

# Cows as indicators for TBE endemic regions: suitability of testing for antibodies in serum and milk

Regina Leutloff (1), Matthias Nübling (2), Dieter Neumann-Haefelin (1), Monika A. Rieger (1, 3)

(1) Department of Virology, Freiburg University Hospital, D-79104 Freiburg, Germany

(2) FFAS, D-79098 Freiburg, Germany

(3) University of Wuppertal, FB D / Occ. Health, D-42097 Wuppertal, Germany, monika.rieger@uni-wh.de

## Introduction

In countries where TBE endemicity is not homogeneous, recommendation of vaccination may be based on epidemiologic data in humans, on prevalence data of TBEV infected ticks or on seroprevalence in animals. Here, the investigation of animals used for milk production has been of special interest as they may be the source of alimentary TBEV infections, too. After first investigations in cows performed in southern Germany in 1996 (Rieger et al., 1998 [Gesundheitswesen 60, 348-356]), a comparative investigation in a standardised sample should be performed. Additionally, the suitability of milk for measuring anti-TBE seroprevalence should be assessed.

## Methods and Material

- cattle farms from regions with higher (group D, E, K) and lower TBE incidence among humans (group R) in southwestern Germany (fig. 1)
- n=506 cows (group D, E, K: each n=100; group R n=206), serum and milk samples (1997-2004)
  - age: 2 to 16 years, mean 5 ys (SD=2.2y), no diff. between groups
- IMMUNOZYM® FSME IgG all species (Progen, Germany - modified)
  - quantitative and qualitative results (VIEU/ml)
  - group E & R: manual testing (Dept. Virology, Freiburg)
  - group D & K: automatic testing (ETILAB, Univ. Wuppertal)
- statistical analysis: SPSS 12

## Results

### Results 1: cows = indicators for human TBE

- significant differences in antibody prevalence (serum / milk) between groups (fig.2)
- prevalence in milk lower than in serum (figure 2)
- differences in human TBE incidence are reflected by antibody prevalence (serum / milk):

	group E (high)	group R (low)
serum ( $\geq 126$ VIEU/ml) :	10%	6,8%
milk ( $\geq 126$ VIEU/ml):	8%	4,0%

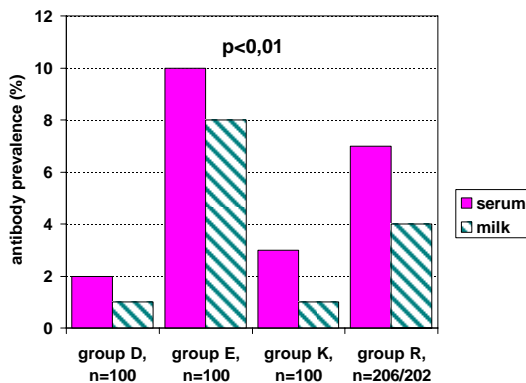


Figure 2: prevalence of TBEV-antibodies ( $\geq 126$  VIEU/ml) in serum and milk. group D & R: manual test, group E & K: automatic test

## Conclusion

- use of indicators is suitable to determine regional endemicity of TBE
- cows are suitable indicators, but: the right farms have to be chosen
- protocol for testing of milk has to be adapted
  - need for further investigations
- (last but not least): stick to the test procedure you started with !

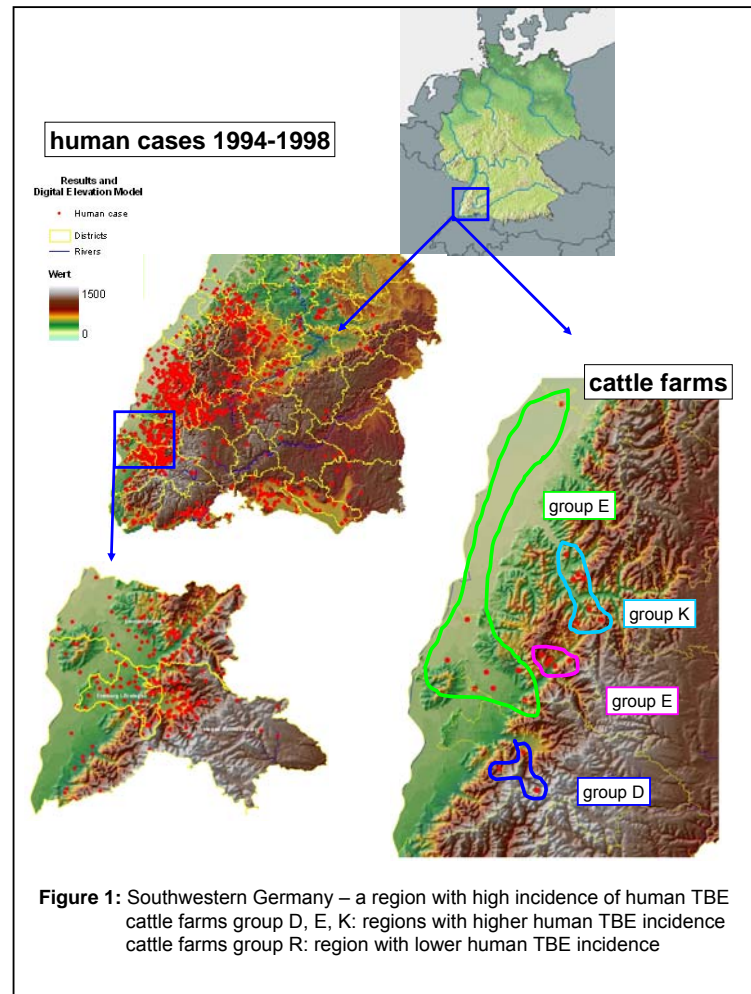


Figure 1: Southwestern Germany – a region with high incidence of human TBE cattle farms group D, E, K: regions with higher human TBE incidence cattle farms group R: region with lower human TBE incidence

### Results 2: comparison: antibody testing in serum and milk

- qualitative results:
  - in all groups significant differences in prevalence
  - sensitivity, specificity, positive predictive value (milk to serum)

( $\geq 126$ VIEU/ml)	sensitivity	specificity	PPV
all groups	20,7%	97,5%	33,3%
group E&R	25%	96,4%	37,5%
group D&K	0	97,5%	0

- quantitative results:
  - no good correlation between milk and serum results (fig.3)

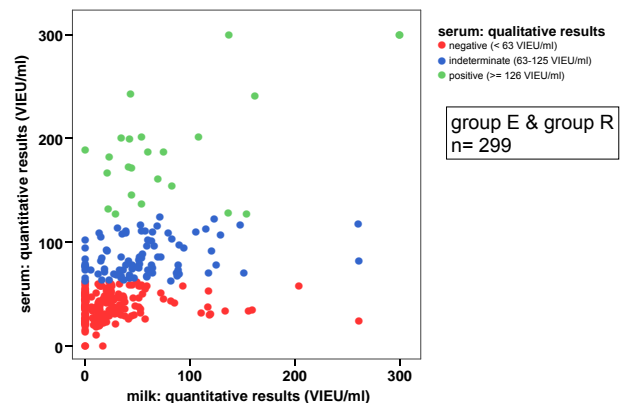


Figure 3: pairs of quantitative results, only group E and group R

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