Motile gut organisms affecting gamebirds (part 2)

In his third disease in focus article, Dr Mark Elliott BVSc VetFFHom MRCVS PCH DSH RSHom takes a second look at the story of key gut bacteria and protozoans.

In Part 1 of this article (*KtB* Spring 2022, page 50) Hexamita and Brachyspira were the topics as more relevant to the earlier part of the rearing cycle. As we move into June and July the disease pattern can change and evolve so the organisms covered here are more commonly seen.

Trichomonas

Two forms of Trichomonas causing disease can occur in gamebirds.

Trichomonas gallinae, the oral form, is uncommon in gamebird species, being a more of a problem that affects pigeons, doves and raptors. However, it is seen from time to time in the odd gamebird, and results in mouldy, cheesy oral lesions such that the birds will be seen drooling and repeatedly swallowing. Infection of the sinuses may cause swelling and the eyes water as a result. As this is not ever to my knowledge seen in gamebirds as a significant infection affecting more that the occasional bird; affected individuals are best culled.

The intestinal form, often called *Trichomonas gallinarum* to distinguish it from *T gallinae* is more significant as a concern and the focus here.

It is thought that Trichomonas is a normal inhabitant of the bird's intestine, and it is commonly found in the caeca in healthy birds. Not so long ago, I undertook surveillance post mortems in wild grey partridge, red-legged partridge and pheasants from the game carts; Trichomonas species were found in around 40% of all in small quantities

However, in large quantities it can be linked to enteric disease, with depression of the birds, typically yellow to brown frothy diarrhoea and slow wasting. On post-mortem examination, the caeca is often swollen and inflamed, full of yellow to light-brown content.

It is the disease that can catch even experienced gamekeepers out from time to time as, unlike Hexamita, the onset of the symptoms is insidious and by the time it is spotted many of the birds will already be at different stages of developing it as part of their illness.

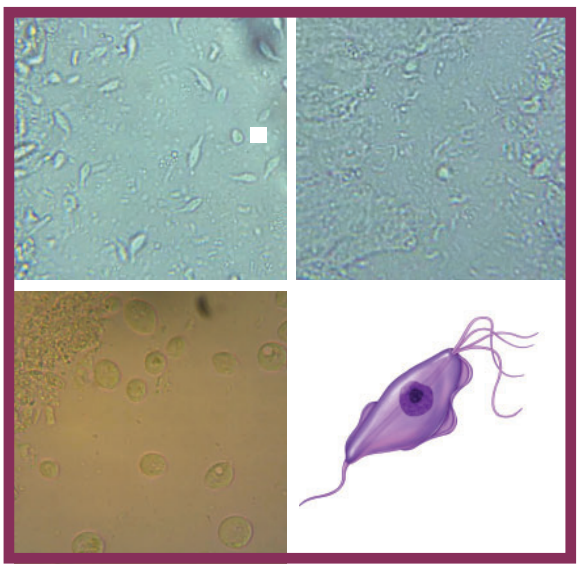
Under the microscope, it is a small pear-shaped organism, larger than Hexamita; and instead of darting about, it tends to move with a smoother, directional motion. It has four anterior flagella, and one longer backward-pointing one, which is attached to the body with an undulating membrane. It has a posterior axostylum, a thread-like structure, which gives its body rigidity and sticks out from the posterior end. With better microscopes, the membrane and axostylum can be clearly seen.

So what causes an organism that is regarded as normally present to develop into disease? In many cases this will be due to immune suppression or other concomitant disease. Damage to the gut wall from uncontrolled Coccidiosis is an obvious link, and the presence of other motile protozoans is another. Stress doesn't just affect humans and cause illness – birds are affected too. So stress resulting from constant harrying from predators, sudden changes in feed and/or problems with the feed itself, sudden inclement weather after a long period of perfect rearing conditions and the birds are not hardened off, over-stocking of pens and so on will all affect the birds. Quite simply good management and provision of the perfect environment reduces disease risk, as we all know.

Another factor is age of the bird and development of their immune systems. Birds do need challenge with disease-causing organisms in the early part of their lives to develop a good immune system that can respond when tested. Using human analogies again, think of it as similar to the children who are allowed to play outside, get dirty and through their exposure to the world have fewer allergies and less illness compared with their counterparts who are reared in sterilised urban environments on sterilised, processed foods. These children are more likely to get ill when exposed to disease in childhood, and often turn into less robust adults.

Analysis of post mortems in practice over a number of years clearly shows that Trichomonas is a disease occurring anytime from three weeks but rarely beyond 15-16 weeks, with early and middle peaks probably linked to Coccidiosis risk on the rearing field and then at or just after release.

