

Keeping fish fresh

Researchers are rapidly cooling fish, reducing spoilage, improving product quality and extending shelf life, potentially increasing profits for one of Australia's largest fisheries.

The South Australian sardine fishery, with an annual catch of 30,000 tonnes, sends 98% of its quota to the tuna mariculture industry as fresh or frozen product. The industry currently relies on a crushed ice slurry or refrigerated seawater to protect its catch after harvest.



Australian sardines

Within the industry there is growing interest in value-adding sardines for human consumption; particularly in the fresh chilled market within Australia. The challenge is to maintain the quality of this notoriously delicate fish.

As part of a Seafood CRC funded project, SARDI Scientists from the South Australian Food Centre, in conjunction with the South Australian Marine Scale Sardine Industry Association, are using flow ice, a pumpable microscopic suspension of ice crystals in water, to cool sardines 3 to 4 times faster than current practices.

Flow ice (also called Beluga™ ice, slush ice and micro ice) completely coats the fish in tiny ice crystals that melt on contact. This instantaneous phase-change combined with the coating effect is what makes it so effective; far superior to flake ice or ice slurry cooling.

Shelf life trials, assessed using the Quality Index Method (QIM), demonstrated that flow ice successfully improved sardine quality and extended shelf life. Anecdotal evidence from markets supports this, with sardine quality benefiting from flow ice treatment, although this did not translate into higher prices for flow ice over ice slurry-cooled fish in this case.

Improving the quality of sardines through better post harvest practices provides the fishery with an opportunity to diversify, by supplying a greater portion of its catch for human consumption to markets in Sydney, Melbourne and overseas.

Cost benefit analysis, accounting for flow ice machine costs and Sydney and Melbourne 2006 wholesale market price benefits, suggests that fishers could increase current profits on value-added sardines by \$0.37-\$0.61/kg by targeting these markets using this technology.

This technology has been taken up by a Tasmanian salmon aquaculture company, as well several Australian dairy, poultry, baking and fruit processing companies.

At this stage more information is required to estimate the volume and value of market expansion that could be facilitated by the providing and adoption of flow ice technology. Research is also needed to explore the potential of flow ice, particularly at greater fish to cooling medium ratios.

The scientists currently have the loan of a Beluga™ ice machine which will be demonstrated to interested SA businesses at a forum on Monday the 29th of March, 2010. The Beluga™ Ice Forum has been organised in conjunction with the SA Freight Council.

For further information contact Richard Musgrove.

Key Points

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There is interest in value-adding sardines for human consumption.

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