

SURVEILLANCE SCHEME FOR SCRAPIE IN FRANCE

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Face à l'hypothèse de l'existence d'une forme d'ESB ovine, un réseau national d'épidémiosurveillance de la tremblante des petits ruminants a été mis en place en France à l'initiative du Ministère de l'Agriculture, faisant suite à l'inscription de cette maladie sur la liste des maladies à déclaration obligatoire. La finalité de ce réseau est d'écartier de la consommation humaine tout produit ovien susceptible de contenir l'agent de la tremblante.

Ce réseau est organisé au niveau départemental par les Services vétérinaires qui s'appuient sur le réseau des vétérinaires praticiens et sur les organisations professionnelles agricoles locales ; il est coordonné et géré au niveau national par le CNEVA-Lyon.

Les principes généraux de la police sanitaire mise en place sont les suivants : (a) la suspicion de tremblante est portée par examen clinique dans les élevages ou à l'abattoir ; (b) le diagnostic est posé par examen histopathologique de l'encéphale ; (c) une enquête est menée afin de déterminer si la tremblante prend une forme épidémiologique sporadique ou enzootique dans le troupeau ; (d) les animaux atteints de tremblante sont euthanasiés et incinérés, et les animaux susceptibles d'être infectés font l'objet d'un abattage avec saisie de la tête et de l'ensemble des viscères thoraciques et abdominaux ; (e) un suivi de l'élevage est instauré pendant une durée minimum de deux ans afin de contrôler l'évolution de la maladie dans le troupeau.

Ce réseau permet en outre de collecter des données et des prélèvements biologiques à des fins de recherches épidémiologiques, génétiques, diagnostiques, ainsi que pour des recherches plus fondamentales sur les prions. Entre le 1^{er} juin 1996 et le 31 mars 1997, 75 troupeaux ovins ont fait l'objet d'une suspicion de tremblante, et le diagnostic de tremblante a été confirmé dans 54 cas.

The results on the experimental transmission of BSE to the sheep by the oral route (Foster et al., 1993; Foster et al., 1996) as well as the plausible transmission of BSE to the human consumer have focused the attention on scrapie. If contaminated meat and bone meal have been feeded to sheep unfortunately, these results point out the possible existence of an ovine form of BSE that could be clinically identical to scrapie. Facing this hypothesized risk, the French Ministry of Agriculture declared scrapie a legally notifiable disease on June 14, 1996, and decided to organize a national surveillance scheme for this disease.

The surveillance scheme is dedicated to small ruminants, in that sense that the goat can be affected exceptionally (Wood et al., 1992). However, given that scrapie affects the sheep most of the time, we only mention the ovine species in the rest of the paper, leaving the reader transposing to the caprine species when it is necessary.

GOALS OF THE SURVEILLANCE SCHEME

The aim of the scrapie surveillance scheme is public health. In the event of an ovine form of BSE, and as a precautionary measure, the goal is to remove from human consumption the products that are susceptible to be contaminated by the scrapie agent. There are two goals: (i) to eliminate the diseased animals suffering from scrapie (euthanasia and incineration), and to eliminate from consumption the head and offal of the animals that are susceptible to be infected in the contaminated flocks (these measures are added further to already existing measures: systematic condemnation of the head and spinal cord of sheep older than 12 months, and of the spleen of all sheep); (ii) to search for the existence of an ovine form of BSE. Another goal is to collect field data and biological samples for research (epidemiology, genetics, etc.) hence following the recommendations of the French expert committee on Subacute Transmissible Spongiform Encephalopathies (STSE) and Prions (Comité d'Experts sur les Encéphalopathies Subaiguës Spongiformes Transmissibles et les Prions, 1996).

DESIGN AND STRUCTURE OF THE SCRAPIE SURVEILLANCE SCHEME

The national surveillance scheme for scrapie integrates and generalizes at the national level a previous and experimental surveillance scheme that was organized in 1991 by the CNEVA-Nice in the South part of France. The goal of this experimental scheme was to study the clinical types of scrapie in naturally infected herds, and to build up a collection of scrapie strains (Russo et al., 1996).

