



Coxiella burnetii Infection In Ruminant Herds In Estonia

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INTRODUCTION

Q-fever is a zoonosis caused by *Coxiella burnetii* (*C. burnetii*), which causes mainly reproductive disorders in domestic ruminants and atypical respiratory disease in humans. Ruminants are considered as the main source of *C. burnetii* infection for humans, but the transmission pathways in domestic ruminants and transmission to humans are not fully understood (EFSA, 2010). We report here the preliminary results of a larger study, one part of which is to clarify the prevalence of *C. burnetii* infection in domestic ruminants in Estonia.

MATERIALS AND METHODS

Samples:

Cattle herds: random sample of herds tested for official control in Estonia in 2012, stratified by production type (dairy; beef)

- Serum and milk samples: Random sample of individual serum (beef herds) or pooled milk samples (dairy herds) from a selected herd. (Detection level at least 10% prev. at 95% CI).

Sheep and goat flocks: all herds tested for official control in Estonia in 2012-2013 included.

- Serum samples from randomly selected animals (Detection level at least 20% prev. at 95% CI).

Sample analysis:

- One pooled milk sample (PMS) of max 50 animals per dairy herd and pools of 5 serum samples from beef herds, sheep and goat flocks were tested for *C. burnetii* antibodies with LSIVet™ Ruminant Q Fever – Serum/Milk ELISA
- Antibody positive pooled milk samples (dairy herds) were tested for *C. burnetii* DNA with Trans-PCR (primers from Berri *et al.* 2000) :

Statistical analysis:

- Apparent herd prevalences for ruminant herds with exact binomial 95%CI were calculated
- Comparison of proportions with 2-sample z-test

REFERENCES

- Berri, M., K. Laroucau, and A. Rodolakis. 2000. The detection of *Coxiella burnetii* from ovine genital swabs, milk and fecal samples by the use of a single touchdown polymerase chain reaction. *Vet. Microbiol.* 72:285–293.
- EFSA Panel on Animal Health and Welfare (AHAW); Scientific Opinion on Q Fever. *EFSA Journal* (2010); 8(5):1595, 114 pp.: www.efsa.europa.eu

RESULTS

Table 1. Seroprevalence of *C. burnetii* in Estonian ruminant herds

Animal Category	No of tested herds	No positive*	Herd prevalence (CI95%)	Comparison of proportions
Dairy cattle	355	97**	27,3 (22,7 – 32,0)	p<0,0001
Beef cattle	155	7	4,5 (1,2 – 7,8)	
Sheep	102	1	1 (0 – 2,9)	p=0,1138
Goats	21	0	0% (0-13,3)	X

