

SCRAPIE

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Scrapie is a nervous disease of sheep, characterised by symptoms of severe and progressive itch resulting in loss of wool and condition, and inco-ordination of gait. It has a very long incubation period and is invariably fatal.

Although new to New Zealand, Scrapie has been known to occur in Britain for the last 200 years and appears to be prevalent in certain areas of Germany and France. In Britain, the breeds most commonly affected are Border Leicester, Cheviot, Suffolk and their crosses. There is a distinct possibility that certain breeds of sheep have a natural resistance to the disease and also, that within breeds, certain resistant lines may exist. In Britain the incidence of Scrapie is not high, occasionally reaching five per cent in affected flocks, and the sporadic cases that do occur are almost entirely confined to the Border counties.

For many years research workers have tried to elucidate the cause of Scrapie and although there was some field evidence to suggest that it was an infectious disease, any attempt to reproduce it experimentally failed; for example, as early as 1867 attempts were made to reproduce the disease in previously healthy sheep by inoculating into them material reproduced from actual cases, and by running diseased and healthy sheep together.

In 1936 out of some 18,000 sheep which had been vaccinated the previous year against "Louping Ill" (another virus disease) about ten per cent developed Scrapie. Investigations revealed that this vaccine had been prepared from the brains of slaughtered sheep, some of which had been included in an experiment involving the study of Scrapie, although, at the time of slaughter, all the sheep had appeared to be in perfect health. This

unfortunate occurrence did, however, show that the disease could be transmitted from one sheep to another by inoculation of infective material. Furthermore, since during the preparation of the incriminated vaccine the suspension of brain material had been passed through a specially fine filter, it appeared that the causal agent was a filterable virus—larger bacteria would not have been able to pass through the filter.

More recent work has shown that the infective agent can remain alive for long periods of time in dried brain tissue and that it is very resistant to adverse conditions. Numerous theories have been advanced to explain the way in which Scrapie is transmitted from one sheep to another. Some authorities believe that the disease is hereditary and that close inbreeding tends to predispose to it. There is also some evidence that transmission may result from congenital infection, although the infective parent may be apparently normal at the time of mating and may never, or perhaps only after several years, show typical signs of the disease. As yet these theories are unproven.

As has already been stated, it has been shown that experimentally, Scrapie can be transmitted by inoculating sheep with infective brain material, and that at least nine successful passages can be made.

Attempts have also been made to prove that the disease is transmitted through the medium of the pasture. In 1932 an experiment was begun in Scotland along these lines. A small group of Scrapie sheep and a number of healthy sheep were alternately grazed at intervals of three to four days over the same ground. Care was taken that the two groups of sheep did not come into immediate contact with each other, thus avoiding the possibility of direct contact with the disease. This trial was a very prolonged one, and a period of about

three years and three months elapsed before the first symptoms of Scrapie appeared in the healthy group of sheep. During the next two years nine more of these sheep developed symptoms. This work was published in 1950 and from the results it was concluded that experimentally the causal agent of Scrapie could be transmitted through the medium of the pasture.

SYMPTOMS:

As previously stated, the incubation period of this disease is usually very prolonged. Under natural conditions it may be two years or longer; under experimental conditions, by inoculating infective material direct into the sheep's brain, it has been reduced to four to five months.

As the onset of Scrapie is so insidious it is not usually recognised until the advanced stage of the disease is reached, when symptoms are pronounced. These initial symptoms are of a nervous type and the affected sheep appears apprehensive and more excitable than normal. Accompanying these signs are fine muscular tremors of the thighs and flanks and, quite frequently, the head and neck may be carried high and stiffly and the ears assume an unnatural position.

The most characteristic clinical symptom of Scrapie is the development of an itch, beginning usually in the region of the rump, and eventually extending over the whole body. Affected sheep may be seen nibbling at their legs and rubbing themselves against a fence or any fixed object as the itch becomes generalised. The constant torment of the irritation of the skin and the constant rubbing leads to loss of wool, a very ragged appearance of the fleece, and a progressively emaciated condition due to interference with grazing and rumination. Eventually the affected animal is unable to rise and death occurs. In some cases of Scrapie, aberrations of gait are seen, such as a peculiar "trot."

The course of the disease is very variable and may be anything from two to three weeks up to six months in more chronic cases. It is generally regarded as being invariably fatal, but even in those flocks in which Scrapie is established, the incidence never rises very high and only sporadic cases occur.

DIAGNOSIS

At the present time there is no test for Scrapie and diagnosis is made on the clinical symptoms of severe itching, accompanied by a change in demeanour and gait of the sheep. Care must be taken by farmers that they do not mistake all cases of skin-irritation and wool-rubbing for Scrapie. Heavy infestation with external parasites such as sheep ticks and lice, or severe cases of mycotic dermatitis may cause sheep to rub themselves. In Scrapie, no skin lesions other than abrasions caused by rubbing against hard objects will be found.

Scrapie can also be diagnosed in the laboratory by microscopic examination of certain parts of the brain and by inoculation of suspect material into the brains of healthy sheep.

CONTROL MEASURES:

This disease was first diagnosed in New Zealand in June 1952, a year after it first appeared in Australia. Material from this outbreak was sent to Scotland and a further examination there confirmed the diagnosis. The three cases concerned (two positive and one suspicious) in the outbreak in Canterbury in 1952 were Suffolk sheep imported from England in 1950. They came from separate flocks having no history of Scrapie, and were quarantined on their arrival in New Zealand. However, the fact that this disease takes such a long time to show up in the sheep, and that there is no test for it at the present time, makes the pre-

vention of introduction of Scrapie very difficult. All the sheep involved in the original outbreak in Canterbury in 1952 have been slaughtered. Two years later the disease broke out in Southland in a South-Suffolk flock and a policy of total slaughter was followed. From these two affected properties a number of sheep had been sold. This meant that all these sheep had to be traced in order that quarantine could be imposed on those farms which had received them. In Canterbury 61 properties were involved, 49 of which were fat-lamb properties and 12 bred stud sheep. A quarantine period of three years has been placed on these farms and others similarly involved in other parts of New Zealand. This three-year quarantine is based on the long incubation period of the disease, and dates from the time when in-contact sheep were first introduced on to the affected property. During this period sheep may leave the farm only for slaughter. However, in the case of some stud farms where the quarantine period would still have a long time to run, farmers have elected to have all their stock slaughtered, to receive full compensation and later to re-stock.

It is important to note that only a few sheep, perhaps fewer than four, have been diagnosed positively as cases of Scrapie and that these have occurred on only two farms, one in Canterbury and one in Southland. All of the quarantined farms are thus far completely free of the disease, being placed in quarantine merely because they have received sheep from one or other of the two infected farms.

There is no cure for Scrapie and no preventive treatment such as vaccination.

By the control measures adopted and the prohibition of introduction of further sheep from Great Britain, it is hoped that Scrapie will be unable to gain a foothold in New Zealand's sheep industry.