

INFEST: Insect Feeding Behavior Statistics

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EPG can produce valuable and abundant comparative experimental data. Nonetheless, recordings can generate thousands of waveform events that first need to be processed and properly organized to be statistically tractable. The hundreds of variables that can be obtained from the recordings consist of duration and counts, which often presents heteroscedasticity and non-normality. Some computer programs have been developed to process and analyze EPG data. A few of them performs error diagnostics on raw output EPG files. Fewer allow the user to perform statistical analyzes, mostly based on rather restrictive classical methods and/or data transformation. INFEST® is a web application that can process multiple AC-DC EPG recording files and generate several non-sequential and sequential variables, with tools to build informative graphics and models in a user-friendly interface. INFEST's main statistical analysis strategy is based on GAMLSS – Generalized Additive Models for Location, Scale and Shape, a modern and sophisticated modeling framework that allows fitting models assuming several probability distribution models for the response variable, including Gaussian and, already implemented in INFEST, at least eleven more distribution models such as Gamma, Weibull and a couple of distributions for zero-inflated data. Users can easily find the best fitting model and use it to perform multiple comparisons of treatment means. And not only means, but also variances can be modeled. Inference is based on likelihood ratio tests. The recent INFEST v.1.1 can be accessed and run at: <https://arsilva.shinyapps.io/infest/>