Q-fever in Swedish dairy cattle

Conclusions

Q-fever shows a marked spatial distribution in Swedish dairy herds, with highest prevalence in the South-East, in particular on the isles of Gotland and Öland.

Presence of antibodies in bulk milk is strongly correlated with presence of the agent.

Further studies are underway to estimate within-herd prevalence of seropositive individuals, as well as shedders.

Introduction

Q-fever, a zoonosis caused by the bacterium *Coxiella (C.) burnetii*, has recently gained increased attention within the EU. The presence of Q-fever in Swedish cattle has been known since the early 90's. A serosurvey was carried out in 1993, indicating a low prevalence (1.3% on an individual level). The disease is notifiable in animals but up to 2009, no cases had ever been reported. In humans, only one domestic case has been reported since 2004 when the disease became notifiable.

Objective

To update our knowledge about the Q-fever situation in Swedish dairy cattle by estimating the prevalence of herds with antibodies to *C. burnetii* in bulk milk, and to what extent antibody positivity correlates with presence of the agent.

Material and methods

Bulk milk survey: A systematic random sample was drawn from bulk milk samples submitted for BVDV surveillance, covering >95% of all dairy herds. A sampling fraction of 25% was used. The samples were collected in October 2008 (n=1000) and in May 2009 (n=537). Fifty-three herds were sampled twice.

Follow-up study: In April 2009, all farmers with herds positive in the 2008 screening (n=85) were invited to submit a new sample to retest for antibodies and for attempted detection of the agent by PCR.

From those that responded (n=41), information on contacts with small ruminants and herd size was collected.

Antibody detection: Indirect ELISA based on *C. burnetii* phase I and phase II purified antigens from the Nine Mile reference strain: (IDEXX Chekit® Q Fever Antibody Kit, IDEXX Laboratories, Westbrook, MA, USA).

Agent detection: Quantitative (Real Time) PCR targeting the IS1111 elements of the *C. burnetii* genome (Adiavet Cox PCR detection kit (Adiagene, Saint Brieuc, France)).

Results

Bulk milk survey: The overall prevalence of antibody positive dairy herds was 8.2% (95% CI 6.9-9.7).

There were marked regional differences with highest prevalence on the isles of Gotland and Öland (Fig 1.)

The retested herds all maintained their status (52 neg, 1 pos).

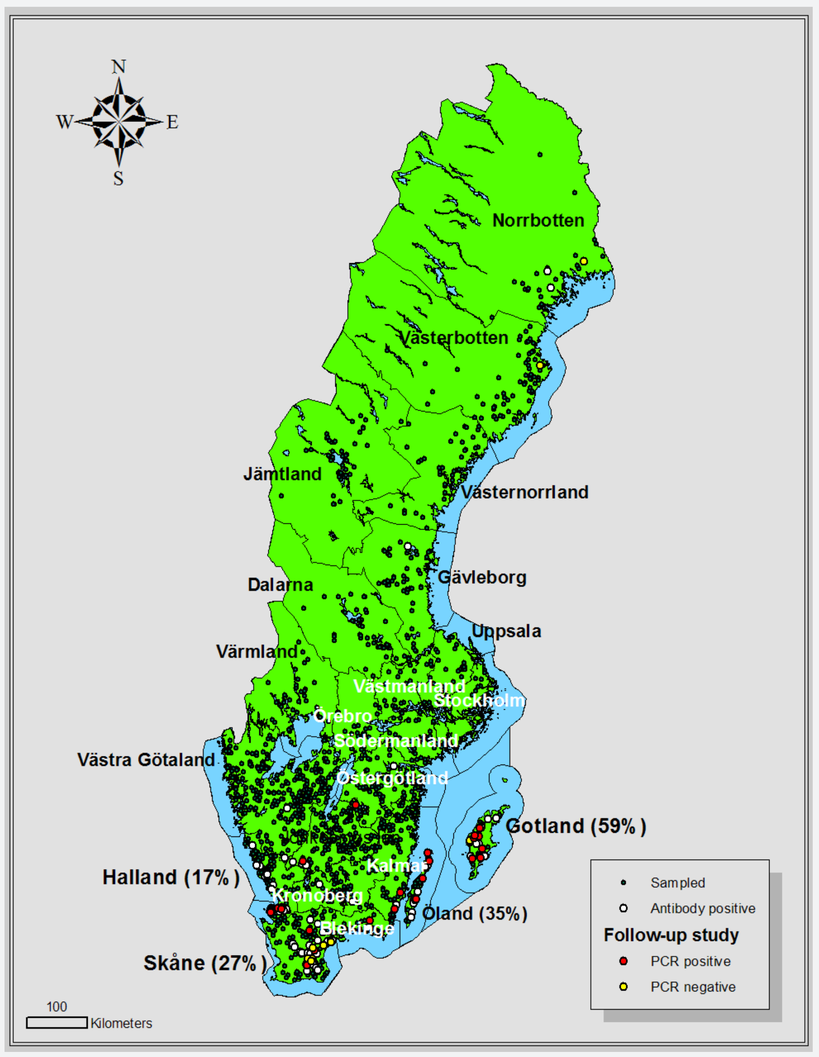

Figure 1. Spatial distribution of Q-fever positive dairy herds in Sweden. Names denote counties and percentages indicate prevalence of antibody positive herds.

Follow-up study: Of 41 retested herds, 35 (85%) were still ELISA positive 7-11 months after their first sample. Of these, 29 (83%) were also PCR positive. One antibody negative herd was PCR positive. None of the herds from Northern Sweden were PCR-positive.

PCR-positive herds were to a higher extent in contact with small ruminants (17% vs 9%) although this difference was not significant given the small number of exposed herds (5 vs 1). PCR-positive herds were also slightly larger (93 vs 77 cows, not sign.).

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