


How can I take natural survival/mortality (titration for quantal data) into account?

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Answer:

The natural survival and natural death rates correspond to the lower and upper asymptotes of the sigmoid curve linking response rates and dose. By default, these asymptotes are estimated from observed data. However, their value can also be set via 'Options > Advanced > Preferences' (or F12); the parameters $d =$ and $a =$ correspond to the lower asymptote and the difference between the asymptotes, respectively.

Example 1: We are interested in post-treatment survival rates. We know from experience that 10% of the untreated controls will survive (natural survival) and that 20% will die irrespective of the dose administered (natural mortality). The analysis can be carried out using the set values $d = 0.1$ and $a = 0.7$.

Example 2: Now let us assume that 10% of the untreated controls survive, but that the natural mortality rate has not been clearly established. The analysis can be carried out using the set values $d = 0.1$ and $a = 0.7$, as was the case in our first example, but with the 'fixed' option unchecked for parameter a .

Remark 1: In practice, it is rare for quantal responses to allow estimation of the asymptotes from the observed data. Knowledge from past experiments is usually necessary to specify the asymptotes explicitly. It should also be noted that, for the analysis of variance and the confidence limits, CombiStats does not take into account the fact that the asymptotes are estimated from the data. They are treated, even after estimation, as known and fixed.

Remark 2: It is possible to use a fixed upper asymptote and an unknown lower asymptote, but it requires a little trick because there is no way to specify a fixed upper asymptote without knowledge of the lower asymptote. The trick is to use the complementary rates, either by specifying $y' = 1 - r/n$ in the advanced options or by typing the complementary rates explicitly in the tables.