

Clostridial disease in Irish livestock

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Introduction

Clostridial diseases are found in most countries throughout the world. Ruminants (animals which chew the cud such as cattle and sheep) are the species which are most susceptible to clostridial diseases. Clostridial organisms can also cause disease in other species including goats and pigs. The most important clostridial diseases, and the bacteria which are usually responsible for them, in an Irish context, are summarized in Table 1 below.

| Disease | Causative organism | Species substantially affected |
|---|--|--------------------------------|
| Blackleg | <i>Clostridium chauvoei</i> | Mainly cattle |
| Malignant oedema | <i>Clostridium septicum</i> , <i>sordelli</i> , <i>chauvoei</i> , and <i>novyi</i> | Mainly cattle |
| Black disease (infectious necrotic hepatitis) | <i>Clostridium novyi</i> | Cattle and sheep |
| Botulism | <i>Clostridium botulinum</i> | Mainly cattle |
| Pulpy kidney disease (PKD) | <i>Clostridium perfringens</i> | Sheep |
| Enterotoxaemia (other than PKD) | <i>Clostridium perfringens</i> | Cattle and sheep |
| Braxy | <i>Clostridium septicum</i> | Mainly sheep |
| Bacillary haemoglobinuria | <i>Clostridium haemolyticum</i> | Cattle and sheep |
| Tetanus | <i>Clostridium tetani</i> | Many species |
| Emphysematous abomasitis | Various clostridial species | Mainly cattle |

Table 1: The most important clostridial diseases in an Irish context, and their causes.

For most of these diseases, the course is very acute (the disease makes the animal very ill in a very short time). This is because the illness is typically caused by toxins, lethal even in small amounts, which are produced by the causative bacteria as they grow. The bacteria can grow and multiply very quickly, and therefore the most common sign associated with many of the clostridial diseases is sudden death.



Figure 1: The hindquarters of a bullock, diagnosed with blackleg on necropsy. Photo courtesy of Kilkenny RVL.

Occurrence in Irish cattle and sheep in 2019

Hundreds of cattle and sheep carcasses are submitted to DAFM's regional veterinary laboratories (RVLs) for necropsy (detailed post-mortem veterinary examination) each year. The work generates valuable data, as it allows us to track the occurrence of different diseases over time. It should be noted, however, that the RVL data only cover the diseases affecting animals submitted to the laboratories. Accordingly, the data do not represent exactly the cause of illness or death of all animals on farms in this country, but do provide a very

useful guide as to the overall trends in many important diseases. An indication of the relative frequency of different clostridial diseases in Ireland in cattle and sheep in 2019 is provided in the following table.

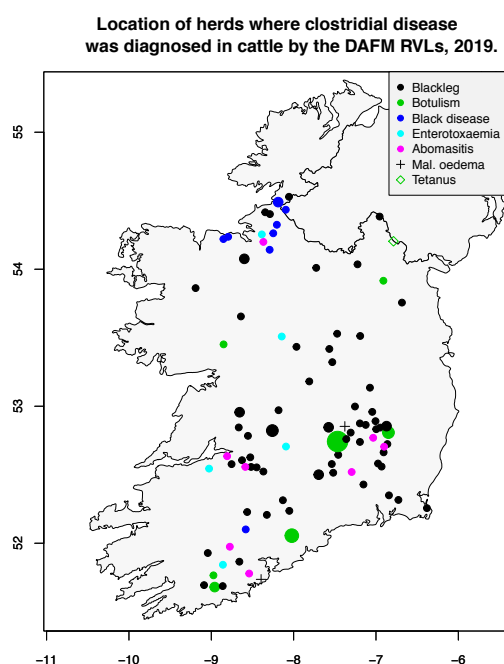
| Clostridial disease | Number of cases recorded in RVLs in 2019 in cattle and sheep | % of all clostridial disease cases | Number of herds/flocks represented |
|---------------------------|--|------------------------------------|------------------------------------|
| Blackleg | 69 | 41.1% | 62 |
| Pulpy Kidney Disease | 39 | 23.2% | 32 |
| Botulism | 21 | 12.5% | 7 |
| Black disease | 13 | 7.7% | 12 |
| Enterotoxaemia | 13 | 7.7% | 11 |
| Abomasitis-emphysematous | 8 | 4.8% | 8 |
| Malignant oedema | 3 | 1.8% | 3 |
| Braxy | 1 | 0.6% | 1 |
| Tetanus | 1 | 0.6% | 1 |
| Bacillary haemoglobinuria | 0 | 0.0% | 0 |
| | 168 | 100.0% | 137 |

Table 2: The number of cases of different clostridial diseases detected in Irish cattle and sheep in 2019.

