

**Animal Health Advisory: Salmon Poisoning Disease in four dogs**  
**4.2.2024**

**Key Points:**

- Salmon Poisoning Disease is an infectious disease in dogs caused by the bacteria *Neorickettsia helminthoeca*, contained in a trematode parasite called *Nanophyetus salmincola*. It is not a poisoning. Most cases in LA County are associated with exposure to raw trout, not salmon.
- Infected dogs can become seriously ill with lethargy, fever, vomiting, diarrhea, and enlarged lymph nodes. Affected dogs often need hospitalization.
- Dogs in Southern California usually become infected after exposure to raw trout, specifically trout that has been caught for sport fishing in local lakes, or water used to rinse raw trout. Trout farmed in the Pacific Northwest are used to stock local lakes for sport fishing.

Dear Veterinary Colleagues:

On March 22, 2024, an emergency veterinary practice in Pasadena, in Los Angeles County, reported four cases of Salmon Poisoning Disease in dogs that had become seriously ill. The cases spanned between June 2023 and March 2024. All four dogs were hospitalized but ultimately survived. Two of the dogs live in Los Angeles County and two live in San Bernardino County.

- June 2023 – A Belgian Malinois in LA County was exposed to raw trout fished from a lake in San Bernardino County. The dog had vomiting, diarrhea, weight loss, mild thrombocytopenia and peripheral and abdominal lymphadenopathy. *Neorickettsia helminthoeca* bacteria were visualized on a biopsy from lymph node. The dog then tested PCR positive for the bacteria.
- Jan 2024 – Two Boxer dogs in San Bernardino County were exposed to raw trout fished from a lake in Orange County. Both dogs developed fever (104 deg F), vomiting and diarrhea. One dog was hospitalized, and enlarged abdominal lymph nodes and thrombocytopenia were confirmed. This dog also tested PCR positive for the bacteria.
- March 2024 – A Bull Terrier in LA County was exposed to raw trout fished from a lake in LA County. The dog had transient high fever (105 deg F), and also had vomiting, diarrhea, abdominal lymphadenopathy, and thrombocytopenia. When raw trout ingestion history was revealed, dog was PCR tested for the bacteria and was positive.

**What is Salmon Poisoning Disease?**

Despite its name, Salmon Poisoning Disease (SPD) in dogs is caused by an infection, not a poison. Moreover, in Southern California, dogs usually get infected after exposure to raw trout

fished from local lakes, not salmon. SPD causes illness in dogs primarily via bacteria called *Neorickettsia helminthoeca*. The bacteria are contained in a trematode parasite called *Nanophyetus salmincola*, which can infect trout, salmon, and other species of fish raised in waters that contain certain species of snails or salamanders. Fish that are infected with the parasite and bacteria may appear normal.

The life cycle of the *Nanophyetus salmincola* parasite involves species of freshwater snails or salamanders which are capable of serving as the intermediate hosts for the parasite. An infected mammal releases parasite eggs in its stool into the water. A free-swimming life stage of the parasite infects snails, then matures to another free-swimming life stage which then infects fish. When a mammal eats the infected fish, the parasite matures to the adult stage and produces eggs which are then passed in the feces of the mammal. This parasite is primarily found in fish in freshwater locations in the Pacific Northwest of the United States, including Northern California.

### **How do dogs become infected?**

Dogs become exposed to SPD when they eat raw infected fish. In Los Angeles County, most reported cases have been associated with raw trout that were caught during sport fishing in local lakes, which are stocked with trout that typically originate from farms in the Pacific Northwest.

In the four recently reported cases, dogs became infected by eating raw trout heads or filets. In past reported cases of SPD, one dog became infected after digging up and consuming raw trout that had been buried in a garden as fertilizer. Another dog in the past became infected simply by drinking from a puddle of water in an area where raw trout had been rinsed. Dogs can also become infected by licking raw fish.

