PRAIRIE DIAGNOSTIC PERSPECTIVE

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PDS 2026 Holiday Season Schedule

Thursday December 24, 2026 – closed at 3 P.M.

Friday December 25, 2026 - closed for Christmas Day

Monday December 28, 2026 – open with reduced staffing

Thursday December 31, 2026 – closed at 3 P.M.

Friday January 1, 2027 – closed for News Years Day

PDS Test Updates

Suspect RG3 Clinical Pathology Submissions: We are pleased to share an update from Clinical Pathology. Following updates to our biohazard handling processes, we are now able to accept Risk Group 3 (RG3) suspect samples for testing.

Refer to PDS website for suspect RG3 submission information - *https://pdsinc.ca/resources/submission-protocols/#suspect-risk-group-3-rg3-submissions*.

Nitrate: rumen samples are no longer accepted as a sample type for nitrate testing. Feed is the only acceptable sample.

Vitamin A and E and Mineral Panels: Hemolysis may affect results. To help avoid hemolysis, allow sample to clot, centrifuge and transfer serum to a plain red top tube. Store in fridge or freeze for longer storage.

Changes to Vitamin D Testing at PDS

We have discontinued our in-house Vitamin D testing due to technical challenges that would require significant additional development to resolve. To ensure clients receive the highest quality and most reliable results, samples will now be referred to the Michigan State University laboratory, which, to the best of our knowledge, is currently the only veterinary laboratory in North America offering this test.

For more information, please contact PDS before submitting samples.

Changes to Brachyspira Testing Options

PDS is updating its available testing options for Brachyspira to provide greater flexibility in selecting tests for specific species.

What's changing?

- Individual qPCR tests: *B. hyodysenteriae*, *B. hampsonii*, and *B. pilosicoli* qPCR tests will each be available individually.
- New combination test: A *B. hyodysenteriae* + *B. hampsonii* qPCR combo will be introduced.
- Discontinued combination test: The current *B. hyodysenteriae* + *B. pilosicoli* qPCR combo will no longer be offered.

What's staying the same?

All other *Brachyspira* testing options will remain unchanged, including *B. hampsonii* Clade I/II typing, nox gene PCR with sequencing, culture, and antimicrobial resistance gene (ARG) PCR.

These updates will provide additional flexibility in selecting *Brachyspira* qPCR testing options while maintaining access to the other existing testing services.

For questions about the revised test menu, please contact PDS.

Important Shipping Guidelines for Shipping Samples in Winter Months

It's crucial to adjust how samples are shipped to PDS to minimize the risk of freezing during winter months.

Tips to help decrease the risk of freezing:

- **Formalin Fixed Tissue**: Fix in 10% formalin for 24 hours, then transfer to 70% alcohol (e.g., isopropyl) if shipping in very cold weather.
- **Use a Room-Temperature Ice Pack**: Helps prevent freezing in transit.
- **Label Packages**: Mark "Protect from freezing" on the outside.
- **Avoid Friday Shipping**: Don't ship temperature-sensitive samples on Fridays or before long weekends.

Samples to Protect from Freezing:



- **Trichomonas Pouches:** Use a warm pack in the container.
- **Whole Blood:** Includes EDTA, heparin, sodium citrate, and red top tubes.
- **Formalin-Fixed Tissues:** Ship in 70% alcohol in winter.
- **Feces for Parasitology:** Avoid freeze-thaw cycles.
- **Gel Swabs:** Prevent thawing to maintain gel consistency.

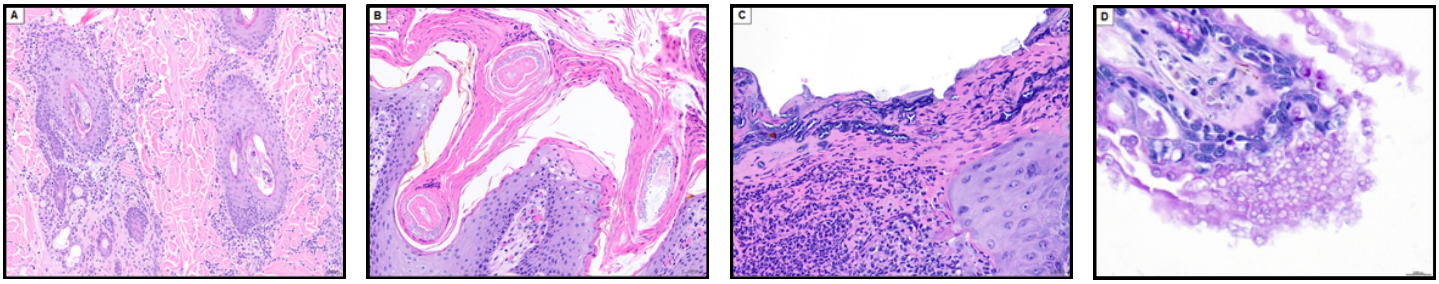
For test-specific guidelines, see the PDS Test and Services Guide. Contact PDS at dso@usask.ca or 306-966-7316 with questions.

