Within herd eradication of footrot with the aid of the new *D. nodosus*-PCR – an interventional study without using antimicrobials

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Key words
Footrot, Footbath, Sheep, Lameness, Real-time PCR (*aprV2/aprB2*)

Aim of the study
The aim of this study was to evaluate the feasibility of complete elimination of virulent *D. nodosus* strains carrying the *aprV2* gene from feet of the sheep of flocks, kept separated from other sheep, goats, cattle and wild ruminants (proof of concept).

Material and methods
The elimination of *aprV2*-positive sheep should be reached, based on weekly footbaths of the entire flock for 10 minutes using a zinc sulphate (10%) disinfecting solution, thereby waiving any vaccination or systemic or large-scale local use of antibiotics during the entire study. The farms were visited in three to four weeks interval until a successful sanitation was achieved. In the follow-ups, each individual sheep was examined for the clinical signs of footrot, scored according to the Health Service for Small Ruminants, Switzerland scoring system, and a four-feet-pooled cotton swab sample was taken for the real-time PCR (*aprV2/aprB2*). The sanitation was successful if all sheep of the flock were clinical and *aprV2*-negative in the PCR. The success of the sanitation was controlled in a follow-up before commingling on alpine pastures for the season 2015.

Results and significance
All 28 farms (100% of the study farms) were successfully sanitised. An elimination of *aprV2*-positive sheep based on weekly footbaths in zinc sulphate is possible, and also without any use of antibiotics and vaccination. After the first six weeks, the first seven farms (25% of the study farms) and at 12 weeks, 20 (71.43%) of the study farms were successfully sanitised. A strong correlation was shown between the duration of sanitation measured as number of footbaths and the clinical flock prevalence at the beginning (Spearman's rho = 0.68; P <0.001). Between the flock size and the duration of the sanitation and the clinical prevalence at the beginning, respectively, there was no statistically significant correlation detected. Risk factors for animals being *aprV2*-positive were: found sheep with score 3 & 4 with the highest odds ratio (28.39). The footbaths were found as a protective factor with the lowest odds ratios (0.14, 0.13, 0.06) for in bathgroups 6 (1≤6), 9 (7≤11) and 13 (12≤19), respectively.

Publications, posters and presentations
Paper in preparation (manuscript attached): Greber D.; Schüpbach G.; Bearth G.; Lüchinger R.; Steiner A. (2015).Elimination of virulent strains (*aprV2*) of *D. nodosus* from 28 sheep flocks by weekly footbaths.
Oral presentation: Greber D.; Bearth G.; Lüchinger R.; Steiner A. (2015). Proof of concept – Moderhinkesanierungsprogramm vorläufige Resultate. In Tagung der DVG-Fachgruppe "Krankheiten kleiner Wiederkäuer" (pp. 1–4). Weidenbach.

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