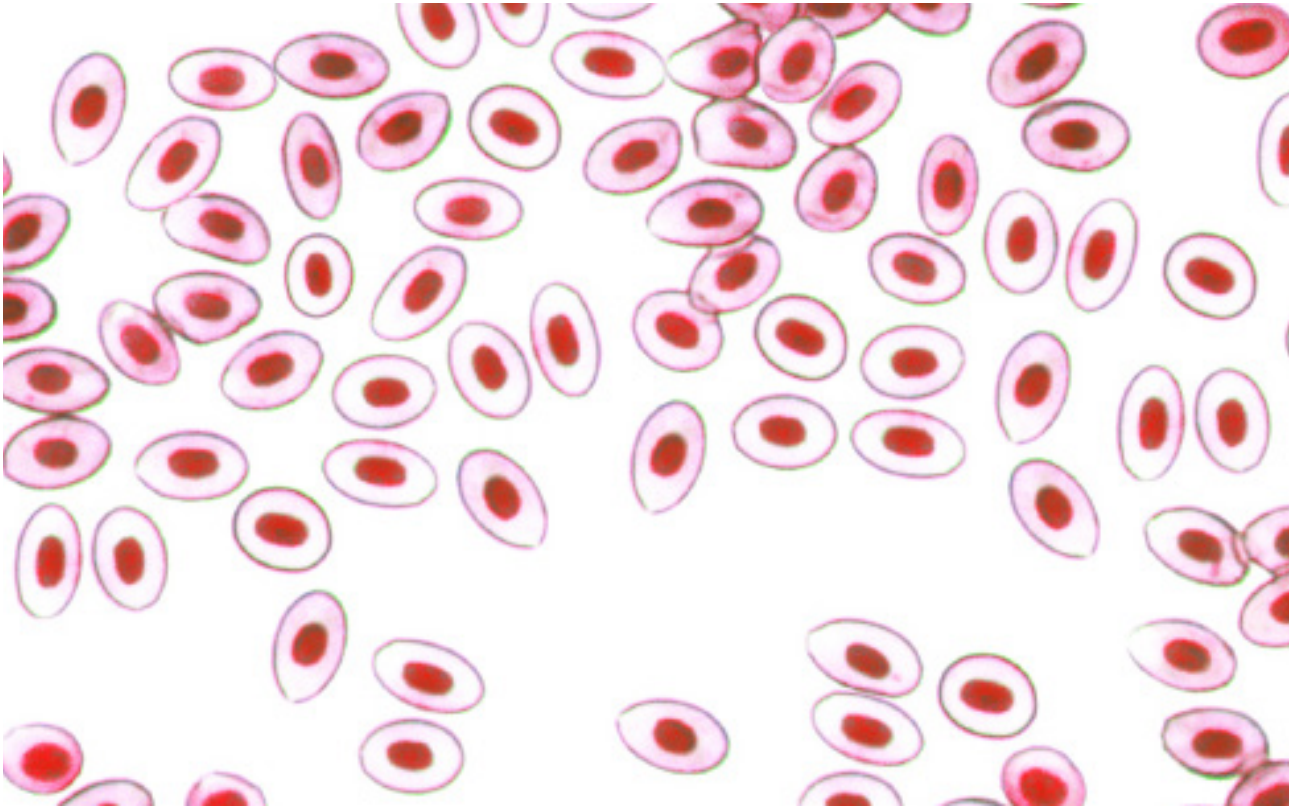


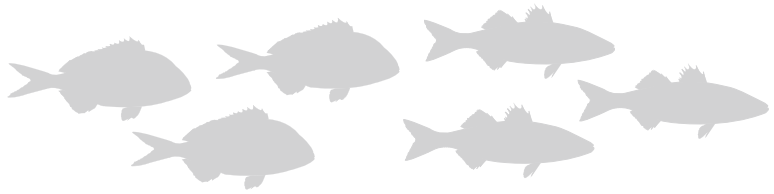
## The proven choice for summer



Summer water temperatures can exceed the optimal range for sea bass and sea bream, and result in a lack of oxygen availability. Supporting the fish with the right nutrition can help them overcome these challenging conditions.



