

Chapter 7: Hypothesis Testing with One Sample

Testing a Claim about a Mean: σ is Unknown

t-test Example 1

A maker of diet meals claims that the average calorie count of its meals is **800**. A researcher tests **12** meals finds that the average number of calories was **873** with a standard deviation of **25**. Does the evidence support the claim? Let $\alpha = 0.05$. State any assumptions you are making.

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t-test Example 2

Packs of a certain brand of cigarettes carry the specification that the average nicotine content is **0.6 mg/cig.** A government agency analyzes a random sample of **30** of these cigarettes and finds the mean and standard deviation to be **0.63** and **0.11 mg/cig.**, respectively. Do these results suggest that the mean nicotine content is higher than the specified value? Let $\alpha = 0.05$. State any assumptions you are making.

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t-test Example 3

A physical model suggests that the mean temperature increase in the water used as a coolant in a compression chamber should not be more 5°C . Temperature increases in the coolant measured on **8** independent runs of the compression unit give the following data:

6.4, 4.3, 5.7, 4.9, 6.5, 5.9, 6.4, 5.1

- (a) Does the physical data contradict the assertion of the physical model? Let $\alpha = 0.05$.
- (b) What assumptions did you make in part (a)?

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t-test Example 4

E-Canis infection is a tick-borne disease of dogs that is sometimes contracted by humans. In the general population, the mean white blood cell count is **7250/ mm³**. The mean white blood cell count of a random sample of **15** infected persons is **4767/ mm³** and the standard deviation is **3204/ mm³**. Does the data suggest that persons infected with E.Canis have lower white blood cell counts? Carry out the test at the 5% significance level.