the Super Salty Slush Puppy – Newsletter #1

high saline sub zero treatment for oyster over-catch and fouling

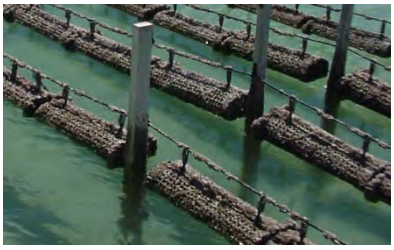
Welcome to the first of a series of newsletters on the development and trials of the application of technology for the management of oyster over-catch and fouling.

With the support of the oyster Consortium, Marine Culture, through the Tasmanian oyster Research Council, has made successful application to the Australian Seafood CRC to take forward its development of a cold shock over-catch treatment system.

The intent of this newsletter is to introduce the initiative and explain the science behind it. Later newsletters will present the results of the sea trials of the equipment and the results of the work with the Port Stephens Fisheries Institute to verify the efficacy of the treatment and the range of applications.

Why?

Do any of these pictures apply to your farms?



Or might they sometime? Have you ever had a mudworm or flatworm infestation?

Over-catch is certainly not a new issue, indeed, without it we wouldn't have an oyster industry. However, once you've got the oysters in their growing modules, having the oysters or module or both over-caught reduces growing performance, contributes to losses and oft reduces the marketability.

The preliminary investigations have shown the potential for cold shock to control oyster over-catch of both Pacific oysters and Sydney rock oysters, but this is also likely to be effective in control of a variety of other fouling organisms such pigmy mussels (*Xenostrobus securis*) and hairy mussels (*Trichomya hirsuta*) which compete with oysters for food and bind them together in clumps. Effective control of barnacles, including common honeycomb barnacles (*Balanus trigonus*) is likely, while destruction of predatory Stylochid flatworms (such as *Imogene mcgrathi*) is almost assured.

Hyper and hyposaline baths have been used to control mudworm infestations (*Polydora* spp. and *Boccardia* spp.) in other bivalves and therefore the combination of hypersaline solutions and cold shock may well prove beneficial in the control of these worms that have such significant impacts on oyster health and marketability.

Finally this technology is likely to be effective in deterring a broad range of soft bodied fouling organisms ranging from algal growth to ascidians which variously impact bivalve culture across all Australian states.

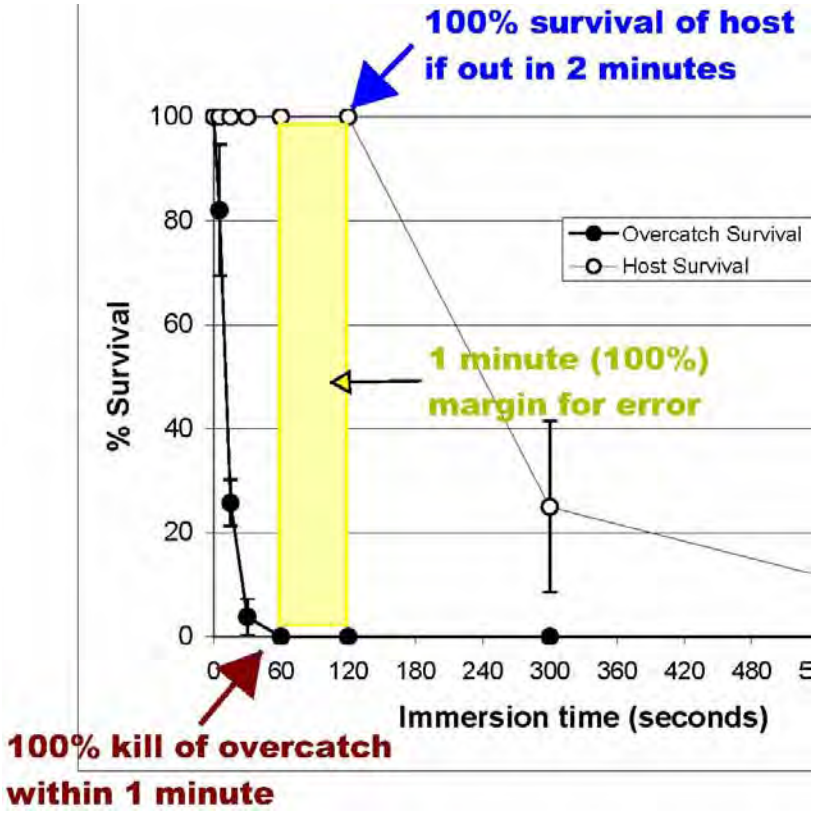
Other industries that face the significant the impost of fouling control and that may adopt this technology are the Pearl industry, most notably the northern silverlip pearl oyster (*Pinctada maxima*), but also those producing black pearl oysters (*Pinctada margaritifera*) and akoya (*Pinctada imbricata*). These pearl industries all handle stock far more frequently than the edible oyster industry, largely to remove fouling. The mussel industry may also benefit as it has significant over-catch problems and has suffered significant losses as a result of Stylochid flatworm predation.

