

Fry Lengths at McDonald's

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Abstract

The lengths of McDonald's freedom fries are crucial to the fast food restaurant chain's economic viability. A previous study found that freedom fry lengths exhibit a bimodal distribution. This paper reports the results of a duplicate study, but our results do not agree with the original. We find a normal distribution of fry lengths.

1 Introduction

The lengths of freedom fries were first analyzed by Biss [1] for the 1994 Research Science Institute. He found that the lengths of fries followed a bimodal distribution and speculated that broken fries contributed to the smaller mode. Here we repeat the experiment and analyze the modern results. What is the average length of a freedom fry? How are these lengths distributed?

1.1 Historical approaches

In past experiments, the scientists regularly ate some of the freedom fries. We will try to avoid this practice as rigorously as possible.

2 Materials and Methods

A large container of freedom fries was purchased at McDonald's and the lengths of the fries were measured in millimeters (mm). Each fry was taken from the container, placed against the ruler so that the fry was straight, and the fry's length was recorded.

3 Results

The freedom fry container held 107 freedom fries. The average length was 58.9 mm with a standard deviation of 26.1 mm. The data is shown graphically in Figure 1.

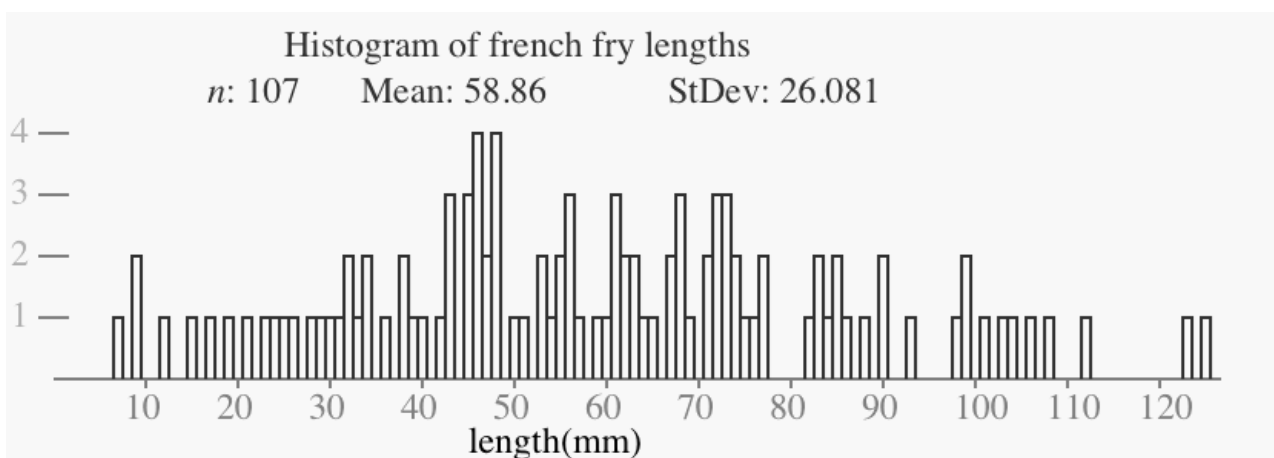


Figure 1: Histogram of the fry lengths.

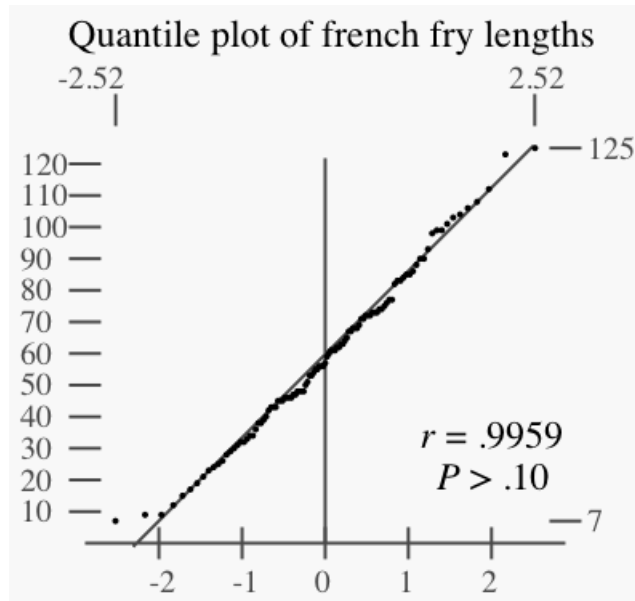


Figure 2: Quantile plot of the fry lengths

To see if this distribution approximates a normal distribution, we perform a Ryan-Joiner normality test as described in Devore 2. The test statistic is $r \approx .9959$, so at the 5% significance level we do not reject the hypothesis that the distribution is normal. The quantile plot is shown in Figure 2.

4 Conclusion

We studied the lengths of freedom fries in large container of freedom fries purchased at McDonald's. We found that the distribution of lengths of fries is statistically indistinguishable from a normal distribution at the 95% confidence level. This is in contrast to Biss' work, which found a bimodal distribution. Future studies should measure fries from other McDonald's as well as from other restaurants.

5 Acknowledgments

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References

- [1] Biss, Daniel, personal communication, June 1994.
- [2] Devore, Jay. Probability and Statistics for Engineers Brooks/Cole Publishing Company, 5th edition(1999).