

Group Study Tour New Zealand Oyster/Shellfish Industry

Ian Duthie



AUSTRALIAN
SEAFOOD
COOPERATIVE
RESEARCH CENTRE

Project No. 2010/730

Copyright Australian Seafood CRC, the Fisheries Research and Development Corporation and Oysters Australia 2012.

This work is copyright. Except as permitted under the Copyright Act 1968 (Cth), no part of this publication may be reproduced by any process, electronic or otherwise, without the specific written permission of the copyright owners. Neither may information be stored electronically in any form whatsoever without such permission.

The Australian Seafood CRC is established and supported under the Australian Government's Cooperative Research Centres Program. Other investors in the CRC are the Fisheries Research and Development Corporation, Seafood CRC company members, and supporting participants.

Office Mark Oliphant Building, Laffer Drive, Bedford Park SA 5042
Postal Box 26, Mark Oliphant Building, Laffer Drive, Bedford Park SA 5042
Tollfree 1300 732 213 Phone 08 8201 7650 Facsimile 08 8201 7659
Website www.seafoodcrc.com ABN 51 126 074 048

Important Notice

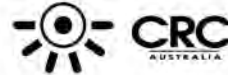
Although the Australian Seafood CRC has taken all reasonable care in preparing this report, neither the Seafood CRC nor its officers accept any liability from the interpretation or use of the information set out in this document. Information contained in this document is subject to change without notice.



Australian Government
**Fisheries Research and
Development Corporation**



An Australian Government Initiative



ISBN: 978-1-925982-64-0

NON-TECHNICAL SUMMARY

PROJECT NO: Group Study Tour New Zealand Oyster/Shellfish Industry

PRINCIPAL INVESTIGATOR: Ian Duthie

ADDRESS: P.O. Box 74, Orford, Tasmania 7190
ian-duthie@bigpond.com

(PROJECT) OBJECTIVES OF RESEARCH TRAVEL GRANT/ INDUSTRY BURSARY

This study tour sought to expand our understanding of the New Zealand shellfish industry with particular focus upon the oyster industry, and why/how they are able to effectively export NZ\$16.9 million worth of oysters overseas, much of it value added. The Australia market receives 75.1% of this production, mostly as frozen half shell.

Participants involved in the study group possess experience across a broad section of the Australian Oyster industry from hatchery/nursery/grow-out, marketing, research and development. This enabled them to evaluate the growing methodology, environment, and structure of the New Zealand oyster industry.

The New Zealand oyster industry was still dealing with the impact that the *Ostreid herpesvirus 1 (OsHV-1) μ var* - POMS (Pacific Oyster Mortality Syndrome) when the study tour was undertaken. The impact of this disease upon the New Zealand oyster industry and the actions being taken to respond to this are discussed.

NON TECHNICAL SUMMARY:

The study tour was to include the following people:

- Michael Cameron
- Adam Butterworth
- Hayden Dyke
- Greg Kent*
- Peter Bowers*
- Giles Fisher*
- Ian Duthie*

Unfortunately due to a number of circumstances the number of people that travelled was reduced to the last four listed above*.

The people and places visited allowed us to gain an insight to the New Zealand Shellfish Industry, with research providers and industry support and education agencies, big and small farmers & processors all represented.

We experienced a very open, warm and enthusiastic welcome from all of the Kiwis visited, which enhanced our visit and opportunities to learn about the New Zealand industry. See Table 1: Visit Programme for Australian Oystermen.

The oyster industries production methodologies, processes, structure and experience of *OsHV-1* were all discussed in a full and frank manner. The scale of the challenges the NZ industry faces are immense, but so are the opportunities they possess with very productive waterways, vertical integration and a culture of innovation and adaption.

This report and associated appendixes, and 'photo-albums' provide an overview of the participant's experiences and knowledge gain through the 'study tour' of New Zealand.

Date	Day	Activity	Meet Who	Where
07-May-11	Saturday	Flying to NZ		Auckland
08-May-11	Sunday	Kaipara Harbour oyster farm visit Mahurangi Harbour farm visit & oyster harvest Dinner with Oyster Farmers @ Sky Towers	Jim & Dan Dollimore	Warkworth
09-May-11	Monday	Oceanz Blue/NIWA aquaculture park	Owen Bunter	Bream Bay
		Drive to Russell - Accommodation O'night		Russell
10-May-11	Tuesday	Orongo Bay - Kororareka Oysters	Andrew Thompson	Whanaroa
		Clevedon Oysters Farm & Processing	Callum McCallum	Clevedon
11-May-11	Wednesday	Visit Waiheke Fresh Seafoods	Nat Upchurch	Waiheke Island
		Visit Kia Ora - PMF processing plant	Don Collier & Stephen Haywood	Auckland
		Fly to Nelson - Accommodation O'night		
12-May-11	Thursday	Cawthron Institute 'The Glen' Aquaculture Park RMIT	Achim Janke	Nelson
13-May-11	Friday	Marlborough Sounds	Aaron Pannel	Havelock
		Mussel Processing Factory visit - Sanfords Ltd		
		Flying back to Australia - GF/PB		
14-May-11	Saturday	Nelson - Supermarkets, Seafood		
15-May-11	Sunday			
16-May-11	Monday	Wakatu - Hatchery	Andy Elliot	Nelson
17-May-11	Tuesday	Cawthron Institute	Henry Kasper et.al.	Nelson
18-May-11	Wednesday	Marlborough Sounds	Aaron Panell	Havelock

Table 1: Visit Programme for Australian Oystermen

OUTCOMES ACHIEVED TO DATE

Delegation of seven New Zealand oyster industry representatives and producers attending and presenting at the Tasmanian hosted '4th International Oyster Symposium/Shellfish Futures'.

Enhanced communication and participation between the two countries in relation to POMS.

Development of direct relationships between not only the study tour participants and the New Zealand industry hosts, but also through networking/introductions with wider participants within both nations oyster industries.

(PROJECT) OUTPUTS DEVELOPED AS RESULT OF TRAVEL GRANT/ INDUSTRY BURSARY:

The objective of this group study tour was to investigate the potential for Australian industry growth via these key oyster industry representatives, all of which have a strong personal commitment to the industry and its development.

The opportunity to engage with individuals and businesses within the New Zealand oyster/shellfish industry has proven to be a significant advantage to the group's understanding of the differences and similarities of the NZ industry, and an insight into their export focus and value adding. This has provided for enhanced networking opportunities to learn new technologies and processes, and collaborate in common areas of research and development. The NZ oyster industry now has a representative on the Australian POMS Working Group. This type of linkage will directly enhance the opportunities to better facilitate and achieve outcomes in the fight against threats to our industry such as POMS.

Each member of the tour gave a presentation to the staff and industry representatives while at the Cawthron Institute relating to their experiences within the Australian Industry, each of the representatives were acting as 'ambassadors' for the Australian industry, building valuable relationships across industry and research communities.

The tour group comprised of a good mix of grassroots producers, new industry entrants, second generation, oyster researcher and hatchery operators. This enabled a full dissection of the structure of the NZ industry, and identification of advantages and disadvantages they possess. The opportunity to view the way the mussel industry is structured and operates also proved to be insightful, with possible linkages to the future development of the Australian oyster industry.

This study tour provided the opportunity for the group to "look outside of the box", to a country with a very similar demographic and political structure, but which is able to deliver with value adding and a strong export focus. To develop an understanding of why and how the NZ industry has been able to achieve this will provide for great opportunities for the Australian oyster industry, and the individual members of the group.

BACKGROUND AND NEED

This study tour sought to expand our understanding of the New Zealand shellfish industry with particular focus upon the oyster industry, and why/how they are able to effectively export NZ\$16.9 million worth of oysters overseas, much of it value added. The Australian market accounts for 75.1% of this mostly as half shell frozen product.

The New Zealand oyster industry was still dealing with the impact that the *Ostreid herpesvirus 1 (OsHV-1) μ var* - POMS (Pacific Oyster Mortality Syndrome) when the study tour was undertaken. The impact of this disease upon the New Zealand oyster industry and the actions being taken to respond to this are discussed.

The opportunity to utilise the CRC bursary to provide for a study tour of the NZ oyster industry, for a group of committed and passionate shellfish producers, allows for a great insight into one of our strongest competitors, exporting NZ\$12,7 million of oysters into Australia. The ability to learn how they can do this, and what if any lessons to be learnt is invaluable.

The bursary will help improve the collective knowledge of the members of the study tour, all of which have demonstrated an ability to collect and apply information to the success of their individual businesses and the greater industry. This knowledge will be particularly useful at a time when the growth of the Australian oyster industry as a whole is essentially stagnate or in decline.

The need to assess what we do, and how we do it is critical, and the potential lessons learned from visiting NZ, and seeing the perspective they hold on the industry coordination, production, processing, value adding and export and marketing of their oysters may provide for opportunities for the Australian oyster industry to stop the decline and invigorate new methodologies and production and value to the industry.