### **What are the clinical signs of SPD in dogs?**

Dogs usually start to become ill after an incubation period of 5-7 days after exposure. Infected dogs can become seriously ill with lethargy, high fever, vomiting, diarrhea (sometimes bloody), and sometimes enlarged lymph nodes particularly in the abdomen. The fever may be transient or persistent, based on locally reported cases. In one of the recent cases, widespread lymph node enlargement in the abdomen was noted.

### **How is it diagnosed?**

- **Fecal sedimentation** test to look for the eggs of the trematode parasite *Nanophyetus salmincola*. The eggs may sometimes be seen on standard fecal flotation / centrifugation or a direct fecal smear. Note that if parasite eggs are not seen in a fecal sedimentation test, the dog may still be infected.
- **PCR test for the bacteria** *Neorickettsia helminthoeca* on a whole blood sample (lavender top tube), lymph node aspirate, feces, spleen, or liver tissues. The UC Davis Veterinary

Diagnostic Laboratory performs this test: <https://pcrlab.vetmed.ucdavis.edu/veterinary-diagnostics/veterinary-submission-formsdiagnostic-tests-and-panels>.

### How is it treated?

- **Supportive care.** Infected dogs often require hospitalization, close monitoring, and supportive care such as IV fluids.
- **Antibiotic and antiparasitic treatment.** Since the clinical signs occur primarily because of the bacterial infection, antibiotic treatment is essential. Dogs may occasionally clear the parasitic infection on their own, however anti-parasitic treatment is typically given. Note there are other antibiotic and antiparasitic medications that may be used than those listed below, and veterinarians are encouraged to review the recommended reading below for more information. A common choice for treatment is:
  - Doxycycline 5 mg/kg IV (or PO once eating) BID for 7-14 days
  - Praziquantel 10-30 mg/kg PO q 24 hours for 1-2 days

### Can SPD affect humans?

- The bacteria that causes SPD is not considered to be zoonotic. However, the trematode *Nanophyetus salmincola* has occasionally infected humans and can cause mild, self-limiting gastrointestinal signs.

### Reporting Cases

- Veterinarians practicing in Los Angeles County are required to report cases of Salmon Poisoning Disease. Complete [this form](#) and send it, along with the medical records, to [vet@ph.lacounty.gov](mailto:vet@ph.lacounty.gov), or fax to 213-481-2375.

### Recommendations

- Never feed raw fish caught during sport fishing to a dog. Most reported cases of SPD in LA County were linked to raw trout caught during sport fishing in various lakes across Southern California. Do not allow dogs to drink water used to clean raw fish.
- If a dog ingests raw fish, especially salmon or trout caught during sport fishing, the dog should be monitored for clinical signs of SPD for 10-14 days.
- For dogs presenting with vomiting, diarrhea and lethargy, include questions about sport fishing and raw fish exposure when taking a medical history.
- Trout and any other fish caught during sport fishing should be cooked before being consumed. Always wash hands thoroughly after handling raw fish.

### Additional resources:

- Salmon Poisoning Disease – Veterinary Public Health, Los Angeles County Department of Public Health - <http://ph.lacounty.gov/vet/spd.htm>

- Diniz, PPV (2020). Chapter 94: Salmon Poisoning Disease. In D. Bruyette (Ed.), *Clinical Small Animal Internal Medicine* (pp. 913-915). John Wiley & Sons.  
<https://onlinelibrary.wiley.com/doi/book/10.1002/9781119501237>
- Sykes, JE. (2023). Chapter 47: Neorickettsiosis. In JE Sykes (Ed.), *Greene's Infectious Diseases of the Dog and Cat, 5<sup>th</sup> Edition* (pp. 571-581). Elsevier Saunders.  
<https://www.sciencedirect.com/book/9780323509343/greenes-infectious-diseases-of-the-dog-and-cat>

Veterinary Public Health is available if you have questions or concerns. Please reach out to us by phone at 213-288-7060 (Monday – Friday, 8am-5pm) or email at [vet@ph.lacounty.gov](mailto:vet@ph.lacounty.gov).

Sincerely,

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