COMPARATIVE GROWTH OF ALL-FEMALE VERSUS MIXED SEX YELLOW PERCH (*Perca flavescens*) IN RECIRCULATING AQUACULTURE SYSTEMS

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ABSTRACT

Nine, production-scale, recirculating aquaculture systems were utilized to compare the growth parameters between all-female and mixed sex yellow perch stocks. Each system was stocked with 455 fish m^{-3} and contained one of three different biofilter types: a rotating biological contactor, a trickling filter or a bead filter. The all-female fingerlings (S1) used were originally derived from Lake Mendota, Wisconsin. The mixed-sex fingerlings (S2) used were originally derived from Lake Erie. Temperature and photoperiod (23^{o}C, 16H-L) were maintained at levels for optimal growth.

Absolute growth rates ranged from 0.27-0.48 g/day. Mean final density within treatments was 42.8 kg/m^3 and ranged from 37.2-50.2 kg/m^3. The main effect of stock did not have a significant effect on growth ($p > .1$). All-female treatments exhibited more uniform growth. The main effect of filter type did have a significant effect on fish growth ($p < .01$), with fish in tanks containing trickling filters exhibiting significantly higher growth. Total feed conversion averaged 1.61 across all treatments and ranged from 1.38-1.78. S1 treatments consumed a significantly higher percent body weight per day than S2 treatments ($p < .05$).

Analysis of PIT tagged individuals revealed that the mean relative growth rate was significantly higher in S2 individuals (513.9%) compared to S1 individuals (315.3%:

$p < .01$). S2 females (597.8%) grew 1.9 times faster than S1 females (315.3%: $p < .01$). Within S2 individuals, females (597.8%) grew 1.5 times faster than males (395.2%: $p < .05$). For all individuals, 33.6% of the variation in final weight was explained by the variation in initial weight. Differences in the geographic strain or culture history of these stocks may have had a larger overall effect on growth than sexual classification (all-female or mixed sex).

Dress percentage of skin-on butterfly fillets was examined in 20 individuals per stock and in six groups of 20 individuals per stock. Within S2 individuals, 73.7% were female. Mean fillet yield was significantly greater in S1 individuals (47.6%) compared to S2 individuals (43.0%: $p < .01$). Mean GSI in S1 individuals (1.01%) was significantly higher than S2 individuals (0.54%: $p < .05$). Within S2 individuals, mean GSI was significantly higher in females (0.70%) when compared to males (0.08%: $p < .05$). Fillet yield was significantly greater in S1 groups (47.2%) compared to S2 groups (44.9%: $p < .01$). Within each stock fillet yield increased with size.

The difference in fillet yield demonstrated between these stocks may be a result of differences in strain of origin. The identification of superior yellow perch strains or strain crosses with regard to growth rate and fillet percentage is of considerable importance to the industry.