Rice breast disease (sarcocystosis) monitoring

Annual report: 2025/2026 season

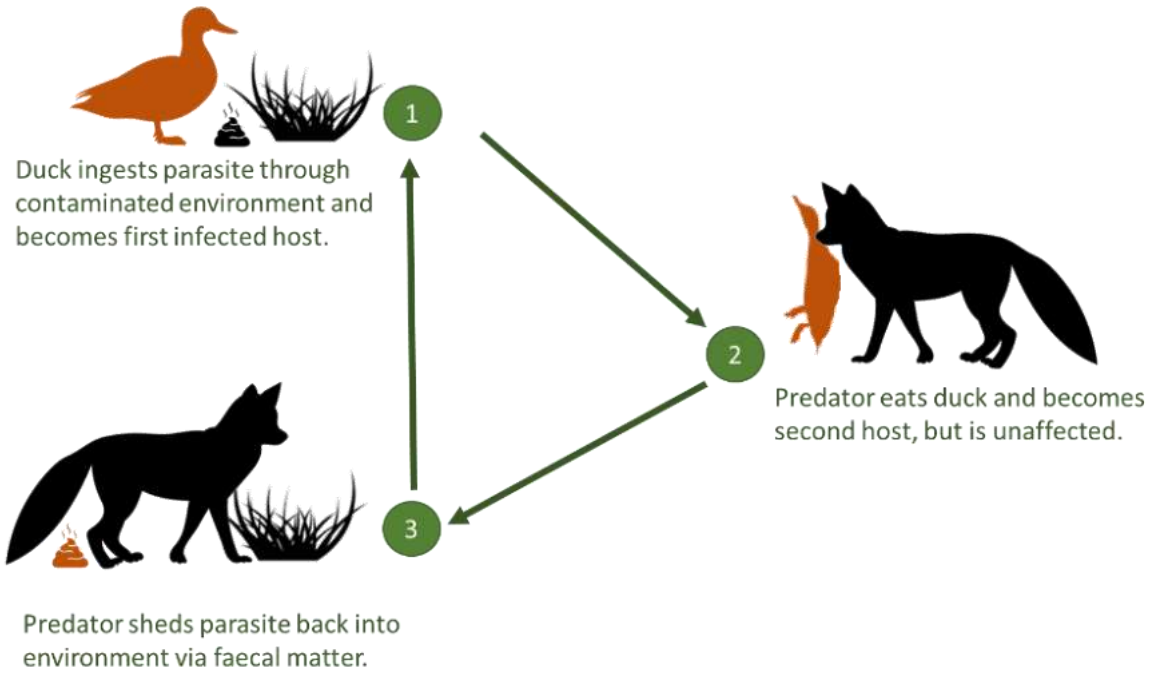

Figure 1: Example of the *Sarcocystis* life cycle, with waterfowl as the intermediate host and fox as the end host.

Project overview

The BASC rice breast (sarcocystosis) monitoring project was launched in 2014 to track the presence and distribution of this parasitic disease in shot waterfowl across the UK.

Sarcocystosis is caused by protozoan parasites of the genus *Sarcocystis*, which have a two-host life cycle involving prey species, such as ducks, and predator species, such as foxes (figure 1). Predators act as definitive hosts, shedding infectious parasite eggs into the environment via their faeces, which are then ingested by prey species from contaminated foraging sources.

Although sarcocystosis has been well documented in North American waterfowl since the nineteenth century, it was considered rare in Europe until the early 2000s. Since then, reports have increased across northern and central Europe, including the UK, alongside growing research interest.

Several *Sarcocystis* species are known to infect various waterfowl in Europe, but they differ in their effects and how easily they can be detected. *Sarcocystis rileyi* is associated with the classic "rice breast" disease, forming macroscopic, rice-grain-like cysts within the muscle tissue that are visible to the naked eye when the skin is peeled back. Other *Sarcocystis* species known to infect waterfowl, including *S. anseris* and closely related species, typically form microscopic cysts that cannot be detected without laboratory examination.

Molecular studies carried out in collaboration between BASC, the Wildfowl & Wetlands Trust and the University of Liverpool confirmed *S. rileyi* as the cause of many reported rice breast cases in free-living UK waterfowl.[1]

Sarcocystosis can affect several quarry species. It is therefore of particular importance that the shooting community understands how to recognise the disease and handle suspected cases responsibly, as birds are usually harvested for consumption. While the disease is typically asymptomatic in live waterfowl and is most often detected only after shooting and inspecting, severe infections may affect muscle function and energy metabolism, with potential implications for flight performance, migration and vulnerability to predation.[2]

In the absence of visible clinical signs in live birds, cases from shot waterfowl play a key role in understanding the occurrence and spread of the disease in the UK. Data gathered through the project enable BASC to map disease occurrence, identify any emerging trends and contribute to wider scientific research.

