

SCRAPIE: A MAILED QUESTIONNAIRE SURVEY IN SWITZERLAND

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Scrapie is a transmissible spongiform encephalopathy of sheep and goats occurring almost world-wide. Although the disease is known for more than two hundred years¹ neither the epidemiological pattern nor the geographical distribution, the source of infection and the factors of transmission between animals and flocks are fully understood. In Switzerland Scrapie is notifiable since 1990. In addition to one case in 1981 in a goat² only six additional cases have been reported between the years 1990 and 1999, but reliable estimates for the true prevalence of Scrapie in Switzerland are not available. Mandatory reporting is based on the disease awareness of the animal owners and veterinarians for the disease and its differential diagnoses as well as on the immediate and the long-term advantages – or disadvantages - for owners to report a case. The incidence of clinical cases is often underestimated by passive surveillance systems if the disease is rare^{3,4}. The few Scrapie cases reported in the 90's could be a consequence of a very low incidence but also a result of a low disease awareness which reduces the effectiveness of a mandatory surveillance system. Scrapie surveillance has gained importance again with the potential of BSE having entered the small ruminant population⁵.

The objective of this study was to improve the knowledge on the Swiss Scrapie situation.

Material and Methods

The total Swiss sheep population is 400000 while the total Swiss goat population counts 60000 animals. The sampling frame contained all registered breeding farms with more than four breeding sheep or goats (10278 farms) and included 97,8% of the registered breeding sheep population and 74,2% of the registered breeding goat population, hobby holdings excluded. The sample size was calculated to detect a prevalence of 1% of flocks having animals with neurological disorders. 1200 questionnaires were needed, but due to an expected return rate of 25% the sample size was increased to 4711 farms. The farms were randomly selected and stratified by cantons.

A short anonymous mail questionnaire, kept separate for sheep and goat flocks, was sent to the selected farms to collect information on disease awareness and occurrence of neurological diseases including Scrapie in recent years.

A follow up with a reminder postcard to all 4711 farms was conducted to increase return rate. Returned questionnaires were entered in an electronic database. Because of underestimates in passive surveillance an active (targeted) component was included in the surveillance: The clinical and histopathological examination of adult sheep and goats with neurological or behavioural disorders was offered free of charge in one veterinary university and started April 1999 to increase the number of suspect cases examined per year. Approximately 400-500 sheep and goats are rendered annually at the single Swiss rendering plant for fallen stock out of which five samples per week are collected, since April 1999, and tested with the Prionics® Check Test. Publications in the official bulletin of the Federal Veterinary Office (FVO) and the farmer's journal for small ruminants informed sheep and goat breeders about the ongoing Scrapie study.

Results

The reminder postcard increased return rate from 24% to 36%. The total sheep and goat population represented by the survey was 35819 animals in 1998 respectively 34210 animals in 1997. According to the mail survey 8.3% of all flocks (1706) had at least one animal with observed neurological disorders in 1998 respectively 6.8% in 1997. Listeriosis with 21% in 1998 (1997: 29%) was the most commonly reported neurological diagnosis made by farmers.

To the question "Did you ever have had a Scrapie suspect animal between 1990 and 1998?" 22 owners indicated they did. The resulting proportion according to the mail survey is twice as big as mandatory reporting indicates (Table 1).

The number of examination of adult sheep and goats increased from two submitted suspect cases in 1997 and six in 1998 to 27 in 1999. One of the animals (1999) was confirmed to be a Scrapie case. For the remaining 26 animals Scrapie could clinically not be excluded and all of them were examined for differential diagnosis. The main differential diagnosis was again Listeriosis with 17.1% of all examined cases. Out of the approximately 300 brain samples collected at the rendering plant not one showed any detectable PrP^{Sc} accumulation.

Period	Owner-declared Scrapie		Breeding Population		Proportion	
	Animals	Flocks	Animals	Flocks	Animals	Flocks
1998 mail survey	7	3	35819	1653	0.02%	0.18%
1997 mail survey	4	2	34210	1624	0.01%	0.12%
1990-1998 mail survey	not asked	22	not asked	1571	not asked	1.40%
1990-1998 officially reported suspects	not asked	72	not asked	10278	not asked	0.70%

Table 1: Scrapie cases at the animal and flock level according to the survey compared with officially reported Scrapie cases

Discussion

The high increase of the return rate (12%) due to the reminder postcard shows that a follow up in anonymous surveys is important and can be implemented easily and effectively.

The percentage of flocks with animals that showed neurological disorders is higher than initially expected. This can be a consequence of the smaller median herd size (14 in sheep flocks and <5 in goat flocks in Switzerland) and therefore a closer observation of the animals by the farmers.

The higher proportion of flocks with Scrapie suspects between 1990 and 1998 from the survey (1.4%) than from the mandatory reporting (0,7%) might be a consequence of misclassification bias by basing the survey on owner observations alone. On the other hand results of mandatory reporting could be lowered by the consequences of reporting suspect cases (movement restrictions, flock culling). A similar study conducted in Great Britain has recently shown reporting levels of only 13%.⁶

The expected low annual incidence of Scrapie suspects was confirmed by the survey results (1997: 0,12%; 1998: 0,18%) as well as by the results of active surveillance. The six confirmed Scrapie cases between 1990 and 1999 are single events of yet unknown origin, and the last confirmed Scrapie case (1999) will be further investigated. Overall, our results indicated that Scrapie, although present in the Swiss sheep and goat population, is currently not a major problem for the countries' small ruminant business.

References

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