Structure of Risk Factors for BSE Infection in Lower Saxony, Germany

Amely Ovelhey[1], Martin Beyerbach[1], Jan Schäl[1] & Lothar Kreienbrock[1,2]

[1] Department of Biometry, Epidemiology and Information Processing,
[2] WHO-Collaborating Centre for Research and Training in Veterinary Public Health at the University of Veterinary Medicine Hannover, GERMANY
Corresponding author: lothar.kreienbrock@tiho-hannover.de

Introduction

Several parameters of farm structure and management can be considered as important for the development of BSE infection. The epidemiological importance of these parameters still remains unknown for the cattle population in Lower Saxony, Germany. A cross-sectional study of cattle farms was conducted to describe farm management and to compare a standard population with the population of BSE farms in Lower Saxony. A variety of risk factors for BSE was included in the study like import of cattle from UK (1), commercial foodstuffs, dairy farming, herd size (2) and cross-contamination with foodstuff for other animals (3, 4).

Method

A questionnaire was sent by post to a representative sample of 1,995 of 34,117 cattle farms in Lower Saxony. Distribution of risk factors within this standard population and the BSE population were compared following the concept of indirect standardisation in stratified populations (SMR analyses (5)). The population of the cross-sectional study was defined as standard (n = 731). The animals that tested positive for BSE (n = 52) were defined as the population under study. The size of farms was used as the stratification variable, with three strata. Standardized prevalence ratios (SPR) were calculated using 95 % confidence intervals via Poisson distribution (7).

Results

The two populations differ concerning certain parameters (cf. Fig. 1, 2, 3; BSE = BSE-case population; Standard = Population of cross-sectional study)

Comparison of the distribution of categorial parameters

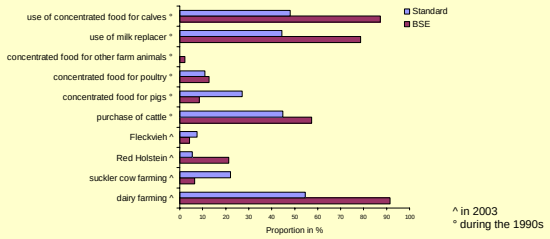

Fig. 1: Distribution of parameters in BSE and standard population (in %)

SPR-Analysis

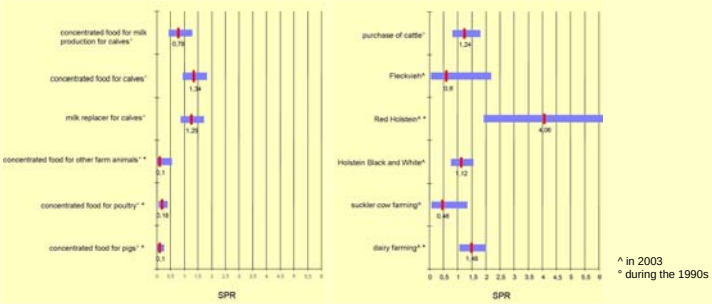

Fig. 3: SPR and 95 % confidence intervals for several parameters (* = p < 0.05)

Comparison of the distribution of quantitative parameters

	BSE		Standard	
	ave.	std. dev.	ave.	std. dev.
size of farm [ha]	74.7	52.2	68	58.6
number of cattle per farm	148	104.4	117	85
milk production per animal * [kg/year]	6958	1531	7867	1324

Fig. 2: Average of quantitative parameters (* = p < 0.05; t-Test for independent samples)

Analysis of Red Holstein concerning feeding management

Because of the increased SPR in Red Holstein cattle, the use of milk replacer in this breed was compared to the use in other breeds:

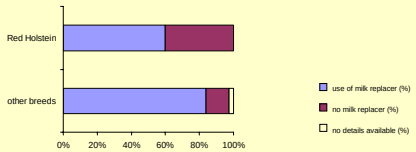

Fig. 4: Proportion of milk replacer use in % in Red Holstein cattle and other breeds

BSE in Lower Saxony was found predominantly in **dairy cattle** during the study period. **Red Holstein cattle** were most at risk of a BSE infection. **Milk replacer** was used less frequent for Red Holstein cattle than for any other breed. **Milk production** was reduced in BSE-infected cattle. There was no reference to an increased risk through **cross-contamination**, the **use of milk replacer** or **concentrated food for calves** or the **purchase of cattle**.

Discussion & Conclusion

This is the first indication of increased susceptibility to BSE of Red Holstein cattle. However, this study did not confirm the assumption that the use of commercial foodstuff or the purchase of cattle increases the risk of BSE infection. It nevertheless remains likely that commercial foodstuffs such as concentrated food for calves and milk replacer are risk factors in Germany (4, 6). Milk production was reduced in BSE-infected cattle compared to the standard population. Therefore, other parameters, which were not investigated in this study, could have an influence on the risk of a BSE infection. Overall, the study suggests the presence of differences in the risk pattern of BSE infection in Germany which should be investigated using information on individual animals.

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