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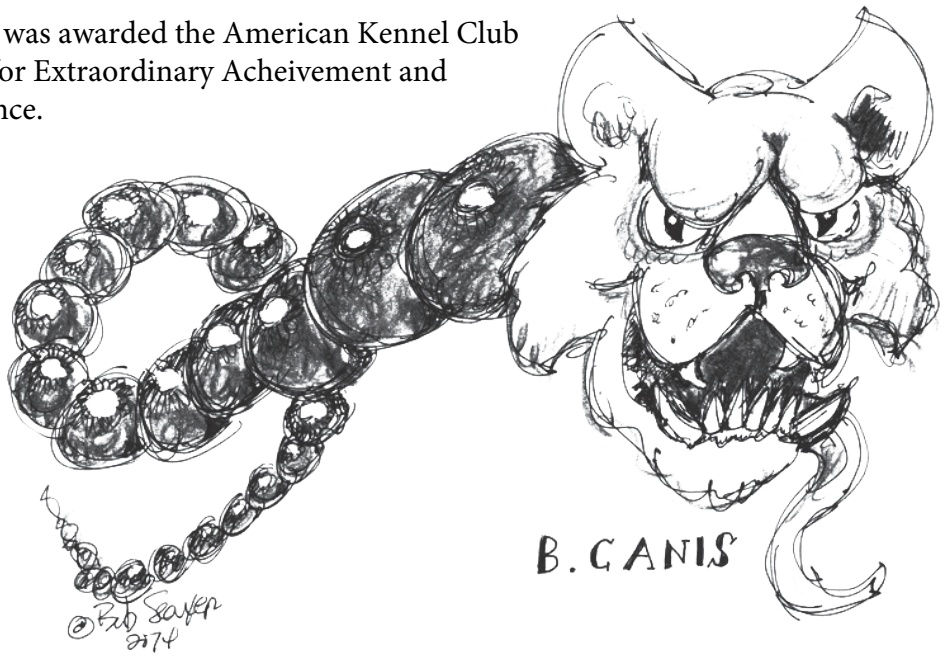

Brucellosis:

A Devastating Diagnosis for Breeders and Pet Owners, Part I

By Nancy P. Melone, Ph.D.

This article is printed in two parts. Part I discusses the cause of brucellosis, *where it is found, its clinical signs, and the risk to humans. In the August issue, Part II considers how the disease is transmitted, diagnosed, and prevented. Recommendations are offered for breeders, pet owners, and puppy buyers.*

A diagnosis of *brucellosis* effectively ends a dog's breeding career. Bitches infected with *brucellosis* experience failure to conceive, re-absorption, and third-trimester abortion. The number of puppies whelped is often reduced by up to 75%. Stud dogs can produce abnormal sperm and be rendered infertile. Entire kennels can be at risk. Because breeding is not the only way dogs contract *brucellosis*, castrated pets and rescue dogs can get *brucellosis* and can pass it on to other dogs and people in the house. While no deaths (excluding puppies and fetuses) have been attributed to *brucellosis*, depending upon the state in which the diagnosis occurs, a *brucellosis* diagnosis can result in mandated euthanasia of affected dogs.

There is no cure or reliable treatment for canine *brucellosis*. There is no vaccine to prevent it. Symptoms are often absent or vague, and definitive diagnosis can be complex, expensive, and difficult.

Until we have better ways to diagnose, treat, and prevent this disease, our primary tools for managing risk of infection are disease knowledge and adoption of prudent breeding, testing, and ownership practices.

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What Causes *Brucellosis* in Dogs?

There are six *Brucella* species. Dogs can be infected by four of the six species. Three of the four species infecting dogs are self-limiting (*i.e.,* resolve on their own). The fourth, known as *Brucella canis (B. canis)*, is the cause of *brucellosis* in dogs and is not self-limiting. If the dog or bitch is infected with *B. canis*, it is infected for life and is infectious to other dogs and people.

Where is Canine *Brucellosis* Most Prevalent?

Brucellosis has been called a "cosmopolitan" disease because of its worldwide dissemination. The first U.S. case was diagnosed in 1966. While southern states tend to have greater infection rates, breeders in northern states should not become complacent. For example, on November 26, 2013, Michigan's state veterinarian announced that dogs at three kennels had been diagnosed as positive for *B. canis.* Michigan mandates reporting of any *B. canis* diagnoses. As a result it has good data on the incidence of the disease. Most states do not mandate reporting and as such underestimate the extent of infection.

Carter and Johnson (2012) describe in clinical detail how the infection devastated kennels and pet owners alike in a previous outbreak.

