The science behind safer seafood

We spoke with Dr Santiago Pascual about an international, translational research project aimed at improving the detection, monitoring and risk mitigation of zoonotic parasites present in seafood in Europe.

What are the main aims of the Parasite Risk Assessment with Integrated Tools in EU Fish Production Value Chain (PARASITE) project, and why was it established?

Recognising the uncertainties in risk management of parasitised fishery products, the PARASITE project developed a strategic work plan based on the achievements of existing scientific evidence, while expanding its scope to encompass every dimension of a policy-support science. This involves developing and implementing surveillance, inspection and diagnostic tools, as well as broadening the scientific methodological approaches to assess the safety, quality and performance of EU fishery products.

Why is it important to detect, monitor and mitigate the risks of zoonotic parasites?

Fishery products naturally host parasites, some of them with well-recognised zoonotic and allergenic potential. This is the case for many anisakid species that through many years of co-evolution have adapted to the trophic networks

Improved management of risks posed by fish parasites

The PARASITE project is building collaborations across Europe and Asia to improve the safety and quality of fishery products in Europe.

In 2010, the European Food Safety Authority (EFSA) published a scientific opinion outlining a number of knowledge gaps present in parasite risk evaluation for seafood marketed in Europe. Since some parasites in fishery products are known to have zoonotic and allergenic potential, improvements needed in risk evaluation and management processes were highlighted.

Anisakids are the better known example of a zoonotic parasite found in fish products. These parasitic nematodes exist harmlessly in marine creatures but can cause anisakiasis (herring worm disease) or allergic reactions when accidentally ingested by humans through the consumption of raw or undercooked fish. Symptoms of anisakiasis can range from mild to severe, and, in some cases, surgery or endoscopy is required to remove the infective larvae. There are increasing concerns in Europe, and worldwide, on how to mitigate and manage the risks such parasites pose – from both a public health perspective and, no less importantly, from an industrial and economic point of view.

The PARASITE project

To address the research needs identified by EFSA regarding the risk of seafood-borne parasites, the Parasite Risk Assessment with Integrated Tools in EU Fish Production Value Chain (PARASITE) project was established. Its overarching goal is to provide new scientific evidence and technological developments for the detection, monitoring and mitigation of parasites present in European and imported fishery products, and to, ultimately, improve seafood safety and quality.

To achieve this, PARASITE is employing a collaborative, multidisciplinary approach; it comprises researchers from 15 research institutions and six SMEs from a total of 13 different countries spanning Europe and Asia. As such, it is anticipated that an additional output of PARASITE activities, beyond knowledge creation and technological development, will lead to the strengthening of translational relationships between different stakeholders.

A multi-pronged approach

The PARASITE project’s activities are divided into nine work packages. Seven of these focus
of marine ecosystems. Public health concerns regarding these parasites, and their impact on the quality of fish, are good reasons to look for improvement of control measures in the EU fish value chain, with the aim to detect, monitor and mitigate the risks associated with these parasites. We are confident that the best value for money approach is to produce knowledge that may be applicable and helpful in effective risk management, including its communication to stakeholders.

Could you provide an overarching summary of the project’s core activities?

The PARASITE project comprises nine work packages that cover four relevant aspects of a risk evaluation programme: risk exposure, hazard identification, hazard characterisation and quantitative risk analysis. Furthermore, we concentrate on the improvement of detection methods and the potential interventions in the food chain to reduce the risk. Additionally, a biobanking platform was created – for the first time within a biohazard project dealing with parasites – with the aim of adding value to the sample and data management originated in the surveillance plan designed for the project. Many scientific approaches – including genomics, proteomics, high-resolution microscopy, immunology, advanced statistics and technical approaches have been applied to determine the public health and economic impact of anisakids in fishery products.

What importance does the project place on disseminating its results to stakeholders in the field of fish parasitology, including scientists, policy makers and industry?

One of the most promising, exciting challenges of the PARASITE project was to take an outcome-focused approach. While some results only hold interest for a scientific audience, as a base for wider biological understanding and planning of future research applications, many pieces of information generated in the project are to be disseminated to industry and policy makers.

To achieve this, the PARASITE consortium includes the European Reference Lab for Parasites as a strategic project partner and we have actively encouraged industrial involvement. This provides an adequate framework for producing the science-based orientations, data and technologies, needed to improve seafood quality and safety standards. In our view, PARASITE represents a good example of how to make progress in research for seafood safety and quality under efficient collaboration patterns.

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BETTER, SAFER SEAFOOD

Overall, it is anticipated that the PARASITE project will contribute to three major outcomes. First, it will contribute to enhanced seafood safety and quality in Europe. Second, it will strengthen the competitiveness of the European seafood sector, bringing about economic benefits and consumer trust. Third, it will produce data and tools that can be used to support EU food safety policies. Indeed, discussing the latter point, Project Coordinator Dr Santiago Pascual of the Institute of Health Research, belonging to the Spanish National Research Council, predicts: “The scientific evidence generated in PARASITE should be considered to elaborate recommendations and to support and discuss future changes in the EU regulations for parasites in fish”.

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THE PARASITE SURVEY

The PARASITE consortium has produced a survey aimed at assessing exposure to Anisakids. The findings will be used for guaranteeing better seafood safety and quality.