The outbreak that started in 2007 continues into its 5th year in the Netherlands. As of 2 Feb 2011, there were 8 more confirmed cases so far in 2011.

Since 2007, there have been more than 4000 cases and several deaths, including 11 deaths in 2010.

Though the cases have been seen throughout the country, the US Centers for Disease Control and Prevention (CDC) notes that most of these cases have been in Noord (North) Brabant, Gelderland, Limburg, and Utrecht Provinces in the southern part of the country. The CDC offers the following prevention recommendations for US travelers to the Netherlands:

- Avoid farms in the affected areas.
- If you cannot avoid visiting farms, avoid going near areas where animals are kept, such as barns and pens, and avoid direct contact with animals.
- Breathing in soil and dust contaminated by animals can make you sick.
- Eat only milk and dairy products that have been pasteurized. Do not drink raw milk or eat raw milk products.
- Wash your hands often with soap and water, especially if you have been near animals. If soap and water are not available, use an alcohol-based hand gel with at least 60 percent alcohol.
- Pay attention to your health after your trip. People can become sick with Q fever 2-5 weeks after being exposed to the disease. If you feel sick, go to the doctor and tell him or her that you have traveled to The Netherlands.

Q fever is caused by the obligate intracellular pathogen, _Coxiella burnetii_. The disease is usually transmitted to people through either infected milk or through aerosols. This disease is found on most continents with the reported incidence probably much lower than the actual because so many cases are so mild. Animal reservoirs of _C. burnetii_ include sheep, cattle, goats, dogs and cats. In areas where these animals are present, Q fever affects veterinarians, meatpacking workers and farmers. Q fever is also considered a potential agent of bioterrorism.

The symptoms of Q fever according to the CDC are an unexplained febrile illness, sometimes accompanied by pneumonia and/or hepatitis, the most common clinical presentation. Illness onset typically occurs within 2-5 weeks after exposure. The mortality rate for acute Q fever is low (1-2 percent), and the majority of persons with mild illness recover spontaneously within a few weeks, although antibiotic treatment will shorten the duration of illness and lessen the risk of complications. Chronic Q fever is uncommon (less than one percent of acutely infected patients) but may cause life-threatening heart valve disease (endocarditis).

[Byline: Robert Herriman]
Q fever in the Netherlands: The animal health aspects. By Christianne Bruschke, CVO, Ministry of Economic Affairs, Agriculture and Innovation, The Hague, Netherlands

Up to 2007, some 20 people became infected yearly with Q fever, a zoonotic disease. Suddenly in 2007, 170 people fell ill, and in 2008 there were 1000 cases. In 2009, there were more than 2300 known cases of people becoming infected. Experts believed that there was a relationship between Q fever abortions on milking goat and milking sheep farms and the sharp increase in the numbers of human infections.

In the Netherlands, several measures were taken between June 2008 and December 2009 to control Q-fever in animals. Measures were directed in particular at the dairy goat and sheep sector, but measures were also taken for small ruminants that come into close contact with the general public. Q fever in sheep and goats was made notifiable in June 2008. Hygiene measures, transport restrictions and restrictions for visitors were implemented. Vaccination with a non-licensed vaccine was performed in a restricted area in 2008 (voluntary) and 2009 (compulsory).

In October 2009, monitoring based on bulk milk PCR was started to detect infected farms. Knowing that the vaccine was not fully efficacious in infected or pregnant animals, and having the possibility to detect infected farms at the end of 2009, the responsible ministers took the following decisions:
1. cull all pregnant animals on infected farms
2. a nationwide breeding ban for dairy sheep and goats
3. a compulsory vaccination program for the whole country in 2010.

With these very drastic measures, further contamination of the environment during the lambing season would be prevented. Breeding would be only allowed thereafter with animals coming from non-infected vaccinated farms.

In 2010, the number of human patients with Q-fever was 382. As of now, the focus of the measures is to prevent another outbreak, with yearly vaccination of the dairy goat and sheep population.

[Byline: C. Bruschke]


Background: From 2007 through 2009, The Netherlands faced a series of multiple Q fever outbreaks in the southern part of the country. Q fever was specifically seen in the vicinity of dairy goat farms where abortion waves due to _Coxiella burnetii_ occurred.

