

Epidemiologic investigation on the risk of Border disease virus infection of cattle from infected sheep on alpine community pastures

Ueli Braun¹, Rahel Büchi¹, Claudia Bachofen², Ernst Peterhans²

¹Department of Farm Animals, Vetsuisse Faculty, University of Zurich, CH-8057 Zurich, ²Institute of Veterinary Virology, Vetsuisse Faculty, University of Bern, CH-3001 Bern

Keywords

Sheep, cattle, transmission of Border disease, alpine community pasture, epidemiology

Aim of the study

The primary goal of the study was to investigate whether Border disease virus is transmitted from infected sheep to seronegative cattle during communal alpine pasturing. A secondary goal was to investigate whether cattle thus infected produce calves that are persistently infected with Border disease virus.

Materials and methods

A total of 1'170 sheep were examined for Border disease virus (BDV) using RT-PCR before they were moved to one of four alpine community pastures in the cantons of Uri, Schwyz and Obwalden. A total of 923 cattle that were to be moved to the same pastures were tested for pestivirus antibody using an ELISA test. The mean duration of pasturing was 88.1 days, after which time the ELISA was repeated in those cattle that were seronegative in the first test. The cattle that had seroconverted underwent a serum neutralisation test (SNT) to differentiate between bovine virus diarrhoea virus (BVDV) and BDV antibodies. Calves that were born after communal pasturing with sheep were tested for persistent infection with BVDV and the results were analysed.

Results and significance

Before the start of the alpine pasture season, Border disease virus was detected in eight sheep, and 396 cattle were seronegative for pestivirus. After the pasture period, 99 of the 396 seronegative cattle were seropositive in the ELISA test; of these, 25 had a titre to BDV and 14 had a titre to BVDV, of which seven had a titre to both viruses. The seroconversion in 25 cattle shows that cattle may be at risk of infection with BDV when pastured together with infected sheep. Three calves born to BVDV seropositive cows after the pasture season were persistently infected with BVDV, but no calves born after the pasture season were persistently infected with BDV. A possible explanation for the lack of persistently BDV-infected calves born to cows that seroconverted in the BDV antibody test is that at the start of the alpine pasture season, all cows were at least 4 months pregnant. Therefore, further study is required using cattle during the first trimester of pregnancy to examine the risk of intrauterine infection with BVD.

Publications, posters and presentations

- Büchi, R.; Bachofen, C.; Peterhans, E.; Braun, U. (2010) Epidemiologische Untersuchungen über die Ansteckung von Rindern durch mit Border-Disease-Virus infizierte Schafe auf Alpweiden. Vortrag, gehalten an der 7. Internationalen Buiatriktagung in Oberschleissheim (bei München), 7. Februar 2010.
- Büchi, R. (2009) Epidemiologische Untersuchungen über die Ansteckung von Rindern durch mit Border-Disease-Virus infizierte Schafe auf Alpweiden. Dissertation, Vetsuisse Fakultät Universität Zürich.

Project 1.09.06

Project duration April 2009 – March 2010