Answer on Question #82646 – Math – Statistics and Probability

Question

Of 535 broiler chickens purchased from various kinds of food stores in different regions of a country and tested for types of bacteria that cause food-borne illnesses, 23% were infected with a particular bacterium.

a) Construct a 95% confidence interval.

b) Explain what your confidence interval says about chicken sold in the country.

c) A government spokesperson claimed that the sample size was too small, relative to the billions of chickens slaughtered each year, to generalize. Is this criticism valid?

Solution

a) $95\% CI = \left(p - z_{0.025}\sqrt{\frac{p(1-p)}{n}}, p + z_{0.025}\sqrt{\frac{p(1-p)}{n}} \right) =$

$$= \left(0.23 - 1.96\sqrt{\frac{0.23 * 0.77}{535}}, 0.23 + 1.96\sqrt{\frac{0.23 * 0.77}{535}} \right) =$$

$$= (0.1943, 0.2657).$$

b) We are 95% confident that the population proportion of the infected broiler chickens lies between 0.1943 and 0.2657.

c) No. Until the necessary assumptions and conditions for the confidence interval are met, the results can be generalized.