All members of the study tour have strong networks within the Australian industry for communication of their NZ experience. Two are TORC and CRC representatives, which puts them in the position of being able to drive change within the industry. Opportunities identified will be communicated, and vigorously pursued.

The sfCRC Oyster Consortium is currently undertaking a “Business Plan” and strategic review of the Australian oyster industry, the information gained from this study tour will be able to be immediately integrated into this process for the betterment of the entire Australian oyster industry.

RESULTS

Photo Albums of Industry visit are included in the Appendix, and can be found on YouTube

MAP #1 – Marine Aquaculture Sites around New Zealand.

APPENDIX #1 - Notes made during visit to Kia Ora (Pacific Marine Farms)

APPENDIX #2 - *An Excellent explanation of the growing techniques and processes adopted by the New Zealand industry is summarised within an article ‘Clevedon Coast Oysters are a growing success’ – by Keith Ingram, NZ Aquaculture July/August 2005.*

APPENDIX #3 - **‘Industry is noted for its passion’** – by Dorothy-Jean McCoubrey, NZ Aquaculture January/February 2011; *Provides an outline of the NZ Shellfish Quality Assurance Program.*

APPENDIX #4 – **‘Virus Devastating Pacific Oysters’** – by Anon

APPENDIX #5 – **‘NZ Recovers From OsHV-1 Outbreak’** – The Fish Site

APPENDIX #6 – Debate about Pacific Oyster expansion using hatchery produced seed hits the Press – an excerpt from the Nelson Mail.

APPENDIX #7– **‘Callum McCallum – NZ Oyster Industry’** Power Point Presentation at 4th International Oyster Symposium – Hobart 2011

APPENDIX #8 – **‘Jim Dollimore & Callum McCallum – NZ Oyster Farming = Post JOM/POMS.** Power Point Presentation at 4th International Oyster Symposium – Hobart 2011.

APPENDIX #9 – Examples of NZ Aquaculture Training Opportunities

APPENDIX #10 – Clevedon Coast Product Brochures.

The typical working week in NZ is 40 hours, and the shellfish industry selectively pays above award to retain ‘good’ staff. Their base rate of pay though is considerably less than Australia’s, other expenses are also reduced, and an example is Superannuation is managed under ‘Kiwi-saver’, and has an employer contribution of 2%, only if employees also co-contributes.

Minimum Base Rate of Pay Full-time labour rate comparison – 38 hour week

Country	Base Rate of Pay AU\$	38 hour week
<i>Australia</i>	<i>\$15.50</i>	<i>\$589.30</i>
<i>New Zealand</i>	<i>\$10</i>	<i>\$380</i>
<i>United States of America</i>	<i>\$8.30</i>	<i>\$315.40</i>

x-rates.com as @ 15/9/11

(Steve Newman – The use of Labour & Machines in Vegetable Production, Nuffield Australia Project No 1013)

SWOT – New Zealand Oyster Industry

Strengths:

- Excellent productive water
- Cheap reliable wild spat catch
- Efficient and effective ‘stick’ culture production systems
- Independent Shellfish Research Capacity – Cawthron Institute
 - Strong research & innovation, i.e. triploid, selective breeding

- Clean water – USFD/EU & Japanese accepted growing water programmes
- Clean & Green Marketing Image
- Organic Certification
- Well accepted product, and capacity to ‘freeze half-shell’ oysters successfully
- Season specific branding i.e. “Summer Harvest”
- Professional and successful marketing approach i.e. web presence, brochures, packaging and ‘story to tell’
- Selling the Health Benefits of oysters
- Professional business management and support due to scale of operations and concentration of production i.e. 70% across four growers
- Can-do attitude
- Export/market driven economy – established trading links
- Well developed successful marketing strategies, i.e. Giant Rugby Ball



Clevedon Coast Oysters® featured in opening of the Giant Rugby ball in London.

- Successfully established processing, value adding technology, i.e. freezing
- Low relative labour costs
- Low costs of production
- Flexible labour/employment regulations
- Collaborative/ strategic grower relationships i.e. JEMCO marketing product to Japan
- Relatively small number of producers
- Economy of scale – vertical integration of production, processing, marketing
- Professional industry representation/advocacy – New Zealand Aquaculture supporting New Zealand Oyster Growers Association
- Development of aquaculture diploma training at Cawthron Aquaculture Park, with NMIT (Nelson Marlborough Institute of Technology), encompassing on the job training and shellfish specific subjects
- Support of ‘Parent’ companies – financial and skills/knowledge
- Collaborative staff training programmes in conjunction with the NZ Seafood Industry Training Organisation – improving and supporting skills development of the workforce

Weaknesses:

- PRESENCE OF *Ostreid herpesvirus 1 (OsHV-1) μ var*
- Small domestic market
- Distance to world markets
- Full cost recovery for water classification, certification
- Water allocation and aquaculture management is antiquated, and cumbersome, with National and Local Council responsibilities, and Maori treaty obligations and un-certainty for future industry development.
- Wild catch spat and grow out impinges on shell shape quality
- Need to ‘Highway’ farm using specialised catching, and fattening leases – moving considerable amounts of ‘cultch’ (sticks & bundles) from one estuary to another, reducing the capacity to manage, control pests and disease
- Low price achieved for export and domestic product sales
- No ‘Commercial’ shellfish hatchery production facilities, limited knowledgeable hatchery staff
- Need to convert to single-seed “hatchery” oyster grow-out systems – expensive, capital and labour
- Stick-cultivation processes are “dirty”, and hard work, i.e. bashing clumps of oysters off of sticks on the farm, then having to manually separate the oysters into ‘singles’ becomes very labour intensive, and time-consuming, impacting on the ability to efficiently return the oysters back to the seawater on the farm, where they can recover from the handling stresses

Opportunities:

- Increase the sale price of New Zealand oysters
- Fully develop existing oyster shellfish water allocations utilising higher yielding production processes, i.e. single-seed

- Adoption of single-seed, improve product quality and market pricing
- Selective breeding – disease resistance, economic benefits
- Triploid production – growth and yield/product quality advantages
- Single-seed enhances convenience, greater uniformity, and yields/hectare farmed
- Develop alternative grow-out methods to utilise additional sub-tidal waters in highly productive water
- Integrate oyster hatchery production capacity with planned developments for hatchery production for mussels – economy of scale, robust capacity development
- Utilise existing trade and market development to increase export sales volumes and returns
- Consolidation of production with opportunity to purchase water from growers that want to exit the industry
- Direct sales from farmers to domestic market – collaboration of growers for roadside stalls, farmers markets
- Coordinated industry research and development initiatives
- Improve husbandry and adopt world best practice technology for growing and handling oysters
- Alternative oyster species (*Saccostrea commercialis*) – ‘NZ Rocks’ – probably not the best marketing name given the earthquakes of late, but an endemic species that is POMS resistant, although would still require hatchery production processes
- Remote setting of oysters onto ‘sticks’, allows the for advantages of hatchery production i.e. reliability, consistency, selective breeding and triploidy, this would enable existing farms to utilize their existing infrastructure and husbandry processes, and decide if and when they might move across to full single-seed hatchery production
- Sub-tidal production of (*Ostrea chilensis*) the Bluff Oyster, similar to the European Flat oyster *Ostrea edulis* which has strong market demand, and fetches good prices

Threats:

- Disease – and this one has bitten them hard with POMS impacting almost all of the North Island, by
 1. Killing farmed populations of oysters
 2. Impacting on wild-spat catches, killing both larvae and newly set spat
 3. Market perception – initial use of the name ‘Herpes’ to describe the virus resulted in some consumer confusion and resistance to oysters
- Industry confidence, and investor support, including banks has been diminished by the impact that POMS has had on the entire supply chain, grower-processor and marketing
- Keeping and Attracting Skilled and Knowledgeable Industry participants and employees
- Maintaining a significant presence within the export market, and possibility of losing market share and placement

- Having sufficient financial capacity to ‘ride-out’ the influence of POMS, and then redevelop and restructure their individual businesses and broader industry

INDUSTRY IMPACT

PROJECT OUTCOMES (THAT INITIATED CHANGE IN INDUSTRY)

It is too early to project what the full results of this study tour will be upon the Australian Oyster Industry once the information in this report is fully disseminated, beyond stimulating discussion at the individual/regional and industry representative levels.

This study tour has already enhanced the relationship between numerous growers and industry representatives and researchers on both sides of the Tasman, and the continued fostering of these relationships are critical for both nations response to the impact/threat of POMS. The NZ industry provides Australia with an opportunity to study the impacts and appropriate responses to POMS within the NZ context, and how these might translate to the Australian industry.

This study tour highlights the opportunities to learn that exist by visiting industries similar to your own, and given the contacts and relationships built with the NZ producers extends that opportunity for individual and industry representatives to continue to foster this relationship.

