

# Fisheries & Aquaculture



Dependable online, inline, and atline solutions for aquaculture optimization.

# Forecast: farmed fish to overtake wild caught by 2030

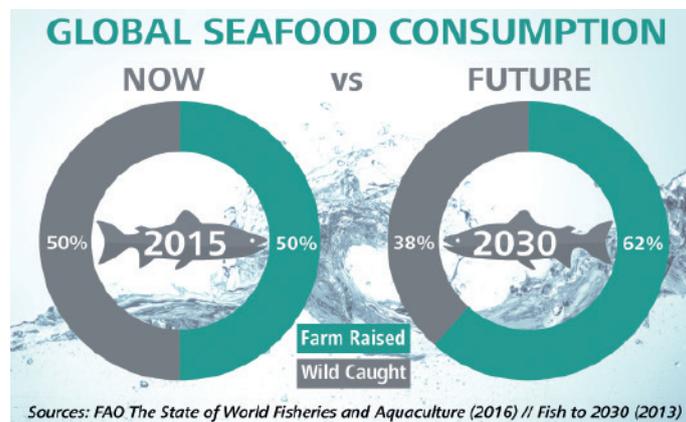
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Fish is well-known as a healthy source of animal protein, high in unsaturated fats and other essential nutrients. In 2013, 17% of worldwide animal protein intake came from fish (UN, *The State of World Fisheries and Aquaculture 2016*). According to the UN, the current world population is expected to increase to 8.5 billion by 2030 («*World Population Prospects: The 2015 Revision*»).

With the ever-growing population comes the challenge of global food security. Aquaculture has already gained

a foothold in many coastal communities, and farm raised fish sales are on the rise. This has turned aquaculture into a major part of the export economy in some countries.

It is expected that global seafood consumption from farm raised sources will increase significantly in the coming years. Therefore administering sustainable practices in the burgeoning aquaculture industry is key to alleviate pressure on wild fish stocks and reduce other environmental impacts.



## Healthy fish require monitoring

Adherence to strict environmental and health standards is important as a food producer. Animal health, hygiene, and especially water use are important factors to consider in aquaculture. Disease and sickness can spread easily between the animals, and due to the nature of these floating aquatic farms, the outbreaks can spread to wild populations as well. Medical treatments and additional nutrients must be regulated to protect the other wildlife. Ensuring correct dosage of these as well as monitoring the water quality and waste is essential for compliance with government standards.

## Lower costs with optimization

Implementing a process analyzer will lower the costs of running a fish farm by accurately monitoring the water for medications, nutrients, and waste levels – optimizing the processes which keep your fish healthy and growing.

Metrohm Process Analytics offers several analytical techniques in many different analyzer configurations for any need: titration, photometry ion chromatography, NIR spectroscopy, and ion-selective measurements. Our online process analyzers and custom sample pre-conditioning systems are manufactured in the Netherlands and supported by our local service engineers worldwide.



# Applications

## Delousing with Hydrogen Peroxide

Fish are introduced to dilute baths of hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) for up to 20 minutes for delousing. This removes the attached parasites, which can then be filtered from the water. However overdosing can cause oxidative stress in the fish, the bleaching of skin/scales, and death. Therefore, a quick analysis and response time is needed. The Metrohm Process Analytics 2035 and 2045TI Process Analyzers are suitable to perform this measurement online.

- Monitor H<sub>2</sub>O<sub>2</sub> in a typical range of 0–2500 mg/L
- Accurately control dose rate into treatment tank
- Improve fish welfare, lower overhead costs, lessen environmental burden by measuring online



Process Analyzer ADI 2045TI



2035 TP Analyzer

## Monitoring nutrient loads

Farmed fish require many essential fats, amino acids, and other nutritional elements to grow. However, many of these nutrients also feed other organisms in the water. In higher concentrations, limiting nutrients such as phosphate enable proliferation of toxic algal blooms, significantly diminishing water quality for the fish.

The 2035 TP Analyzer is configured with an integrated cuvette digester to measure both ortho- and total phosphate phosphorus around the clock.

### 2035 TP offered in 3 measurement ranges:

- Low TP (0–150 µg/L)
- Standard TP (0–5 mg/L),
- High TP (0–100 mg/L).

## Water quality

Continuous online measurement of waste products such as ammonia is especially important for the water quality in the fish pens and surrounding environment.

The ICON series of process analyzers perform photometric absorption measurements of single analytes in the visible light range.

- Differential Absorbance Colorimetry (DAC) compensates for color and turbidity of the sample
- Heated cuvette for added measurement stability
- Each ICON comes preconfigured and programmed for one of **16 different applications**



Plug and Analyze: ICON Analyzer

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