Answer on Question #71798 – Math – Statistics and Probability

Question

Hereford cattle are one of the most popular breeds of beef cattle. Based on data from the Hereford Cattle Society, the mean weight of a one-year-old Hereford bull is 1245 pounds, with a standard deviation of 97 pounds. Would it be unusual for the mean weight of 120 head of cattle to be less than 1130 pounds?

Solution

The sampling distribution of the sample means:

$\mu_{\bar{x}} = \mu = 1,245$;

$\sigma_{\bar{x}} = \dfrac{\sigma}{\sqrt{n}} = \dfrac{97}{\sqrt{120}} = 8.85$

Then

$z = \dfrac{\bar{x} - \mu_{\bar{x}}}{\sigma_{\bar{x}}} = \dfrac{1,130 - 1,245}{8.85} = -12.99$

Since the value is located very far from the mean (13 standard deviations below the mean), the event is highly unusual.

Answer: yes, it would be very unusual for the mean weight of 120 head of cattle to be less than 1130 pounds.