General Secretary's Report

Hello to you all.

It has been a busy last four months or so for the Association.

I'll start with the board meeting of the European Working Community for Food Inspection and Consumer Protection (EWFC) board meeting in April.

Clearly, one of the main topics was always going to be Brexit and its implications for the UK membership of the EWFC. The AMI was requested (at a previous board meeting) to consider its position and intention in time for this April meeting, with the endorsement of the board that the UK input is both considerable and valued.

AMI council made the decision that we should continue to maintain full participation for as long as the EWFC consider us welcome (which is at least two years from the triggering of article 50) and for longer if agreed by EWFC.

At the April meeting the AMIs decision was welcomed by the rest of the board and further endorsed by a decision to keep the UK involved in the future, beyond Brexit. This could be by way of an 'associate membership' which is already provided for in EWFC statutes, or possibly by way of a continued 'full membership' which might require a constitutional change. Either way, the AMI consider the European consumer to be the important consideration, and we will continue to represent the UK for the foreseeable future.

Another important matter that was discussed at the meeting was the revision of regulation 882, the overarching regulation for food production and inspection. In the final draft it appears that regulation EC 854 2004 will be repealed in December 2019. 854 is the regulation that sets out the detail for inspection, including those of animal origin. Our big fear now is that the EU Commission will deregulate by way of implementing acts, possibly clearing the way for industry to regulate themselves at some point. This possibility has been mentioned through these pages in previous editions so I won't go over old ground here. Suffice it to say that AMI and EWFC believe this to be the 'wrong' path to follow and will continue to contest this at every opportunity.

Echinococcus

Echinococcus, both *Granulosus* and *Multilocularis* have been under serious discussion in the veterinary circle recently. E. Granulosus is a recognised hazard to human health in certain parts of the UK and there is huge concern that if *E. Multilocularis*, not currently known to be in the UK, does find its way across the channel and gets in to the wildlife, most notably the fox population, then it could well be a cat that would be impossible to get back in to the bag.

The risks I mentioned in the last edition, should you wish to refresh your knowledge, and I was invited to give a small presentation at the spring meeting of the Veterinary Public Health Association setting out the value of meat inspection in aiding the control of all tapeworms. I was a little unsure of the level to pitch this presentation so I followed the advice of an older stalwart and pitched it as though 'I was speaking to my Grandmother'.

The consensus was that the meeting very valuable for all who attended. The audience ranged from small animal vets (who did not fully understand the role of the MHIs and OVs), right through to a top surgeon who specialises in human Hydatidosis. Some of the images that he included in his presentation were really quite startling, and left the audience in no doubt as to just how serious the condition is in humans.

My presentation should appear further in to this edition, and I hope that you will note, as I did in putting it together, that the three main attributes with regards to the MHI in this respect are knowledge, diligence and fortitude. I never doubt any of these three things bit when I saw it written like that, it reminded me of just how important all three are in varying degrees and varying times throughout our working days.

The veterinary advisor to the AMI, Dr Eleni Michalopolou is also a Senior Lecturer in Veterinary Public Health and Epidemiology at Liverpool University, and one of her students is running some research to do with Hydatidosis, and has requested the co-operation of MHIs.

I am confident that AMI members will aid this research in any way asked so I will end this report with Eleni's document setting out this request.

FSA/HyData Liverpool collaborative study: UK distribution of *Echinococcus granulosus* in sheep and cattle at slaughter and validation of hydatidosis identification procedure at post-mortem inspection

Project title: *Hy*Data: Investigating the national distribution of *Echinococcus granulosus* in the United Kingdom

Study title: UK distribution of *Echinococcus granulosus* in sheep and cattle at slaughter and validation of hydatidosis identification procedure at post-mortem inspection

PhD student: Marisol Collins[1]

Primary study supervisors: Philip Jones[1], Eleni Michalopoulou[1]

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Funding: BBSRC (via BBSRC Doctoral Training Programme studentship), Institute of Infection and Global Health - University of Liverpool, Bayer Plc.

Project timescale: October 2015- October 2018

Study period: 6 months (possible extension up to 12 months)

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Summary

The canine tapeworm *Echinococcus granulosus* is a parasite of global importance to human and animal health. Hydatid disease, caused by infection with tapeworm larvae manifests as cystic lesions in the viscera,

particularly the liver and lungs, of a range of host species including livestock and humans.

There is a current lack of data about the distribution and impact of *Echinococcus* in the United Kingdom. To address this knowledge gap, the HyData project, led by researchers at the University of Liverpool, aims to investigate *Echinococcus granulosus* in several important host species, including sheep and cattle at slaughter.

In collaboration with the Food Standards Agency (FSA) and abattoirs nationwide, this study within the project will sample cattle and sheep lesions identified during post-mortem inspection as hydatid in origin. FSA throughput data and reported figures on hydatid lesion rejections will be used to develop a statistically robust and representative sampling frame.

