HIGH PERFORMANCE GROWTH AND PROTEIN TURNOVER OF INDIVIDUAL RAINBOW TROUT (*O. mykiss*)

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Recent studies have shown that individual fish can consume similar amounts of food and yet exhibit markedly different growth rates (reviewed in McCarthy *et al.* 1993). However, the physiological mechanisms bringing about these differences are unclear (see Houlihan 1991, Houlihan *et al.* 1993). Here we examine how (1) digestive capacity (trypsin activity, size of pyloric caeca), (2) protein turnover and (3) RNA concentration/activity may correlate with the growth performance of individual fish. The analysis of nine pairs of fish with similar protein consumption rates but different rates of protein growth revealed that more efficient fish exhibited reduced degradation rates (synthesis minus growth); this was the only significant difference between the fish. In the inefficient fish, significant linear relationships were found between protein consumption and rates of protein synthesis, growth and degradation. Similar linear consumption/synthesis and consumption/growth relationships were found for the efficient fish. However, for a given rate of protein intake, synthesis rates were lower and growth higher in the efficient fish. Degradation rates were independent of ration in the efficient fish. Since higher rates of synthesis and degradation will increase the energetic costs of growth for an individual, the results support the hypothesis that individual differences in protein turnover are important determinants of growth efficiency in fish.

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