

# Development of a risk based surveillance program for *Trichinella* spp. in domestic swine and wildlife in Switzerland

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## Key words

*Trichinella*; domestic pig; wildlife; risk-based surveillance; ELISA; Westernblot

## Aim of the study

The objective of this project was to develop a risk-based surveillance program for *Trichinella* in Switzerland that (1) is scientifically sound, (2) meets international standards, in particular EU standards, (3) guarantees food safety at a level at least equivalent to the current level, and (4) has a good balance between costs and benefits.

## Material and methods

First, a qualitative risk assessment was conducted to assess the probability of human exposure to *Trichinella* spp. in Switzerland. Second, a prevalence study was conducted in the domestic pig and wildlife population to substantiate claims of *Trichinella* freedom and determine the prevalence of infection in indicator species, respectively. Third, a stochastic risk-based surveillance model was developed that demonstrated freedom from *Trichinella* infection in domestic pigs with an equal level of confidence as the current surveillance efforts. Finally, a cost analysis was conducted to compare costs of the current surveillance program with the estimated costs of a risk-based surveillance program for domestic pigs in Switzerland.

## Results and significance

The risk assessment showed that it could not be excluded that consumers are exposed to *Trichinella* spp. through consumption of game meat or pork from free-ranging pigs. The prevalence study subsequently confirmed the presence of *T. britovi* in wild carnivores, but also showed that there was no evidence that *Trichinella* infections occur in the domestic pig population. Also in the high-risk population of free-ranging pigs no infected pigs were detected. The prevalence study demonstrated that serological *Trichinella* surveillance is technically feasible in Switzerland. Using modeling techniques, it was shown that a risk-based surveillance program based on serological techniques can provide an equivalent level of confidence regarding freedom from infection in the Swiss pig population. The sample size in such a risk-based surveillance program could be decreased by at least a factor 4 in comparison to current surveillance efforts. The cost analysis however showed that the costs of risk-based surveillance may be lower or higher than the current costs, depending on the defined sample size. Based on the results of this study, BVET decided to request extension from the EU to continue excluding small pig slaughterhouses from mandatory *Trichinella* testing to gain time to demonstrate freedom from infection of the domestic pig population by the end of 2012. In 2012, a new decision should be made about implementation of risk-based *Trichinella* surveillance in domestic pigs.

## Publications, posters and presentations (only peer-reviewed)

Frey CF, Schuppers ME, Müller N, Ryser-Degiorgis MP, Gottstein B, 2009. Assessment of the prevalence of *Trichinella* spp. in red foxes and Eurasian lynxes from Switzerland. *Vet Parasitol* 159: 295-299

Frey CF, Schuppers ME, Nöckler K, Marinculić A, Pozio E, Kihm U, Gottstein B, 2009. Validation of a Western Blot for the detection of anti-*Trichinella* spp. antibodies in domestic pigs. *Parasitol Res* 104: 1269-1277

Frey CF, Schuppers ME, Eidam V, Boujon P, Waldvogel A, Gottstein B, 2009. Vorkommen von *Trichinella* spp. beim Wildschwein in der Schweiz. *Schweiz Arch Teilheilk* 151: DOI: 10.1024/0036-7281.151.10

Gottstein B, Pozio E, Nöckler K, 2009. Epidemiology, Diagnosis, Treatment, and Control of Trichinellosis. *Clin Microbiol Rev* 22: 127-145

Schuppers ME, Rosenberg G, Graf R, Eidam V, Wittwer C, Zimmermann W, Gottstein B, Frey CF. A study to demonstrate freedom from *Trichinella* spp. in domestic pigs in Switzerland. Accepted for publication

Schuppers ME, Frey CF, Gottstein B, Stärk KDC, Kihm U, Regula G. Comparing the demonstration of freedom from *Trichinella* infection in domestic pigs by traditional and risk-based surveillance. Submitted for publication.

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