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FSAS' update on marine biotoxin related research

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A critical review of the current evidence for the use of indicator shellfish species for the purposes of biotoxin and chemical contaminants monitoring in the Scottish shellfish production areas

- The aim of this project was to critically review and assess the current and most up-to-date available evidence base on feasibility of the use of a shellfish indicator species for biotoxin and chemical monitoring in Scotland
- The project was undertaken by Dr Cath McLeod of Seafood Safety Assessment Ltd
- This was a 6 month desk-study which finished in August 2014
- The final report is currently undergoing peer-review,
- Outcomes of the project will be considered by the FSA on completion of the peer-review process
- Expected publication of the final report November - December 2014

Review of use of shellfish indicator species – cont.

Background

- Scotland has a diverse bivalve shellfish industry with over 160 classified harvesting areas grouped into approximately 90 pods
- EU law specifies that classified areas must be monitored for presence of certain marine biotoxins and chemical contaminants (Official Control monitoring programmes)
- Use of shellfish indicator species is allowed by the Regulation (EC) 854/2004

‘When knowledge of toxin accumulation rates is available for a group of species growing in the same area, a species with the highest rate may be used as an indicator species.’

Review of use of shellfish indicator species – cont.

Use of indicator species for toxin management in Scotland

Total number of pods	84
Number of single species pods	64
Single species pods in which indicators are used	7
Number of multi species pods	19
Total number of pods in which indicators used	26

Indicator species	Representative species	Number of pods
Mussels	Pacific oysters	12
	Cockles	7
	King scallops	2
	Native oysters	2
	Razors	2
Cockles	Razors	3
	Pacific oysters	1
Pacific oysters	Mussels	1
	Queen scallops	1
	Razors	1
Razors	Cockles	1

Review of use of shellfish indicator species – cont.

Studies objectives:

- To complete a critical review of international literature on use of indicator shellfish species and uptake and elimination patterns for major regulated marine toxins and chemical contaminants in bivalve molluscan shellfish
- To compile a summary of the use of indicator shellfish species in international shellfish risk management programmes;
- To review Scotland's toxin monitoring data to evaluate the effectiveness of indicator species and identify data gaps;
- To develop recommendations on future research that could be undertaken to address high priority data gaps on feasibility of indicator species.

Review of use of shellfish indicator species – cont.

Summary of outcomes : Accumulation/elimination rates

Toxins

- Mussels are highly efficient accumulators of marine toxins and during algal blooms generally accumulate higher concentrations than most other bivalve species;
- King scallops can accumulate higher levels of ASP and PSP than co-occurring mussels
- Pacific oysters can accumulate significant quantities of AZAs and have been reported to contain higher concentrations than mussels co-sampled from the same area at the same time
- Toxin elimination rates can differ between bivalve species, and mussels frequently detoxify more rapidly than other bivalve species

Chemical contaminants

- Oyster accumulate higher concentrations of cadmium, PAHs and PCBs than mussels
- Mussels accumulate higher levels of lead and mercury than oysters

Review of use of shellfish indicator species – cont.

Summary of outcomes: Approaches applied in other countries

Toxins

- Use of shellfish indicator species is common
- Mussels are most often used as indicators
- Other shellfish species are also used as indicators (oysters, cockles, clams)
- Some countries refrain from using mussels to represent scallops
- Most countries test species individually and do not use indicator species to facilitate re-opening of areas
- Different management approaches are used in response to toxin detection in the indicator species

Chemical contaminants

- Use of indicator species is rare
- Mussels are infrequently used as indicators for metals, PAHs, dioxins and PCBs

Review of use of shellfish indicator species – cont.

Contractor's recommendations for FSA's consideration

Toxins

- Dual monitoring during toxic algal blooms should be considered where indicator species are currently used to strengthen available evidence base
- Concurrent monitoring of oysters and mussels for AZA and King scallops and mussels for ASP and PSP during toxin blooms should be considered to assist in appraisal of appropriate indicator species for this toxin/species combination

Chemical contaminants

- Before considering use of indicator species, concurrent monitoring data should be gathered to support a science-based approach

Review of the currently available rapid testing methods for detection and quantification of the marine biotoxin in shellfish

- Project currently in contract negotiation stages, due to commence in November 2014 and complete in March 2015
- The study's aim are to review the status of rapid testing methods, the capabilities of the methods which are available on the market, and what other existing technologies could be utilised in end product testing of shellfish
- The supplier will recommend where future research effort should be placed to improve the available techniques

Evaluation of FSAS' Shellfish 'traffic light' toxin guidance



MANAGING SHELLFISH TOXIN RISKS

GUIDANCE FOR HARVESTERS AND
PROCESSORS

Reviewed April 2014

For all queries about this guidance — including if you require the information in an alternative format such as audio, large print or Braille — please use the number below.

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<http://www.food.gov.uk/sites/default/files/multimedia/pdfs/guidance/managing-shellfish-toxins-guidance.pdf>



Evaluation of FSAS' Shellfish 'traffic light' toxin guidance

- Project currently out to tender, planned to commence in February 2015 and complete in November 2015
- The supplier will be expected to work in collaboration with shellfish harvesters and processors in Scotland, as well as with the enforcement officers
- The project will investigate:
 - whether the guidance is sufficiently robust and clear as a risk management tool
 - the impact of the guidance on businesses and local authority
 - whether there is sufficient access to relevant information/expertise on shellfish risks in order to apply the guidance
 - any barriers that harvesters and processors are encountering in applying the guidance
 - access to technical services across Scotland and whether there is sufficient commercial and/or private expertise available to businesses and local authorities
 - alternative risk management models which may be in use where this guidance has not been applied

Thank you