

SURVEY ON NEUROLOGICAL SYMPTOMS IN GOAT HERDS

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Introduction: Occurrence of neurological symptoms in Italian goats is unknown. Such a knowledge would be very helpful e.g. in the implementation of an effective surveillance for scrapie in this species. Scrapie is a fatal neurodegenerative disease of sheep and goats classified within the group of transmissible spongiform encephalopathies (TSE) which include Creutzfeldt-Jakob disease in human beings and bovine spongiform encephalopathy (BSE) in cattle. The active surveillance for scrapie based on the application of rapid tests as required by the EU health authorities involves each year a small sample of goats and herds: as a result a large proportion of cases are likely to be missed. The clinical monitoring of neurological syndromes when carried out at herd level might allow the identification of herds eligible to deeper diagnostic investigations. Aim of this poster is to present the results of a pilot survey on neurological symptoms carried out in a small caprine population in Sardinia, Italy. Based on the results an estimate of the potential for scrapie herd prevalence is also provided.

Materials and Methods: On the basis of the available cooperation of the veterinary officers of an Italian local health unit (Ogliastra, Sardinia), all the 113 goat herds of twelve villages (Fig. 1) were recruited in a survey. During June 2006 each farm was visited by a veterinarian and a clinical questionnaire was administered to the owner. The questionnaire included the following sections: general information on size and type of herd, list of neurological symptoms (Fig. 2) observed in the herd, number of animals showing symptoms in the previous three years, outcome (death, recovering) for each case, number of dead cases by age class (<1 year, 1-2, >2), number of dead cases by clinical duration (<1 week, 1-4, >4).

The accuracy of the questionnaire in discriminating scrapie from other neurological syndromes had been assessed in a previous study. The following set of simultaneous criteria was used to define a flock having a clinical pattern compatible with scrapie: (1.) presence of animals with pruritus or a combinations of any three symptoms and (2.) mortality $\geq 10\%$ and (3.) at least 50% of non-recovered individuals belonging to the ≥ 1 year age class. Applying the criteria to 67 flocks (9 scrapie outbreaks and 58 flocks in which, on the basis of a known sanitary status, the presence of scrapie was excluded), sensitivity and specificity were respectively 100% and 84.5%.

Fig. 1 The study area

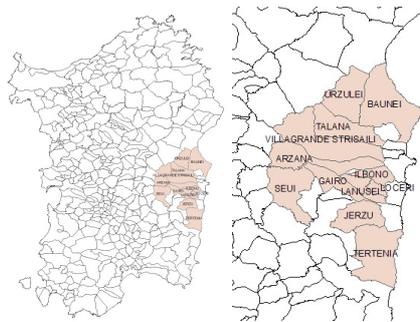


Fig. 2 List of neurological symptoms included in the questionnaire

Behavioural disorders	Hyperexcitability Depression Disorientation Fear
Postural disorders	Weakness of the limbs Loss of equilibrium Opisthotonus Twisting or tilting of the head Scoliosis Lordosis
Gait	Cifosis Paresis (mono, para, hemi, tetraparesis) Circling Ataxia Dysmetria (too short or too long movements)
Sensitive disorders	Pruritus (not due to ectoparasites) Blindness (not due to trauma) Paresis of facial muscles
Peculiar signs	Loss of alimentary materials from mouth Hypersalivation (not due to oral lesions) Tremors Seizure-like syndrome

Results and conclusions: The herds per village included in the study ranged between 2 and 29. The average number of goats per herd was 207.2 (SD 129.4) and the overall goat population included 22,366 animals. Over the 113 investigated herds only 10 were mixed flocks. Most of the herds were dairy ones using local pasture. Tables 1 shows the prevalence of herds where neurological symptoms were reported and Figure 3 the relative frequency of symptoms. During the analysis of data, neurological symptoms were combined to create a single category of "neurological syndrome". It is obvious that different diseases might have been summed up. Table 2 shows the number of herds meeting the criteria used to identify herds with a clinical pattern compatible with scrapie. However assuming that the prevalence of Scrapie in the examined sample may actually be 0 and taking into account the specificity of the questionnaire (84.5%), the expected number (113*(100-84.5)=18) of holdings with (false) positive Scrapie-eligible disease is higher than the number (8) of herds meeting the criteria. In the neurological syndrome group the mean number of goats per herd was lower (279.7) compared with that (305.4) observed in the scrapie group.

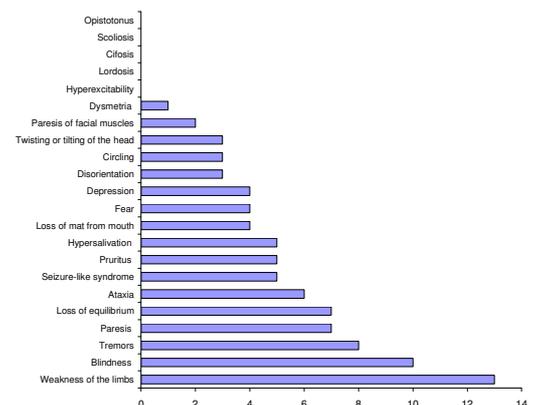
Table 1 Prevalence of herd where neurological symptoms were reported

symptoms	Freq.	Percent
No	94	83.19
Yes	19	16.81
Total	113	100.00

Table 2 Prevalence of herd showing clinical patterns compatible with scrapie

scrapie	Freq.	Percent
No	105	92.92
Yes	8	7.08
Total	113	100.00

Fig. 3 Frequency of the symptoms in the herds



This preliminary study might have an intrinsic value as an attempt to quantify the occurrence of neurological syndromes in the caprine population through the administration of a screening questionnaire. Moreover this approach may be used in small areas in parallel with active surveillance, in particular when the number of animals submitted to rapid testing may result insufficient to detect low level of prevalence of scrapie.