SUMMARY OF CHANGE IN INDUSTRY

(What immediate changes might be expected for business/industry?)

Enhanced awareness and understanding of the potential impacts of POMS, (even just calling it POMS – to avoid the market back-lash and community concern when the *Ostreid herpesvirus 1 (OsHV-1) μ var* was referred to simply as the “oyster herpes virus”, the NZ experience was that this impacted both their domestic and export markets, with a mixed message going out to the public. *The Australian Oyster industry had developed a strategy around this issue prior to the study tour to NZ, with key producers in NZ being consulted on their experience. The outcome of this study tour is that an enhance relationship and communications between NZ & Australia has resulted.*

Australia has established a POMS working group for strategies on communication and research priorities as they relate to the disease. The NZ oyster industry has been invited to have representation within this group, and open dialogue and exchange of knowledge is expected to increase as it relates to the strategies and research that both Australia and NZ participate in with relations to POMS.

For participants of the study tour, the opportunities that exist within the Australian Oyster industry were highlighted; and current business directions and strategies were supported by what they learnt in NZ.

For example:

Giles Fisher – Freycinet Marine Farms- provides a direct to the public retail outlet, this was identified as a well developed practice in NZ, with varying levels of sophistication from full service coffee and dining experience to a simply roadside stand selling unopened oysters to tourists. This extension into retail in NZ has helped business's stay afloat with less volume being sold, but a greater return achieved for the stock grown.

Peter Bowers – Cremorne Pacific Oysters, has identified the need to grow their production capacity, utilising different leases and specialisation suited to the water conditions. The business's visited provided a working example of what a fully integrated operation looks like and the level of scale and investment necessary. Providing an informed guide to what steps, skills and resources are necessary to commit to the next stage in the supply chain.

For the hatchery producers, the challenges and opportunities that are presented by having traditional 'stick-culture' oyster farms switch to 'hatchery spat' where highlighted, especially the need to provide support and extension services to growers unfamiliar with small single seed.

Consideration of how the Australian hatchery supply model maybe impacted by POMS, and alternative processes that maybe necessary to keep oyster business's afloat have been highlighted seeing the devastation that lack of supply has had on the NZ industry. The risks and opportunities this presents hatcheries with have also been highlighted and discussed.

Valuable relationships have been formed between both the NZ and Australian industry to enhance further communication and exchange of expertise, in both directions across the Tasman, across all aspects of the oyster farming businesses.

WHAT FUTURE AND ONGOING CHANGES ARE EXPECTED?

(What will be the impact?)

Increased communication and coordination across the Tasman, at all levels of industry from the individual through to the research and advocacy.

Individual businesses will benefit from seeing the business models that are working in NZ, and the way they have adapted their businesses through from the farm through to processing and marketing.

The opportunities to continue:

Trans Tasman dialogue for "ANZAC" Oyster R&D

- *JOM/POMS science e.g. Genome, Viral M.O.*
- *Breeding Programs*
- *Farm Practices & Biosecurity*
- *Sell Lots More Sexy Oysters at Right Price*

(Copied directly from a presentation by Jim Dollimore/Callum McCallum given at the 4th International Oyster Symposium in Hobart)

Hatchery and nursery technology sharing and exchange, and adoption of 'new' growing technologies that provide the opportunity to '*Sell Lots More Sexy Oysters at Right Price*'.

The discussion and relationships that this visit has started is already bringing benefits.

WHAT BARRIERS ARE THERE FOR CHANGES TO OCCUR?

Distance and cost are the biggest impediment to enhanced communication and coordination of Industry priorities.

- Competitive 'Interests'/Concerns
- Juridical/legislative & regulation differences
- Quarantine concerns (as they relate to breeding programs)
- Lack of existing structural – coordination of communication
- Financial funding opportunities
- National rivalry – Kiwi vs Aussie (although this exists at a state level, and we can get over that....)
- IP
- Language ☺

IF NOT ALREADY HAPPENING, WHEN WILL THE CHANGES OCCUR?

(e.g. 2 businesses will adopt project findings and two more are expected to adopt findings within 12 months)

Some of these changes have already started, further formal industry relationships will be restricted due to financial constraints. However, the informal industry relationships already exist and are continuing to be built upon.

The aim of this tour wasn't to pick up any one specific 'thing' and translocate it. It was the big picture review and lessons that can be learnt from how the Kiwis approach the business of farming oysters.

Even before this report is out to industry, it had opened the relationship between the Kiwi industry and Australia with the contingent of Kiwis coming across to Tassie and reporting on the impact of the Herpes virus on their industry. And I'm sure once this report is out there within industry it will help inform businesses, and promote discussion. And provide an avenue to contact NZ growers and collect further specific information of interest, build relationships.

Thanks to the Kiwis visit and introductions following our visit, we have some of Australia's largest producers discussing with New Zealand producers the need to ensure that our sale prices of oysters in the market ensures that our businesses are profitable on both sides of the Tasman.

WHAT IS THE LIKELIHOOD THAT THESE CHANGES WILL OCCUR?

(e.g. 50% chance that four businesses will adopt project findings)?

The changes that this report and study tour will result in are beyond a realistic measure, as it covers the opportunities that exist for individual businesses through to industry research and development.

In light of the NZ experience with POMS, and the impact that POMS may have on the Australian Pacific Oyster industry, the relationship is important and will continue to grow.

WHAT BARRIERS ARE THERE TO ADOPTION OF THESE CHANGES AND WHAT ACTION COULD BE TAKEN TO OVERCOME THESE?

(e.g. to adopt project findings will require group training/sharing equipment/invest additional capital etc.)

The barriers to adoption are listed above and the action to overcome these are discussed below:

There are a number of similarities between the Australian and NZ oyster industry, and a number of the more established oyster business's within Australia are moving towards a similar business structure to that which dominates the NZ industry, with a presence and collaboration throughout the supply chain from spat to a processed/market product.

The initial capital and then operating costs that the Australian farmer faces are a barrier to growing the type of vertically integrated business the NZ growers have, as is the relative productivity of the growing water, and input costs such as labour and spat. Given the onset of POMS, the NZ businesses now also face these same barriers, in addition to resolving a strategy to manage the disease. (A shift to 'single-seed' hatchery produced oysters will force these changes).

The increased collaboration and cooperation between NZ and Australia will face difficulties due to the distance and costs of travel between the two nations for face: face type meetings and discussion, however technology and innovations such as 'webinars' will help overcome this. The establishment of a formal structure to link communications between the two nations Oyster Industries will assist maintaining the relationship and delivering outcomes in R&D.

The opportunities presented and lessons learnt from NZ, will face the usual barriers to implementation such as; financial, skill and knowledge limitations, uncertainty of security of the business model, with the threat of POMS in Australia. The circumstances of individual business, being able to expand, such as available water and infrastructure, labour availability

COMMUNICATION OF PROJECT/EXTENSION ACTIVITIES

WHAT IS THE OUTPUT THAT NEEDS TO BE COMMUNICATED?

The key lessons to learn from the NZ industry are:

- Listen to the market, and produce what they want (they are producing Pacific's off of sticks, and the typical Australian oyster farmer would consider the shell shape to be un-marketable, however the NZ growers are able to produce these oysters at a lower cost, and also sell them, despite the 'shell-shape').
- Vertical integration to provide for economies of scale, and control through the 'supply (value) chain'.
- Collaboration and specialisation between industry participants, not just at the production/farm level, but also through processing and marketing.
- Tell the story, what is unique about your business and product.
- Embrace innovation and adaptation through out the supply chain.

The impact of POMS on the industry, and their resilience and unity. The NZ industry didn't have a strong technical, health surveillance program. This has impacted their ability to respond to the onset of POMS, and has cost them time and opportunity in their response to the disease.

Learn everything you can about POMS, and what it would mean for your business if 80% of your stock died.

- How would you respond?
- How would you fund your business?
- How would you re-stock?
- How would you maximise your returns from the remaining oysters?
- How do you retain key staff?

WHO IS/ARE THE TARGET AUDIENCE/S?

The Australian Oyster industry representatives both advocacy and research, and related participants, such as service providers; R&D, education.

WHAT ARE THE KEY MESSAGES?

What can the Australian Oyster Industry learn from the New Zealand industry?