What is the science?

The original idea arose from the thought that the effectiveness of the widely used "cooking" of oysters was more to do with the rapid temperature change when the oysters were plunged after the cooking.

Why not try cold instead of heat – roughly the same temperature differential can be achieved, much safer for personnel and likely less damaging to the host oyster if "over cooked".

An initial study of cold shock treatment was undertaken by Dr Mike Heasman, then with the Port Stephens Fisheries Institute.



The trial utilised an immersion quick freeze unit which are found on fishing boats and heavily over-caught oysters were immersed for varying times.

A saturated salt solution doesn't freeze solid till close to -30°C but for the trial the temperature was set at -19°C.

The trials delivered very exciting results – the graph says it all.

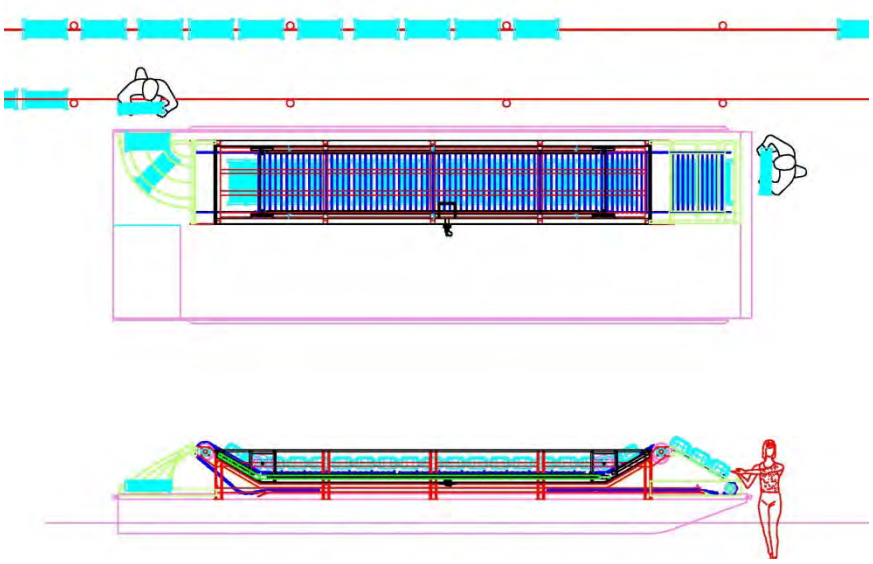
How to do it in the field?

It is important to stress that the application of the science can be in any number of forms – all that's needed is a vessel to hold a tank of high salt concentrate water, a means of chilling that water down to – 20° C or so and a mechanism to bring your oysters into the tank and after treatment immediately plunge the oysters back into normal temperature water. That, and a very loud egg timer.