55th Western Conference of Veterinary Diagnostic Pathologists

Michael Zabrodski, (Anatomic Pathologist, PDS) BSc, DVM, MSc, DACVP

In early October, Prairie Diagnostic Services hosted the 55th Western Conference of Veterinary Diagnostic Pathologists (WCVDP). The WCVDP is a case-based meeting that brings together veterinary anatomic pathologists and trainees from across western Canada and the northwest United States. This year's diagnostic theme was dermatopathology and we were privileged to have two excellent moderators for this topic: Dr. Charles William Bradley (board-certified veterinary dermatohistopathologist) of the Department of Pathobiology at the University of Pennsylvania School of Veterinary Medicine; and Dr. Allison Foster (board-certified veterinary dermatologist) of the Department of Small Animal Clinical Sciences at the Western College of Veterinary Medicine. A total of 33 cases were presented over two days, including 16 excellent trainee presentations. Cases included diagnostic mainstays of veterinary dermatopathology such as pemphigus foliaceous, dermatophytosis, and hepatocutaneous syndrome, while also covering a wide range of more exotic species including chickens, bats, reptiles, amphibians, and even a case of round cell neoplasia in an electric eel.

Figure legend. A) Generalized demodecosis in a dog. Note multiple sections of *Demodex* mites within the lumina of hair follicles. B) Dermatophytosis (i.e., ringworm) in a calf. Multiple hair shafts are infiltrated by fungal hyphae with numerous rounded fungal arthrospores. C) Exudative epidermitis in a piglet (i.e., greasy pig disease). Microcolonies of *Staphylococcus hyicus* are embedded within superficial crusts of inflammatory debris and keratin. D) Chytridiomycosis in a wood frog. Numerous rounded fungal thalli occupy the stratum corneum of the skin of the foot.

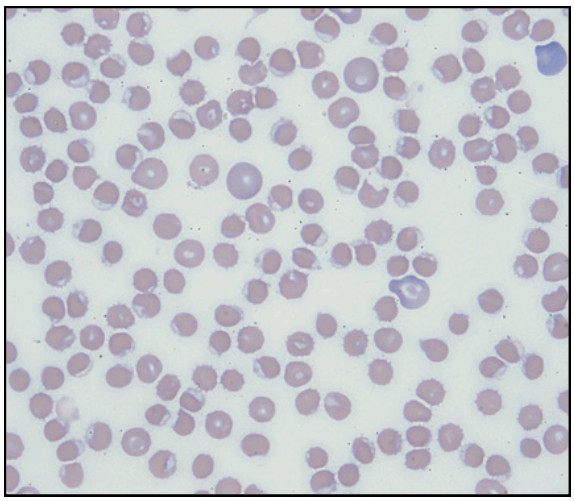


When the Blood Smear Tells the Story: Recognizing Oxidative RBC Injury

By Lilani Munasinghe (Clinical Pathologist) and Parneet Jandi (MVetSc Clinical Pathology)

A 4-year-old spayed female dog was evaluated for lethargy and found to have mild regenerative anemia. Blood smear examination revealed numerous Heinz bodies and eccentrocytes, providing strong morphologic evidence of oxidative red blood cell (RBC) injury. Oxidative injury can result from exposure to a variety of substances, including onions, garlic, acetaminophen, and zinc. When these changes are identified, a thorough exposure history is essential and should include medications, supplements, unusual foods, and topical products.

Several ghost cells were also observed, supporting intravascular hemolysis, while occasional spherocytes raised the possibility of concurrent immune-mediated hemolysis. The direct antiglobulin (Coombs) test was negative; however, a negative result does not completely exclude immune-mediated hemolysis. Taken together, the findings were most consistent with a regenerative hemolytic anemia associated predominantly with oxidative RBC injury, with possible concurrent low grade extravascular hemolysis.



Occasional siderocytes (RBCs containing iron-containing inclusions) were also present. Siderocytes may be encountered in association with abnormalities of erythrocyte iron handling or heme synthesis and in certain toxic exposures. In this case, their clinical significance remains unclear.

If an acquired oxidative exposure cannot be identified, less common intrinsic RBC abnormalities affecting antioxidant defenses or cellular metabolism may warrant consideration. These include abnormalities involving glucose-6-phosphate dehydrogenase activity and glutathione metabolism. Pyruvate kinase deficiency may also be considered in the broader differential diagnosis of intrinsic RBC disorders, although it primarily affects erythrocyte energy metabolism rather than antioxidant defense.

This case highlights the diagnostic value of blood-smear examination. Careful assessment of RBC morphology can provide evidence of hemolysis while offering important clues to its underlying mechanism, helping guide further diagnostic investigation. Although the blood smear strongly supported oxidative RBC injury, the underlying cause and precise mechanism of injury were not established in this case.

Providencia alcalifaciens: A Potential Emerging Enteropathogen in Dogs?

Dr. Ruwani Karunarathna, Microbiologist, PDS
Dr. Helene Philibert, Clinical Associate, Anatomic pathology, WCVM

Escherichia coli, Salmonella spp., Clostridium perfringens, and *Campylobacter spp*. are among the leading bacterial agents associated with canine diarrhea. However, the isolation of these bacteria does not necessarily establish their role as the primary cause of disease. Clinical presentation, animal age, bacterial abundance, virulence typing results, and pathological findings must be considered when interpreting diagnostic results and assessing the potential significance of these bacterial spp.