On the request of the French Ministry of Agriculture, the conception of the surveillance scheme was coordinated by the CNEVA-Lyon and carried out by a committee comprising the public veterinary services, the researchers (CNEVA, Colleges of veterinary medicine), the farmer and veterinarian organizations (national association of the flock books, farmer associations for animal health, sheep national federation, veterinary technical organizations).

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The scrapie surveillance scheme is structured on the same way as the French BSE surveillance scheme (Savey et al., 1991). It is organized at the local level, under the direction of the veterinary services and it is based on the dense and efficient network of veterinary surgeons and farmer organizations. At the national level, it is coordinated, managed and led by the CNEVA, under the authority of the Ministry of Agriculture.

A communication campaign is being prepared currently. It is organized at the local level (department) by the veterinary services, as well as at the national level by the farmer organizations in charge of animal health. The goal is first to make the field surveillance scheme partners (farmers, veterinarians, etc.) aware of the scrapie question and to inform them on the policy measures, and secondly to train them to detect affected animals on the basis of the clinical signs of scrapie. The communication campaign is based on papers published in farmer and veterinarian journals, as well as on communication aids for meetings, and a movie on the clinical symptoms of scrapie.

DISEASE CONTROL SCHEME

Disease control measures have been taken in order to protect the public health towards scrapie. The scrapie suspicion can occur at the killing plant, during the antemortem examination, or on the farm, on the farmer request. Facing a suspicion, the veterinarian examines the clinically suspect animal at the time of a farm visit, fills up a case history form and takes different samples on the animal after euthanasia (head, blood). The diagnosis is then performed on the basis of a standardized pathological examination of the brain, in one of the three authorized laboratories (Alfort and Toulouse Colleges of Veterinary Medicine, CNEVA-Lyon).

If the case is confirmed, an epidemiological investigation is carried out on the farm in order to determine the epidemiological pattern of the scrapie in the given flock. It is based on the accurate knowledge on the transmission mechanism of the disease within the herd. It comes from the existing scientific studies, as well as from the analysis of the data collected within the experimental surveillance scheme carried out previously and of the preventive plans developed in certain parts of France, like in the Pyrénées Atlantiques department.

Two types of scrapie are identified on the farms, one sporadic and the other enzootic.

In the sporadic type, the annual incidence rate is less than 10% in all age classes within the flock. In this case, the risk of transmission of the disease between animals is considered to be low. The only policy measures are the euthanasia and the incineration of clinically affected animals.

In the herds with an enzootic type of scrapie (the others), the risk of transmission of the disease between animals is considered to be high within the age classes showing an annual incidence rate higher than 10%. In these herds, besides the measures related to the sporadic situation, it is requested to slaughter the animals of the affected age classes as well as the last born of the slaughtered ewes; it has to be performed within 6 months. There is systematic condemnation of the head and offal on these animals.

All the flocks infected with scrapie, whether a sporadic or enzootic form, are then subjected to a clinical and epidemiological follow-up that lasts at least two years. It allows to control eventual new clinical cases. If so, the policy measures are applied again.

Farmers receive a financial compensation for the animals that are euthanized or slaughtered within the frame of the program (500 FF. per animal registered in a flock book, 300 FF. in the other cases).

EPIDEMIOLOGICAL DATA AND BIOLOGICAL SAMPLES

Another goal of the scrapie surveillance scheme is to collect epidemiological data and biological samples for research.

On the herds where scrapie has been diagnosed on the basis of pathology, an epidemiological study is carried out and the data are entered in a database that is used for descriptive epidemiology (incidence rate, clinical types of disease, geographic and time distribution) and gives preliminary information for analytic epidemiology.