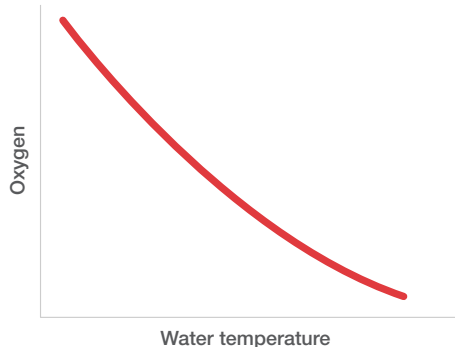
# Oxygen availability



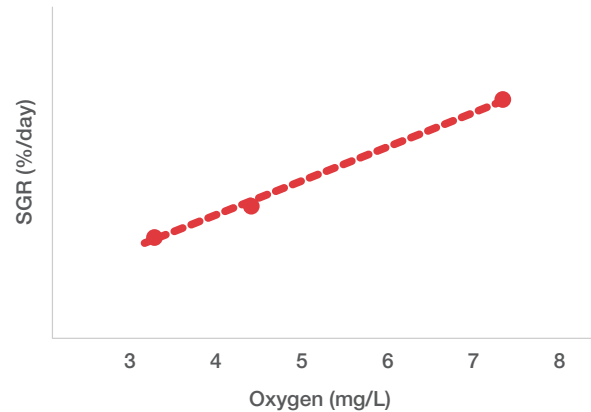
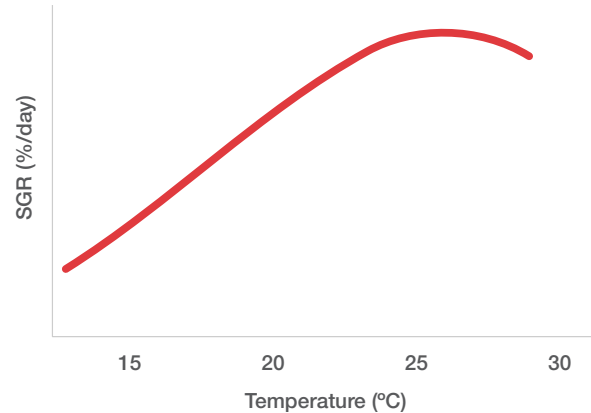
# Oxygen availability

Oxygen solubility decreases as water temperature increases. In warm conditions, this means there is less oxygen available for the fish.

HTO2 supports sea bass and sea bream in low oxygen conditions by increasing the number of red blood cells, so the fish can maximise the effectiveness of the oxygen that is available. This ensures more oxygen is available for growth.



*Oxygen solubility decreases with increasing water temperature.*



*Growth rate of sea bass and sea bream decreases above optimal temperatures and under low oxygen conditions.*

Figures adapted from Person-Le Ruyet et al. (2007) Aquaculture 237, Pichevant et al. (2001) Journal of Fish Biology 59, Hernandez et al. (2003) Ecological modelling 165.



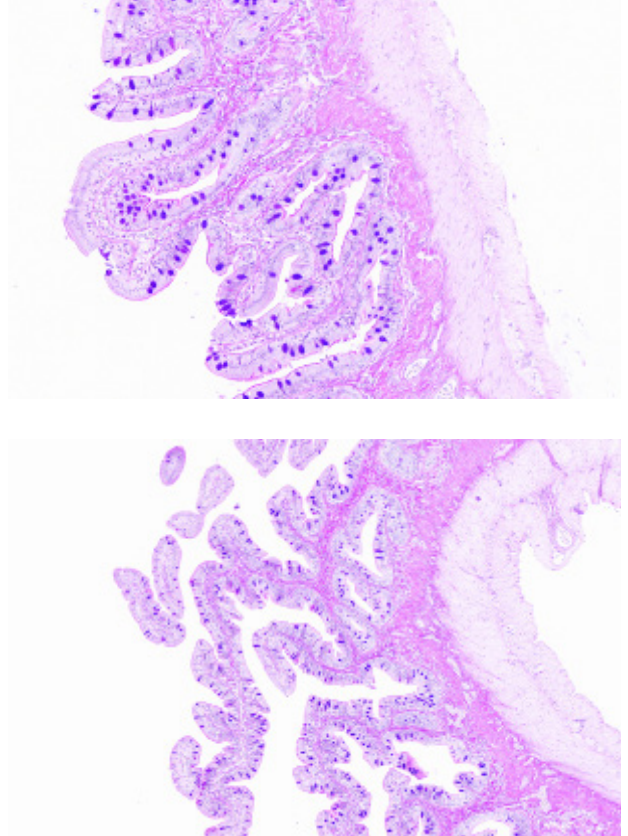
The background of the slide is a microscopic image of intestinal tissue, showing the characteristic finger-like projections of the villi. The tissue is stained, giving it a reddish-pink appearance. A semi-transparent horizontal band is centered across the image, containing the text "Gut functionality" in a bold, grey, sans-serif font.

