

Scottish Deer Health Survey 2017-2018

STEC O157 Results



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About Shiga-toxicogenic *E. coli* (STEC) O157

- *E. coli* bacteria are very common in the environment, with many types of *E. coli* living in the guts of mammals. Some types of *E. coli* can cause disease, some are harmless and can even be beneficial.
- Shiga-toxicogenic *E. coli* (STEC) are a particular type of *E. coli* that can cause human disease as a result of the Shiga toxins they produce during infection.
- Human infections can cause serious illness or even death, particularly in very young or elderly people.
- The most important type of STEC which causes disease in humans is STEC O157; a number of other types of STEC which are not O157 (non-O157 STEC) can also cause disease.
- STEC O157 and non-O157 STEC can be carried by cattle and other ruminants, including deer and sheep, without affecting them in any way. Shedding of the bacteria from ruminants tends to be sporadic.

Background of the project

- An outbreak of human STEC O157 infections occurred in 2015 which was linked to the consumption of Scottish wild venison.
- The source of STEC O157 was most likely due to contamination of the venison carcass with deer faeces which contained the bacteria.

Aims of the project

- To determine the risk of future STEC O157 infections in humans arising from venison consumption, a survey was conducted to determine how common *E. coli* O157 is in wild deer faeces.

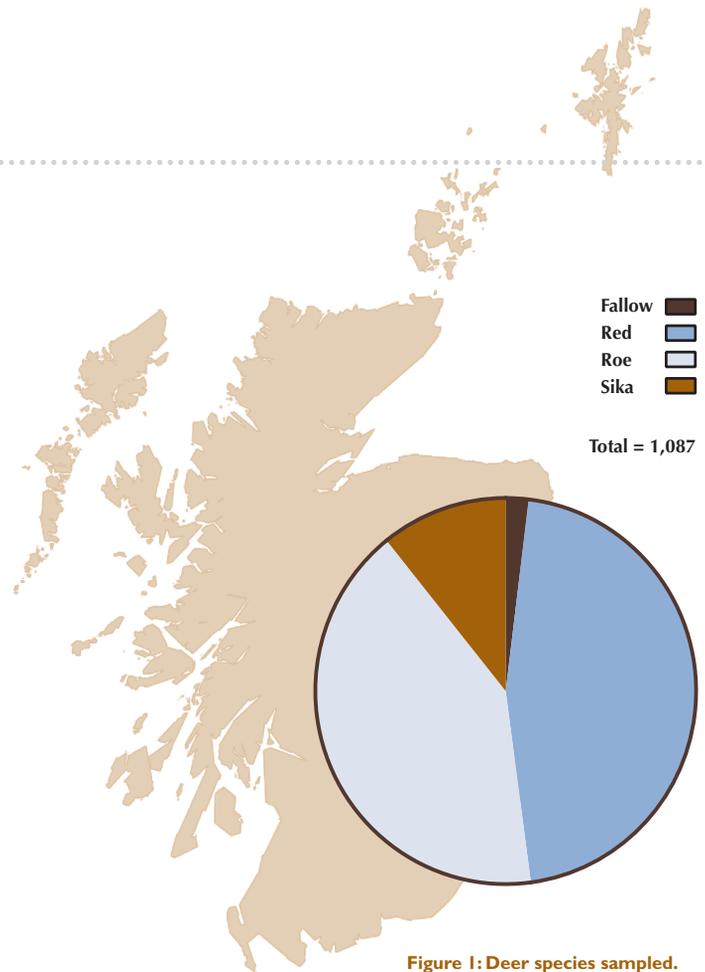


Figure 1: Deer species sampled.

What we did

- In collaboration with gamekeepers, deer managers and the Forestry Commission, over 1000 samples of deer faeces were collected from wild deer at the point of cull between July 2017 and June 2018.
- The samples were from all regions of Scotland and from a range of different deer species (Figure 1).
- The samples were tested for the presence of *E. coli* O157 at Moredun Research Institute.
- *E. coli* O157 bacteria detected in deer faeces were further characterised at the Scottish *E. coli* Reference Laboratory (SERL).



What we found

- We found only 3 out of 1087 samples (around 0.3%) were positive for STEC O157; two positive samples were from Red deer and one from a Sika deer.
- The three positive samples contained high levels of STEC O157 and the types of strains found were very similar to those which cause human disease.
- We also found a number of the STEC O157 negative samples contained Shiga toxin DNA. This may or may not indicate the presence of non-O157 STEC and the risk these toxin-positive samples pose to humans is unclear.

Conclusions

- We found very low prevalence of STEC O157 in wild Scottish deer.
- However, the levels of STEC O157 we found in each positive faecal sample were very high and the types of STEC O157 identified are potentially dangerous to humans.
- Therefore, strict hygiene precautions should be taken when processing deer carcasses to avoid faecal contamination of the carcass, as outlined in the Best Practice Guidelines <https://www.bestpracticeguides.org.uk/carcass-preparation/venison-supply/>

Next steps

- We are currently analysing the samples which were positive for the toxin to determine if these contain non-O157 STEC.
- Any non-O157 STEC will be characterised to determine their potential risk to humans.
- We will also explore whether there is a link between the presence of STEC in deer and contact with cattle and other ruminants.

Thank you to all those who participated in this study.

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