



# The serological diversity of *Dichelobacter nodosus*

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## Aims

**Understanding the serological diversity of *D. nodosus* in England, & whether this differs by flock, region & management, will be important in making improvements to vaccination & control**

*Dichelobacter nodosus* causes footrot, a disease which causes significant problems in England:

- present in > 90% of sheep flocks
- accounts for > 60% of foot lesions.

Commercial vaccine (Footvax™):

- targets 9 of the 10 serogroups (A – I) of *D. nodosus*
- reduces lameness on average by 20%
- mono/bi-valent vaccines are more effective and have been used to eliminate footrot.



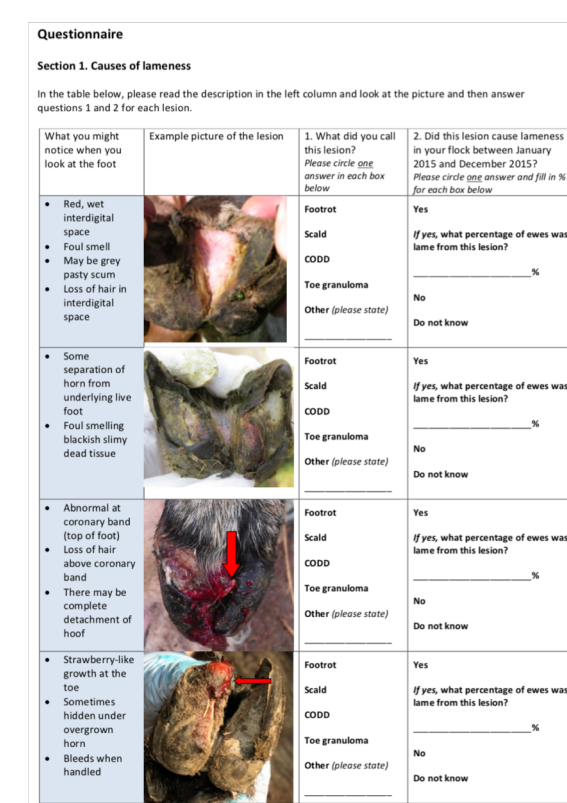
## Data collection



164 flocks in England



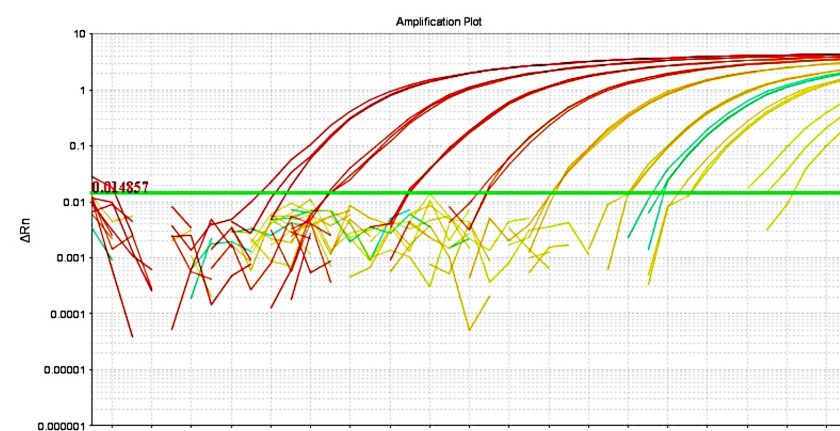
Up to 8 interdigital swabs per flock



Questionnaire on lameness & its management

## Laboratory analysis

1,288 swabs:  
Extracted DNA tested in a *D. nodosus* specific qPCR



687 *D. nodosus* positive swabs:  
9 serogroup specific PCRs (A – I)



