

Statistical evaluation of graded histopathological findings

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In the evaluation of (eco)toxicological assays, the following basic paradox exists: there are sophisticated methods for continuous endpoints, with commonly rather low toxicological relevance, but hardly any methods for ordered categorical data, which are relevant.

Five approaches for comparing doses vs. control are discussed comparatively using real data examples with a particular focus on interpretable effect sizes and their simultaneous confidence intervals: i) simple data transformation approach, ii) $gl(m)m$ assuming extra-Poisson variability between the animals, iii) a nonparametric Williams-type test for relative effect sizes iv) cumulative logit link model, and v) a collapsing categories c -by- k table trend test using either a resampling or multiple marginal model approach.

Finally, related CRAN packages are discussed for these approaches.