

***Brucella suis* Infection in Dog Fed Raw Meat, the Netherlands**

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A *Brucella suis* biovar 1 infection was diagnosed in a dog without typical exposure risks, but the dog had been fed a raw meat-based diet (hare carcasses imported from Argentina). Track and trace investigations revealed that the most likely source of infection was the dog's raw meat diet.

Exposure risks for *Brucella suis* infection typically include contact with wildlife or livestock, breeding, and travel to brucellosis-endemic areas. We report a case of *B. suis* infection in a dog for which the risk was determined to be a raw meat-based diet.

The Case

In November 2016, a 6-year-old, intact, male American Staffordshire terrier was admitted to a primary care veterinary clinic in the Netherlands, where fever, ascites, and epididymitis/orchitis were detected. Because clinical signs did not improve after a 5-day course of amoxicillin/clavulanic acid (12.5 mg/kg 2×/d), the dog was neutered. During surgery, purulent exudate from the epididymis was noted; this exudate and abdominal fluid were collected and submitted to a routine veterinary diagnostic laboratory. Both samples yielded bacterial growth that was identified by matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF) mass spectrometry (Bruker Daltonics, Bremen, Germany) as *Brucella* spp. The Dutch National Reference Laboratory identified the isolate by MALDI-TOF mass spectrometry (with an in-house extended database) as *Brucella suis* biovar 1, and the EU reference laboratory confirmed this phenotypically (1). One isolate was sequenced and molecularly characterized in silico by multilocus variable-number tandem-repeat analysis (MLVA) as Ms Bruce 06/08/11/12/42/43/45/55/18/19/21/04/07/09/16/30:

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2/3/6/10/4/1/5/2/4/38/9.5/5/4/8/5/3 and by multilocus sequence typing (MLST) as sequence type (ST) 14 (2–4).

After diagnosis confirmation, serum and urine samples were collected from the dog. Serologic testing for *B. suis* yielded a positive result by microscopic agglutination test (MAT; >120 IU/mL) and rose bengal test (4,5). Serologic test results for *B. canis* (serum agglutination test <50 IU/mL) (1) and bacteriologic culture of a urine sample were negative. Despite treatment with doxycycline (10 mg/kg 1×/d for 14 days starting 3 days after neuter), the dog did not recuperate and because of the poor prognosis was euthanized. Postmortem examination of the dog was performed, and samples from kidney, spleen, prostate, liver, and abdominal lymph nodes were tested by PCR (4). Only the prostate yielded a positive result for *Brucella* spp.

Because brucellosis is notifiable in the Netherlands, the Incidence Crisis Centre of the Netherlands Food and Consumer Product Safety Authority was notified. The Centre started investigations to track potential transmission and trace the source of infection. The owners of the index dog were asked to list all dogs that had had frequent contact with their dog during the previous 2–3 months. From the 5 contact dogs identified, blood samples were collected (twice, 4 weeks apart) for serologic testing (MAT and rose bengal) and urine samples were collected for bacteriologic culture. Blood from 1 contact dog yielded a weakly positive result for *B. suis* antibodies (MAT 30 IE/mL; rose bengal negative) at both collection times. An acute infection in this dog was considered unlikely because no seroconversion was detected. All other dogs yielded negative serologic results. All urine samples were bacteriologically negative.

The owners of the index dog reported no relevant exposure risks except that the dog was fed a raw meat-based diet (usually commercial mixed raw feed and in June–July 2016 unprocessed heads of hares, all from the same supplier). Because raw meat consumption has been associated with *B. suis* infections in dogs (6,7), the feed was considered a potential source of infection. In December 2016, the index dog owner provided leftovers of the commercial mixed raw feed, which we tested by PCR for the presence of porcine DNA and *Brucella* spp.; results for both were negative. The investigators visited the raw feed supplier and sampled a (not yet marketed) 30,000-kg batch of hare carcasses imported from Argentina. Of 40 representative

seroconversion to *B. suis* (postexposure weeks 2, 4, 6, and 24) according to national guidelines (10). To our knowledge, no human infections were linked to this case.

B. suis biovar 1 is a potential threat to the pig farming industry because introduction of *B. suis* into pig herds can have substantial economic consequences (11). A striking detail is that the last *B. suis* infection in pigs in the Netherlands (1969) was associated with swill feeding of hares imported from Argentina (12).

In response to our findings, preventive measures were implemented (e.g., sampling of imported raw meat and communication of risk to international authorities and raw-feed suppliers). This case stresses the microbiological risks for humans and animals of feeding raw meat-based diets, which has become increasingly popular among pet owners (13). This case also highlights the need for a One Health approach because *B. suis* biovar 1 is a zoonotic agent and can cause severe infections in humans (14,15).

Acknowledgments

We thank the dog owners for their cooperation and Nicole Helmond, Sylvia Bruin, Anky Schoormans, Frank Harders, Annemieke Dinkla, Alieda van Essen, Yvonne Dijkstra, Rob Buijs, and Evelien Kern for their excellent technical assistance and Maryne Jaÿ for confirmation of the strain.

Surveillance of zoonotic pathogens in companion animals in the Netherlands was funded by the Dutch Ministry of Agriculture, Nature and Food Quality and the Dutch Ministry of Health, Welfare and Sport. Confirmation and laboratory work done at Wageningen Bioveterinary Research was financed by the Ministry of Agriculture, Nature and Food Quality (project no. WOT-01-002-006.01).

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