- Be prepared for POMS
 - Understand the disease, educate the industry, what it is and what it means for them
 - Industry and Government coordination – forward planning, steering group
 - Industry preparation, surveillance, impact of quarantine areas, risk mitigation planning, financial planning and preparation, response/emergency plan for their own businesses and industry
 - Prepare and coordinate for press/media interaction
 - Safeguard the integrity of your spat supply, and potential vectors for transmission around the industry
 - How will your business survive, what are the alternative income streams, how can you improve the return on oysters that survive?
 - Look for alternative species and opportunities
- Move up the value chain – opportunities for direct retail and tourism, creating an experience and adding value to your product
- Create economy of scale and efficiencies
- Work together strategically with other oyster businesses to create a brand, and efficiencies and economies of scale to take control of your supply chain
- Uniformity of quality criteria, and packaging standards
- Know your business and where your costs lie, and drive for efficiencies, control your costs of production
- Know your product and what the customers want, and then deliver it to them!
- Market – tell the story of your business and your product
- Organic Certification is an opportunity for the industry
- Promoting the health benefits of our oysters
- Innovate and question the efficiency of everything your doing
- Innovate – Oyster Poultry Grit, Oyster soup, Oyster pate, Oyster meat
- Pay for professional industry representation, and develop strategic plans for continued industry/market development and advocacy
- Build strong relationships with Government
- Create a skilled workforce, many of the operators we meet were smart tertiary educated business people, that had self-motivated hardworking farm operators

DON'T GET WRAPPED UP IN SHELL SHAPE ALONE! – People eat the oyster meat, presentation is important, but the Kiwi's don't even flip the oyster (freezes better) and have achieved great market penetration and success.

WHAT IS THE CALL TO ACTION?

(What is it you want people to do once you communicate the key message to them –i.e. what change of behaviour or action do you want them to take?)

Learn everything you can about POMS – and start planning contingencies for ‘if it hits.

Continue working together – and that’s already started, Oysters Australia is an example of that. The opportunities for individual businesses to see the advantages of specialisation, and coordination with other businesses including growing, processing and joint marketing, is evident seeing it successfully achieved in NZ. Work together within the domestic and export markets. The Kiwi businesses we looked at, do a great job of telling the story of their product, and we should all do the same.

The need to assess what we do, and how we do it is critical, and the lessons learned from visiting NZ, and seeing the perspective they hold on the industry coordination, production, processing, value adding and export and marketing of their oysters provides an example for the Australian Oyster Industry of what can be done when we work to our strengths and work together. These lessons can be applied to stop the decline and invigorate new methodologies and production and value to the Australian Oyster Industry.

COMMUNICATION CHANNELS

(How can these messages be communicated and by who?):

<i>Channel</i>	<i>Who by</i>	<i>When</i>
<i>Oysters Australia – Report distribution</i>	<i>EO – Oysters Australia EO – Oysters Tasmania EO – SAOGA EO – NSW Oyster Growers Association</i>	<i>ASAP</i>

LESSONS LEARNED AND RECOMMENDED IMPROVEMENTS

WHAT IS YOUR FEEDBACK?

Getting the timing right across a group of busy people on both sides of the Tasman Sea. Be flexible, and ready to change your plans – Leave a couple of extra days ‘FLEX’ and you’d be surprised by the opportunities this opens.

Organise a ‘thank you’ gift, and remember to follow up with a Thank You phone call/email. And be prepared to open your doors for an ‘exchange’ visit.

FURTHER ACTION REQUIRED IN REGARDS TO COMMERCIALISATION?
(e.g. IP protection, licensing, sales, revenues etc)

Not Applicable

ACKNOWLEDGEMENTS

All our Kiwi Hosts including:

Achim Janke	Owen Bunter
Callum McCallum	Don Collier
Jim Dollimore	Dan Dollimore
Steve Haywood	Dan McCall
Aaron Pannel	Andrew Thompson
Nat Upchurch	Andy Elliot

MAP #1 – Marine Aquaculture Sites around New Zealand.



APPENDIX #1 – Notes made during visit to Kia Ora (Pacific Marine Farms)

11/5/11

Don Collier

- Part of Aotearoa Fisheries Limited, (AFL). – The Pacific Oyster business (AFL also comprises; Wetfish, Lobster & Abalone business's).
- Two trading names/brands; - 'KIA ORA Seafood's' &
- 'Pacific Marine Farms' also a joint industry brand for the Japanese marketplace – JEMCO Ltd.



- 130 hectare water space/ developed farms, almost all intertidal.
- Two factories, located in Auckland and Coromandel.
- Main farms are used to produce;
 - ½ shell frozen – 75-80%
 - ½ shell fresh – 10-15% also some
 - Live whole shell.
- Buy in other growers production
- Account for 30% of New Zealand processed volume.
- Sell into 12 countries; NZ, Australia (½ shell frozen only), S.E Asia, Japan, Pacific (Hawaii, French Polynesia, Fiji etc.) China.
- Oyster Business is around 5% of AFL
 - Maori owned, ex. Treaty Negotiations.
 - 20 years ago, resource share on Quota (approx. 20%), \$3 Billion asset + \$
 - 60-70 Tribes (took 10-15 years)
 - Aotearoa – Tribes – Trust – Totem (20%) not tradable on the share market (yet). The Trust & Totem provide for advocacy roles.
- Production of oysters is 1.1 to 1.2 million dozen processed.
- Pots (Fresh Meats), reject ½ shell, i.e. shell broken.
- Frozen Meats

New Zealand Oyster Production – 3 million dozen/year: 1/3 Domestic, 2/3 Export.

- Aotearoa Fisheries – 30%
- Sanford's – 20%

- Clevedon Coast – 10% (Callum McCallum)
- Biomarine – 10% (Jim Dollimore)
- Sea Products
- NZ Seafood's & some low end producers
- South Island

Aotearoa Fisheries, Sanford's, Clevedon Coast and Biomarine market together into Japan under the brand name JEMCO Ltd.

Exporting Aotearoa provide the invoice in the clients dollars and relate this to the \$NZ to make a margin, they take forward cover.

Aotearoa Seafood's employs between 90 – 100 people in its oyster operations. The Auckland factory has a single manager and is bigger than the Coromandel factory. The Coromandel operations manager has responsibility for both the farms and the factory. The factory managers have autonomy of the methods of processing, with different strategies taken between hand splitting and use of pneumatic knives. The oysters in New Zealand are typically not turned, 'turning' the oyster results in 'blow-out' during the freezing process.

The majority of oyster farmers in New Zealand are 'stick' farmers, with a gradual move to some hatchery production over the last 6-7 years. The move to hatchery produced stock has accelerated following the mortality issues related to OsHV1. Before this hatchery stock was being grown due to:

- Convenience,
- Improve uniformity in shell shape,
- Greater yields/hectare farmed, and a
- Capacity to obtain a price premium for hatchery stock.

The expectation was that a 20:80 split between hatchery and stick culture was planned. This was due to the inherent cost advantage that the stick culture production systems have in both operating and capital cost expenditure, and therefore returns on investment. However, the reverse is expected following the OsHV1 impact on the industry, and its ability to catch and grow 'stick' oysters.

Don Collier – General Manager Aquaculture, Aotearoa Fisheries trading as Pacific Marine Farms & Kia Ora Seafood's. Don manages the sales and marketing, (some is automatic resale). Mortality caused a loss of 30% of stock, pushing for a 20-25% price rise. Costs are greater than \$3/dozen. Farm economics aren't as good as the independent growers. Not achieving 8-9% return on investment, and really need to be doing better than this. They buy stock in from other farmers at \$4/dozen. Minimum wage is \$13/hr., and they pay 'packers' up to \$15/hr., splitters can achieve up to \$25/hr. The working week is still 40 hours. They are interested in buying into the hatchery to influence security of supply. Use to process Rock Oysters back in 1986.



Callum McCallum from Clevedon Coast Oysters during happy times, holding a harvest stick with Pacific oysters, notice the colour of the water indicative of highly productive water (photo: Keith Ingram – NZ Aquaculture July/August 2005).

CLEVEDON COAST OYSTERS

are a growing
success

BY KEITH INGRAM (NZ Aquaculture July/August 2005)



Zealand's isolated position in the vast Pacific Ocean makes it the best country in the world for farming oysters.

Locally we have three species of oysters. The Bluff dredged oyster, which is also found in Nelson, is rated as the premium commercially harvested native oyster in New Zealand. Alongside this oyster in our northern waters is another native, the rock oyster.

But only the Bluff oyster was commercially viable to harvest until a new marine invader arrived in New Zealand during the mid to late-1950s on the hulls of the barges that brought out sections of Auckland's Harbour Bridge from Japan.

This new arrival, the Pacific oyster, found our environment to be ideal, and quickly established itself around New Zealand's northern coastline. Although it arrived illegally, this oyster was soon recognised as having the potential to be farmed and create a new aquacultural industry.

New Zealand's sub-Antarctic convergence zone, where cold, nutrient-rich southern waters meet warm water from the southern Pacific tropical current, centres off the northern coastline, producing high concentrations of plankton that result in optimum conditions for cultivating oysters.

With New Zealand's very small population, nuclear-free environment and vast distance from our nearest, heavily populated neighbour, we have an ideal environment for oyster farming. And so the New Zealand Pacific oyster industry was established some 30 years ago.