* borderline results included

** 8 herds were detected PCR-positive - 8,25% (CI95% 2,8 – 13,7)

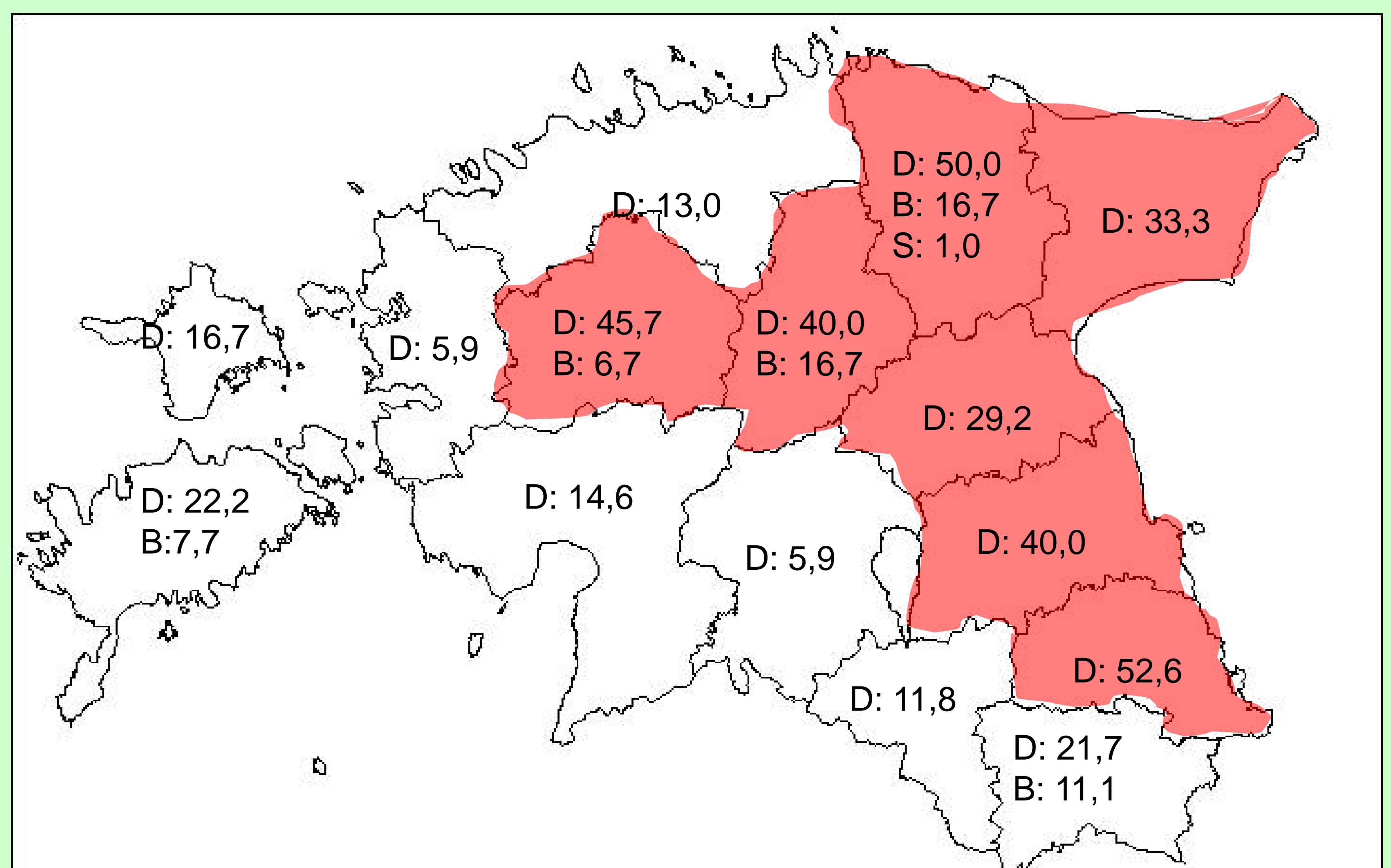


Figure 1. Herd seroprevalence of *C. burnetii* among Estonian ruminant herds located in different counties of Estonia.

D – seroprevalence in dairy herds. B – seroprevalence in beef herds. S – seroprevalence in sheep flocks. Red shading indicates the districts with higher prevalence (>25% for dairy cattle)

* EpiTools: Sergeant, ESG, 2013. EpiTools epidemiological calculators. AusVet Animal Health Services and Australian Biosecurity Cooperative Research Centre for Emerging Infectious Disease. Available at: <http://epitools.ausvet.com.au>.

CONCLUSIONS

- *C. burnetii* antibodies were detected in cattle and sheep but not in goats, however the number of tested goat farms is too small to conclude an absence of the pathogen.
- Herd seroprevalence in dairy herds was significantly higher than in beef herds and sheep flocks.
- Herd seroprevalence in beef herds did not differ from sheep flocks.
- *C. burnetii* seroprevalence in ruminant herds seems to be higher in eastern and central part of Estonia.
- We did detect *C. burnetii* DNA in only 8 of 97 pooled milk samples testing positive for *C. burnetii* antibodies.

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