3
A new disease

A plague o' both your houses!

William Shakespeare, *Romeo and Juliet*, Act 3

With RHD spreading on several fronts across the globe, it was essential to know more about the virus that caused it and how it spread. Work in China and the investigation of a Mexican outbreak by scientists from the United States of America at first suggested the new disease was caused by a parvovirus. Its true identity was independently, but almost simultaneously, established by two separate groups of European scientists. The teams, Drs Parra and Prieto at the University of Oviedo in Spain, and Drs Ohlinger, Thiel and Meyer at the Federal Research Centre for Virus Diseases of Animals, Tübingen, in Germany, separately confirmed that the world was dealing with a previously undescribed calicivirus (Ohlinger *et al.* 1991; Parra and Prieto 1990).

Precisely how the virus spread from rabbit to rabbit was unknown, but within the domestic rabbit industry the spread was linked to poor hygiene. This included inadequate quarantine after taking stud rabbits to shows and poor cleaning of cages taken from farm to farm while collecting rabbits to be taken to abattoirs. Even the movement of domestic cats in and out of barns where rabbits were kept was one suggested possibility, although transmission via cats was not verified. Transmission between domestic and wild rabbits also seemed inevitable: waste from small rabbit farms was commonly dumped in the fields, while food for hutch rabbits could be cheaply supplemented with grasses and thistles collected from roadsides where wild rabbits lived. The disease even spread quickly on well maintained rabbit farms, especially where cages were closely spaced. It was soon realised that aerosol transmission – virus in tiny water droplets breathed out by sick rabbits – was sufficient for spread over half a metre or so even if rabbits did not make direct physical contact. Biting stable flies could potentially transmit the disease too. Laboratory experiments showed that healthy rabbits could be infected by stable flies that had fed around the eyes of sick rabbits (Gehrman and Kretzschmar 1991).

Laboratories in most European countries set to work to develop suitable vaccines to protect domestic rabbits (Pagès-Manté 1989; Šmíd *et al.* 1991). As already known in China, simple but effective vaccines could be made starting with the livers of infected rabbits. Generally, virus particles extracted from the livers were purified, inactivated with formalin then adsorbed onto aluminium hydroxide, an adjuvant that maximises the immune response in inoculated rabbits. By immunising breeding rabbits and improving animal hygiene measures to avoid re-introducing the virus, the disease quickly became manageable in large indoor rabbitries. However, there remained a constant risk of recurrence from the disease reservoirs that had become established on poorly maintained rabbit farms and in wild rabbits. The idea of keeping a few caged rabbits to eat up vegetable scraps lost its appeal for many people who