Callum McCallum started in the oyster industry in 1986 with his first 14ha lease on the Clevedon coast. He built a small packhouse and started growing Pacific oysters for local retailers to sell. Much was learnt in those early days about growing the oysters.

The industry tended to operate on a boom-or-bust scenario, where it was all go during the harvesting season, with a long period of quiet downtime. From these early beginnings, it was quickly recognised that to be successful, harvesting time had to be extended throughout the year.

The first problem was how to stop all the oysters from maturing to market size at the same time. Oyster spat was traditionally caught during January, February and March on spat sticks laid out on racks positioned in the inter-tidal zone.

We now recognise that the Ministry of Fisheries' scientific view of the water depth for positioning approved leases at that time was too shallow. And so new farms were developed in deeper areas of the inter-tidal zone, and older farms had to reposition their racks to be successful.

The idea is for the oysters to be dry, with a minimum amount of time for maintenance and harvesting. So the harvesting season needed to be extended if New Zealand Pacific oysters were to develop as a primary export species.

The spat problem was overcome by clustering the spat sticks in bundles with a small 6-8mm gap between them when gathering spat.

Most of the oyster spat supplying North Island farms comes from the Kaipara Harbour, as this area is recognised as being one of the best spat settling areas and produces excellent quality oysters.

These bundles could then be kept for up to nine months before they were laid out on the racks, with the oyster growth being constrained by the space in the bundles and restricting the nutrient water flow.

This was a major breakthrough, as oyster farmers could then introduce rotational harvesting and place new spat sticks throughout the year, thus opening the export market potential for half-shell oysters. It would also give consistent all-year employment to both farm and processing staff.

With these new skills on board, Clevedon Coast Oysters started exporting in 1998. In 2001, a new export factory was completed on the site.

Another trick learnt was the ability to on-grow smaller oysters to market size after the main sticks had been harvested. Previously, up to 50 percent of oysters were below market size and ended up in the waste heap. Now, with the development of on-growing baskets, bags and small cages (professionally known as aqua purses, trays and bags), where once the oysters were graded into three sub-sizes, they can be placed back out in the farm to grow and mature to commercial harvest size in the following few months.



ABOVE: Oyster purses designed for on-growing small oysters that would normally have been lost in the past

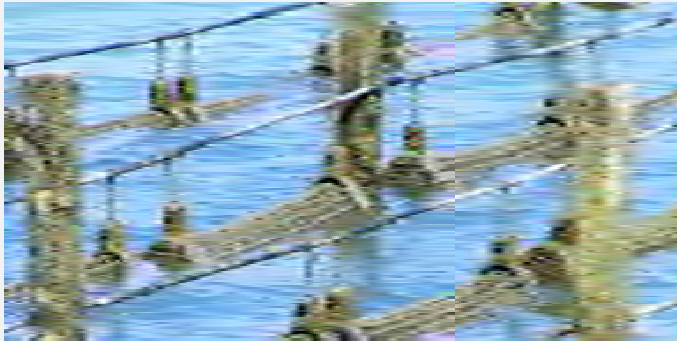


Checking trays of fattening oysters

The move has reduced oyster waste to about five percent, which includes a percentage for oystercatchers and other wading seabirds that feed on shellfish.

Once the spat sticks are nailed out on the racks, they are left to grow for 12 months.

They are then ready for the first stage of harvesting. The sticks are lifted and taken to the factory, where the oysters are stripped off the sticks and passed through a washer. The dead shells are then removed manually before the live oysters enter a Tasmanian-designed, computerised oyster grader. It uses a camera to visually look at each oyster and measure its size in the computer. As the oyster travels along the belt, an airgun squirts air at it, shooting it out automatically off the conveyor system into one of five chutes, depending on the grade. The smaller oysters are recovered and returned to the farm for further on-growing.



Oyster purses designed for on-growing small oysters that would normally have been lost in the past



Oysters are washed and sorted before being loaded on to the grading machine



The high tech grading machine remains a key feature of the farms success high-tech grading machine remains a key feature of the farm's success

All the company's production is aimed at the half-shell market for both domestic and export oysters. Once they are graded, they go to the openers, who use a pneumatic oyster knife to open up to 500 dozen a day. The half-shell oysters are then washed, packed and either quickly chilled for the chilled market, or snap-frozen at -40

degrees Celsius in the blast freezer.

Frozen half-shel

- you do not get oxidation or freezer burn,” says McCallum, who has recently been appointed chairman of the Aquaculture Council. “So most of our oysters leave here in freezer containers.”



The oyster openers can process up to 500 dozen oysters per day

The success of growing oysters on the Clevedon coast is our clean water, he says. “We enjoy good tidal flows from the Hauraki Gulf, and experience limited urban pollution.

“New Zealand’s water quality exceeds world standards for aquaculture requirements, and we have locally set stringent water quality and bio-toxin monitoring programmes to adhere to,” he says. Another benefit of being in a rural area is that oyster farming and processing is labour intensive and low-skilled, as every hectare of water space in an oyster farm creates the equivalent of 1.5 jobs. At present Clevedon Coast Oysters employs about 35 staff year-round.

Work on the farm is carried out around the tides; with the racks being exposed for four to five hours a tide. The farm staff use small, shallow-draft barges to harvest the oysters and act as a platform for carrying out repairs and maintenance, or to

place out new spat sticks or baskets and racks.

Clevedon Coast also has additional leases totaling some 15ha on Waiheke Island where a lot of the initial ongrowing in baskets is carried out. This also gives a safety valve if one area becomes temporarily polluted from boating, urban sewerage or bio-toxins. Oysters can self-flush very quickly, and they may be moved to a new area where they will clean themselves prior to harvesting.

“The areas we prefer for farming are normally low-value mudflats or mangrove areas where oyster farming complements the local environment,” says McCallum.

Urban runoff and siltation has caused severe problems with farms in some areas, particularly in the north, more so when the local authority cannot control sewage outfalls into prime water space, which is already an aquaculture management area. This is one of the key problems in Northland, where farms are lying abandoned and farmers are facing financial ruin.

“The ideal farm should be placed at the neap low tide level, with good water flows and a minimal influence from urban runoff,” says McCallum. Oysters are high in zinc, iodine and Omega-3, all good quality stuff, he says.

Because of the farm management plan, its harvesting operation and subsequent ongrowing of small oysters, Clevedon Coast Oysters was the first to receive the coveted organic certification classification in March, 2005, along with Bio-marine in Mahurangi, one of the other partners in their joint export marketing company, Jemco.

The factory has both European Union and United States Food and Drug Administration approvals, and operates to these stringent requirements at all times, even when it is only producing for the domestic market. Each batch of oysters is recorded and monitored throughout the process, with separate batch testing.

To protect the export quality branding of Clevedon Coast Oysters, or Jemco, the company will not export oysters during the summer spatfall period. However, because of local demand for a continuous supply, oysters processed during this time are marketed under the Summer Harvest brand. While these oysters taste the same, they may not be as fat.

The farm produces 400,000 dozen half-shell, or 4.8 million oysters, each year. Most are exported, mainly to Japan, Europe and Australia, with a limited amount also going to the United States.

Clevedon Coast Oysters says it remains committed to providing enough supplies to satisfy local demand, as the market is buoyant and still growing.

“Our oyster farming industry has the potential to grow to a level where it is no longer the poor cousin to mussels,” says McCallum. “If only the government and local authorities can sort out the aquaculture management areas to allow the industry to develop.”

Aquaculture exports are made up of 60 percent mussels, 30 percent salmon and 10 percent oysters, and currently earn around \$360 million annually. “But this could be as high as \$1 billion by 2020 if we established aquaculture management areas.

These areas need to be in harmony with other marine users, like fishermen, and recreational users.”

The biggest obstacle to developing aquaculture management areas is the Resource Management Act, and of course locals suffering from a severe case of the Not In My Back Yard, or NIMBY syndrome. “All too often, the industry is seeing objections to aquaculture farm applications quoting visual aspects or other vague reasons, when in fact these objectors live miles away or cannot see the proposed farm site,” he says.

Internationally, the aquaculture industry is growing at an annual compound rate of 15 percent, and it now has the biggest growth in primary production in the world.

Unfortunately, the new Aquaculture Management Act cannot deliver to the industry or the people of New Zealand because of the high cost of going through the RMA process.

“Even regional councils are questioning whether they can afford to spend valuable ratepayer’s money to create aquaculture management areas in their coastal management plans.”

The AMA process is both cumbersome and expensive, and one can fully understand why many aquaculture farming participants are taking their skills offshore to Australia.

“The industry recognises that we are using public water space, and there need to be safeguards,” McCallum says. “But the process should be more flexible, transparent and not so expensive.” There was a strong feeling in the aquaculture industry that aquaculture should have its own minister, similar to every other developed country where aquaculture was a primary food-growing source. This minister could be outside of Cabinet, but if they were dedicated to promoting and developing the aquaculture industry for the benefit of all New Zealanders, then this government, would, for the first time, be showing some sound leadership to the industry. The act made no provision for experimental farms or ocean ranching, or natural coastline farming. Instead, it restricted the potential for this industry to grow, he said.

