Trichinella in UK Wildlife

Area of research interest: Foodborne pathogens
Study duration: 2009-04-01
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Conducted by: Food and Environment Research Agency (FERA)

Background

Trichinellosis is a zoonotic disease, caused by eating raw or undercooked meat, which contains larvae of the nematode genus, Trichinella. Species of Trichinella can be found in a variety of wildlife hosts worldwide. In Europe the main sources of human infection are from pig, wild boar and horse meat.

To prevent infected meat from pigs and other relevant species entering the human food chain, routine testing is mandatory within European Union member states. Testing and reporting of Trichinella has continually improved over time, enabling a move towards risk-based surveillance.

For example, the official recognition of Trichinella-free production, as well as the sanctioning of risk based monitoring programmes for Trichinella in pigs was introduced into EU legislation in 2006. This has provided a framework for regions to be recognised as presenting a negligible risk of Trichinella in domestic pigs, to allow exemption from Trichinella testing of domestic pigs kept solely for fattening and slaughter. In accordance with Commission Regulation 2075/2005, before an application can be progressed to the EU for approval, evidential data must be submitted to demonstrate that a wildlife monitoring programme has been put in place using the most suitable indicator wildlife species and detection technique, in order to verify that the animals are effectively 'free' from Trichinella. It is within this context that this project work was carried out.

Research Approach

The main objectives of this project were to obtain and gather data relevant to Trichinella species in foxes to ensure demographic coverage of the UK and also to assess the value of gathering data from other wildlife species and animals at slaughter.

Trichinella testing in foxes, as an indicator wildlife species, was carried out in Britain and Northern Ireland between 1 April 2009 and 31 March 2012. Approximately 1,503 foxes from around Britain and 492 from Northern Ireland were subject to post-mortem removal of relevant tissues for analysis. Trichinella testing was then carried out using the digestion method. This involves the enzymatic degradation of muscle fibres to release muscle Trichinella larvae. Microscopy was then used to identify the presence of Trichinella. In addition, in the same timeframe, a total of 31 cetaceans (13 harbour porpoises, 2 striped dolphins, 15 common dolphins and 1 Cuvier’s beaked whale) and 11 pinnipeds (10 grey seals and 1 hooded seal) were tested for Trichinella.

The project also involved examining the practicality of using other wildlife species, such as wild boar and rats, as indicators of Trichinella infection. The work also involved carrying out an assessment of the value of alternative serological Trichinella testing methods.

Results

Between 1 April 2009 and 31 March 2012, a total of 1,503 foxes from Britain were tested for Trichinella. All foxes were found to be negative for Trichinella. During the same timeframe, 492 foxes from Northern Ireland were tested for Trichinella. All foxes were found to be negative for Trichinella. Over the same period an investigation of alternative wildlife species was carried out, including 31 cetaceans (13 harbour porpoises, 2 striped dolphins, 15 common dolphins and 1 Cuvier's beaked whale) and 11 pinnipeds (10 grey seals, 1 hooded seal). All samples tested negative for Trichinella.

It was found that the red fox continues to represent the best opportunity for detecting Trichinella in UK wildlife. This is because the fox is widely used throughout Europe as an indicator animal and is also a potential indicator for all four species of Trichinella, which are reported in Europe. Samples can also be obtained easily as a result of normal pest control.

Part of this study involved keeping a watching brief on any new developments in serological methodology and testing. Due to the low specificity of currently available assays, there are several challenges to the development of serological tests in wildlife. This may be due to the high level of sample contamination (which may be parasitic, bacterial, viral or fungal in origin), but also due to cross-reaction with other parasites, which leads to false positive results. Due to this, it is generally accepted that only data obtained with the digestion method (which involves the enzymatic degradation of muscle fibres to release muscle Trichinella larvae for subsequent identification) may be considered with objectivity.

Published Papers

1. Zimmer, I.A., Fee, S.A., Spratt-Davison, S., Hunter, S.J., Boughtflower, V.D., Morgan, C.P., Hunt, K.R., Smith, G.C., Abernethy, D., Howell, M. & Taylor, M.A. (2009). Report of Trichinella spiralis in a red fox (Vulpes vulpes) in Northern Ireland. Vet. Parasitol., 159, 300-03.

Research report

England, Northern Ireland and Wales

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