

Aquaculture

Population growth causes an increasing demand for food and therefore for fish and seafood. This need can no longer be met by conventional fishery. Reports about reduced or depleted fisheries, fishing quotas or even moratoriums are omnipresent. Therefore, in some countries aquaculture has become one of the most important and fast growing industries. Today, aquaculture accounts for around half of the fish consumed worldwide - increasing tendency.

Besides substantial amounts of yields, farmers are also facing growing challenges. In addition to increasing costs or more stringent regulations, especially water quality needs to be considered in order to ensure good yield and avoiding damage as well as environmental stress. Water quality assurance requires monitoring of many parameters on a regular base.

Hatchery and smolt production

At the hatchery stage it is critical to measure, log and monitor the temperature correctly. When the eggs are hatched they will stay in the hatchery in a temperature controlled tank until the larvae are ready to start eating on their own. Our systems can be used in the production chain to collect data for reports and documentation. When the eggs are hatched the smolt is transferred to grow tanks. It is important to control the oxygen, temperature levels and CO₂ levels. Xylem Analytics Germany Sales offers handheld systems for random measurements as well as self-contained systems for continuous monitoring.



This includes D.O., pH, salinity, temperature, phosphate, nitrate and COD within the aquaculture itself or from impact of agrarian fertilizers. Particularly fish poisons such as free ammonia (NH₃), Nitrite or CO₂ need to be observed as well. Therefore, Xylem Analytics Germany offers trustful and reliable handhelds, lab meters and instruments for continuous monitoring.

The monitoring systems are also able to log and report the conditions and can be fully integrated with the control systems. The sensors and solutions vary based on the different tank shapes and the different fish or shellfish species.

Parameters to be measured:

- Temperature,
- D.O.,
- Salinity

Additional parameters:

- CO₂

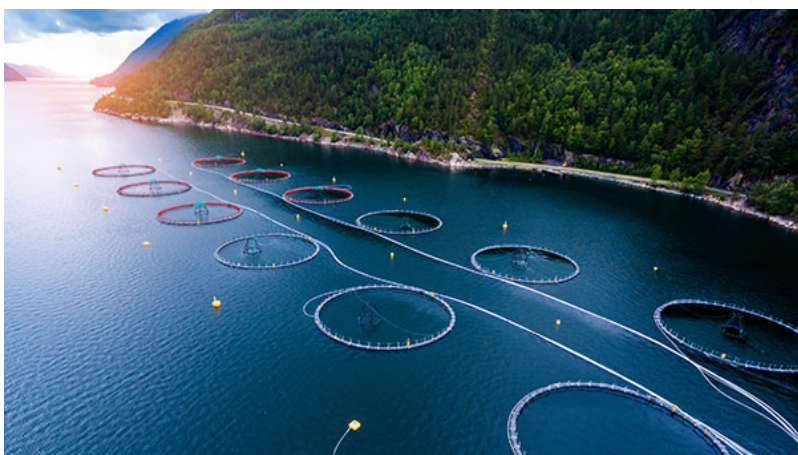
Fish farming on land and in ponds

Reliable sensors and systems are required when farming on land or in ponds. Farming on land requires accurate and stable measurements of oxygen, temperature and CO₂ levels. With correct environmental information, stress, disease, overfeeding and mortality of the fish can be avoided. Sensor values can be directly enter into the control systems of circulation pumps, CO₂ strippers or oxygen generators. With Xylem Analytics Germany Sales' reliable and long lasting sensors and systems, fish welfare and effective fish growth are maximized as is profit.



Fish farming in the ocean

When the smolt reaches a certain size, it is moved into larger cages in the ocean for further growth. Farming in the ocean is normally done in large floating circular cages or smaller clusters. The size of the cage varies from small scale to >100 000 m². The different farm methods and cage configurations require different measuring approaches in order to control the farming process and secure fish growth. It is also important to scale your instrumentation according to the location and size of the cage.



In order to control the growth process, and to secure the fish welfare, it is vital to monitor the surrounding environment, both inside and outside the cage. As a minimum the oxygen level, temperature, currents speed and direction should be monitored; oxygen is essential in all energy demanding processes for the fish. Sufficient oxygen is essential in the process of transforming feed into energy.

Parameters to be measured:

- Temperature,
- D.O.,
- Conductivity/Salinity,
- pH,
- Ammonia

Additional parameters:

- Turbidity,
- NO₂,
- ORP,
- TSS,
- PO₄,
- CO₂

Oxygen levels below fish welfare- and limit of tolerance will yield poor production results due to lower appetite and feeding utilization. Temperature is also an important physiological parameter for the fish, as they have the best appetite when the temperature conditions are optimal. Good current conditions will ensure a supply of fresh oxygen-rich seawater.

Parameters to be measured:

- Temperature,
- D.O.,
- Conductivity/Salinity,
- pH,
- Ammonia,
- (Current speed/direction, waves, Wind speed/direction)

Additional parameters:

- Turbidity,
- NO₂,
- ORP,
- TSS,
- PO₄,

Fish transport

Live smolt and full grown fish are transported in well boats or by trucks. Control of temperature, oxygen and CO₂ levels is vital in these environments. It is essential to keep the oxygen and CO₂ level stable. If the oxygen level is too low and CO₂ level is too high the fish may suffocate during transport. If the oxygen level is too high when the fish is transferred to a new environment, the shock may cause mortality.



Parameters to be measured:

- Temperature,
- D.O.,
- Conductivity/Salinity,
- pH,
- Ammonia

Additional parameters:

- Turbidity,
- NO₂,

At processing plant

The harvesting stage is where the fish are most valuable. The processing plants has holding tanks on land and/or in the ocean. In order to ensure the highest quality, it is important that the fish are not stressed. Providing the fish with optimal temperature, oxygen levels and low pCO₂ levels to ensures quality and avoids mortality.



Parameters to be measured:

- Temperature,
- D.O.,
- Conductivity/Saltinity,
- pH,
- Ammonia

Additional parameters:

- Turbidity,
- NO₂,
- (Current speed/direction, waves, Atmospheric conditions)

Do you have further questions?

Please contact our

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August 2022