Sarcocystosis in European wildfowl:
The hunter’s surveillance role in an emerging wildlife disease

Allan Muir
MSc Wild Animal Health
What is Sarcocystosis?

- Sarcocystosis is the disease caused by *Sarcocystis* spp. infection
- *Sarcocystis* spp. are intracellular coccidian parasites with 2 host predator-prey lifecycle
- 5 *Sarcocystis* species are known to infect wildfowl
- Rice breast disease
Sarcocystis rileyi in North America

Definitive host:  
*Mephitis mephitis*

Intermediate host:  
*Anas clypeata*
Timeline: European *Sarcocystis* research

- **2003**: Light microscopy of *S. rileyi* cysts in mallard\(^1\), 20 Anseriforme host identified
- **2011**: DNA confirmation of *S. rileyi* in mallards\(^3\)
- **2014**: *S. rileyi* isolates almost genetically identical to USA isolates\(^4\)
  - S. *rileyi* isolated from eider duck\(^5\)
- **2015**: Possible definitive hosts identified\(^6\)

\(^1\) Sarcocysts found in a mallard\(^2\)
S. rileyi definitive hosts in Europe

Vulpes vulpes

Nyctereutes procyonoides
UK emergence?

The Sarcocystis Survey

UK Wildfowl Sarcocystis Survey

Welcome to the UK Wildfowl Sarcocystis Survey website.

Here you will find information about a possibly emerging parasite of wildfowl in the UK and a form for wildfowlers (or others) to submit any surveillance findings.

The disease

Sarcocystosis, or ‘rice breast’ disease of ducks, is caused by the parasite Sarcocystis spp and seems to be on the rise in the UK. The parasite has a relatively complex life cycle using birds as an intermediate host and carnivores as the end host. Within birds in later stages of infection the parasite creates cysts throughout the muscles, in particular the breast and leg, which look like grains of rice.
Our Project:

Three primary objectives:

1. To assess UK hunter experiences of sarcocystosis emergence in the field.

1. To confirm the presence of *S. rileyi* in hunter submitted infected wildfowl and investigate the phylogeny of these UK isolates.

1. To histologically assess the pectoral muscles of submitted wildfowl for sarcocyst associated myopathy.
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BASC Questionnaire

- Emailed to 106,485 BASC members and Facebook
- Responses from 948 individuals
- 14.35% (136) of respondents had seen wildfowl *Sarcocystis* infection
- 211 UK cases reported
Wigeon (A. penelope)
Mallard (A. platyrhynchos)
Teal (A. crecca)

Total number of cases reported

- Unknown
- Female
- Male

Mallard (A. platyrhynchos)
Wigeon (A. penelope)
Teal (A. crecca)
Canada goose (Branta canadensis)

Goldeneye (Bucephala clangula)

Tufted duck (Aythya fuligula)

Pintail (A. acuta)

Gadwall (A. strepera)

Greylag goose (A. anser)

Pink-footed goose (Anser brachyrhynchus)
Where and when?
**Sarcocystis** observation vs. duck harvest

**Yes (mean):** 61.8 ducks

**No (mean):** 52.8 ducks
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DNA analysis of UK cases
DNA analysis of UK cases

- PCR: 18S gene and ITS-1 region
- Sanger sequencing
- All 13 birds- S. rileyi infection

Sanger sequencing
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Histology of hunter submitted ducks
Myopathy observed in 5/13 birds investigated:
• Impacts on host health/fitness?
• Increased predation/shooting risk?
• Causes of sarcocyst rupture
Thank you for listening, any questions?