As the disease is likely to be underreported, continued engagement from the shooting community remains critical to improving data quality and informing future research efforts.

You can support this research by reporting cases through our online reporting form.

How to identify and report suspected cases

Figure 2: Image of cysts in waterfowl caused by rice breast disease.

Sarcocystosis disease causes rice-grain-like cysts to develop, most commonly in the breast muscle (Figure 2), but occasionally in other muscles such as the thighs.

The cysts can vary in size and in the early stages of infection there may only be a few cysts visible. Because the cysts are located within the muscle tissue, they are unlikely to be detected unless the muscle is closely examined. Breasting shot waterfowl is therefore the most effective way to thoroughly inspect birds prior to consumption.

If a bird is cooked whole, the cysts are unlikely to be noticeable after cooking. Although *Sarcocystis rileyi* infection in waterfowl is highly unlikely to pose a risk to humans, and thorough cooking destroys all stages of the parasite, is it not recommended to eat infected birds or feed them to dogs.

How you can help

If you shoot ducks, you can continue to play a vital role in this work by:

- ✓ **Inspecting** shot waterfowl for the presence of cysts;
- ✓ **Submitting** suspected cases through BASC's online reporting form;
- ✓ **Encouraging** others within your club or syndicate to report cases; and
- ✓ **Recording** local occurrences to help track changes and trends over time.

Your continued participation is essential to building a clearer national picture of this disease.

The 2025/2026 season at a glance

Species, sex and age composition

During the 2025/2026 season, a total of 55 suspected cases of sarcocystosis were reported to BASC, spanning four waterfowl species. Mallard accounted for most reports (55%), followed by wigeon (24%) and teal (18%), with only a small number of gadwall (4%).[3] This species composition is broadly consistent with previous seasons, reflecting both the relative abundance of these species in the UK and their proportions in the bag.

The overall sex ratio of reported birds was skewed towards males (60%), with females comprising 30% and the remaining 10% being unidentified. This pattern was generally consistent across species and comparable with previous years.

However, some species-level variation was evident, with wigeon showing the strongest male bias (77% male), followed by mallard (62% male). Teal showed a lower proportion of males (30%) than females (40%) but a high proportion of unknown sex (30%), which may reflect identification challenges in the field for this species. All gadwall reported were male.

Age data indicated that 65% of birds reported were adults, 5% juveniles and 29% unknown. All males were recorded as adults, whereas females showed a more mixed age structure (35% adult, 18% juvenile), but also higher proportion of unknown age (47%), suggesting greater difficulty in ageing female birds reliably.

Current sample sizes remain small, making it difficult to observe clear trends. We therefore cannot conclude whether certain species, ages or sexes are more susceptible to infection.

Proportion of the bag

A subset of respondents (n=9) provided bag data for the species they reported, allowing exploration of disease occurrence relative to bag composition, albeit limited due to the small sample size.

Across these returns, a total of 213 birds were reported, comprising predominantly mallard (67%), followed by teal (23%) and wigeon (10%). Within this subset, the proportion of birds identified with rice breast was 7% in mallard, 9% in wigeon and 4% in teal.

While the figures provide some initial insights, sample sizes are small and so must be interpreted with caution. They are not currently sufficient to draw robust conclusions on species-specific prevalence but will offer a useful basis for comparison as data collection continues.

Geographic distribution

Geographically, reports were unevenly distributed across all four UK countries. Most cases (73%) were in England, with just under half of all reports coming from northern England. Scotland accounted for 22% of reports, while Northern Ireland (4%) and Wales (2%) contributed relatively few cases. This distribution is likely influenced by a combination of factors, including regional differences in levels of wildfowling activity, species abundance, and awareness of or engagement with the reporting initiative, rather than reflecting true underlying disease distribution alone.

Bird condition

Bird condition was assessed to explore whether sarcocystosis infection was associated with any visible decline in body condition, which would indicate broader impacts on bird health and fitness. Reported bird condition was generally good across all species (Figure 3). Most birds were classified as being in "good" or "fair" condition, with few reports of birds described as thin or emaciated. That pattern was consistent across the three main species reported (mallard, teal, and wigeon), indicating that, in most cases, infected birds did not show obvious signs of poor body condition.

