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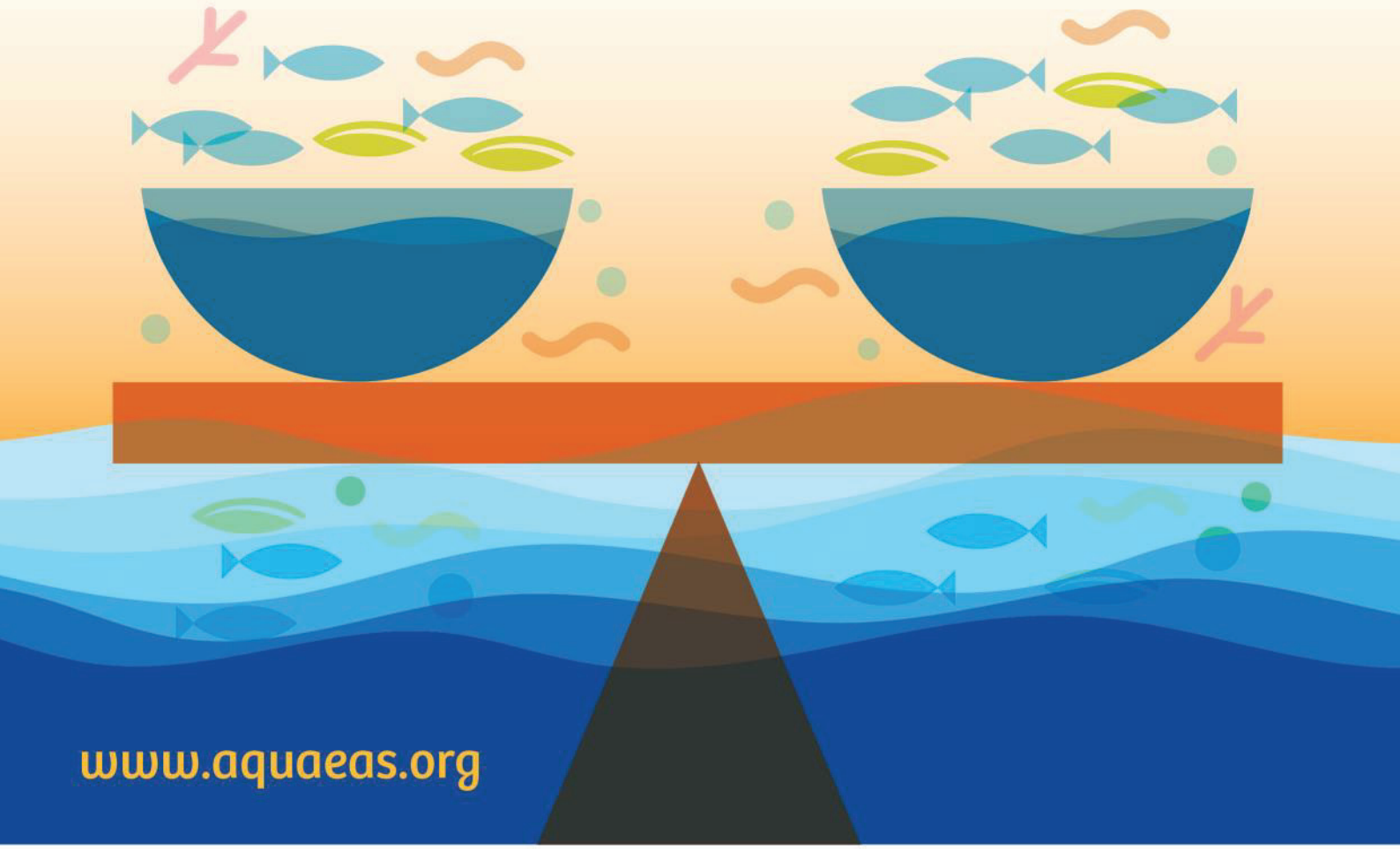

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ABSTRACTS

THE HIGHER STOCKING DENSITY THE BETTER PHYSIOLOGICAL STATUS OF *Seriola dumerili* UNDER RAS CONDITIONS

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Introduction
The diversification of species can be a good strategy for the economic success of the aquaculture industry. This strategy has been followed in Europe with international projects like DIVERSIFY, which highlights the role of some species, as *Seriola dumerili*, for its great potential, both taking biological and economic issues (Robles & Mylonas, 2017). For this purpose, it is necessary to determine optimal culture conditions for this species and one of these basic conditions is the stocking density. A first approach in this field was made by Jerez et al. (2017), who evaluated the effects of different stocking densities on this species. This study reached a maximum density of ~7 Kg/m^3 for the high-density group, which showed a lower growth performance. However, our study was aimed to evaluate the metabolic orchestration, intestinal well-being and welfare reaching stocking densities higher than 30 Kg/m^3 for the high-density group.

