Combined between-and within patient response surface pathway design

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Background: This study describes a combination of between- and within patient in a two dimensional Response Surface Pathway (RSP) design and introduce a randomization procedure in the clinical trial. This development is exemplified by a dose-response study of Qlice in treatment of Atlantic salmon against sea lice (salmon louse).

Methods: The study was performed as a “between-patient” three level RSP trial in single dose finding and “within-patient” RSP in duration of the dose. Reduction in lice was the outcome variable. The study consisted of 15 net pens (3.6 mill. salmon incl. control) with minimum 4 lice/fish. The study was conducted to determine the minimum efficient dose (MED) of a new treatment procedure. Adjustment of the dose from one design level to the next and duration between treatments within net pens was based on k-adjustment factors estimated to ensure coverage of the entire two predefined windows. Three net pens were included on the first dose/design level, five on the second and seven on the third. In order to obtain the “between patient” RSP in the dose arm, a randomization procedure was introduced.

Results: The optimal dose procedure of Qlice was estimated to 8.0 mg/kg biomass distributed during a period of 2 hours and 10 minutes. This dose procedure reduced the percent lice with 83.6%. No obvious interaction between dose and duration of dosage was detected. No adverse events were recorded.

Conclusion: Both the two dimensional RSP design and the randomization procedure used in the dose-arm worked satisfactorily in the field.

Biography
Trond Holand graduated as a veterinarian from the Norwegian School of Veterinary Science (NVH), Oslo, Norway in 1995. Besides experience from practice as a veterinary surgeon, he is co-founder of US based OptiNose Inc. (www.optinose.com) with strong phase III results and has 12 years experience from medical research and contributed to 8 publications in international medical journals. He started as a PhD fellow at NVH with Prof. Stig Larsen in 2013 and will finalize his thesis in Clinical Research Methodology in 2015.