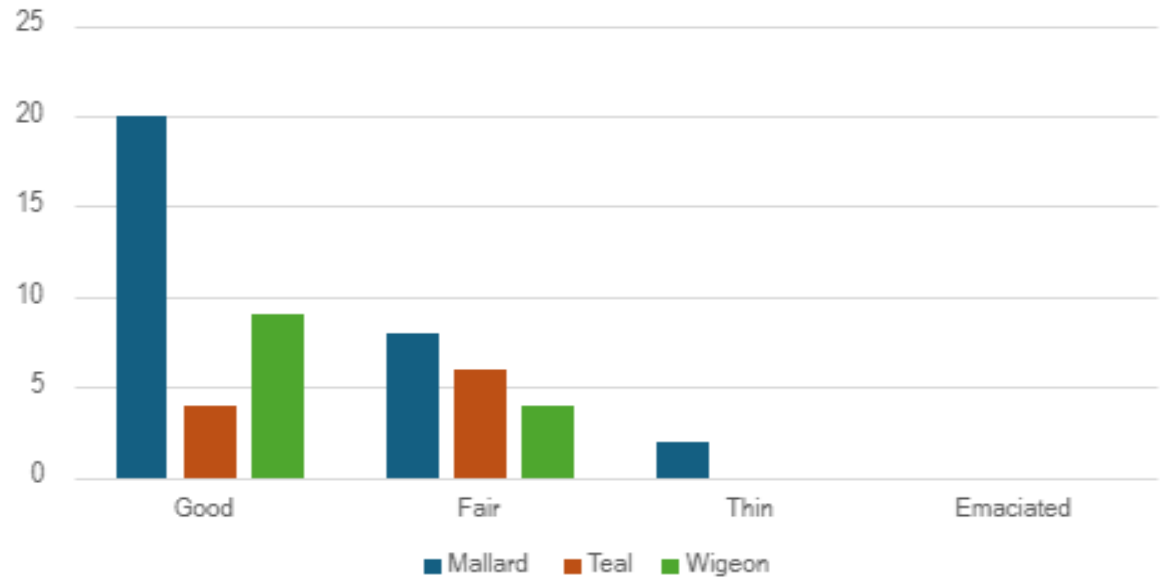

Figure 3: The number of each species reported in each condition category (good, fair, thin, emaciated).

When converted into a numerical scoring system (good = 4, fair = 3, thin = 2, emaciated = 1), mean condition scores remained high: 3.6 for mallard, 3.69 for wigeon and 3.4 for teal. Overall, these findings align with wider evidence that sarcocystosis is typically asymptomatic in live waterfowl and does not usually result in obvious deterioration in body condition.

However, conditional scoring is inherently subjective outside formal clinical assessments and may be influenced by hunter experience and individual opinion. The results should be interpreted with appropriate caution.

Project developments

eDNA pilot study

In 2026, the project expanded into a new area of investigation with the launch of an environmental DNA (eDNA) pilot study.

The pilot study aims to detect *Sarcocystis* parasites directly from water samples collected at waterfowl feeding sites where we have previously had reports of rice breast. By filtering water through a fine membrane, traces of DNA shed into the environment by the parasite can be captured and analysed in a laboratory to determine whether *Sarcocystis* species are present in the waterbody.

The pilot represents an important step forward in how we monitor the disease. Current surveillance relies largely on the reporting of visible cases in shot birds, which is valuable but limited to the shooting season and to infections that are advanced enough to be seen. In contrast, eDNA sampling has the potential to provide year-round insights into where the parasite is present in the environment, helping to identify possible transmission hotspots and improve understanding of the disease prevalence and distribution.

We are very grateful to the clubs and sites who agreed to take part in this initial phase of sampling. All sampling is now complete, with laboratory testing to be undertaken over the summer, and we hope to share early findings later this year.

If successful, this work could form the foundation for a longer-term monitoring approach and support future research into the ecology of sarcocystosis in the UK.

References

[1] Muir, A., Ellis, M., Blake, D. P., Chantrey, J., Strong, E. A., Reeves, J. P., & Cromie, R. L. (2020). *Sarcocystis rileyi* in UK free-living wildfowl (Anatidae): surveillance, histopathology and first molecular characterisation. *Veterinary Record*, *186*(6), 186–186. https://doi.org/10.1136/VR.105638

[2] Prakas, P., Stankevičiūtė, J., Švažas, S., Juozaityt˙E-Ngugu, E., Butkauskas, D., & Vaitkevičiūtė-Balčė, R. (2023). *Sarcocystis spp*. Macrocysts Infection in Wildfowl Species in Eastern Baltic Region: Trends in Prevalence in 2011–2022. *Animals 2023, Vol. 13, Page 2875*, *13*(18), 2875. https://doi.org/10.3390/ANI13182875

[3] Percentages may not sum to 100 due to rounding.