# Gut functionality

## Restored gut functionality

High water temperatures have been shown to disrupt the barrier function of fish intestinal membranes, leaving fish more vulnerable to nutrient leakage and invasion by pathogens.

Investigations at Skretting Aquaculture Innovation (AI) have identified functional feed additives effective in stabilising the gut which, along with appropriate antioxidants, have proven to be effective measures against the negative effects of high water temperatures.



*Histological images of sea bass gut after feeding with a control feed (above) and with HTO2 (below). The gut from the fish fed HTO2 is much more complex, with increased surface area to maximise absorption and therefore fish performance.*





# **Antioxidant status**

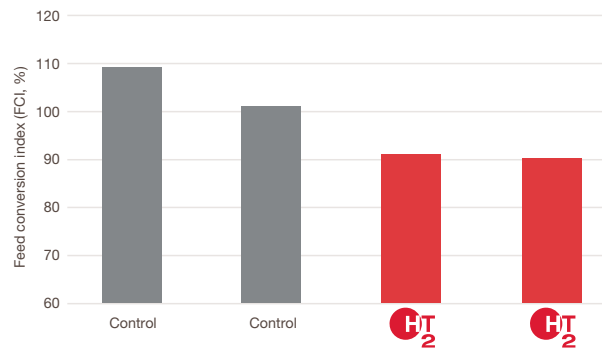
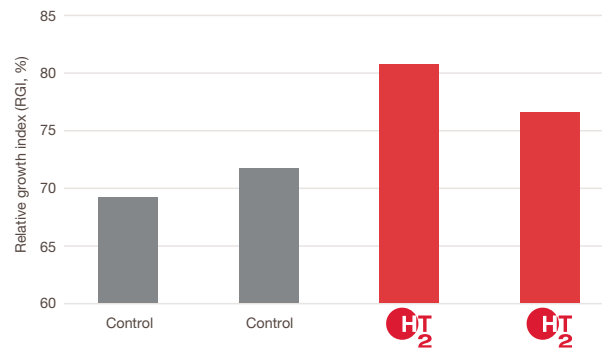
## **Improved antioxidant capacity**

Free radicals are formed during many forms of stress, such as temperature, low oxygen, inflammation and pollutants. It is important that free radicals (pro-oxidants) are in balance with antioxidant processes, or damage can occur within the body.

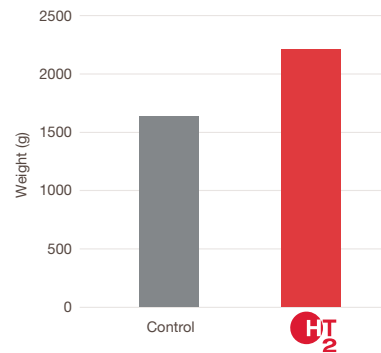
Organisms have an arrangement of antioxidant metabolites and enzymes that work to prevent oxidative damage to cellular components such as DNA, proteins and lipids. Under high water temperatures, the antioxidant status of fish can be impaired.

HTO2 is formulated with a higher natural lipid-soluble antioxidant content to compensate and restore the antioxidant status in sea bass and sea bream.

