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A FIRST DEMONSTRATION OF REALIZED SELECTION RESPONSE FOR FILLET YIELD IN FISH, IN RAINBOW TROUT *ONCORHYNCHUS MYKISS*

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Fillet yield, the proportion of edible fillet relative to body weight, is a major trait to improve in fish sold processed, as it has a direct impact on profitability and can simultaneously decrease the environmental impact of producing a given amount of fillet. However, it is difficult to improve by selective breeding, because it cannot be measured on live breeding candidates, its phenotypic variation is low, and, as a ratio, it is not normally distributed and a same change in fillet yield can be the result of different changes fillet weight and body weight. Residual headless gutted carcass weight (rHGCW) was previously shown to be heritable and highly genetically correlated to Fillet% in rainbow trout, and can be predicted by the ratio of abdominal wall thickness to depth of the peritoneal cavity (E8/E23), measured on live fish by ultrasound tomography. We selected broodstock from the breeding programme of Aquaculteurs Bretons, using rHGCW EBVs estimated from slaughtered sibs, EBVs of E8/E23 measured on the live breeding candidates, or a combination of both. Seven groups of candidates were selected: with 15% highest (HGC+) or lowest (HGC-) EBV for rHGCW, with 15% highest (Echo+) or lowest (Echo-) EBV for E8/E23, with both HGC+ and Echo+ (HE+) or HGC- and Echo- (HE-), or with close to zero EBVs for both traits (mid). Seven corresponding groups of offspring were produced on the same day and reared communally since eyed stage. At harvest size (1.5 kg mean weight), 1561 individuals were slaughtered and measured for the traits of interest. Positive and negative significant realized responses (higher or lower EBV) were observed on rHGCW for HE+, HGC+ and Echo + groups. The phenotypic mean for Fillet% (correlated response), was higher in up-selected fish than in down-selected fish. The highest difference was between HE+ (69.4%) and HE- (68.2%), a 1.2% difference in fillet percentage. The change in Fillet% was explained by an opposite change in Viscera%, while Head % remained stable. Selection using sib info on rHGCW was more efficient than selection using own E8/E23 phenotypes, and downward selection (decreasing Fillet%) was more efficient than upward selection.

Keywords: Fillet yield, rainbow trout, selective breeding

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