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Ovine footrot – further investigations in preparation of a new Swiss nationwide footrot control program

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Key words
Dichelobacter nodosus, transmission, pooling, real-time PCR, lameness

Subprojects A and B

Aim of the subprojects A and B
The aim of our study was to evaluate different pooling methods to reduce the number of samples, which would be used during a treatment or surveillance phase of a footrot control program.

Material and methods
Samples of individual feet were compared to pools of all four feet of the same sheep, and pools of 5 and 10 sheep, respectively were compared to four-feet samples of individual sheep.

Results and significance
The sensitivity and specificity of the four-feet samples for detection of aprV2-positive strains of Dichelobacter nodosus were 93.8% (CI: 87.6 - 97.5%) and 98.3% (CI: 96.5 – 99.3%), respectively (gold standard = individual feet samples).The sensitivity and specificity of the pools-of-10 was 86.7% (CI: 78.4 – 92.7%) and 100.0% (CI: 97.4 – 100%), respectively, while pools-of-5 were not more sensitive than pools-of-10. Finally, applying a risk-based sampling resulted in 95.8% (CI: 78.9 – 99.9%) sensitivity and 100.0% (CI: 88.1 – 100%) specificity (gold standard = four-feet-sample). All 15 flocks that were identified as aprV2-positive in the risk-based samples were also tested positive in at least one risk-based-pool-of-10.
The pooling of 4 individual-foot samples to one four-feet sample is an adequate method to reduce the number of samples to determine the footrot status of individual sheep. The sensitivity of pools-of-5 and pools-of-10 is too imprecise to be used for a control program. The risk-based sampling and the analysis of risk-based-pools-of-10 represent adequate methods to determine the footrot status during the surveillance phase of a footrot control program.

Subproject C

Aim of the subproject C
The aim of this study was to determine the prevalence of D. nodosus in sheep presented on shows and markets and to investigate different transmission routes of D. nodosus during foot trimming, as well as testing decontamination protocols.

Material and methods
Sheep at six markets and four shows were sampled and tested for the presence of *D. nodosus*. All samples obtained were subjected to real-time PCR identifying benign and virulent *D. nodosus*. Different vectors such as

foot trimming knives were sampled and cultured for *D. nodosus* as well as analysed by real-time PCR, for evaluation of the transmission during foot trimming.

Results and significance

The prevalence of virulent *D. nodosus* in sheep presented on Swiss shows and markets ranged from 1.7% to 100%. Positive cultures were obtained for the knives as well as the hands of the claw trimmer and removed claw horn material whereas boots were positive only by real-time PCR.
In conclusion, the risk for transmission of *D. nodosus* is high and measures like wiping the knife with an alcohol-impregnated disinfection towel after every sheep are recommended to prevent transmission during claw trimming.

Publications, posters and presentations

Poster presentation at ADALUS-Tagung 10th of November of 2016 in Bern
Presentation at Kleinwiederkäuertagung 09th of February 2017 in Zürich
Presentation at Schweizerische Tierärzte Tage 11th of May 2017 in Fribourg
Presentation at Lameness in ruminants 7th of September 2017 in München

Greber, D.; Locher, I.; Kuhnert, P.; Butty, M.A.; Holdener, K.; Frey, J.; Schüpbach-Regula, G.; Steiner, A. (2017): Pooling of interdigital swab samples for PCR diagnosis of virulent (aprV2) ovine footrot. JVDI in press

Locher, I.; Giger, L.; Frosth, S.; Kuhnert, P.; Steiner, A. (2017): Potential transmission routes of Dichelobacter nodosus. Vet Microbiol submitted for publication

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