After reviewing the farming and processing operations at Clevedon Coast Oysters, we remain convinced that if the rest of New Zealand’s oyster farming industry is managed and operated in a similar manner, this industry, with a bit of leadership from the government, could grow into one of New Zealand’s leading primary seafood producers for both local consumption and export returns.



NZ Aquaculture January/February 2011

Industry is noted FOR ITS PASSION

BY DOROTHY-JEAN MCCOUBREY

“The passion of all those involved in New Zealand’s shellfish programme makes a discernible difference between New Zealand and other countries,” said

David Wiggins, the shellfish specialist of the United States’ Food and Drug Administration during a visit to New Zealand in October.

Wiggins, along with another senior member of the FDA’s shellfish programme, Paul DiStefano, was here to audit the commercial shellfish programme. The historical reason for these audits is to give the FDA food safety confidence in shellfish shipped to the United States.

This year the audit scope was wider, reviewing the “comparability” of all New Zealand’s food regulations and safety programmes so consideration can be given to easier trade for all food between the two countries – a

bit like a “food free trade” agreement. This meant legislation, inspection programmes, laboratory systems and industry systems were all under the microscope.

New Zealand’s shellfish growing area regulations, although similar to those used by the United States and the European Union, have been adapted to fit the unique features of our aquaculture industry and geographical environment. The result is that when commercial harvesting occurs, the water is not polluted by land or marine activities.

The 2010 audit mainly focused on the Marlborough and Coromandel regions because of their major Greenshell mussel and Pacific oyster production. Coromandel has been a significant harvesting area for a long time now, starting out with a government-owned demonstration oyster farm in the

1960s.

I asked two people involved with the Coromandel programme to tell me more about the audit and how things went for them.

Nicole Petersen is probably the newest and youngest person involved in the shellfish programme. She was employed in 2009 as a technical officer with the Waikato District Health Board and is being trained by veteran health officer David Cumming in all aspects of shellfish sanitation.

“The FDA audit was primarily about demonstrating we have effective systems in place with the New Zealand Food Safety Authority and our shellfish programme is consistent with the rest of New Zealand,” Nicole told me. During the audit we demonstrated this with our manuals, reporting and training systems.

“We also showed them how we apply the regulations to our field work.” This included a shoreline survey, a visit to a wastewater treatment plant, a growing area visit and an inspection up a river which impacts a growing area to identify any potential pollution sources.

Nicole says she and David were well prepared for the visit and were able to answer any relevant questions. Nicole excitedly tells me she is really enjoying the challenges and variety of the shellfish work. She is finding with shellfish you never stop learning and the visit from the FDA was a wonderful new experience for her.

On the other hand, Vince Syddall has much more know-

how as the respected, long-term operations manager for Pacific Marine Farms, which operates farms in Coromandel and Northland.

Over the years he has experienced the eagle eyes of many auditors and realises the importance of such international audits to secure international trade opportunities.

“This year our audit focused on relay and growing areas and the FDA was particularly interested in our documentation and systems,” said Vince. “There were no major issues but a few little things needed updating. The whole process only took a few hours and the Americans were very knowledgeable and a pleasure to deal with, which you cannot say about all auditors.”

The outcome of the 2010 shellfish growing audit was very successful, thanks to all of those involved in the programme. It takes a team effort to ensure success and many individuals play important parts; sampling officers, regulatory staff, farmers and harvesters who battle the climate and marine conditions, and the processors who ensure safe and delectable products reach the consumer.

Both Wiggins and DiStefano told me they have audited commercial shellfish areas in many countries but have never experienced the passion they found among the many New Zealand people they interviewed. They believe this

passion and commitment to always achieve the best means New Zealand is special and makes us stand out.

It was great to hear such praise and be reminded of what makes a Kiwi extraordinary, especially in today's

environment, when economic challenges and other industry pressures can absorb all our attention. We must take care to never lose this spirit, as it makes us unique when we compete in the global seafood arena.



Virus devastating PACIFIC OYSTERS



Millions of juvenile Pacific oysters are dying on farms in the upper North Island from the effects of the virus ostreid herpesvirus-1, or OsHV-1.

Scientists from the Ministry of Agriculture and Forestry said on December 8 they had found OsHV-1 in oyster samples from affected farming areas. Aquatic disease specialists took approximately 250 samples for analysis.

Some farms had reported that 80 per cent of their juvenile oysters have died, compared with five to 10 percent in a normal year, said New Zealand Oyster Industry Association executive Tom Hollings. “It’s devastating for the oyster industry.”

Overall, about half the crop had died over November and early December. Farmers may have to reduce staff numbers and some could even consider shutting down, Hollings said.

Pacific oysters are a \$30 million industry in New Zealand. The annual harvest is about 3.5 million dozen oysters, or about 2800 tonnes, and most are exported, mainly to Australia and Asia.

MAF response manager Dr Richard Norman said the virus could not be transmitted to humans, so there was no health risk from the disease.

It was a completely different herpes virus to those found in reptiles, birds and mammals, Norman said. Sharp changes to water temperature could also have contributed to the dieback.

New Zealand's Bluff oysters tested negative for the disease.

Ostreid herpes viruses affect not only oysters but also clams, scallops and other molluscs. French scientists said global warming could explain the appearance of this particular type of the virus.

The virus has wiped out stocks in France in recent years and Britain has declared a containment area on the Thames and the coast of northern Kent. In 2008, France's main marine research institute, the French Research Institute for Exploitation of the Sea, or Ifremer, set up a crisis team which found 40 percent to 100 percent of oysters aged 12 to 18 months are dying from the oyster herpes.

Animal health experts at the European Food Safety Authority are assessing the extent to which a combination

of "infectious agents" such as OsHV-1 and environmental factors are causing the die-off of Pacific oysters there, whether other shellfish species are involved and the risk of infection posed by the transfer of adult Pacific oysters from infected farms.

European authorities want increased bio-security measures in their oyster aquaculture sector, and tests on the health status of oyster spat before it is collected for farming.

But MAF said the World Organisation for Animal Health (OIE) did not list OsHV-1 as a mollusc disease, so it was not an issue of concern in oyster trade.

"The oyster industry is clearly facing significant production issues with a predicted shortfall of approximately half of next year's harvest," said Dr Norman. "MAF will continue to work closely with the industry to identify other causes of the event and ways future production can be managed."

Oyster culture

New Zealanders are partial to

oysters and two types are harvested locally: dredge oysters and rock oysters. Both have been commercially harvested since the mid-1800s. Dredge oysters, or Bluff oysters (*Ostrea chilensis*) have not been farmed in New Zealand. Rock oysters (*Saccostrea commercialis*) are found naturally in the intertidal zone in the north of the North Island, and were the subject of early cultivation experiments. These trials showed that a marketable product could be

farmed within 3½ years – half the time it took an oyster to mature when growing naturally on rocks. During the 1960s the commercial farming of native rock oysters spread throughout the harbours and inlets of the northern North Island. Most farmers grew their oysters on cement-coated sticks laid down in racks.

Pacific invader

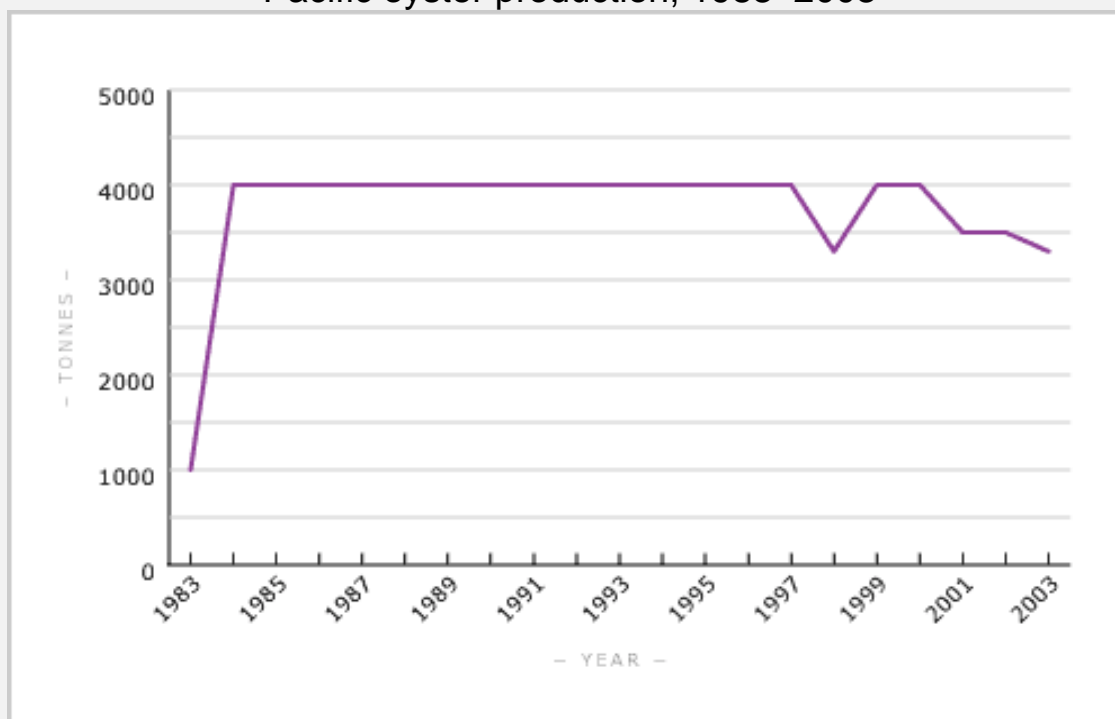
Oyster spat, the free-swimming larval stage of an oyster, were collected during summer on sticks placed at mid-tide level in Mahurangi estuary, near the Hauraki Gulf. In 1970, farmers noticed another oyster that quickly outgrew the rock oysters. This newcomer was the Pacific oyster (*Crassostrea gigas*), which had probably been introduced into New Zealand waters from a Japanese source in the 1950s. At first, farmers tried to clear it from their collecting sticks, but each year more and more Pacific oyster spat attached itself until it proved futile to try and get rid of it.

