

DATA ANALYTICS

Enhancing IPRS and Split Pond Systems

by Aqua Sightline, USA

Through IPRS (In-Pond Raceway Systems) and Split Pond Systems, fish farmers can produce more fish on less land and water at lower costs while being more environmentally sustainable; data analytics applications like Aqua Sightline are key to achieving these goals.

The demand for fish production as a reliable protein source is increasing every year around the world. With IPRS (In-Pond Raceway Systems) and Split Pond systems, also known as Partitioned Aquaculture Systems (PAS), fish farmers are able to significantly increase the productivity of their farms and meet the demands of the market. In addition, these two systems allow farmers to harvest the fish with far less environmental impact making it possible to produce three times more compared to the traditional aquaculture system while reducing costs by up to 30 percent.

IPRS was created and initially launched at the School of Fisheries, Aquaculture and Aquatic Sciences at Auburn University (SFAAS-AU, Alabama, USA) in the early 90s and has seen significant growth in the last few years. “IPRS is a promising strategy to further increase fish performance in static ponds,” says the Global Seafood Alliance (GSA). Instead of the fish growing freely in the pond, in IPRS they are confined at high densities in floating or fixed raceways. “Water circulation and aeration are continuously provided to each raceway, maintaining adequate and safe oxygen levels in the grow-out cells, regardless of the oxygen status in the pond,” they add.

Split Pond systems are another efficiency-based aquaculture method where a typical pond is partitioned into smaller sections

or cells using berms or screens. This allows for separating fish by size, species, or production stage while still operating within the same pond. While mostly used for Catfish, Split Pond systems are looking to be used to culture additional species such as largemouth bass and the California hybrid carp.

Both IPRS and Split Pond systems are efficiency-based yet intensive aquaculture production methods that require stringent management of key factors like aeration, water quality, inventory control, feeding, and growth monitoring. The constant circulation, aeration, and sectioning provided by these systems necessitate real-time data monitoring and analysis for optimal results. Key similarities of the two systems include:

1. The need for constant aeration and oxygen monitoring/notifications to maintain adequate dissolved oxygen levels in the high-density fish populations.
2. Close water quality parameter monitoring and evaluation is critical, as water quality issues can escalate rapidly in these intensive systems.
3. Precise inventory control measures are needed to track inputs, production data, and stock numbers in each sectioned area.
4. Feed conversion and feeding activity data inform growth rate projections and feed management.
5. Rigorous record-keeping allows for accurate forecasting of anticipated harvests and “go to market” planning.

A great opportunity

The Aquaculture Consultant for Aqua Sightline, Tony Vaught, agreed that there is currently a lot of work being done to

incorporate IPRS and Split Pond systems within the fish farming sector, “in order to improve production systems that go hand in hand with profitability, not only in economic terms of increasing the quality of filet and fresh meat but also obtaining higher densities in smaller bodies of water and at the same time contributing to sustainable systems in environmental terms.”

According to Vaught, the AQUA Sightline application was launched so that the producers can have greater control of their aquaculture operations while reducing the need for intensive manual labour. “Farmers can keep accurate daily records of food consumption, mortality, and water quality so that, through the data captured in real-time, 24/7, analysis of optimal operational performance can be carried out to be more competitive and sustainable over time.” He emphasizes that, in IPRS and Split Pond systems, “it’s necessary to always track water quality,” given the fact that these systems tend to host relatively high biomass.

“Our application and its alert system, supported by sensors in the pond, allows the producer to make decisions in real-time before a major problem arises. For example, in those cases when water quality parameters are triggered, which will directly affect animals with inadequate FCF (Feed Conversion Factor),

providing the producer with a significant reduction in the profitability of the crop.”

The Aqua Sightline app is at the forefront of modern data-driven aquaculture while being affordable and easy to operate from the palm of your hand. From projected harvest dates and feed recommendations to water quality analytics, Aqua Sightline puts the data you need at your fingertips and provides the real-time alerts you need to react quickly and make the best decisions for your bottom line every time.

In today’s competitive landscape, embracing data and analytics can give your operation a significant competitive advantage, enabling you to optimize operations, reduce costs, and ultimately increase your farm’s profitability and sustainability.



Image courtesy of @Suplifish (<https://suplifish.com>)

PEGASUS[®] VACUUM COATING



- Production capacity of up to 30 t/h per unit, batch sizes from 10 up to 3000 l/batch.
- Low coefficient of variation.
- Various options to improve accessibility, such as extra large inspection hatches.

Various cleaning options (such as CIP).

- Fitted with vacuum tight exclusion valves that have a FDA-approved type seal, developed exclusively by Dinnissen.



TRUSTED BY THE BEST

powtech@dinnissen.nl www.dinnissen.com

DINNISSEN 
PROCESS TECHNOLOGY



The Importance of Data Analytics in Aquaculture

Data analytics plays a crucial role in modern intensive aquaculture operations like IPRS and split pond systems. By collecting and analysing real-time data on key parameters like water quality, feeding, oxygen levels, and fish growth, farmers can make informed decisions to optimise their operations.

One of the primary benefits of data analytics is the ability to detect issues early and take corrective action before problems escalate. For example, if dissolved oxygen levels start to drop or ammonia levels rise, the Aqua Sightline system can immediately alert the farmer, allowing them to adjust aeration or perform a water exchange. This proactive approach helps prevent fish mortality, reduces stress on the stock, and improves overall health and growth rates.

In addition, data analytics enables more precise feed management, minimizing waste and improving feed conversion ratios (FCR). By tracking feeding activity and fish growth, farmers can fine-tune their feeding regimens, ensuring that the fish receive the optimal amount of feed without overfeeding, which can lead to deteriorating water quality and increased costs.

Inventory control is another area where data analytics shines. In intensive systems like IPRS and split pond, where fish are separated by size, species, or production stage, accurate tracking of stock numbers and growth rates is essential. Analytics tools can help farmers predict future stocking requirements, forecast harvest yields, and plan their sales and marketing efforts accordingly.

Furthermore, data analytics allows for benchmarking and continuous improvement. By analysing historical data on factors like feed conversion, growth rates, and water quality parameters, farmers can identify areas for optimization, experiment with different strategies, and continually refine their practices for maximum efficiency and sustainability.

As the aquaculture industry continues to evolve and face increasing pressures from competition, environmental concerns, and consumer demands, data analytics will become even more critical. Those farmers who embrace data-driven decision-making and leverage tools like Aqua Sightline will be better positioned to stay ahead of the curve, reduce costs, and operate more sustainable and profitable aquaculture operations.