Medications used to treat disease outbreaks will mostly involve antibiotics similar to those used for Hexamita, such as Doxycline and Tiamulin. However, it is worth considering products here that impact on the balance of gut flora, such as water acidifiers and herbal additives, all of which if appropriately used are thought



Left: Images as seen under a microscope – top left Trichomonas (note the tails); top right Brachyspira (motile 'turkey twizzlers'); bottom left Blastocysts (which rotate and are larger than other protozoans); bottom right, a Trichomonad (diagramatic).

to reduce the organism's ability to develop into a problem. Anecdotally we have found acidification of the water reduces the disease impact and improves response times to treatment, with less chance of relapse.

When medicating for this, it is important to consider the development and progression of the problem through the flock and pen. Unlike Hexamita, when it seems that every bird succumbs almost on the same day, and so early effective treatment can be given for a shorter period, with Trichomonas the development and exposure time is spread and prolonged. Accordingly for this disease seven days' treatment is the norm, and very occasionally treatment is needed for longer to resolve matters completely.

Blastocystis

An under-recognised potential pathogen of gamebirds, Blastocystis does crop up in post mortem examinations from time to time, often with other motile protozoans present that have greater significance as regards disease. However, over the last few years I have seen more infections that are just this organism alone, often in older released poults, and there might be a link with guineafowl when they are kept in close proximity. Recent research in collaboration with Surrey University found much more of this organism than I had expected in 2021 samples tested.

Symptoms are generally mild – just ill thrift and diarrhoea – and anecdotally the faeces are a darker brown rather than yellow

In description, the organism is identifiable by its much larger size than Trichomonas and Hexamita, it being usually a rounded shape moving in a circular fashion due to eccentric flagella. Typically the cells have two nuclei (there can be up to four), and these can be confirmed on smears using a trichrome stain.

Treatment, if indeed it is needed, is the same as Hexamita and fortunately it does seem to be resolved fairly easily

It is worth a note that some strains can be zoonotic and cause symptoms of diarrhoea and gut pain, as well as hives in humans. I have not seen any human issues linked to cases to date, so I suspect this is more an interest point, although studies have found the significant sub-types in pheasants.

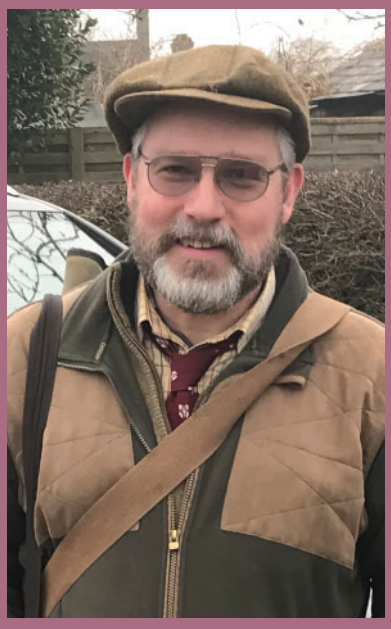
Tetratrichomonas gallinarum

Noted more for interest than concern at this time, but worth keeping an eye out for is *Tetratrichomonas gallinarum*. Often described as a common finding in many bird species, the only actual papers I could find on this occurring in red-legged partridges were from 2014 and 1956! However, it was identified in Hampshire in 2021 in a case with significant mortality over a short period and classic lesions affecting the liver and spleens. It is said to occur commonly in mixed infections with other protozoans including Blastocystis, so perhaps it might become a significant issue in future years if Blastocystis is to become more common.

Good management and provision of the perfect environment reduces disease risk.

Summary

We are fortunate that, despite the variety of these organisms, we do have treatments that, for now, mostly seem to work. I say *mostly* as there is suspicion that some cases are becoming resistant, and certainly some of the medications used over time as preventatives (a practice now effectively banned) have seemed less effective. It is therefore vital that treatments are given at the correct dose rates for a time appropriate to the diagnostic findings, and if there is doubt as to response, follow-up post mortems are undertaken. We do urgently need more data, more accurate diagnostics and more research if we are to understand these organisms better and achieve the reductions in antibiotic need and use being demanded of us by Government. •



Mark Elliott is a specialist vet, principal of South Downs Veterinary Consultancy. He is a founding member of the Trusted Game health and welfare scheme for gamebirds, and sits on the NGO Deer Branch Committee.

Contact 07766 123105, mark@southdownsvets.co.uk, www.southdownsvets.co.uk •

Images: Mark Elliott; iStock.com/birdartphotography