"From 2007 to 2010, 153 dogs in 9 commercial kennels in Michigan and 10 privately-owned pet dogs were diagnosed with *Brucella canis*. The source of infection in the kennels was acquisition of dogs from kennels in Ohio and Indiana and movement of animals or stud service among Michigan kennels. Prevalence within individual kennels ranged from 7.4% to 84.2%. Tracing sales from infected kennels led to 10 pet dogs, 6 of which were positive. Five pet dogs with no known association with infected kennels were diagnosed with *B. canis*. One had orchitis. One had vaginal bleeding. A pet bitch and her litter were brought from Kentucky to Michigan. Three of the 5 pups were infected, one with diskosponylitis."

Both the lack of mandated reporting in most states and the acceleration of the interstate dog trade have been implicated as an underlying cause of increased rates of disease.

Brucellosis is not isolated to the U.S. It has been reported in Canada, Central and South America (including Mexico), some European countries, Africa, and Asia. New Zealand and Australia are the only areas alleged to be free of the organism. The bottom line is that this is a disease about which every breeder, stud dog owner, and pet owner must be knowledgeable.

What are the Clinical Signs of Canine *Brucellosis*?

The clinical signs for *brucellosis* fall into three basic categories: 1. non-specific symptoms, 2. abortion and vaginal discharge, and 3. infertility.

Non-specific Clinical Signs

Infected dogs may be asymptomatic or exhibit non-specific signs. Dogs exhibiting non-specific clinical signs can have swollen lymph nodes (*i.e.*, lymphadenitis) and suffer from lethargy, exercise intolerance, loss of appetite, or weight loss. In a few cases dogs will exhibit lameness or back pain. Generally they do not have a fever.

Abortion and Vaginal Discharge

The classic clinical sign of *brucellosis* is abortion during the last two weeks of gestation. Following these abortions there is typically a gray-green or bloody vaginal discharge that lasts several weeks. Sometimes embryos or fetuses are reabsorbed shortly after mating. Occasionally the bitch will deliver stillborn or weak puppies. Infected bitches have delivered normal-appearing puppies that are congenitally infected and subsequently develop *brucellosis*.

Infertility

Failure to conceive can be a sign of infection. Males with chronic disease can also be infertile. Sperm of infected dogs can be morphologically

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Breeding and non-breeding dogs can get* brucellosis *by coming into contact with the reproductive tissues, urine, discharges, or mucous membranes of infected dogs.

Brucellosis Quick Facts

- A diagnosis of *brucellosis* effectively ends a dog's breeding career.
- There is no cure or reliable treatment for canine *brucellosis*
- *Brucellosis* has been called a "cosmopolitan" disease because of its worldwide dissemination.
- Can I get it from my dog? The short answer is, "yes."

Brucellosis

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abnormal and its viability reduced. Once the bacteria infect the body, they target reproductive tissues. In females the targets are the uterus, vagina, and placenta. In males, they are the prostate and testicles. Once the bacteria enter the blood stream, they target other organs and locations, including the liver, spleen, lymph nodes, eyes, and spinal column.

Is *Brucellosis* Zoonotic? Can I Get It from My Dog?

The short answer is "yes," humans can contract *B. canis*. The longer answer is that diagnosed cases are rare and typically involve specific groups (*e.g.,* breeders and laboratory workers). Because dog breeders and certain laboratory workers may come in contact with reproductive tissues and fluids, they are at higher risk of infection than the general population. Disease in humans can easily go undiagnosed and is not generally reported even in states in which *brucellosis* is reasonably frequent. It is likely to be underdiagnosed in humans because the clinical signs are vague (prolonged fever and swollen lymph nodes) and most physicians are not suspecting it as a diagnosis.

Summary Points

- *Brucellosis* is a serious disease caused by the *B. canis* bacteria.
- There is no cure for *brucellosis* nor is there a vaccine to prevent it.
- *Brucellosis* is found worldwide, including in the U.S. and Canada.
- Breeding and non-breeding dogs can get *brucellosis* by coming into contact with the reproductive tissues, urine, discharges, or mucous membranes of infected dogs.
- Many infected dogs show no symptoms.
- Breeding females who are infected can suffer re-absorptions and abortions. Infected stud dogs can produce abnormal sperm and become infertile.
- People can contract *brucellosis* from their dogs, but it is rare.

Photo of Henley by Beth Schmoyer. BG #106925.

About the Author

Nancy P. Melone, Ph.D., Editor Emerita of *The Alpenhorn*, breeds under the kennel name ThornCreek (www.thorncreekbmds.org). She was awarded for her editing, writing, and graphic design, the prestigious Dog Writers Association of America's Maxwell Medallion and the Morris Animal Foundation Advances in Canine Veterinary Medicine Award. She holds a Ph.D. in Information and Decision Sciences from the University of Minnesota's Carlson School of Management and served on the faculties of Carnegie Mellon University and the University of Oregon. She is currently a design student at the Art Institute of Pittsburgh. Nancy lives peacefully, covered in dog hair, with her husband and six Berners on 30 acres in Butler, Pennsylvania.

Resources

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Credits

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Photo by Alison Jaskiewicz. BG# 100429.