Geographic distribution of the different diseases

When considering the distribution of the diseases diagnosed by the RVLs, the tendency for positive results to cluster around the RVL locations should be borne in mind. This pattern occurs because farmers located closest to the RVLs tend to submit carcasses to the RVLs more frequently than other farmers. **Absence of records of clostridial disease diagnosis in particular areas of the country should not be taken as evidence that these diseases are absent in those areas.**

RVL Diagnoses of clostridial disease in cattle, 2019



Points have been moved slightly to preserve anonymity of herd owners. Size of points is in proportion to the number of cases in a herd.

Figure 2: Clostridial disease diagnoses by DAFM RVLs in cattle, 2019. Points have been moved slightly to preserve anonymity of herd owners. Size of points is in proportion to the number of cases in a herd.

Blackleg cases are fairly evenly distributed among different areas of Ireland, but there appears to be a large number of cases in Leinster. This reflects a surge in the number of blackleg cases reported in Kilkenny RVL in autumn 2019. Further details can be viewed in this report on DAFM's animal health surveillance website: <http://www.animalhealthsurveillance.agriculture.gov.ie/currentnews/title,135642,en.html>

The distribution of cases of black disease is of note, with most being located in the northwest of the country. This finding is not entirely surprising, as black disease is associated with liver fluke (*Fasciola hepatica*), and DAFM testing showed that northern and western areas were consistently exposed to a high level of challenge from liver fluke during the 2019 grazing season. Maps reflecting this pattern can be viewed here: <http://www.animalhealthsurveillance.agriculture.gov.ie/currentnews/title,137865,en.html>

RVL Diagnoses of clostridial disease in sheep, 2019

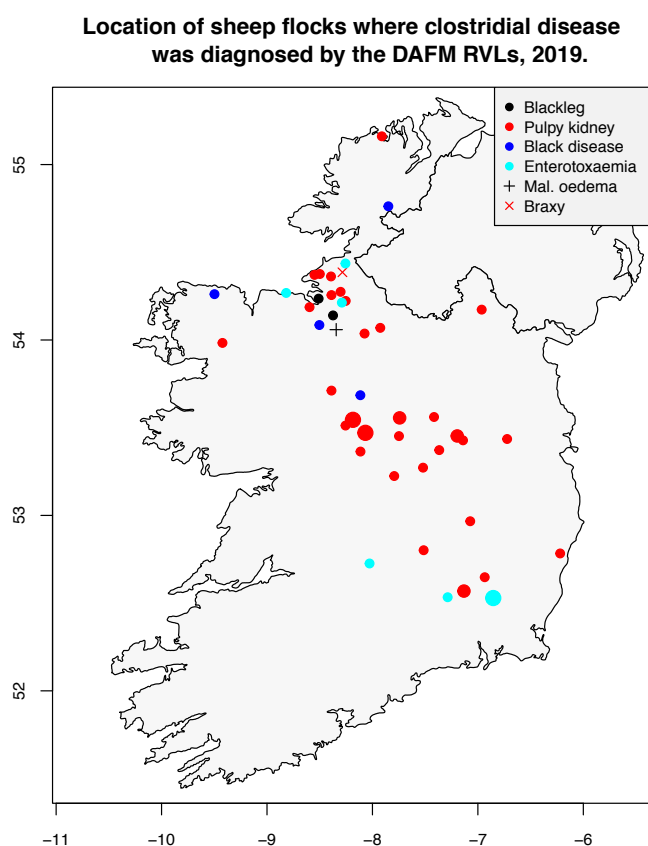


Figure 3: Clostridial disease diagnoses by DAFM RVLs in sheep, 2019. Points have been moved slightly to preserve anonymity of flock owners. Size of points is in proportion to the number of cases in a herd.

