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SUMMARY

This output identified the level of essential fatty acids (DHA and EPA) required by meagre (*Argyrosomus regius*) juveniles for healthy growth performance and liver composition. Results showed that the dietary essential fatty acid requirement (DHA and EPA) for meagre juveniles is at least 2 % of the diet dry weight. This information is important for the formulation of meagre juvenile diets, and will be of particular interest to meagre feed producers and farmers.

KNOWLEDGE NEED

Meagre is a relatively new, promising aquaculture species with high growth rate, feed efficiency and easy adaptation to captivity. It is important to establish a nutritious and balanced diet for meagre, for both the welfare of the fish and the sustainability of the meagre industry. Knowledge on the nutritional requirements of this species is scarce, especially regarding essential fatty acids, which are required to sustain growth, development, immune status and survival.



Meagres © C. Messier



POTENTIAL IMPACT

- Improved nutrition and welfare of meagre.
- Increased sustainability of the meagre farming industry.
- A better understanding of the nutritional requirements of meagre.

EATiP - Strategic Research and Innovation Agenda (SRIA) Thematic Area 4 - Sustainable Feed Production; Goal 1. To see the full list and descriptions of the thematic areas and goals, please visit: eatip.eu/?page_id=46

UNDERLYING SCIENCE

The effect of dietary essential fatty acids DHA and EPA on growth performance and liver composition of meagre juveniles was examined. A trial with meagre fingerlings, with an initial body weight of 2.80 ± 0.23 g (mean \pm SE) and an initial total length of 6.37 ± 0.20 cm (mean \pm SE), was conducted in 15 experimental filtered tanks with sea water at a density of 45 fish per tank. Five isoproteic and isolipid experimental diets were formulated replacing fish oil with vegetable oils (linseed, palm and rapeseed) to obtain five dietary levels of n-3 LC-PUFA: 0.8, 1.4, 2.0, 2.6 and 3.5 % DW (dry weight), where EPA and DHA represented 93 % of total n-3 LC-PUFA. Fish were fed one of the experimental diets three times a day, six days per week for a total of 30 days. At the end of the trial, liver samples were weighed and collected for biochemical analysis and histological examination.

RESULTS

- The results showed that the dietary essential fatty acid requirement (DHA and EPA) for meagre juveniles is at least 2 % of the diet dry weight. This allows for growth maintenance and normal hepatic Essential Fatty Acid (EFA) composition.
- When fed below this level, meagre showed lower growth and significantly reduced EFA contents in liver, as well as an increase of hepatosomatic index and EPA and DHA/oleic acid ratio which is an indicator of EFA deficiency.
- 2.0 % EFA diet reduced the steatosis (abnormal retention of fat (lipids) within a cell or organ) caused by EFA-deficiency as seen in 0.9 % EFA-fed meagre.

END-USERS & POTENTIAL APPLICATIONS

END-USER 1: Meagre farmers

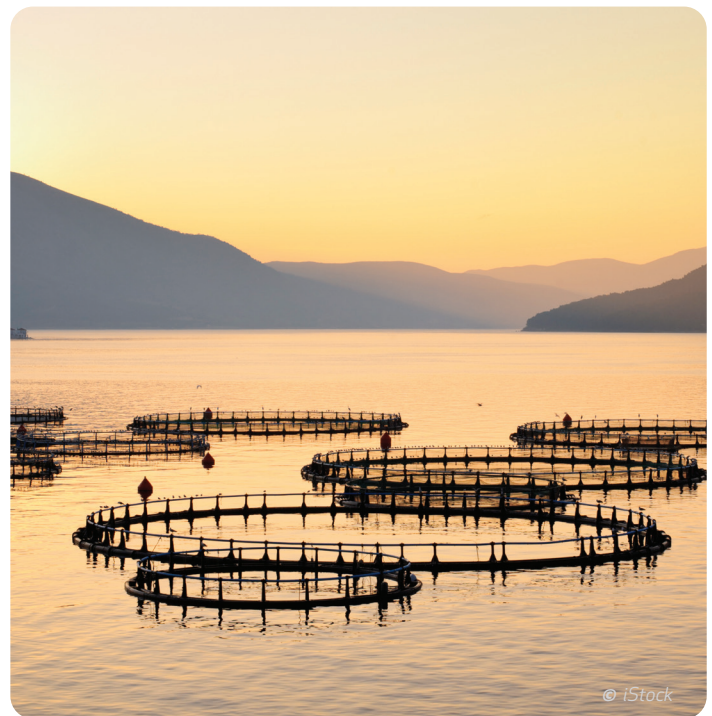
APPLICATION: Meagre farmers can make use of this knowledge by buying suitable fish feed, producing healthier meagre.

END-USER 2: Aquaculture feed producers

APPLICATION: Feed producers can apply these findings by developing fish feed diets specific for meagre that meet its EFA requirements.

END-USER 3: Scientific community

APPLICATION: Furthering knowledge of the dietary requirements of this relatively new aquaculture species.



STATUS

Technology Readiness Level (TRL) 3 – experimental proof of concept

- This research has been shared in a publication in the journal *Aquaculture* entitled "Essential fatty acid deficiency increases hepatic non-infectious granulomatosis incidence in meagre (*Argyrosomus regius*, Asso 1801) fingerlings."

**AT A
GLANCE**

TITLE: Dietary requirements for essential fatty acids in meagre juveniles

KNOWLEDGE TYPE: Exploitable scientific result

WHERE TO FIND IT: doi.org/10.1016/j.aquaculture.2019.02.048

STATUS: Published

TNA FACILITY USED: Universidad de Las Palmas de Gran Canaria - Feed Ingredients-additives Testing Unit (ULPG FITU), Spain

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PATENTS OR OTHER IPR EXPLOITATIONS: No