

BIOSECURITY

Quest to destroy last stocks of rinderpest

Labs encouraged to sequence their remaining samples of deadly livestock virus — then get rid of them for good.

BY DECLAN BUTLER

International authorities are renewing a push for stocks of the deadly livestock virus rinderpest — only the second disease ever wiped out, after smallpox — to be destroyed or consolidated in high-security facilities to reduce the risk of re-emergence.

The disease laid waste to cattle across Europe and Asia for millennia. When it was eradicated in the wild in 2011, dozens of labs worldwide, some with poor safety standards, held samples. Now, some are participating in a research programme called Sequence and Destroy, which involves sequencing the complete genomes of virus strains before destroying them for good.

“The world is not out of the woods,” says

Paul Fenimore, a theoretical biologist at the Los Alamos National Laboratory in New Mexico. The chance of an accidental release is low, but exists as long as lab stocks remain, says Fenimore. Such an escape could cause “billion-dollar-scale disruption”, he adds. Deliberate release is also possible — authorities worldwide rank rinderpest as a bioterrorism threat.

Rinderpest virus is in the same family as measles, but does not infect humans. It causes symptoms including fever and diarrhoea in cattle, which die days after showing signs. When the virus was imported to sub-Saharan Africa in the nineteenth century, it killed more than 90% of the cattle and oxen there.

After it was eradicated, the Food and Agriculture Organization of the United Nations (FAO)

and the World Organisation for Animal Health (OIE) agreed to destroy material containing rinderpest virus, or ship it to a few facilities that they designated high-security, says Monique Eloit, director-general of the OIE in Paris.

Progress in destroying stocks — including samples of the live virus, the vaccine and blood and tissue samples — was swift at first. But there has been a variable response in recent years, says John Lubroth, the FAO’s chief veterinary officer. That’s in part because the FAO and OIE don’t have powers to force compliance, and rely largely on advocacy. Now, 14 countries still hold some form of the virus; 6 of them have designated facilities. So far, Africa is the only region that has sequestered samples in a single facility, in Debre Zeyit, Ethiopia.

The FAO and OIE launched Sequence and Destroy in 2015. Sequence data is made public and could be used to investigate the origin of an outbreak in the case of a reintroduction. Should live virus be needed one day, researchers could also reconstruct strains from the sequences. The Pirbright Institute, an animal-health research centre in Woking, UK, became the first to destroy stocks under the initiative, in June. It got rid of around 3,500 vials and kept a small amount of live virus, says Michael Baron, who works on rinderpest at the institute. A secure holding facility in Montpellier, France, is organizing destruction of its samples. ■

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