk is tested, what is the probability that the bacteria count is between 2350 and 2650?

(b). If 42 random 1 ml samples of milk are tested, what is the probability that the *mean* bacteria count for the samples will be between 2350 and 2650?

(c). If the health inspector finds that the mean bacteria count for the 42 samples is not between 2350 and 2650, what might he conclude?

2. A large apple farm packs its apples in bushels for shipping. The U.S. standard for weight of a bushel of apples is 48 lbs. Assume the population of bushel weights has a distribution with mean 48 lbs and standard deviation of 5.2 lbs.

(a). If a random sample of 50 bushels is selected, can we assume that the distribution of the sample means is a normal distribution? Why or why not?

(b). If a random sample of 50 bushels is selected, what is the probability that the mean weight will be 42 lbs or lower?

(c). Interpret the results of part(b).