Samples collected will be tested in the laboratory for *Echinococcus granulosus* using molecular diagnostic methods and the results compared with visual inspection data. Confirmatory laboratory testing presents a valuable way to validate the system of inspection for this disease on the slaughter line. Importantly, this will also offer evidence towards the feasibility of laboratory testing for identification of other diseases integral to the PMI process, and contribute robust data to the CCIR programme for processors and producers.

The HyData study will also complement parallel collaborative work by the FSA and the University to review and improve consistency within identification of listed diseases using the condition card system available to MHIs as part of the CCIR programme.

Introduction

The tapeworm, *Echinococcus granulosus G1*, maintains a life cycle that includes dogs as the primary host and sheep as the main secondary host. However, many other species, including cattle, horses and humans can also become infected as accidental secondary hosts. Within such hosts, the larval stages of *E.granulosus* can form large ‘hydatid cysts’ in the liver, lungs and other sites leading to tissue damage and disease. Dogs typically become infected by scavenging or being fed raw infected livestock meat and offal, and will carry the parasite in the intestine without any signs of disease. Tapeworm eggs passed in faeces of dogs are orally ingested by the intermediate host during grazing thus completing the lifecycle of the parasite. Humans can become infected through accidental ingestion of eggs in contaminated soil, water or food, or by direct contact with an animal host.

Worldwide, *E. granulosus* presents a significant risk to human health and is an important source of economic loss for livestock industries, associated with poor growth, reduced meat and milk production and rejection of organs at meat inspection. In the UK, human and livestock cases of hydatidosis have historically been restricted to focal farming areas of south Powys in Wales, Herefordshire and the Hebridean Scottish Islands. However, a recent pilot study,

utilizing hydatid data from cattle raised throughout the UK has provided strong evidence that the parasite is more widely distributed than previously thought (Temple *et al*., 2013). The results may suggest a risk of transmission of hydatidosis beyond the traditional areas, calling for further research into the extent of this risk and any putative changing risk to the human population.

The proposed study is a large-scale investigation of hydatidosis in sheep and cattle slaughtered in England, Wales and Scotland, and the first to incorporate molecular diagnostic methods to confirm the presence of the disease in this size sample group. The study has two broad aims; firstly, to explore national hydatidosis distribution in two intermediate hosts, cattle and sheep, by carcass examination and lesion sampling at slaughter. Secondly, to validate the post-mortem inspection process undertaken by Meat Hygiene Inspectors (MHIs) by collecting samples of identified carcass lesions and confirming hydatidosis by genetic identification of the parasite. Current FSA records report hydatidosis in an estimated 0.1% of carcasses examined on the slaughter lines in England and Wales (Ramon Romero, personal communication), however this is yet to be supported by confirmatory laboratory testing, and the geographical distribution of this has not been investigated.

During the study period, samples of liver and lung (the main affected organs) lesions identified by MHIs as hydatid in origin using visualization, palpation and/or incision will be collected, together with identification data on the affected carcasses. In the laboratory, samples will undergo molecular testing for *E.granulosus* as the causative agent. The British Cattle Movement Service Cattle Tracing System database will allow pre-slaughter movement traceability of cattle. Together with the disease data generated, mapping techniques will be used to illustrate the geographical distribution of hydatidosis in this population.

Data generated by this study will be used by the FSA for the validation of the inspection process for hydatidosis, and will serve as a pilot proof-of-concept for identification of other diseases on the line. The dataset will be used by the HyData project to explore the UK distribution of *Echinococcus granulosus*, the causative parasite of hydatidosis, in important intermediate host populations.

Methodology

1. Determining the sampling frame

The study will adopt a stratified sampling approach. Inclusion criteria are abattoirs in England, Wales and Scotland undertaking the slaughter of cattle (greater or equal to 8 months of age) and/or sheep (greater or equal to 12kg in weight). Minimum age and weight categories are in place as hydatid lesions are unlikely to have developed to a visible size in young livestock. Abattoirs in England, Wales and Scotland will be recruited by the FSA to a larger existing post-mortem inspection evaluation exercise. From this national cohort, the hydatidosis study will use anonymised

FSA data on slaughterhouse numbers and throughput in England, Wales, and Scotland in 2015-2016 to identify the number of premises operating in each devolved country. This figure will be stratified further into three tier groups describing low (≥100 <1000), medium (≥1000 <10000) and high (≥10000) head throughput over a 24-month period. From each tier group, the total number of premises providing 80% of the throughput for the group will be selected for inclusion in the hydatidosis study. The list of the selected premises, each identified by a unique number, will be given to the FSA and the responsible MHI at each selected slaughterhouse will be informed and requested to participate.

2. Sample collection

The selected slaughterhouses in England, Wales and Scotland will be invited by the FSA to participate in the study, which will run for a provisional period of 6 months, with the possibility of extension to 12 months depending on the number of samples collected over time.

