

**Evaluating bias in an observer and self-sampling discard programme**

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Sampling bias in selecting discards samples is an issue in self-sampling. To exclude spatial and seasonal variations and possible bias in sorting of discards, a co-sampling programme was implemented since 2011. From an unbiased estimator the variance of haul effect and fish residuals is estimated from the variance components. Results show that scientific observers overlook a number of fish species (mean=7.0,  $p < 0.01$ ). The most frequently detected species in both programmes is lemon sole and plaice, among others. The mean lengths is compared for several target and bycatch species that are found in the samples. The length measurement of each individual fish is decomposed into grand mean, haul effect and residuals. An unbiased estimator is used to estimate the grand mean, and variance of haul effect and fish residuals can be estimated from the variance components. Non-parametric bootstrapping method is used to estimate the mean difference of mean length and variance components. Results show that self-sampling exhibits an average of 1.2cm (95%CI 0.34-2.1cm) shorter plaice than observer samples, while for lemon sole no difference is detected (-0.1, 95%CI -0.7-0.5cm). This result suggests bias in sampling of plaice from the discards fraction. Self-sampling programme yields a smaller sampling variance of mean length than observer (0.07 vs. 0.20cm<sup>2</sup> for plaice, 0.10 vs. 0.12cm<sup>2</sup> for lemon sole). The estimated population variance of haul and fish are 3.10 and 11.29cm<sup>2</sup> (plaice), 2.04 and 8.7cm<sup>2</sup> (lemon sole). The next step is to include non-co-sampled hauls and trips and conduct a variance component analysis.

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