Commercial success

Within a few years most commercial growers wisely began cultivating Pacific oysters. They grow three times faster than native rock oysters, produce a consistent quantity of spat, and have a well-established international market. The Pacific oyster turned up in the Marlborough Sounds in 1977 and farming began there in the 1990s. In contrast to the northern North Island method of racks,

Marlborough farmers cultivated their oysters on suspended longlines. By 2001, 100 oyster farms were producing 3,500 tonnes of Pacific oysters; 30% was consumed by the domestic market and the rest was exported, with a value of \$13.6 million.

Pacific oyster production, 1983–2003



Pacific oysters are farmed in Northland and Coromandel. The species accidentally arrived in New Zealand some time before 1970, and became established in habitats similar to those of the native rock oyster. Because the Pacific oyster grew bigger and faster, farmers switched from cultivating the native species to the Pacific oyster in the 1980s. Since 1984, annual production has remained between 3,300 and 4,000 tonnes.

Source: Statistics New Zealand

Training and research (from Wikipedia)

In recent years, skill levels in the New Zealand aquaculture industry has considerably improved. This has been largely due to [Seafood Industry Training Organization](#) (SITO), an integral part of the seafood industry. SITO have developed tailored aquaculture training programmes based on their prior experience with industry-based training for wild fisheries. They now offer nationally recognised training programmes based on the needs of companies involved in aquaculture.^[1]

At the tertiary level, the [Auckland University of Technology](#) offers an undergraduate degree in aquaculture. Other tertiary training centres offering aquaculture courses include the [Bay of Plenty Polytechnic](#), the [Nelson Marlborough Institute of Technology](#), and the [Mahurangi Technical Institute](#).^[1]

Government funding for aquaculture research is about two percent of the annual sales of

the industry. These funds are mostly delivered through a competitive bidding process, organised and controlled by the [Foundation for Research, Science and Technology](#).^[1]

- The principal aquaculture research group is the [National Institute of Water and Atmospheric Research](#) (NIWA). NIWA is structured as a profit-making private company, though it is owned by the government. It operates three aquaculture research facilities; [Bream Bay Aquaculture Park](#), [Mahanga Bay Aquaculture Research Facility](#) and [Silverstream Hatchery](#). The Bream Bay Aquaculture Park includes other private aquaculture companies organised as an industrial-technology park. NIWA produces [yellowtail kingfish](#) spat, seed [abalone](#) and salmon smolts, which it sells to on-growers.^[1]
- The [Cawthron Institute](#) is a non-profit organisation which does regional research around [Nelson](#). It operates a nearby saltwater research facility called the [Cawthron Aquaculture Park](#).^[1]

Debate about Pacific Oyster expansion using hatchery produced seed hits the Press – an excerpt from the Nelson Mail

Farming Cawthron Institute-produced pacific oysters in the top of the south is taking a risk that could kill the developing Marlborough industry, says Okiwi Bay grower Maurie Heberd.

His concerns are shared by the other main grower in the region, Okiwi Bay Aquaculture, which has been farming for two decades and built up a thriving business.

Mr Heberd has vowed to block a plan to put large numbers of Cawthron spat in Croisilles Harbour to begin their growth before shipping the juvenile oysters to Northland farms to reach harvest size. He said unless Cawthron could give an absolute assurance that its spat, produced at the Glen, would not spread the ostreid herpes virus that has devastated the North Island oyster industry, it must be stopped from putting more into top of the south waters.

He has written to Prime Minister John Key, Fisheries Minister Phil Heatley, Environment Minister and Nelson MP Nick Smith and officials in an effort to halt the release of more spat.

After the Northland farms were hit the virus was found in Glen oyster larvae at the beginning of the year, causing a temporary shutdown of the hatchery. The institute's business manager, Mike Mandeno, has written to Mr Heberd saying that it has reviewed its practices and procedures and "we believe the safety measures we have in place are rigorous and appropriate".

But Mr Heberd said stopping short of a guarantee of no virus was not good enough.

He likens the planned method of raising the spat in small trays to putting 100 schoolchildren into a classroom meant for 20, causing any bug to spread quickly.

"I'm totally concerned that it will kill our wild stock. They say our industry is small compared to the North Island one, but they'll kill our industry down here and then we'll all be out of business."

His oyster turnover exceeded \$1 million in the past year and he had just sent four container-loads overseas. He estimated the industry already provided 50 full and part-time jobs in the top of the south, with "massive potential" for growth. This was why the Cawthron spat should be tried in an area well away from the existing farms, he said.

Echoing Mr Heberd's fears, Okiwi Bay Aquaculture director Margaret Hippolite said she was disappointed with the response from the industry, Cawthron and the Government. The company had a big long-term investment in the area and was expanding.

"It's not been done before, what they're planning on doing. It's kind of an experiment and when there's a juvenile oyster virus around, it's just logical not to overpopulate an area with juvenile oysters. Why take a risk when you don't have to?"

Nelson lawyer Tony Stallard, who acts for Mr Heberd, said there was an absolute prohibition on the transfer of diseased fish, including spat.

If diseased spat was transferred into Croisilles the effect would be to effectively wipe out Mr Heberd's business.

Mr Heberd's company was also opposing a resource consent application to place a barge in Croisilles Harbour for handling the spat and was questioning if the biosecurity process was sufficiently robust.

"The issue for me is that you can't possibly do enough testing to ensure that you're going to get 100 per cent certainty. It's at what level do you then decide that you're going to put it out there and say there is no risk," Mr Stallard said.

In a statement, Nelson-based director of the Ministry of Fisheries aquaculture unit Dan Lees said the cooler waters in the Croisilles area might be better suited to hardening susceptible juvenile spat before it was transferred to the warmer waters of the upper North Island. He confirmed that the ministry was working with Cawthron to ensure its spat were not diseased, and that released spat would not threaten the marine environment.

APPENDIX #5 – ‘NZ Recovers From OsHV-1 Outbreak’ – The Fish Site

NZ Recovers From OsHV-1 Outbreak

NEW ZEALAND - With the majority of oysters exported, New Zealand oyster producers have benefited from international prices rising by 25 per cent in the past year. Charlotte Johnston, TheFishSite editor reports.



Charlotte Johnston

The rise in prices is due to a number of factors, including the oyster herpes virus (OsHV-1).

In November/ December 2010, New Zealand found cases of OsHV-1 on a number of oyster units in the North Island, and it is estimated that half the country's juvenile crops were wiped out.

Adam Hicks from Aquaculture New Zealand says this resulted in severe production losses in 2011. However, he adds that the industry has experienced minimal losses this season and is confident of continuing to grow.

The NZ Ministry of Agriculture and Fisheries estimated the financial loss to be NZ\$30 million - although Mr Hicks believes it is too soon to put a value on the losses occurred.

Mr Hicks says that the outbreak was a temporary setback. No further outbreaks have been reported since 2010, however the industry has taken a proactive approach to dealing with any future threat by creating a selective breeding programme with broodstock to be resilient to the disease.

There are ongoing breeding and rearing technique advancements and grow-out programmes in place that will result in improved farming systems, better management and an improved product to market – while maintaining NZ's deserved reputation for the highest standards of food safety and quality, concludes Mr Hick.