Due to the perceived need to be able to process product "on lease" and looking for labour saving opportunities Marine Culture commissioned SED (Shellfish Equipment of Wynyard in Tasmania) to build an automated unit. Marine Culture predominantly uses SEAPA growing modules and the unit is designed for a staff member to unclip a module, put it on the feed and after coming out of the unit another staff member reclips the module back on the line. While what Marine Culture has had built is of some size, it's designed to be forked onto a vessel.

Marine Culture is happy for people to have a look, take pictures, ask questions and even pinch and adapt the design. But again it's stressed that the project is about the methodology and not what Marine Culture has built to implement the science. Arising from successful factory testing and the

first field day when the unit was delivered to Marine Culture's shed at Port Stephens and the successful land based running of the unit for over-caught Sydney rock and Pacific oysters, it is understood that some farmers are looking at retro-fitting their existing cooking tanks and this seems to make perfect sense, and a very cost effective approach.



Marine Culture's willingness to share the knowledge and IP it has already developed is due to the opportunity to draw on wider industry participation which brings with it the opportunity to obtain the scientific proof and support for the treatment method being developed; and ultimately, a wider acceptance, adoption and lower cost of production and maintenance. There's also the hope that neighbours employ the same mitigation measures and we all avoid the mudworm infestation and re-infestation.

In addition, with Australia being a net importer of oysters and experiencing aggressive pricing challenges in its export markets from emerging producers like Chile and established growers like New Zealand, Australia needs to do better in respect of its cost of production if it is to have an industry into the future.

What's next?

What the project is about is the sea trialling of the unit and exploration of how effective a high saline sub zero treatment system will be in controlling various types of fouling, including oyster overcatch, on Pacific and Sydney rock oysters and their growing modules.

Those next steps will look also at the variables for immersion times and temperature for differing sizes and ages of Sydney rock and Pacific oysters in order to establish optimal and most cost-effective operating parameters for the various applications (oyster over-catch, other hard shell fouling, soft fouling, mudworm, flatworm, etc.).

Oversight of the testing and application is to be undertaken by Dr Wayne O'Connor of the Port Stephens Fisheries Institute.

Marine Culture has proceeded with the acquisition of a vessel suitable to putting the machine to sea along with the power generator. Due to the weight and size of the equipment a semi-special purpose vessel was needed – i.e. one with capacity, high stability and clear deck for when the equipment is on board as well as a vessel being usable for lease development and normal farm operations. After extensive consultation with the usual vessel builders, Marine Culture bought a

punt from Maxcraft in New Zealand which was shipped disassembled in a 40' container and put together on site at Port Stephens.



Marine Culture believes it has achieved an excellent outcome with the vessel – the four pontoons deliver exception stability, despite its size the vessels gets easily on the plane with a single 75 HP motor and it steers straight and true.

Thank you

Many people have tirelessly given of their time and expertise to get us to where we at now and thanks are due to.

Dr Mike Heasman – Mike got the whole thing started with his work back in 2005 in proposing immersion quick freeze and proving up the idea

Dr Wayne O'Connor – Wayne leads the application studies to come and has been a strong supporter of the project

Garry Thompson at SEAPA – we now know we can freeze you baskets as well as cook 'em

Matthew Brown of SED Shellfish Equipment – brilliant job for the machine, and the input into the design is very much appreciated

Rachel King and the oyster Consortium – your support and encouragement has been invaluable

Board of the Tasmanian oyster Research Council for not just the financial administration but also having the vision to see the national benefit

Dr Graham Mair of the Seafood CRC – hate your paperwork, love your approach

Max Monkley at Maxcraft NZ – you've delivered on the boat in all respects – price, performance and fitness for the job

And it'd be wrong not to make special mention of Harvey Calvert, Matt Kosmeyer, Glen (Jacko) Jackson and Peter (Ripple) Kosmeyer for their hard work and perseverance.

More Information and for a Look See

For further particulars of the Super Salty Slush Puppy, or even just suggestions for a better name, please contact:

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More Next Issue on how you can get on board