

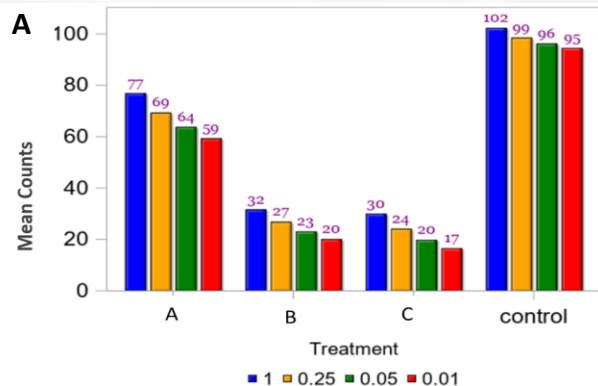
## Introduction

Nematode count data are highly variable, nonnormal, discrete, and skewed. They often include valid '0' observations. Using classical statistical methods for counts can yield inaccurate mean and variance estimates.

**Objective:** Demonstrate that Negative binomial (NB) modeling is more suitable for analyzing nematode counts.

## Methodology

Simulations (500 times, N=10, Mean=10). Modeled using Normal, Lognormal, NB, and Poisson distributional assumptions in SAS 9.4 (PROC GLIMMIX)

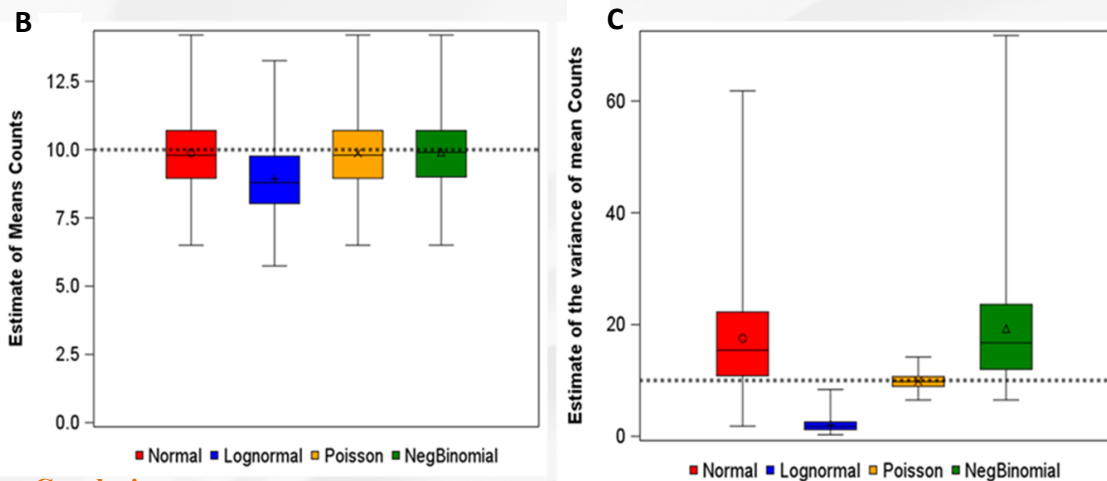


## Results

**Fig. A:** There is evidence that the added constants influence the mean counts. It is challenging to determine the best constant to use to yield an acceptable mean count.

**Fig. B:** Log-transformed means were underestimated compared with Negbinomial-modeled means.

**Fig. C:** Negative binomial distributions explained the high natural variability seen with nematode counts.



## Conclusion

- Generalized linear mixed models (GLMM) analysis of nematode counts with a NB distribution yield more accurate mean and variance estimates.
- We recommend a GLMM approach rather than force nematode count data into ANOVA-conforming analysis using log transformation.