Methods and Materials: Seroprevalence of antibodies against _Coxiella burnetii_ was tested in 2006 in a random sample of the population (ELISA phase I and II). Hospital discharge data were used in retrospect to find previously undetected clusters in time and space. Incidence of acute Q fever was calculated using notification data.
Smoothing incidence lines were calculated using 6 digit area codes. A case control study was performed in 2007. A sample of blood donors originating from the areas with highest incidence was tested twice in 2009 with IFA. A sample of sera from the pregnancy screening (e.g. HBsAg, lues) was tested for antibodies against _Coxiella burnetii_.

Results: In 2006, the seroprevalence of antibodies against _Coxiella burnetii_ in The Netherlands was low (less than 2.7 percent). Before 2007, small clusters of lower respiratory tract infections went undetected. Incidence of Q fever increased from 192 in 2007, to 1000 in 2008 and over 2300 in 2009. Risk for acute Q fever was increased for males in age group 45-55 yrs and living in proximity of infected goat farms, not living near infected sheep farms. In areas where blood donor infection rate could be ascertained, only an estimated 12 percent of infections are leading to microbiologically confirmed disease. Preliminary data show no serious adverse events of infection during pregnancy on pregnancy outcome.

Conclusion: The total number of reported acute Q fever cases approaches 4000. Living near infected dairy goat farms was the major risk factor. The number of chronic infections with serious complications remains unknown.


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[4]
Date: Sun 6 Feb 2011
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Q fever in the Netherlands: _Coxiella burnetii_, laboratory aspects.
By: H.-J. Roest, Central Veterinary Institute of Wageningen, Lelystad, Netherlands

Background: _Coxiella burnetii_ is a Gram-negative intracellular bacterium, which belongs to the family of the Coxiellaceae and the order of the Legionellales. Two phases of the bacterium can be distinguished: phase I, associated with full length lipopolysaccharide (LPS) and phase II, associated with truncated LPS. In the life cycle of _C. burnetii_, 2 stages can be distinguished. The Large Cell Variant (LCV), which is able to multiply, and the Small Cell Variant (SCV), the spore-like form in which _C. burnetii_ is resistant to outside influences.

Methods and Materials: Genotyping was performed by MLVA [Multiple Loci Variable Number of Tandem Repeats Analysis].

Results: The link between dairy goats as the source of human Q fever cases in the Netherlands has been made on the basis of epidemiological evidence. Genotyping of _C. burnetii_ is a tool to further investigate the connection between source and host. Using MLVA, the connection between sheep and humans in a small Q fever outbreak in the Netherlands could be made. MLVA was also used to type a considerable number of goat samples from goats that were considered to be the source of the Q fever outbreak in the Netherlands. Results show that one MLVA type is predominantly present on all dairy goat farms in the epidemic area in the south of the Netherlands.

_C. burnetii_ contaminated goat manure is considered to be a major factor in the transmission to humans. Little is known about the temperature build-up in goat manure piles and the influence of the composting process on _C. burnetii_. In a joint effort of national research institutes, temperatures and numbers of _C. burnetii_ in goat manure and the decimal reduction time of _C. burnetii_ under these conditions were assessed. Results of this study [have been presented].
Conclusion: Results on genotyping show that one MLVA type is predominantly present on all dairy goat farms in the epidemic area in the south of the Netherlands. This MLVA type should also be found in infected humans. Research on this is ongoing. Conclusions on the results of the survival of _C. burnetii_ [have been] given during the presentation.

[Byline: H.J. Roest]

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[The IMED 2011 International Meeting on Emerging Diseases and Surveillance, held in Vienna, Austria, 4-7 Feb 2011, was organized by the International Society for Infectious Diseases. It was co-sponsored by ProMED-mail, EcoHealth Alliance, European Centre for Disease Prevention and Control (ECDC), European Commission (EC), European Society of Clinical Microbiology and Infectious Diseases (ESCMID), HealthMap, Wildlife Conservation Society (WCS) and the World Organisation for Animal Health (OIE).

Though the exceptionally high number of human infections in the affected Dutch districts during 2008-2009, was mainly attributed to the development of dairy-goat mega-farms during recent years, the possibility that this epizootic was caused by a strain of the bacterium with particular characteristics deserves attention. Final results are anticipated with great interest. - Mod.AS]

[see also:
2010
Q fever - Netherlands (31): (NB) investigation report 20100930.3546 Q fever - Netherlands (30): peaked, mitigation measures
20100727.2513