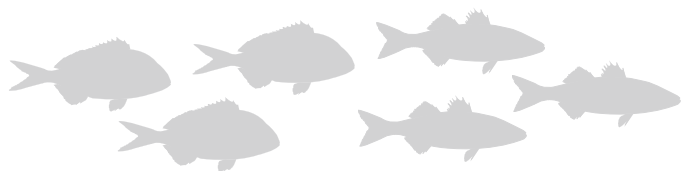
# Field validation



*Results of field validation trials run by Skretting at different farms in the Mediterranean under summer conditions. Feeding HTO2 to sea bass resulted in improved growth rate and feed efficiency.*

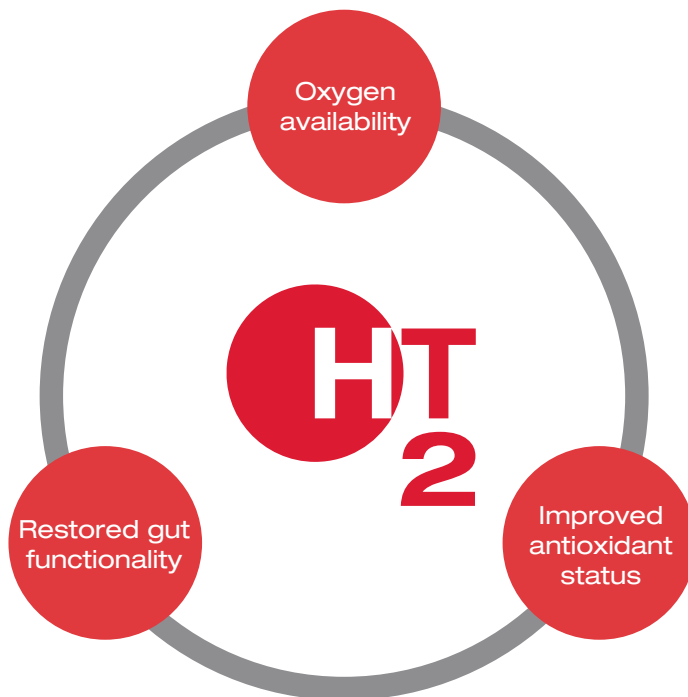






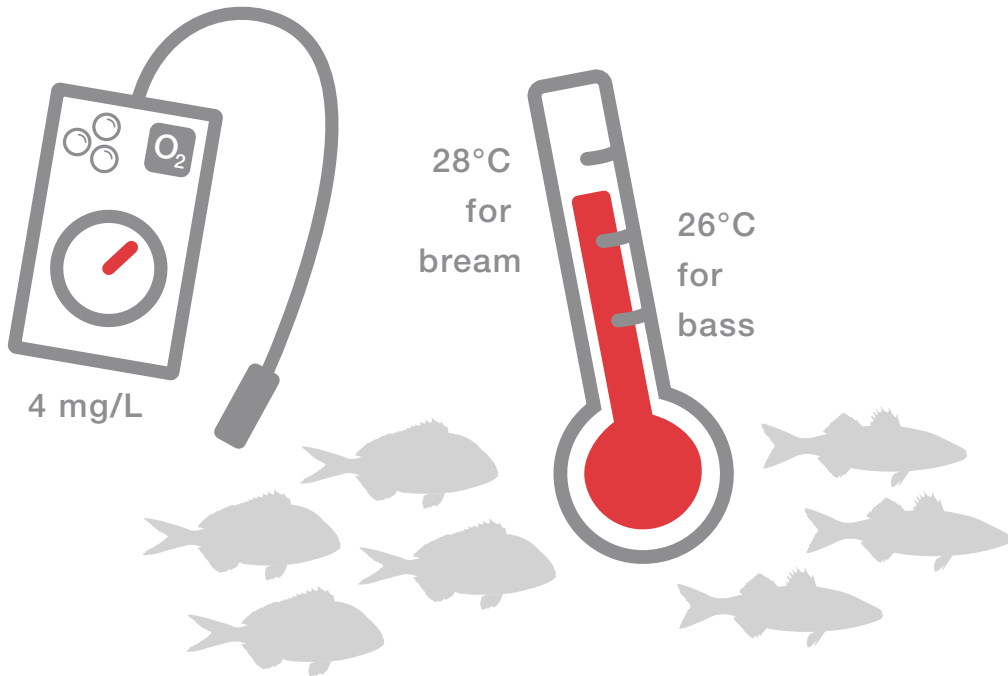
## Challenging conditions

What do fish need in challenging high temperature and low oxygen conditions?

