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🧠 Intelligence

Can artificial intelligence revolutionize barramundi aquaculture?

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By Responsible Seafood Advocate

University of Queensland researcher says AI can 'push the boundaries of aquaculture' to help meet global food demand

Computer simulations are key to bringing aquaculture into line with genetic advances being made in land-based agriculture, according to a University of Queensland (UQ) researcher.

Ph.D. candidate Jessica Hintzsche from UQ's Queensland Alliance for Agriculture and Food Innovation (QAAFI) is using software to virtually model the genetic tools available to barramundi farming, in collaboration with the ARC Research Hub for Supercharging Tropical Aquaculture at James Cook University and MainStream Aquaculture Group.

"We are creating the farm's virtual twin – a 3D digital replica of the real thing to allow us to run simulations," Hintzsche said. "The benefit of a digital twin is that we can test the impact of different genomic, breeding and production technologies such as parental selection and harvesting options before they are rolled out on the farm. It would allow producers to make decisions about how to take their business to the next level with healthy fish populations."

Aquaculture in Australia's north is currently valued at AUS $223 million (U.S. $153 million) and has a

Artificial intelligence can "push the boundaries of aquaculture" to help meet global food demand, says a University of Queensland researcher. Photo courtesy of MainStream Aquaculture.

projected value of AUS $1.34 billion (U.S. $862 million) by 2030. Hintzsche said aquaculture was growing exponentially, but the integration of genetic technologies into breeding programs was slow, with just 10 percent of the fish farmed globally descended from genetically improved strains.

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"We are at a tipping point globally where the production of farmed fish is about to overtake wild-caught fish in fisheries," Hintzsche said. "To meet demand and keep up with other agricultural industries, genetic tools need to be integrated into breeding programs."

Hintzsche said there were many benefits of using AI, including sustainability, and there was no limit on what could be modeled with the right quantitative data.

"No one yet has the capacity to apply these techniques in aquaculture and it's amazing to be on the forefront, using this technology to push the boundaries of aquaculture," she said. "The sky is the limit."

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