

Reduction of *Coxiella burnetii* load in bulk tank milk using vaccination in Q fever affected dairy cattle herds

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Coxiella burnetii is the infectious agent responsible for Q fever, a world wide spread zoonosis. Infection mainly occurs after inhalation of contaminated aerosols generated in the environment by domestic ruminants. Vaccination using a phase 1 vaccine has been shown as an effective tool to prevent shedding in ruminants at the animal level especially when applied on dairy heifers. Antibiotics (mainly tetracycline) are also used by practitioners as a medical measure to limit shedding especially around parturition, but their effectiveness has not been quantified yet. The aim of this study was to assess the impact of medical strategies applied on dairy cows, combining vaccination using a phase 1 vaccine and/or antibiotics at drying off on the evolution over time of the *C. burnetii* load that may be released by cows in the environment. As milk was reported as the main shedding route in cattle, the Cb load in Bulk Tank Milk (BTM) was here the criterion under study. In 74 Q fever clinically affected dairy cattle herds, BTM was sampled 3 months apart over one year. In each herd, all dairy cows were assigned to one of the 4 following strategies: (1) vaccination; (2) tetracycline; (3) vaccination and tetracycline; or (4) no intervention. The *C. burnetii* load in each BTM sample was quantified using qPCR (LSI, Lissieu, France). The likelihood for a given herd to show a reduction in *C. burnetii* load was quantified function of the implemented strategy using logistic regression. Herds implementing vaccination had a significantly higher probability to exhibit a reduction in *C. burnetii* load over time (OR=6.25; CI: 1.4-33.3) than herds with no vaccination. The reduction was the highest when at least the vaccinal coverage was >80% of dairy cows. Implementation of antibiotics had no significant effect on reducing the *C. burnetii* load in BTM. These findings confirm the effectiveness of vaccination on limiting *C. burnetii* shedding and provide some evidence for a rational use of antibiotics.