

TITLE: COMMERCIAL FLAVOUR UTILIZATION IN SOLE FEEDS. EVALUATION OF EFFICACY ON BEHAVIOUR AND GROWTH.

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Sole is one of the species concentrating a higher interest as a potential candidate for industrial aquacultural production. The main interest of the species arises from its gastronomic appreciation. Furthermore, the sole could be a feasible substitute of other cultured species produced in land-based facilities. The soleids could use those facilities with few or even none significant changes in the existent infrastructures. Nevertheless, both the reproduction and the feeding of sole are not completely under control. The feeding of sole is the subject of the present thesis.

Sole's trophic profile does not include fish, but polichaeta, molluscs and crustaceans that sole can find while burrowed in the sand. Due to its nocturnal and benthonic habits and in order to develop the feeding activity, the sole possesses special sensorial equipment constituted by chemoreceptors and mechanoreceptors, relying scarcely on vision. Such feeding strategy implies specific organoleptic requirements, which are difficult to satisfy with conventional feeds formulated on fishmeal as a main ingredient.

In the present work, a commercial flavour was added to the feed. This is a common strategy in other areas of animal production, where industrial flavours are used to promote intake in the earlier life stages and also to hide the unpleasant taste of vitamins, supplements or therapeutics.

The efficacy of different feeds including commercial flavour was compared with that of feeds including betaine. This compound has for long been considered the most efficient attractant for sole, but at too high an economic cost. Control feeds, without any organoleptic modification were also offered to the soles. All experimental feeds were formulated under commercial standards in order to easy the transfer of results to the industrial sector.

The influence of flavour addition was evaluated through two aspects: first, through the changes in the feeding behaviour, and second through the improvement of the most relevant productive parameters, i.e. growth, survival and size dispersion.

Using an ethological methodology specifically adapted to the sole feeding behaviour, it may be concluded that the addition of this commercial flavour improves the attraction of the feed, inducing the fish to swim to the vicinity of the feed from a certain distance and to taste it. The improvement of the palatability is not so clear. In a trial including two groups of fish with different sizes, the bigger fish preferred the feeds including flavour, while the smaller fish were more efficiently attracted by those feeds including betaine.

In disagreement with other results reported in the literature, the feeds without any organoleptic modification, and thus with a dominant taste of fishmeal which would make the feed unpalatable for sole, are accepted by the fish in the present work. This conclusion allows to optimistically look at the feeding of sole with dry diets similar to those utilized for less exigent species in a near future.