## Data analysis

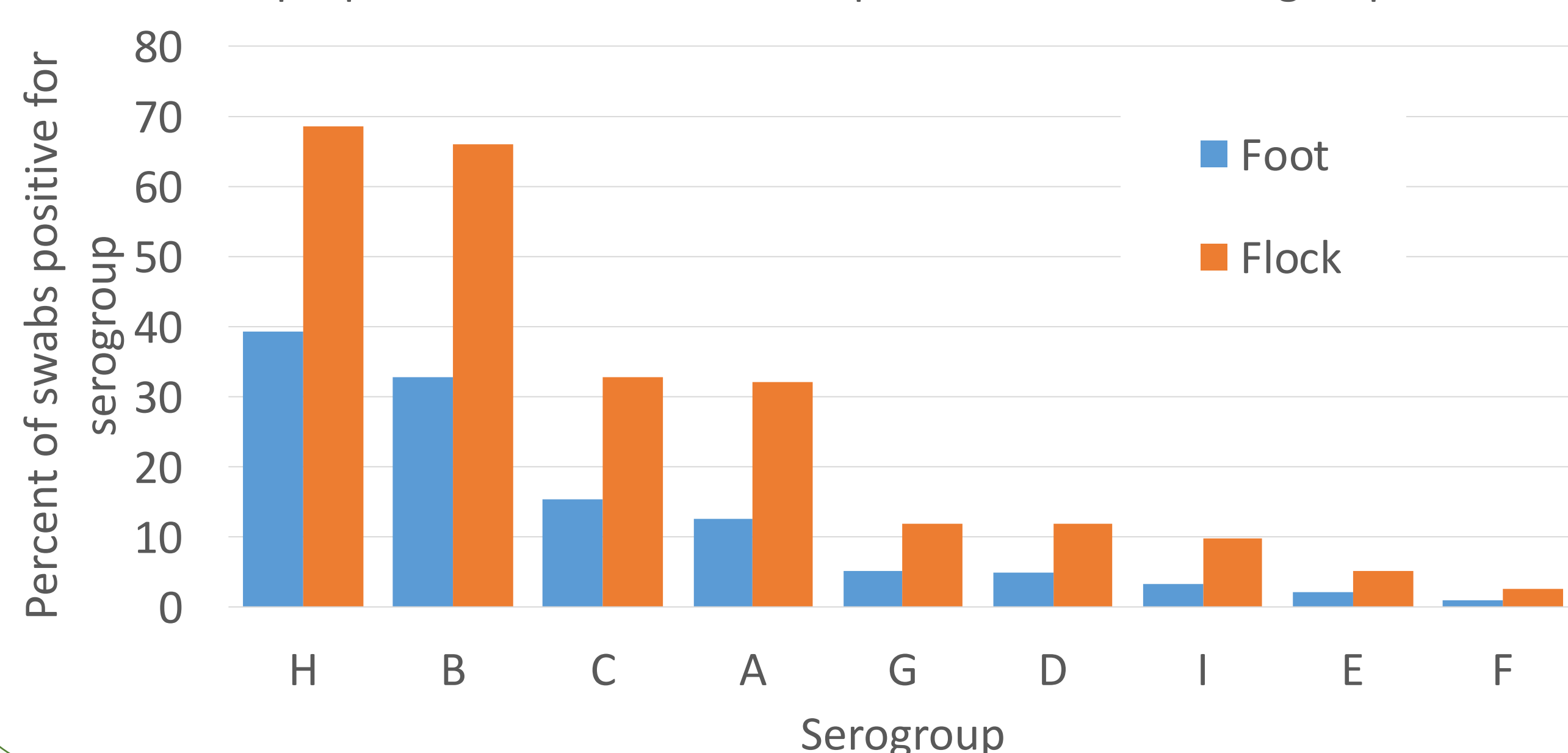
- Simulated the serogroups present by swab, parameterised with the observed probability of a swab being positive for each serogroup.
- Compared observed serogroup results with simulated serogroup results.
- Statistical models & tests to investigate whether flock region or any biosecurity practices were associated with the serogroups present in a flock.

## Results

### Serogroup diversity

- There was variability in the frequency of detection of each serogroup.
- H & B were the most commonly detected serogroups.
- Serogroups were clustered within flocks.
- It is likely that serogroups that were not detected were present in flocks.

The proportion of feet and flocks positive for each serogroup



### Number of serogroups

- Up to 6 serogroups (median = 2) were detected per flock and up to 4 serogroups (median = 1) were detected per foot.
- Flocks that culled sheep that were lame three times or more had significantly fewer serogroups than flocks that culled lame sheep after one or two bouts of lameness.
- No other biosecurity variables were associated with the number of serogroups per flock.

## Conclusions

- All 9 serogroups that had been detected previously in the UK were detected in this study.
- The distribution of serogroups appears random and therefore there was a diverse community of *D. nodosus* serogroups between flocks. Serogroup-specific vaccination of *D. nodosus* will require identification of serogroups present in each flock.
- Further research is needed to understand the relationship between the number of serogroups present and culling.

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