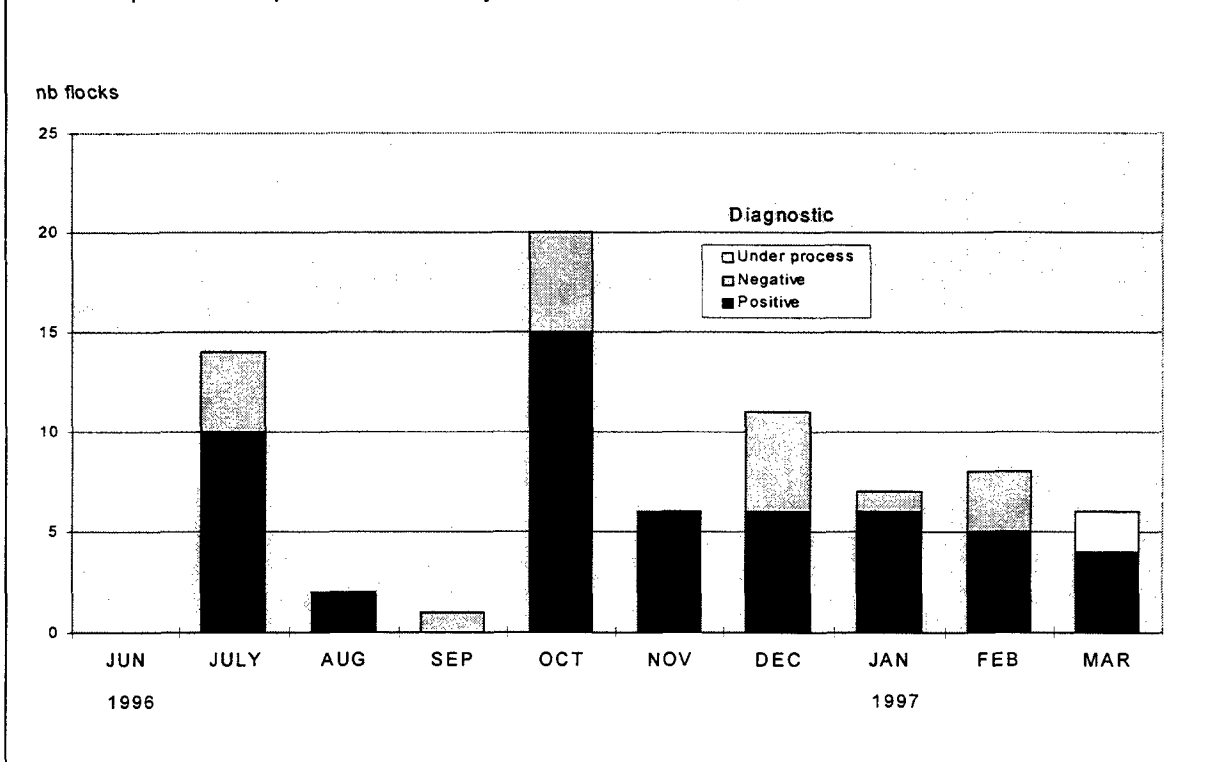
The biological samples collected on the contaminated flocks are organized in a biological sample bank (brain, blood, lymphoid tissue) and are used, among others, to improve alternative diagnostic methods (e.g. Western blot, Immunohistochemistry), to study the genetic type of the animals and to perform fundamental research. Particularly, one of the aims of the analysis of the biological samples is to confirm or not the existence of an ovine form of BSE in France.

RESULTS

The results shown on the figure are preliminary results in that sense that most of them are related to an anticipation on the routine functioning of the scrapie surveillance scheme that officially started in April 1997, when the ministerial orders were signed. The high percentage of actual cases, compared to clinical suspicions ($54/75 = 72\%$) is explained by the fact that most of the time, it is a matter of herds that were already known to be infected with scrapie and have been officially declared as infected when scrapie became a legally notifiable disease.

The current figures permit to estimate neither the prevalence and incidence of scrapie in France, nor its geographical distribution. Indeed, the official surveillance of the disease and the communication campaign started recently and most of the previous scrapie declarations came from partners (veterinarians, farmer organizations) that were already involved in the experimental surveillance scheme organized since 1991.

French national surveillance scheme for scrapie: Time distribution of the number of farms having declared a clinical suspicion of scrapie between January 1, 1996 and March 31, 1997.



CONCLUSION

The organization settled down permits to fulfill the different goals of the scrapie surveillance scheme in France. The efficiency of it will depend on different parameters, among them the willingness of the field partners to become involved in this official control program.

As it has been conceived, the scrapie surveillance scheme permits to carry out and to give rise to pluridisciplinary research projects, so that collaborations with other research teams have already been established. Particularly, a research project on the analytic epidemiology of scrapie is been prepared in order to study the factors that have an effect on the transmission of the disease between farms and within a flock, while taking into account the genetic characteristics of the flocks and the strains of scrapie.

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