Oyster Herpes Virus (OsHV-1)

Officially identified in France no more than 24 months ago, the Ostreid herpesvirus-1 (OsHV-1) is one that has spread fast. The disease only affects the Pacific oyster, native oysters remain uninfected. To date the disease has been associated with large scale mortalities. It is likely the disease has been present for a lot longer, but has been unknown to the industry. In Europe, the virus is mostly affecting younger stock, although some adult stocks have been affected.

Adult mortality varies between 10 - 30 per cent, however juvenile mortality is a lot

higher, between 60 - 100 per cent.

The cause of the virus is still unknown, although it has been suggested that there are a number of causative agents. One of these is varying climates and temperatures. A French scientist, Tristan Renault, from the genetics and pathology lab at the IFREMER (French Research Institute for Exploitation of the Sea), has suggested in recent publications that one of the contributing factors to the appearance of the disease could be global warming and a subsequent significant rise in the ocean's temperature.

Only very occasionally have mortalities occurred when the temperature has been less than 15-16 degrees Celsius.

Large scale mortalities began in France four to five years ago, with the disease then spreading to Southern Ireland. In early 2010, oyster farms in South England were infected, with smaller mortalities in the Netherlands. Later on in the year, farms in New Zealand became aware of the disease and in January 2011, Australia confirmed an outbreak of the virus.

Prevention

The most efficient method to prevent the spread of the disease is to minimise the movement of stock. However this is not always successful. In Whitstable, South England, a closed farming system was in place, however oysters were still found to be infected with the virus.

Producers are advised not to re-water any oysters from infected areas.

The poster features a background image of a crayfish on the left and several fish and a mussel on the right. The NIWA logo is in the top right corner. The text 'training courses in aquaculture' is prominently displayed, with 'good training is the basis for successful aquaculture' underneath. A list of six topics is provided, each preceded by a small circular icon. Contact information and a website URL are also included.

NIWA
Taihoro Nukurangi

training courses in
aquaculture
good training is the basis for successful aquaculture

- water quality monitoring
- recirculation technology
- puaa farming
- fish and shellfish biology
- hatchery techniques
- fish and shellfish husbandry
- environmental best practice

For information on training courses:
email: training@niwa.co.nz, or call: 0800 746 464.
NZQA qualifications and course subsidies for industry participants may be available through the Seafood Industry Training Organisation (SITO).

www.niwasience.co.nz/edu/training

National Centre for
Fisheries & Aquaculture
generating wealth for New Zealand

Diploma in Aquaculture (Fish Farming and Fishery Management)

- **This diploma will prepare you to work in the aquaculture industry and create a pathway towards management.**
- **There is an increasing need for qualified and professional people to work in the aquaculture industry.**
- **You'll gain knowledge and skills in aquaculture systems, how they work, and how to best manage them.**
- **You will also become familiar with basic aquatic species biology, aquatic ecology, and business management.**

This new programme has been developed in consultation with industry, such as New Zealand King Salmon, Sealord, Aquaculture New Zealand, Aotearoa Seafoods and Marine Farming Association of NZ. The programme has been designed to meet the increasing demands of the aquaculture and fresh water fishery management industries. Graduates will be educated in practical and theoretical aquaculture, as well as having some business management skills. These industries and support services require technologists and managers with applied scientific knowledge, managerial skills and ability for independent thought and analysis. Throughout the two year programme, students learn concepts and technical skills by working together to solve open-ended problems based on real life industry situations. Many of the courses are integrated around key major projects and industry placements. This combination of theory

and practical training will provide students with an excellent background to move into the aquaculture field. An industry experience component for students not already working in the field will see them spend a minimum of eight weeks (two weeks of each semester) working in industry to hone their learned skills.

- **Qualification:** NMIT Diploma in Aquaculture (Fish Farming and Fishery Management) **and** National Certificate in Aquaculture (Level 4) **Programme Levels:** NMIT Diploma Level 5, National Certificate Level 4
- **Enrol now:** [NZ & Australia Students](#) | [International Students](#)

APPENDIX #10 – ‘Farm will nearly double National Oyster Output’.

NEWS

MUSSEL MEAT RECALLED

Sanford issued a global recall on November 27 of 280 tonnes of Greenlip mussel meat that could contain the killer bacteria listeria.

Listeria monocytogenes had been identified "at a low level" on the mussel meat's production line at the company's Havelock plant in Marlborough, said Sanford's managing director, Eric Barratt.

The meat was sold as requiring cooking before consumption, which would render the listeria harmless and eliminate any food safety risk, Barratt said.

Most of the mussel meat was exported, to a variety of markets, including the United States, Canada, Spain, Hong Kong, Germany, Australia, Bulgaria and the United Kingdom. But a limited amount was sold in Nelson and two companies which further process the mussels. Sanford had voluntarily recalled products from these customers that had not yet been used.

The listeria monocytogenes bacteria causes an infection called listeriosis. The bacteria occurs widely in nature and is found on a large range of foods. It survives freezing for long periods and in food with up to 20 percent salt.

Listeriosis can cause septicaemia, meningitis, encephalitis and intrauterine or cervical infections in pregnant women, which may

result in spontaneous abortion or stillbirth. The mortality rate is between 20 and 30 percent.

In 1997, two Auckland women lost their unborn babies, one at 24 weeks and the other near full term. In 2005, there were 20 reported cases of listeriosis.

FARM WILL NEARLY DOUBLE NATIONAL OYSTER OUTPUT

A new oyster farm capable of producing over one million dozen oysters per year is to be built off the southern shores of Kaipara Harbour, one of the largest harbours in the southern hemisphere.

The Biomarine site is very remote from land, being 4km from the coast, 13km from the mouth of the Hotoe River and 6km from South Head. Huge water flows of up to two cubic kilometres of water are exchanged with each tide, but sandbanks opposite the entrance will protect the farm from open sea swells.

The original application was for 104ha in four blocks, but the farm will be 76ha in size, in three blocks of about 1500m x 500m. The fourth block was omitted because shading from the oyster baskets could have affected seagrass.

The farm is to be developed in five stages



with a minimum of two years for each stage. The density of development is very low, with 20m between lines, compared with 4-5m for other farms. All the oysters will be in baskets, with no loose oysters at all.

The water quality is said to be extremely high, with no sources of runoff or human habitation, such as pollution from houses or boats, from anywhere nearby. A shore base is being set up at the mouth of the Hotoe River, and ultimately a new processing plant will be built near Warkworth.

"It's good to get out into an area where there is no pressure on the catchment," said Biomarine director Jim Dollimore.

It is expected that about 7000 baskets will be put in on 6000m of lines this summer, with a similar number to be built in 2008. These will be used mainly for on-growing oysters from Biomarine's Mahurangi farms. It is expected that 2.5 million to three million oysters, depending on size, will be put through the baskets in the first year.

A new 13m barge has been built to service the farm. It is expected that this barge will be adequate for the first three years' development, by which time another barge will be required. When fully developed at least four barges will operate for seven days a week.

The farm is likely to employ about 24 people directly when fully developed, and the processing operation should employ a further 80 or more. Depending on the size and type, production from the new farm will range from 25 million to 30 million oysters per year when it reaches full production in about a decade, compared with New Zealand's current annual oyster production of 36 million per year.

The Cawthron Institute has developed a rigid biosecurity plan, and no equipment is to be shared with other harbours to prevent the transport of pests from one harbour to another.

According to the operators, it will be a long time before there are any other marine farms on the southern Kaipara, as the Auckland Regional Council has withdrawn proposed AMAs for the area.

INNOVATIVE BAGS ADD APPEAL

Donald Napier Limited is a recognised supplier of innovative and technologically advanced processing and packaging systems.

The company specialises in sourcing quality equipment from around the world to meet New Zealand manufacturers' needs, says the managing director of DNL, Nigel Hollis. They can range from washing, drying, grading and slicing to weighing, filling, counting, bagging, overwrapping, metal detecting and labelling. "In fact you name it, we can supply it," he says.

Given that the company had this capability, the next challenge was shellfish, and mussels in particular. The live mussel industry has already established itself in providing quality, fresh live seafood to consumers in our supermarkets and seafood outlets. But often it's not all that convenient for consumers to pick through varying sizes of mussels, broken shell and even some weeds while trying to dodge the cabinet's spray unit.

"So we were asked if we could develop a packaging system that would suit large shellfish, in particular mussels, in graded sizes to give a consistent product in 1kg, 2kg and even 4kg bags."

The bags could still be presented in the supermarket's chilled spray cabinet, but the householder could select one with confidence that the product was of the best quality and of consistent size.

Donald Napier has two types of machines and bagging systems that are suitable for shellfish, says Hollis. One uses a pre-made and pre-printed bag with ventilated drainage panels, and the other makes the bag on demand and can pack up to 30 bags per minute.

These machines are at the trial stage, and early indications suggest that adding value to make shellfish a convenient product will find favour with consumers.



The pre-printed and ventilated bag



This bag is made as required