Geographical investigation for chemical contaminants in seafood collected from UK marine waters and coastline

Research programme Research projects -
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Conducted by Fera
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Background

Previous surveys for contaminants in fish and shellfish have generally been targeted at the retail level. Although non-compliances are rare, there is variability in contaminant levels even within the same fish species. Currently we have limited information about variability in background pollution levels in different locations and how they might impact on levels in seafood. The Marine Strategy Framework Directive aims to pull together a range of regulations, codes of practice, licensing systems and initiatives impacting on the marine environment. As part of this work Good Environmental Status will be defined by a series of descriptors. Descriptor 9 (D9) states that food produced in the marine environment is safe for human consumption. This project generated data that was used to provide a baseline for the UK D9 assessment. The data was also supplied to the European Food Safety Authority for use as necessary in their exposure and risk assessments This data included contaminants under investigation as emerging risks as well as those that are currently regulated under EU legislation

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Research Approach

A list of ‘higher risk’ species was prepared. These were generally oily fish and those that had been shown to contain raised contaminant levels in previous surveys. Samples were collected during research vessel cruises and supplemented by samples purchased at Billingsgate fish market (where information about the catch location is accessible).

Samples were supplied to the Food and Environment Research Agency where they were tested for the contaminants currently regulated under Commission Regulation 1881/2006 (as amended), notably heavy metals, dioxins and polychlorinated biphenyls (PCBs). Selected samples were also tested for some contaminants identified as emerging risks from our other research projects, newly listed compounds and candidates for listing under the Stockholm Convention* and substances of very high concern under the REACH regulations. Examples included brominated flame retardants, new dioxins, perfluorinated compounds and polychlorinated naphthalenes.

* The Stockholm Convention on Persistent Organic Pollutants is an international environmental treaty effective since May 2004 that aims to eliminate or restrict the production and use of persistent organic pollutants (POPs).

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Results

Of the species targeted sea bass, sprats, mackerel, sardines and herring showed higher levels of pollutants , which is to be expected as these species have higher oil contents and were also found to be among the more contaminated species in the previous FSA study in 2003-4. Overall, there appears to have been a small fall in contaminant levels since that study. An initial impression of the geographical spread suggests that fish taken in waters around the Southern UK/Northern French coasts tend to contain higher levels of dioxins and PCBs, albeit still predominantly within compliance. Only two samples were found to be non-compliant for dioxins and PCBs, one mackerel and one sea bass, both of which were landed in Boulogne before being sent to Billingsgate. The fish were likely to have been taken in the southern English Channel. The River Seine is known to be a significant source of dioxins and PCBs which has led to a ban on pilchard fishing in the Seine Bay. Levels of polychlorinated naphthalenes (PCNs) appear to be relatively higher in samples from the Irish Sea. This may be linked to emissions from the river Mersey, which previous work by the FSA has shown to be a potentially PCN significant source. Nevertheless, the actual levels are comparable with previous investigations which raised no health concerns.

Metal levels were generally within compliance, with the exception of mercury in a number of sea bass samples. As there was no geographical trend this is likely to be a species-specific effect rather than an indication of contaminant hotspots.

Based on the results, previous advice on fish consumption remains unchanged.

The results from this project have been shared with the Defra lead Marine Strategy Framework Directive (MSFD) Steering Group for use in preparing a baseline for MSFD Descriptor 9 (food safety).The data have also been supplied to the European Food Safety Authority to be combined with wider occurrence date for the various chemicals for use in their ongoing exposure and risk assessments

Research report

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View Geofish data sets as Excel (664.6 KB)