

# Epidemiological patterns of scrapie outbreaks in sheep flocks in Great Britain

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## 1. Introduction

Scrapie is an infectious disease, but one that is unusual in that the incubation period leading to clinical disease is governed by a strong host genetic component and a strong dose-response relationship. These factors can interact to yield intriguing epidemiological patterns.

Here, we describe patterns in the outbreaks of confirmed classical scrapie in 30 sheep flocks. The flocks are part of a large farm-based case-control study of scrapie in sheep flocks, undertaken by the Institute for Animal Health (IAH) since 1998.



## 2. Methods

**Case data:** Cases were reported by the farmers and suspect animals were confiscated. Tissue samples were sent to the Veterinary Laboratories Agency (VLA) for routine analysis for evidence of scrapie. Demographic data for cases were recorded in the Scrapie Notification Database (SND) held at the VLA.

**Flock data:** Data on flock characteristics were collected by IAH staff using a questionnaire. All flocks were blood sampled for PrP genotyping.

## 3. PrP genotypes of cases

Confirmed cases occurred in six (out of 15) PrP genotypes. Cases were predominantly in VRQ-bearing animals, but with some cases also in animals carrying the ARQ allele. The most common genotype of cases was ARQ/VRQ (n=216), followed by VRQ/VRQ (n=78).

The number of cases in each genotype varied by flock (figure 1). In most flocks, cases were confined to just two PrP genotypes: ARQ/VRQ & VRQ/VRQ. However, some flocks had markedly different affected genotypes (e.g. farms 8, 26 and 27).

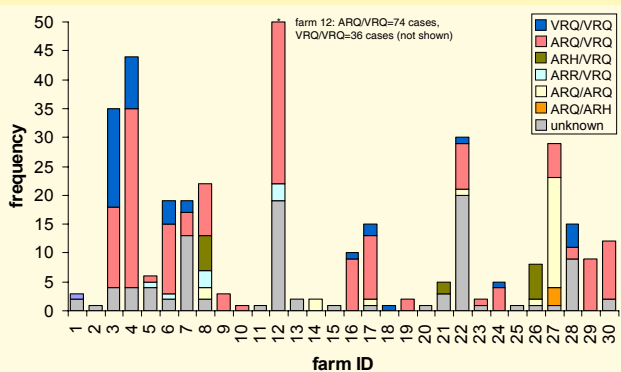


Figure 1. Frequency of confirmed scrapie cases within study flocks.

## 4. Age-at-onset of cases

The age-at-onset of the first case of scrapie varied between flocks from 12 to 68 months (figure 2; mean=32 months, median=30 months).

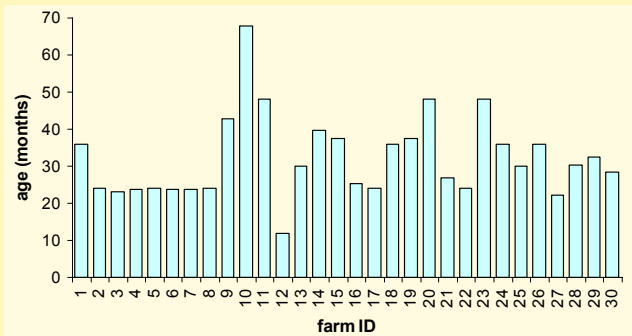


Figure 2. Age-at-onset of the first case of scrapie

The age of cases varied markedly within and between outbreaks (mean ranged from 24 to 68 months; figure 3).

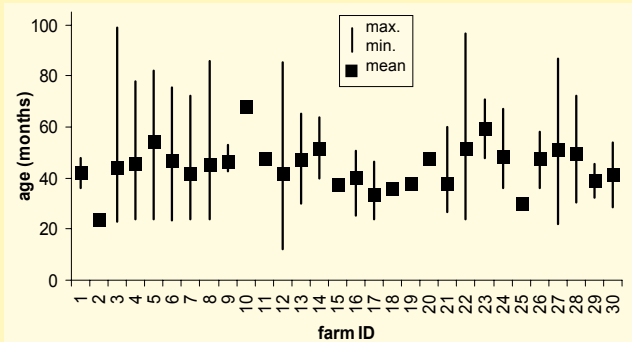


Figure 3. Mean age-at-onset of scrapie cases

## 5. Outbreak duration

Using the appearance of clinical signs as an indicator of the beginning of an outbreak, the duration of outbreaks varied between flocks from <1 to 9 years (figure 4; mean=3.7 years, median=2.6 years).

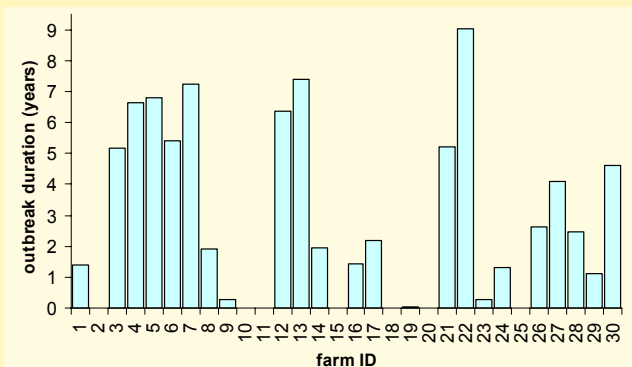


Figure 4. Outbreak duration from first to last case in years.

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