



ADVISORY COMMITTEE ON DANGEROUS PATHOGENS

Dutch Q Fever Outbreak

Issue

1. A recent and ongoing Q-fever outbreak amongst goats in the Netherlands. The Dutch government announced in December that it would carry out a cull of upwards of 40,000 goats on 61 confirmed infected farms as a response to a sharp rise in Q fever in both the animal and human population.

A recent Promed posting¹ reported that research at the Central Veterinary Institute (CVI) in Lelystad has suggested that the Dutch strain is unique and possibly of exceptional pathogenicity. A letter published by a Dutch research group in April 2009 in *Emerging Infectious Diseases*² (Annex A) reported that the Q fever outbreak in the Netherlands involved multiple genotypes of *C. burnetii*, and advised that as most of these genotypes differed only by a single repeat difference, they may represent microvariants of a hypervirulent strain that has been introduced into the Dutch animal population.

This paper is attached for information and comment by Members of the Committee.

Background

2. **HAIRS Review**

At its meeting on 6th January 2010, Defra requested that the Human Animal Infections and Risk Surveillance (HAIRS) Group consider the Dutch Q fever outbreak and potential implications for the UK. The meeting considered the one published paper (Annex A) suggesting the possibility that the organism responsible for the Dutch Q fever outbreak may be found a different strain, but considered this to be speculative not conclusive.

¹ Promed. (2009). 'Q Fever – Netherlands'. Available online: http://www.promedmail.org/pls/otn/f?p=2400:1001:19224:::F2400_P1001_BACK_PAGE,F2400_P1001_ARCHIVE_NUMBER,F2400_P1001_USE_ARCHIVE:1001,20091222.4304,Y

² Klassen et al, (2009). 'Multigenotype Q fever outbreak, the Netherlands.' *Emerging Infectious Diseases*. 15(4). 613-614.

The HAIRS group concluded that there is no current evidence that policy and press lines regarding Q fever in the UK should change in the light of the events in the Netherlands, but that nevertheless there are several knowledge gaps that needed to be filled. It was recommended that the HAIRS Q fever Working Group should be reconvened if the perceived risk to public health increased following such information gathering (this is currently ongoing).

Defra continues to follow guidance of the Veterinary Laboratory Agency's (VLA) small ruminants (sheep and goats) expert group, part of Defra's scanning surveillance network within the VLA. This group has concluded there are currently no reasons for the UK to stop the importation of goats or sheep from the Netherlands. There are very few consignments of sheep and goats imported from the Netherlands annually (14 in 2008). The heightened Dutch controls restricting movements of animals from farms found to be infected with Q fever will also serve to restrict imports from the Netherlands. VLA are investigating a *C. burnetii* isolate obtained in UK from an imported Dutch bovine that was diagnosed to have Q fever to check if it was a different strain to the Q fever endemic in the UK.

3. Situation in the Netherlands

Human health

Q fever in humans became a notifiable disease in the Netherlands in 1978. Until 2006, the number of notifications ranged between 1 and 32 cases annually, with an average of 17 cases per year. However, since 2007 Q fever has emerged as an important human and veterinary public health challenge, with 168 cases notified in 2007, exactly 1000 human cases in 2008, and approaching 2300 cases in 2009. Six of these cases were individuals with underlying health issues who died after contracting the infection.

The specific epidemiology of Q-fever in The Netherlands is most likely related to intensive goat farming in the proximity of densely populated areas. Most affected is the highly agricultural southern province of Noord Brabant, but cases have also been reported from Gelderland, Utrecht and Limburg. The overall outbreak consists of separate clusters with multiple sources. For some human clusters there is a clear epidemiological link to small ruminant farms with clinical Q-fever cases, presenting in animals as abortion waves. For other clusters such a link is less obvious.

Evidence to support a causal link between ruminant abortion outbreaks and human outbreaks includes the results of *C. burnetii* subtyping of goat and human specimens, which have been shown to be highly similar. In addition, a seasonal variation in human cases was observed in 2007, 2008 and 2009 with peak incidence from February to June, which correlates with spread of manure from goat stables during the kidding season.