Material and Methods
Greater amberjacks were obtained from natural spawning at the Marine Scientific and Technological Park of ECOAQUA Institute of the University of Las Palmas de Gran Canaria (Las Palmas, Canary Islands, Spain) and transferred to the Centro Tecnológico de la Acuicultura (CTAQUA, El Puerto de Santa María, Cádiz, Spain). Then, a total of 588 individuals (~ 24 g initial body mass) were distributed in a RAS system with 9 tanks of 400 L, which constituted the 3 experimental groups (in triplicate): i) Low Stocking Density (LSD), with a final estimated density of 8 Kg/m^3; ii) Medium Stocking Density (MSD), with a final estimated density of 16 Kg/m^3 and iii) High Stocking Density (HSD), with a final estimated density of 32 Kg/m^3. After 72 days of an *ad libitum*-feeding trial, a biometric sampling was done, and samples from plasma, liver and muscle were taken. Somatic and zootechnical indices were calculated, and samples from each tissue were analysed.

Results and Discussion
No significant differences were observed in the final body mass of the fish in any experimental group. In addition, the Fulton's condition factor (K) did not show any differences either, so fish in the three densities grew allometrically. Therefore, the results in terms of growth performance are positive and, moreover, parameters such as the specific growth rate (SGR) show normal values in all three groups (Jerez et al., 2017; Fernández□Montero a., 2018; Monge□Ortiz et al., 2018). In terms of somatic indices, only the mesenteric index (MSI) showed significant differences, with an increase in perivisceral fat of the MSD group, concomitantly with i) higher lipid deposition in the liver, and ii) the lowest intestinal selectivity denoted by epithelial resistance (Rt). Finally, regarding intermediary metabolism, the results show a higher energy mobilisation with increasing density, which can be invested in growth performance. Interestingly, the MSD and HSD groups had significantly lower cortisol levels than the LSD group, which can be the cause or the consequence of the gregarious nature in juveniles of this species (Mazzola et al., 2000).

Results obtained in the present study, focussed on the combination of different analytical approaches, indicated that a higher stocking density than the highest currently used for *Seriola dumerili* herein is possible, since neither the growth performance nor the welfare of the individuals was negatively affected. Furthermore, these findings are highly transferable to the aquaculture sector, making the culture of this species more profitable, where the recommended stocking density could be set, at least, at 30 kg/m^3 without impact on fish performance parameters.

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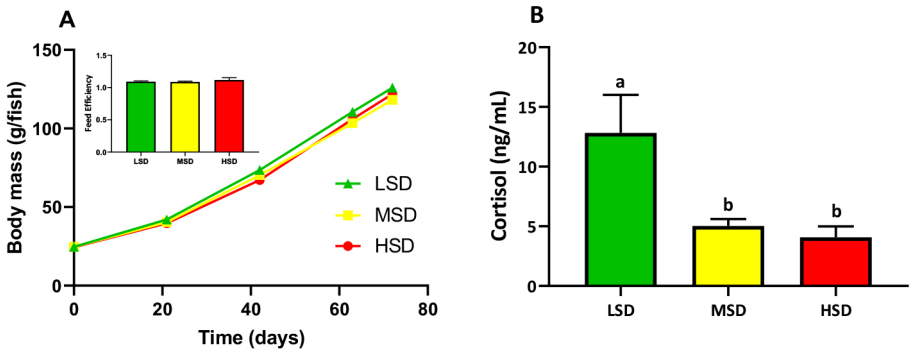

Fig. 1. Evolution of the wet body mass and feed efficiency (**A**), and cortisol levels (**B**) of *S. dumerili* juveniles cultured in three different stocking densities. The results are expressed as the average ± SEM (n = 12 fish). Different letters represent statistically significant differences at a p-value<0.05 resulting from the one-way ANOVA analysis.

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