

AQUACULTURE

The use of cyanide to capture fish for the live reef fish trade threatens coral reefs.

TESTING TIME FOR TASTY FISH

A project to taste-test wild-caught and farmed reef fish in Hong Kong has shown that aquacultured product is an acceptable substitute for fish caught in the wild, report researchers Noel Chan and Brian Johnston



Strategies to improve the long-term sustainability of the live reef fish trade in the Asia-Pacific region are the focus of an ACIAR project that is also looking at the economic and market aspects of the trade. Live reef fish are regarded as premium fish for consumption in Southeast Asia and China and have long been a traded commodity. However, with the growth in incomes in Asia in the past 30 years, the demand for live reef fish has grown to the point where there is concern about the ability of the tropical reefs of the region to remain sustainable.

Consequently, the project researchers are also examining the acceptability of an alternative product from aquaculture.

The project is closely integrated with another ACIAR project that is developing improved hatchery and grow-out technology for marine finfish production in the Asia-Pacific region – a project headed by Dr Mike Rimmer of the Queensland Department of Primary Industries and Fisheries. Because the supplies of wild-caught fish from reefs are under pressure, the potential to supplement wild supplies with aquaculture is considered important to the long-term sustainability of the



From fish farm to table: tasting just like the real, wild-caught thing.



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trade. Aquaculture production of grouper species is now expanding rapidly and the acceptability of the product to consumers is an important aspect to examine.

More than 20 countries supply the trade, valued at more than \$450 million a year, with the principal consuming markets being the Hong Kong Special Administrative Region and the People's Republic of China. Demand is growing strongly, particularly in China. Principal supplying countries of wild-caught fish are Indonesia, the Philippines, Australia, China, Malaysia, Thailand and Vietnam, with small volumes from Pacific countries such as Fiji and Papua New Guinea. A wide variety of live reef fish species are traded, the higher-value species being mostly groupers.

In order to assess the acceptability of an aquaculture product to Hong Kong consumers, trial taste-tests were conducted in Hong Kong in November 2005. In the test, 30 consumers were presented with portions of wild-caught and aquaculture-raised live reef fish for comparison.

The taste-test was 'blind' in that the tasters did not know whether the portion was wild or aquaculture-raised. And to make the test as realistic as possible, the cooked fish portions were served in an established seafood restaurant.

The test was conducted using the triangular taste-test, used widely in the food industry to test for differences in food samples: consumers are presented with three bowls of food and told that only one of the samples is different. They are asked to taste the samples, identify the different one and describe the key food sensory characteristics that make it different. They are also asked to identify which sample they preferred. The research reported here also sought to establish whether such techniques could be successfully applied to the taste assessment of reef fish products.

The testers comprised 16 consumers – guests of the Hong Kong Chamber of Seafood Merchants – and 14 staff from local seafood restaurants. Each consumer was seated at a separate table and asked not to converse with adjacent tables. They were given a survey questionnaire to answer and results were statistically analysed for significance.

The fish chosen for the test were all of the same species – *Comileptes altivelis*, commonly known in Hong Kong as humpback grouper. This is a relatively highly priced fish in the Hong Kong market, selling at about A\$200 per kilogram in restaurants. The fish were provided by the Gondol Research Institute for Mariculture in Bali, who are partners in the ACIAR marine finfish project, and transported to Hong Kong by Bali Minatama Ltd in Denpasar.

PARTNER COUNTRIES: Fiji, Indonesia

PROJECT: Economic and market analysis of the live reef food fish trade in Asia Pacific (ADP/2002/105)

DESCRIPTION: This project aims to enhance the sustainable economic development of the live reef food fish trade, through economic analysis of policy options for improved market performance

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Two types of aquaculture product were included for comparison with the wild-caught fish. Some aquaculture products were fish that had been fed on what is commonly called 'trash fish' (smaller fish of lower value) and some were grown on fish pellets, a scientifically formulated feed of fish meal and vegetable products.

Of the 30 consumers, 16 were able to correctly identify the odd sample on the

plates. However, only 11 were able to correctly determine which bowl was the wild-caught sample and which was the aquaculture sample. A statistical test conducted on the results indicated that there is a 95 per cent chance that the difference detected between wild-caught and aquaculture product by the sample of consumers is real (that is, the results would be repeated if the experiment was conducted again.)

A closer analysis of results was conducted of those participants who correctly identified the wild-caught fish in the blind triangle taste-test, finding that those participants preferred the wild-caught fish because of their more elastic skin texture, richer flavour and meaty flesh texture. However, many commented that the cultured fish samples were acceptable and would be commercially suitable, boding well for the widespread commercial acceptance of aquaculture products.

The project has also identified aspects of the trial taste-test that could be improved. First, because the taste-test did not distinguish between pellet-fed and trash-fed fish, there is a need to determine whether consumers prefer one to the other. Such information would be valuable to scientists and aquaculture operators in formulating optimum feeding strategies in the future.

Second, it would be desirable to broaden the sample to include a larger group of more typical consumers of live reef fish, rather than relying on representatives of restaurants and the trade to provide taste assessments.

The triangular blind taste-test worked well in a restaurant setting and could easily be extended to a larger and more representative sample in the future. It would also be useful to evaluate the visual aspects of the fish swimming in the restaurant tanks to ascertain whether consumers would discriminate for or against the aquaculture product. Further cooperation between the two ACIAR projects is planned, to allow more research to be undertaken on these aspects. ◀

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