

# Economic and epidemiological aspects of bovine neosporosis in Switzerland

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## Schlüsselwörter

*Neospora caninum*, abortion, cattle, antibody kinetics, control strategies, cost-benefit analysis

## Problemstellung und Zielsetzung

*Neospora caninum* has been recognized as a major cause of infectious abortion in cattle worldwide and is considered to produce substantial economic losses to the dairy industry. The present study was designed to assess economic and epidemiological aspects of bovine neosporosis in Switzerland.

## Material und Methoden

- (1) A questionnaire was sent to 222 Swiss dairy farms to retrospectively evaluate the abortion and fertility status on farms over time and its association with putative control measures and putative risk factors. The answers were analyzed using Poisson regression models.
- (2) Characterization of the value of diagnostic analyses of single blood samples to identify *N. caninum*-seropositive animals. Thirty seropositive and 83 seronegative study cows were blood-sampled during pregnancy, every other month, until parturition. Serum specimen were tested for anti-*N. caninum* antibodies using ELISA and immunoblot testing.
- (3) Establishment of mathematical and economic models to assess the impact of different control strategies (testing and culling of seropositive animals, discontinued breeding with offspring from seropositive cows, chemotherapeutical treatment of calves, vaccination) on the *N. caninum* seroprevalence in Swiss dairy cattle and to calculate their cost-effectiveness in view of a Swiss control campaign.

## Ergebnisse und Bedeutung

- (1) The frequency of abortions was found to be dynamic over time and could both increase and decrease. Furthermore it could be demonstrated that on farms without abortion problems, control measures were applied significantly less frequently.
- (2) Fluctuations of anti-*N. caninum* antibody concentrations during pregnancy do occur, but normally range within a limited frame, not affecting the discrimination between seropositive and seronegative cattle.
- (3) The median current annual losses due to *N. caninum* in the Swiss dairy population were estimated to be CHF 13 million. Several policies were shown to reduce prevalence effectively and rapidly. However, economic analyses revealed that only two control strategies were beneficial: "discontinued breeding with offspring from seropositive cows" and "chemotherapeutical treatment of all female calves" (hypothetical scenario). The preferential control strategy at present would therefore be to discontinue breeding with offspring from seropositive cows.

## Publikationen, Poster und Präsentationen

Häsler, B. (2005). Economic and epidemiological aspects of bovine neosporosis in Switzerland. Inaugural-Dissertation, Vetsuisse Fakultät, Universität Bern.

Häsler, B. et. al (2006) *Neospora caninum*: serological follow-up in dairy cows during pregnancy. Vet. Parasitol. 137: 3-4, 227-230.

Häsler, B.; Stärk, K.D.C.; Sager, H.; Gottstein, B.; Reist, M. (2006) Simulating the impact of four control strategies on the population dynamics of *Neospora caninum* infection in Swiss dairy cattle. Prev Vet Med 77: 3-4, 254-283.

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