Meat hygiene inspectors will be asked to collect lesions in the liver and/or lungs identified as hydatid during carcass inspection. For validation purposes, they will also be asked to collect the subsequent three carcass lesions found in the liver and/or lung, irrespective of disease identified. For any lesions collected, MHI's will be requested to record the animal ID number.

Labelled collection and transport kits will be provided to each participating abattoir. Each collection kit includes screw-top containers suitable for the storage of biological specimens, and will be placed in UN3373 and PI650 compliant mailing packaging for postage (Fig 1.).

Fig. 1. Example of kit used for sample collection and postage (image source: info@fischersci.com)

Appropriate COSHH assessments will be in place throughout the study period. Samples will be posted by Royal Mail in pre-paid packaging and instructions for postage will be clearly explained in the pack instructions. On arrival at the laboratory, samples will only be handled in a Containment Level 2 (CL2) facility by the researcher, with full and appropriate measures in place to avoid direct contact or contamination. These include wearing of appropriate Personal Protective Equipment, including disposable latex gloves and a side-fastening laboratory coat. Samples

will be frozen and stored at -20C until further processing and analysis.

Laboratory analysis of samples collected will include histological examination to assess the viability of the cysts and validated PCR techniques to amplify parasite DNA (Craig *et al.*, 2015). Analysis of the DNA sequences will identify the tissue as hydatid, and if so, inform to species level the causative *Echinococcus* parasite.

Collected cattle hydatid disease data will be collated with movement records via Cattle Tracing System (CTS) and cattle passport data gathered during sample collection. Geospatial mapping methods will be used to map the distribution of single-movement cattle as the target sample population. Where possible, sheep hydatid disease data will be collated with identification details available at animal or flock level for mapping as above.

3. Data handling

A Data Sharing Agreement (DSA) formulated by the FSA will be in place between the FSA stakeholders and the research group. This will consider current Liverpool University Information Security Policy and relevant Codes of Practice (Cartwright *et al*., 2011). Transfer of data via email will only be undertaken using FSA and University email accounts and any data stored on secure University servers, behind a firewall.

The proposed study forms a complementary adjunct to an existing FSA-led exercise, in collaboration with The University of Liverpool, to evaluate and improve meat inspection procedures on the slaughter line at abattoirs in England, Wales and Scotland. All Meat Hygiene Inspectors (MHIs) undertaking this work will have been recruited to participate by the FSA. The proposed study will generate data that will be used to validate part of the FSA-led exercise, while providing a dataset that will allow the aims of the proposed study to be also met. The study team is not involved in the process of recruiting participants for the FSA-led exercise, but will select slaughterhouses to total a target 80% throughput for sheep and cattle in England, Wales and Scotland from those recruited by the FSA to take part. Participants will be assured of the full anonymisation of questionnaire responses, such that an individual MHI cannot be identified from the data requested to accompany any samples collected.

Study Outputs

1. As part of the HyData project, the datasets generated for UK cattle and sheep hydatidosis will join the other arms of the project to create a multi-layer GIS dataset of multi-species *Echinococcus granulosus* infection distribution in the UK.

2. Confirmatory laboratory testing presents a valuable way to validate the system of inspection for this disease on the slaughter line, with the overarching aims of improving the accuracy of the post-mortem inspection system and mitigating public health hazards. Importantly, as a proof-of-concept exercise, it will offer

evidence towards the feasibility of laboratory testing for identification of other diseases integral to the PMI process, and contribute robust data towards improvement of the CCIR programme for processors and producers.

3. The HyData study will also complement parallel collaborative work by the FSA and the University to review and improve consistency within identification of listed diseases using the condition card system available to MHIs as part of the CCIR programme.

Challenges

There are several logistical challenges in the design of study, for which expert opinion from stakeholders is sought. These are as follows:

1. Logistics of sample collection on the slaughter line, including packaging and transport: communications to ensure that abattoirs have sufficient sample collection kits, based on their throughput.

2. Logistics of tracing the collected material from offal to carcass: feasibility of carcass isolation on the line to then match offal to carcass and identify animal of origin.

3. Identification of sheep carcasses where possible using scanned tags or any information possible. Tracing of movements of sheep, given the extensive use of markets etc. as interim movements from farm of origin.

References

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Craig, P.S., Mastin. A., van Kesteren, F. and Boufana, B.S. (2015) *Echinococcus granulosus*: Epidemiology and state-of-the-art diagnostics in animals. *Veterinary Parasitology*, 213, 132-148.

Temple, H., Jones, P.H., Brouwer, A. Mapping the distribution of Echinococcus granulosus in Wales and Great Britain (2013) *Society for Veterinary Epidemiology and Preventative Medicine Proceedings, 20-22 March 2013*, pp.57-64.

Keep up the good work.

Regards,

Ian Robinson