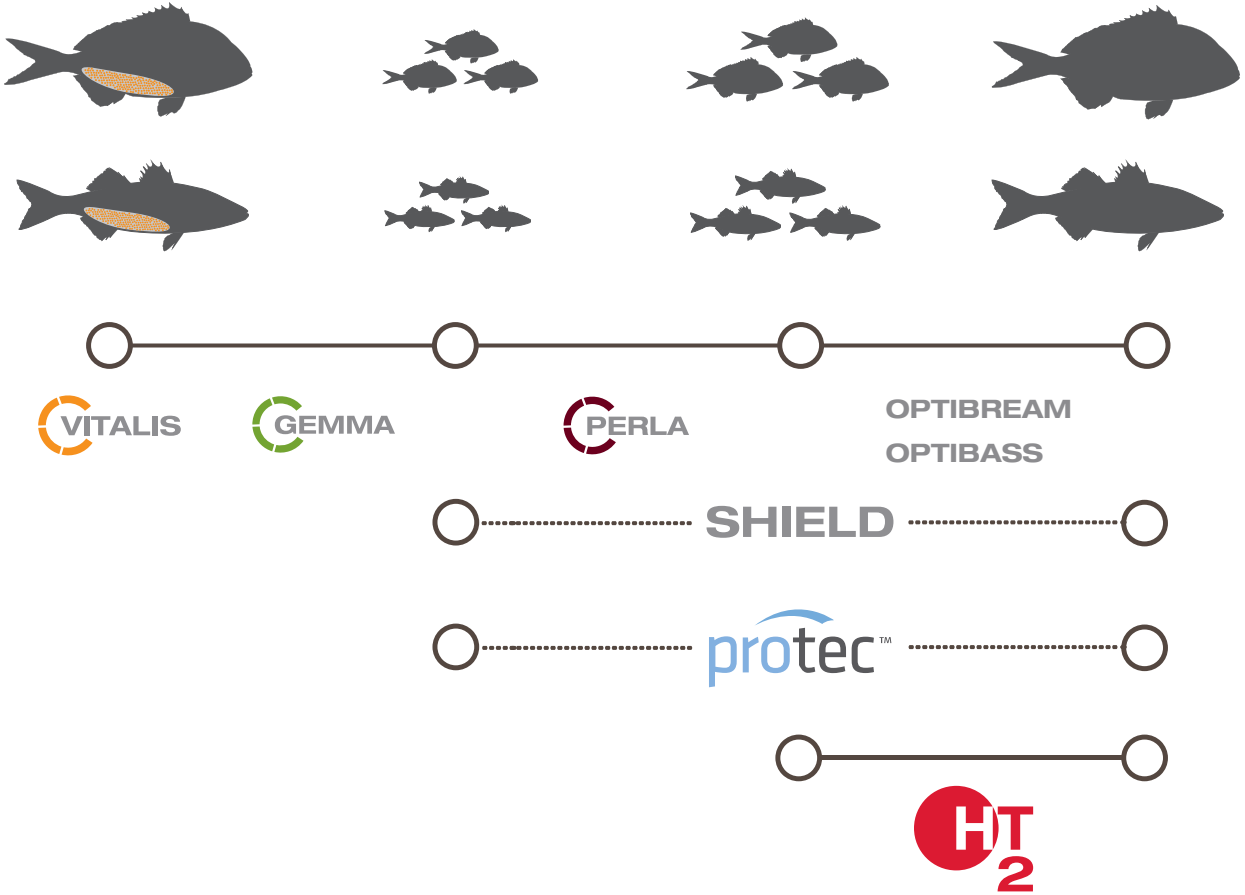


## Feeding recommendation

It is recommended to start feeding HTO2 when water temperatures are expected to reach or exceed 26°C for sea bass and 28°C for sea bream, and/or when oxygen levels drop below 4 mg/L.



The complete package





Skretting is a world leading producer and supplier of feed for farmed fish and shrimp. Total annual production of high quality feeds is over 2 million tonnes. Skretting has operating companies on five continents to produce and deliver feeds from hatching to harvest for more than 60 species of farmed fish and shrimp. Our purpose is #FeedingTheFuture.

[www.skretting.com](http://www.skretting.com)