Animal health

The disease has been confirmed on a total of 61 dairy goat farms, mainly in Noord Brabant. No other domestic animal species has been reported as infected to date.

The cull commenced on 21st December 2009 and includes all pregnant dairy goats on all infected farms, whether vaccinated or unvaccinated. This comprises upwards of 34,500 animals. All male goats on infected farms are also included owing to the risk of transmission via semen; this comprises over 1,200 animals. Non-pregnant females are spared but are banned from use for breeding purposes during their lifetime.

Voluntary vaccination of small ruminants was put in place in October 2008. This was made mandatory in April 2009 in affected regions for all premises where there are more than 50 dairy goats or milking sheep. In October 2009, the government announced that compulsory vaccination would be extended throughout the country in 2010 to include holdings of more than fifty sheep or dairy goats, and premises such as petting farms and zoos.

A general ban on breeding on all farms with 50 or more dairy goats or dairy sheep has been established until July 1 2010.

Holdings of more than 50 dairy goats or sheep have been obliged to participate in fortnightly Q-fever bulk milk testing since October 2009.

Goat farming practices

There has been an exponential growth of goats in the Netherlands from 3,300 animals in 1984 to 354,878 animals in 2008. In parallel, the degree of intensive goat farming has increased. Intensive livestock systems produce large quantities of manure which is often not disposed of regularly. Goats are kept in open stables which facilitate bacterial spread via the air. In addition, the Netherlands is one of the most densely populated countries in the EU/EFTA and farms are frequently next to residential areas, especially in the south of the country. Preliminary research from the Netherlands has shown that bacteria can spread 500m – 5000m around an infected farm after an outbreak among animals. These findings suggest that human populations in the proximity of farms would be at risk, especially those belonging to one of the more vulnerable groups.

4. Situation in UK

Human Health

From January 1999 to December 2008, a total of 1287 cases of Q fever (including acute, chronic and past infections) were reported from England and Wales, 185 cases from Scotland (including 142 cases linked to an outbreak in 2006) and 195 from Northern Ireland. This corresponds to an overall UK mean annual incidence rate of 0.18

cases per 100,000 population/year. Mean annual incidence rates during this period were substantially higher in Northern Ireland (1.17 per 100,000/year) than in England and Wales (0.14 per 100,000/year) and Scotland (0.37 per 100,000/year).

The regional distribution of human cases is similar to the distribution and density of sheep populations, with the majority of cases reported from South West England, Wales, Scotland and Northern Ireland (although there were fewer human cases than might be expected in the northern regions of England).

Q fever cases in the UK are generally considered sporadic but a number of outbreaks have been reported. These include an outbreak in Cheltenham in 2007 (32 cases), thought to be due to windborne spread from a farm source; an outbreak at a meat processing plant in Scotland in 2006 (142 cases) thought to be linked to a sheep lairage; and an outbreak at a cardboard manufacturing plant South Wales in 2002 (95 cases) thought to be linked to drilling into contaminated straw board.

Animal Health

Q fever cases are monitored through general scanning surveillance undertaken jointly by the VLA and SAC, whereby bovine, ovine and caprine material submitted for laboratory diagnosis after abortion is routinely tested for *Coxiella burnetii* by MZN smears on cotyledons. Through this system, 5 cases were identified in Great Britain in 2008 (2 cattle, 2 sheep, 1 goat), 4 in 2007 and 7 in 2006. None had been diagnosed in 2009 to the end of September.

Defra has recently commissioned a Q fever seroprevalence study from VLA to establish the background level of infection in sheep and goats in Great Britain. Blood samples collected from approximately 6000 sheep and 500 goats during the 2008 routine Brucella screening programme are to be screened, with preliminary results expected in early 2010.

Action

5. None – this paper is for information and comment only.

**ACDP Secretariat
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