At Prairie Diagnostic Services (PDS), we have observed an increase in the isolation of *Providencia alcalifaciens* from canine diarrhea cases. The following three cases highlight potential clinical significance of this bacterium in dogs.

Case 1: A 1.5-year-old Australian Shepherd presented with acute hemorrhagic diarrhea (AHD) and subsequently died. Gross and histopathologic findings were consistent with acute, severe hemorrhagic gastroenteritis. There was marked congestion and acute hemorrhage of the superficial portion of the mucosa of the stomach and intestines, with sloughing or attenuation of the surface epithelium. Large numbers of small rods and coccobacilli were detected on the epithelial surface. Neutrophils were also present in mucosa of the intestines and a lymphoglandular structure in the colon. Bacterial culture revealed heavy growth of *P. alcalifaciens* (4+) and low growth of *C. perfringens*, while *E. coli* was not isolated. PCR-based toxin typing of the *C. perfringens* isolate identified it as type A, only positive for alpha toxin and negative for the virulence factors that are associated with canine hemorrhagic diarrhea.

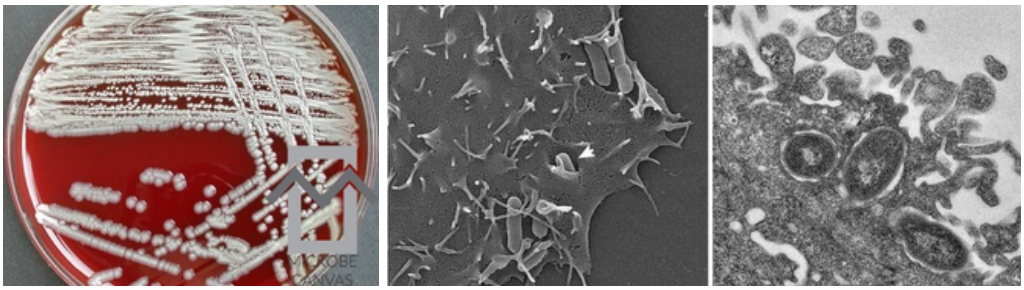
Case 2: A 2-year-old Shih Tzu was presented with acute hemorrhagic diarrhea. Bacterial culture yielded heavy growth of *P. alcalifaciens* (4+), along with *E. coli* (3+) and *C. perfringens* (3+). Further virulence typing of the *E. coli* and *C. perfringens* isolates was not performed because it was not requested by the client.

Case 3: A 3-year-old Boxer was presented with intermittent, watery diarrhea. Bacterial culture yielded *P. alcalifaciens* (3+), *E. coli* (3+), and *C. perfringens* (2+). Parasitological examinations, including testing for *Giardia* and *Cryptosporidium*, were negative. No further testing was performed as per the client's request.

Collectively, these cases suggest a possible association between *P. alcalifaciens* and canine diarrhea, particularly in young dogs. *Providencia alcalifaciens* is a gram-negative bacterium belonging to the family Enterobacteriaceae. Literature, including a study conducted in Norway, has identified *P. alcalifaciens* as a potential emerging enteropathogen in dogs, predominately associated with AHD (1). Molecular studies have revealed that this bacterium can harbor cytolethal distending toxin, which can induce irreversible DNA damage and cell death, as well as Type III secretion systems (T3SS) and their associated effector proteins which assist in attachment to enterocyte and invasion (1, 2).

Although the repeated isolation of *P. alcalifaciens* in these cases raises the possibility of its involvement in canine enteric disease, a causal relationship cannot be confidently established from bacterial culture results alone. Further investigations incorporating clinical findings, histopathologic changes in multiple submissions, and additional microbiological or molecular analyses are needed to better understand its pathogenic role.

Prairie Diagnostic Services will continue to monitor submissions involving *P. alcalifaciens* to assess emerging trends and contribute to a better understanding of its potential significance in canine gastrointestinal disease. **We would appreciate it if our clients could provide a more detailed patient history to help us analyze and interpret the results more thoroughly.**



Non-hemolytic colonies on Blood agar (Left) microbecanvas.com
SEM (Middle), and TEM (Right) image of P. alcalifaciens adghere and enter the intestinal spithelia cells at experiments setting (Klein, Jessica A., et al. "Pathogenic diversification of the gut commensal Providencia alcalifaciens via acquisition of a second type III secretion system." Infection and Immunity 92.10 (2024): e00314-24.)

References:
1. *Soltvedt, Eiril Moen, et al. "Canine Providencia alcalifaciens: virulence factors and phylogenetic analysis of an emerging enteropathogen." Microbial Genomics 12.1 (2026): 001628.*
2. *Shima, Ayaka, et al. "Molecular characterizations of cytolethal distending toxin produced by Providencia alcalifaciens strains isolated from patients with diarrhea." Infection and immunity 80.4 (2012): 1323-1332.*