

WHAT?

A rapid test to guarantee seafood safety for industry & public

WHO & FUNDING:

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BACKGROUND:

Shellfish are forced by regulatory authorities to be tested for algal biotoxins, using expensive analytical methods such as High-Performance Liquid Chromatography (\$500 per sample) carried out by specialised accredited laboratories. Shellfish containing more than 0.8 mg Paralytic Shellfish Toxins per kg are deemed unsuitable for human consumption and prohibited from sale. Currently Australian regulatory programs conduct over 3800 analyses per year for marine biotoxins, with 90% returning negative results. Slow laboratory turn-around times, combined with transport difficulties from regional areas, often mean that test results are not available until 3-7 days after samples are taken. This poses a health risk for consumers, and business risk for industry. A cost effective screening method was required that could be used locally to rapidly sort out harvests with no public health or business risks. Harvests producing positive screen results could then be held on-site, whilst samples are sent for complete chemical analysis.

WHAT WAS FOUND

We resurrected immunological test-kit technology (the "Jellett test kit") that had almost been given up on. The solution to why this approach did not work satisfactorily previously was to use antibodies with better cross-reactivities, fine-tune mixtures of antibodies to match the toxin analogues to be detected, and to convert difficult to detect to more easy to detect toxin analogues. Neogen[®] test kits (20 min @ \$35) proved best suitable for Australian PST profiles. To convince the regulatory bodies of the suitability of this test-kit, we conducted a comprehensive validation exercise using protocols designed by the Association of Official Analytical Chemists in the US. A total of 996 blind samples were sent to 16 laboratories, both domestic and international, ranging from shellfish farmers to fully accredited laboratories. The Neogen[®] test kit passed with flying colours for testing PSP in oysters, was satisfactory for mussels, but surprisingly the results were not only faster and cheaper than chemical methods but also much more reliable between laboratories. We also organized numerous training courses for shellfish farmers in the operation of the test kits, providing them with certificates of competency so that in future they are allowed to perform the test themselves. While PSP toxins are the most widespread seafood toxin problem in Australia, this product but using different antibodies can readily be applied to other biotoxins.

HOW WILL THIS HELP THE OYSTER INDUSTRY:

Application of rapid tests by industry empowers them to make harvesting decisions at the farm gate. Not wasting analytical efforts to test negative samples is estimated to save industry \$750,000 per year.

FURTHER INFORMATION: Gustaaf.hallegraeff@utas.edu.au