The smaller number of diagnoses of clostridial disease in sheep overall reflects the lower number of submissions of sheep carcasses to the regional veterinary laboratories compared to cattle. Pulpy kidney disease is by far the most common clostridial disease diagnosed in sheep. As is the case with cattle, diagnoses of black disease tend to cluster in the northwest.

Timing of occurrence of clostridial disease

Since the risk factors for the different diseases vary, the diseases tend to occur all year round, albeit at varying levels. However, there are notable seasonal effects in the occurrence of the individual diseases. Blackleg is a good example. Occurrence of blackleg tends to peak in late summer and autumn. This is borne out by the RVL data which have been plotted in Figure 3 below:

Occurrence of blackleg cases diagnosed by the RVLs by calendar month, 2019.

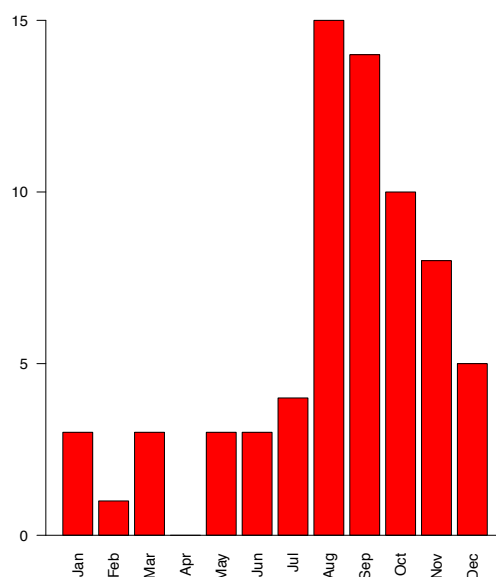


Figure 3: Occurrence of blackleg diagnoses in RVLs in 2019, by calendar month.

Pulpy kidney disease in sheep likewise exhibits strong seasonality in its pattern of occurrence. Here the peak is in late spring and early summer, as shown in Figure 4:

Occurrence of cases of Pulpy Kidney Disease diagnosed by the RVLs by calendar month, 2019.

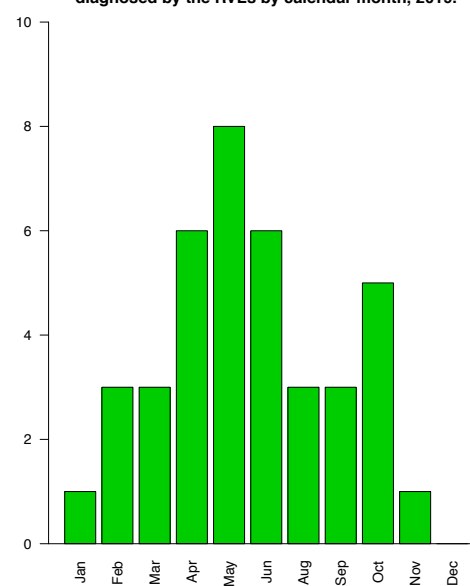


Figure 4: Occurrence of diagnosis of pulpy kidney disease in RVLs in 2019, by calendar month.

Treatment, diagnosis and control
Clostridial disease cases do not tend to respond well to treatment. If you suspect a clostridial disease, the veterinary practitioner over the herd or flock will need to be consulted at an early stage- this will give affected animals the best chance of survival

for at least some clostridial diseases. Vaccines are available for most clostridial diseases. Multivalent clostridial vaccines (vaccines which cover the animal against a range of clostridial diseases) are available for both cattle and sheep. Although vaccination failure in individual animals is reported, these vaccines are very effective at herd or flock level when stored and used properly. Details of a vaccination programme should be discussed with the veterinary practitioner who cares for the herd or flock. However, given that the vaccine must be given several weeks before it is needed to provide cover, and in many cases two injections separated by several weeks will need to be administered to provide reliable immunity, it is wise to commence the vaccination programme well in advance of the anticipated risk period.

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