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WOLFFISHES, IDEAL SPECIES FOR INTENSIVE AQUACULTURE: REARING DENSITY AND WELFARE ASSESSMENT

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ABSTRACT Size-dependent stocking density is considered a priority topic in aquaculture research due to its incidence on the welfare of farmed fish and the need for future recommendations governing stocking density of novel fish productions. It is also mandatory for the evaluation of production costs aimed at profitable farm operations, especially when land-based recirculation technology is the favoured rearing strategy. Spotted wolfish is a promising marine fish species and a candidate species in Quebec, Canada. Wolffishes displays strong domestication traits including a "low-stressed" behaviour. Reports on the physiological responses to stressors of spotted wolffish are scarce and stocking density recommendations for small size fish (range of 50-200g) are not yet available. A first trial evaluated the growth response of 50-100g juvenile wolffish to increasing densities (10, 20 and 40 Kg· m^2 in duplicates) in order to identify the preferred range of density to evaluate more closely. A second trial was conducted in triplicates at fixed densities (20, 30 and 40 Kg· m^2) on 100-170g fish. Growth was only slightly impaired in the increasing densities trial where final densities reached >50 Kg· m^2. Acute stress challenge tests were conducted at the end of the growth trials. Cortisol, ionic composition, HSI, hematocrit, plasma protein and water content (liver and muscle), lysozyme activity were measured. Sedentary life-style of the spotted wolffish (sluggish swimmers and bottom occupancy) is a possible explanation for the observed weak primary, secondary and tertiary stress responses but most likely wolffishes can be considered highly resistant to stress and crowding conditions.

Keywords: wolffish, *Anarhichas minor*, intensive aquaculture, density, welfare, sustainable aquaculture, stress.