VALIDATION OF SELECTION FOR IMPROVED GROWTH AND FILLET PIGMENTATION IN ATLANTIC SALMON FED CONVENTIONAL AND INNOVATIVE DIETS*

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In selective breeding different methods to estimate breeding values, i.e., based on pedigree (EBVs), and/or genomics (GEBVs), coupled with different prediction accuracies, or marker assisted selection (MAS) can be utilized to select towards the breeding goals. To validate the precision of selection today and for possible future conditions, offspring performance from conventional and innovative environments (in terms of diets) can be compared with predicted values of parents. The objective of this study was to validate different selection methods to improve growth and fillet pigmentation in a commercial breeding nucleus of Atlantic salmon fed two different diets. 75 full-sib families (Benchmark Genetics Norway), with parental predictions based on phenotypes and genotypes of different datasets, were reared in four semi-commercial net pens in Norway; two cages were fed with conventional diet (fish oil and fish meal) and two with innovative diet (algae oil and insect meal). At termination fish fed conventional (N=1605) and innovative (N=1328) diet, were individually recorded at respective average body weights 1581 g and 1372 g, and 107 and 86 individuals representing the two respective diets from 5 (3 red/2 pale) MAS selected families were assessed for pigmentation in fillet by NIR technology. The families evaluated by MAS to have red fillets had on average 18% and 10% better colour compared to families predicted to have pale fillets, given conventional and innovative diets, respectively. Correlations between predicted growth values and offspring growth performance will be compared for pedigree and genomic based predictions for offspring fed conventional and innovative diets.

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