

Module 5 Exercise 2 - UBPL 741

Estimation of Confidence Intervals

Learning Objective(s):

- To apply the concepts of estimation and confidence intervals
- To build data analysis skills using Excel

Core concepts/terms:

- Estimation
- Confidence intervals

Evaluation Criteria: You will be graded based on your demonstration of your ability to:

- calculate the statistics correctly,
- apply the statistical calculations to planning decision situations,
- provide clear and concise narrative justifications of the planning decisions made, and
- create relevant graphic representations.

Applications in Practice:

- You may have to make point estimates and generate confidence intervals based on samples.
 - Situations where these approaches may be necessary include generating baseline (fact base) data for a plan document and program analysis.
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Task 1: Working with the University of Kansas Center for Sustainability, KU Dining Services has taken a leadership role in adopting sustainable practices. A few of its initiatives include:

- Recycling: “Cardboard (over 145 tons annually), aluminum cans, plastic (over 6 tons annually), newspaper/office paper and tin cans (over 7.2 tons annually)
- Used cooking oil donation to KU Biofuels Research - 150 gallons each week
- Trayless dining in all residential dining centers leading to a decrease in energy use, water consumption, trash to landfill with overall reduction of: 37% food waste, 55% of beverage/liquid waste, 20% paper of post-consumer waste
- Changed to Earth friendly biodegradable/made from recycled material disposable ware in all retail locations
- “Lose the Lid” campaign: Overall reduction in plastic lid purchases by 33% in the initial year
- Roof top garden Homegrown herbs and tomatoes” (Source: KU Dining Services Sustainability webpage)

KU Dining Services also is moving into composting food waste organically. Currently, however, the food waste must be trucked to Liberty, Missouri. In addition to being costly, this off-site disposal generates greenhouse gas emissions in transport and misses an opportunity to use the composted material on campus grounds or at the KU Student Farm.

Suppose that the Center for Sustainability and KU Dining Services staff are exploring the idea of an organic waste composting facility on West Campus as a pilot project. Facilities planners at KU Design and Construction Management responsible for West Campus land use allocation have indicated that the largest possible facility that can be accommodated at this time is one that handles 500 tons of food waste per day. The goal of Center for Sustainability and KU Dining Services is for the facility to accommodate 10% of KU Dining Services’ compostable materials. For the project to move forward there needs to be 99% assurance that the 10% portion of the compostable materials will not exceed the 500-ton capacity on average.

Should the Center for Sustainability and KU Dining Services pursue the on-campus composting facility?
The data you will need is on the following page.

The following data from KU Dining Services is based on sample of trash generated on 63 days during the 2012-2013 academic year [actually it is made up, but I'm trying to track down the real numbers]:

- Last year, KU Dining Services was responsible for managing 9,750 tons of waste per day on average.
- Assume that we know that the standard error of weight of waste per day for all days was 1,600 tons.
- The best estimate is that 50% of the total waste is compostable.

Recommendation:

Analysis:

What if a 95% assurance was needed?

What if only 68% assurance was needed?