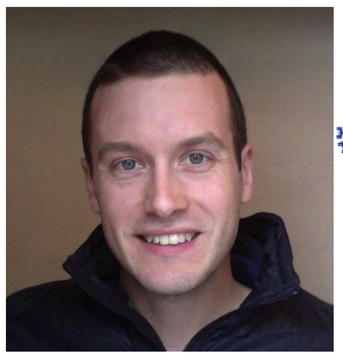

In vitro susceptibility of contagious ovine digital dermatitis associated *Treponema* spp. isolates to antimicrobial agents in the UK

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Introduction

Information about the microbial flora of CODD lesions is limited, although the bovine digital dermatitis (BDD) associated treponemes *Treponema medium/T. vincentii*-like, *Treponema phagedenis*-like and *Treponema pedis* are currently considered to be a necessary cause of disease. In order to inform the development of effective therapeutic strategies for clinical cases of CODD, a greater understanding is required of the susceptibility of the treponemes found in CODD lesions to antimicrobials currently available for use in sheep.

The aim of this study was to determine *in vitro,* the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of a panel of antimicrobials for representatives from each of the three treponeme phylogroups cultured as pure isolates from clinical CODD lesions.

Methods

- Twenty treponeme isolates from 19 sheep with clinical CODD lesions.
- A microdilution method (Evans, Brown et al. 2009) was used to determine *in vitro* the MIC/MBC of ten antimicrobial agents for 20 treponeme isolates (five *T. medium/T. vincentii*-like, ten *T. phagedenis*-like and five *T. pedis*).
- The antimicrobials tested were penicillin G, amoxicillin, oxytetracycline, tilmicosin, lincomycin, spectinomycin, tylosin, tildipirosin, tulathromycin and gamithromycin.

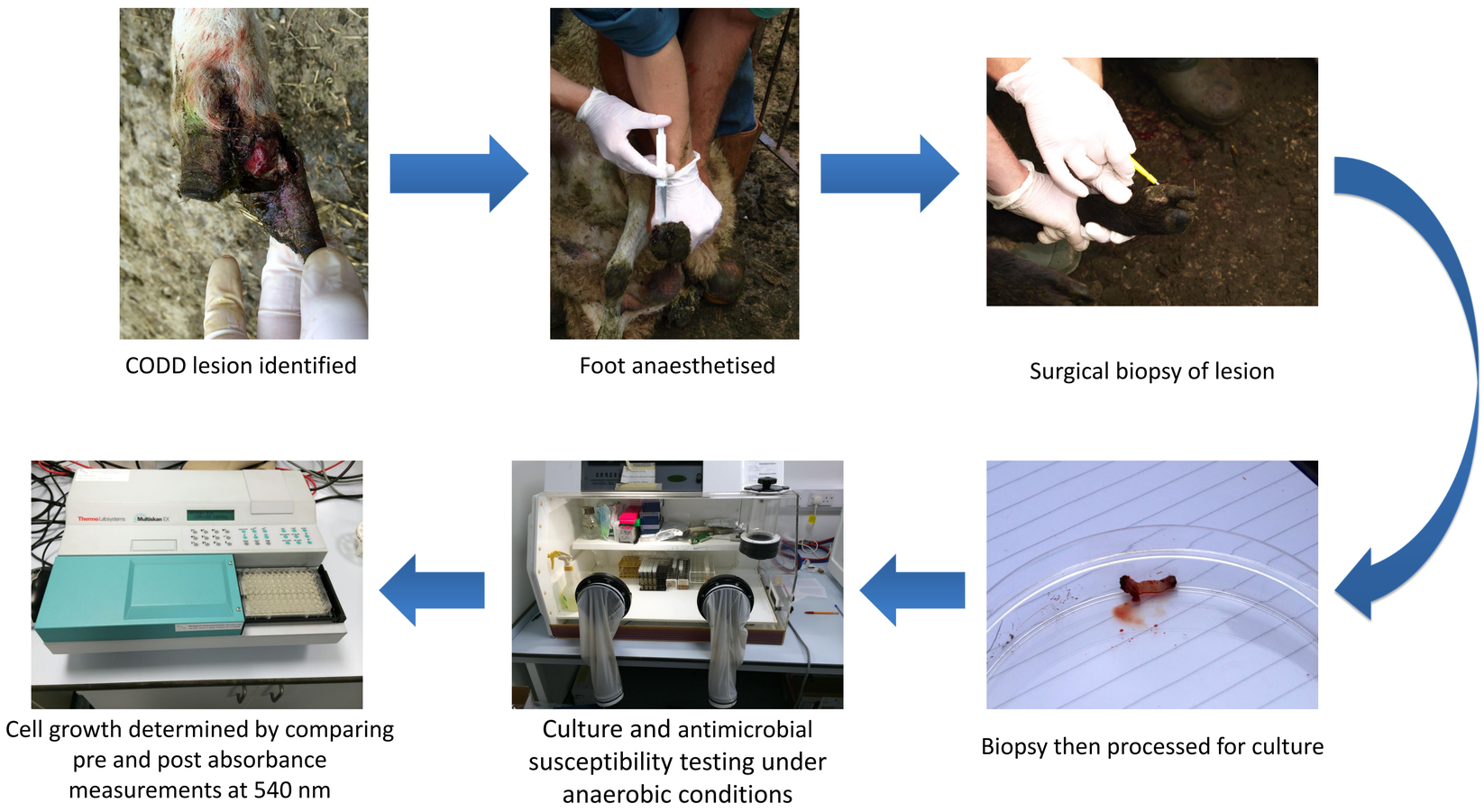

Figure 1: sampling sheep, growing the treponemes and determining MIC/MBC of antimicrobials

Results

- The treponeme isolates tested showed low MICs and MBCs to all ten antimicrobials tested.
- They were most susceptible to gamithromycin and tildipirosin (MIC_{90}: 0.0469 mg/L), and were least susceptible to lincomycin, spectinomycin and oxytetracycline (MIC_{90}: 48 mg/L, 24 mg/L and 3 mg/L respectively).

	Penicillin	Amoxicillin	Oxytetracycline	Tilmicosin	Lincomycin	Spectinomycin	Tildipirosin	Tulathromycin	Gamithromycin	Tylosin
MIC_{90}	0.0750	0.5625	3	0.1875	48	24	0.0469	1.1719	0.0469	0.0938
MBC_{90}	0.0750	0.5625	6	0.1875	96	24	0.0938	1.1719	0.0469	0.1875

Table 1: MIC_{90} and MBC_{90} of ten antimicrobials tested against CODD associated treponemes

Conclusions

These data are comparable to *in vitro* antimicrobial susceptibility data for treponemes cultured from bovine digital dermatitis lesions. Dependent on local licensing, penicillin and tilmicosin appear the best candidates for future *in vivo* studies.

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