Adaptation of the ICMSF spreadsheet

To be able to calculate the performance of mixed qualitative/quantitative plans, the ICMSF spreadsheet was adapted.

Legan et al. (2001) described the procedure for quantitative 2- and 3-class sampling plans, using a lognormal distribution of the concentration in the food to describe the probability that a sample will have a logC below *m* (P_a) or between *m* and *M* (P_m). With these values the probability of accepting a sampling plan with a given *n* and *c* value is then calculated (using the binomial distribution). This was implemented in the first version of the ICMSF sampling tool. Van Schothorst et al. (2009) described the use of the Poisson-Lognormal distribution to describe the P_a for a presence/absence test, given a certain sample weight, which was then implemented additionally to the ICMSF sampling tool.

For this research the tool was further extended to include 3-class plans having a quantitative upper limit but with an *m* based on presence/absence.

For a quantitative 3-class plan P_a and P_m are calculated by

P_a= NORMSDIST((*m*-logC)/sigma)

P_m= NORMSDIST((*M*-logC)/sigma)-NORMSDIST((*m*-logC)/sigma) = NORMSDIST((*M*-logC)/sigma)-P_a

In the mixed 3-class plan the formulas are changed in the following manner:

P_a= 1-PoissonLogNormal(logC, sigma, sample weight)

P_m= NORMSDIST((*M*-logC)/sigma)-P_a

Where PoissonLogNormal is calculated by

$$Poissonlognormal(\mu_{logC}, \sigma, weight) = \int_{-\infty}^{\infty} Pnormal(logC, \mu_{logC}, \sigma)\Big(1 - Poisson(0, 10^{logC} \cdot \ weigth)\Big) dlogC$$