



Barramundi Asia's chief executive Andreas von Scholten and Temasek Life Sciences Laboratory's senior principal investigator Yue Genhua (left) and chief executive Peter Chia with a pool of St John's Sea Bass at the laboratory at the National University of Singapore. The genetically superior Asian sea bass was produced under the selective breeding programme developed by scientists from the Temasek Life Sciences Laboratory and the Singapore Food Agency. ST PHOTO: JASON QUAH

Scientists here produce sea bass that's healthier, easier to breed

The Asian sea bass, also known as barramundi, has been envisioned by some fish farmers here as having the potential to be the "salmon of the tropics".

The fish not only grows well in tropical waters, but can also be cooked in various styles across different cuisines.

Now, new research has made this fish even more appealing – to customers and farmers alike.

A selective breeding programme developed by scientists from the Temasek Life Sciences Laboratory and the Singapore Food Agency (formerly the Agri-Food and Veterinary Authority) has successfully produced a genetically superior Asian sea bass broodstock that not only tastes better and is healthier for consumers, but is also easier for farmers to rear.

Under this programme, adult Asian sea bass with three specific desirable genetic traits – fast-growing, resistance against certain diseases, and a higher Omega-3 oil content in the flesh – are bred to produce offspring with similar traits.

The result is high-quality, superior fish fry and fingerlings that can be reared in aquaculture cages, at a lower mortality rate, until they are ready to be served up on a plate.

The research for the selective breeding programme spanned 15 years and was commercialised in 2018, when start-up Allegro Aqua was spun off with six technical specialists from the Temasek Life Sciences Laboratory.

Last month, Barramundi Asia announced that it is acquiring Allegro Aqua, in a move that the farming company said will boost Singapore's food security.

"The merger will allow us to source fish fry from a Singapore company, which will guarantee and secure a constant supply of superior fish fry," said Barramundi Asia's chief executive Andreas von Scholten.

He said that the farm previously got its fry from suppliers in the region, and the move will help it "avoid the potential risk of regional supply shock".

This "elite" strain has been named St John's Sea Bass, after one of Singapore's southern islands, where the

selective breeding took place.

Mr von Scholten said Allegro Aqua will still supply its premium sea bass fry to other Singapore fish farms, as well as select overseas fish farms rearing barramundi.

Dr Yue Genhua, a senior principal investigator at Temasek Life Science Laboratory and one of the scientists behind the selective breeding programme, said large adult Asian sea bass were first sourced from a wide geographical area spanning the Andaman Sea and the South China Sea.

Sourcing the parental broodstock from a large area ensured a wider genetic diversity, which is important to prevent inbreeding, he said. Inbred populations are usually more susceptible to certain diseases.

But beneficial traits cannot be identified just by sight. For a better idea of which fish had desirable traits, scientists delved into their DNA – the genetic blueprint that determines the characteristics and traits of every individual living organism.

Years of research were spent analysing DNA from more than 50,000 individual Asian sea bass, which was then matched to the desired traits.

In addition, during the selection

process, the scientists also focused on identifying families of Asian sea bass which, if managed in accordance with certain feed protocols, have potential for higher fillet yield, said Dr Yue.

By identifying unique DNA markers associated with important traits, the scientists were able to quickly establish three lines of elite Asian sea bass: one exhibiting quick growth rates, another with the propensity to accumulate high Omega 3, and the third with resistance to common aquaculture diseases.

Said Dr Yue: "By cross-breeding fish across these three lines, we can have fish that exhibit all three traits."

A spokesman for the Singapore Food Agency said it had embarked on research and development for the genetic selection of Asian sea bass in 1998.

Leveraging technology to grow more with less is a key strategy to meet the agency's target of having 30 per cent of Singapore's nutritional needs produced locally by 2030.

The spokesman added: "Singapore imports more than 90 per cent of our food, so our supply is vulnerable to disruption by global developments such as climate change. Raising local production will help mitigate our reliance on imports."

Breeding 'super fish'



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