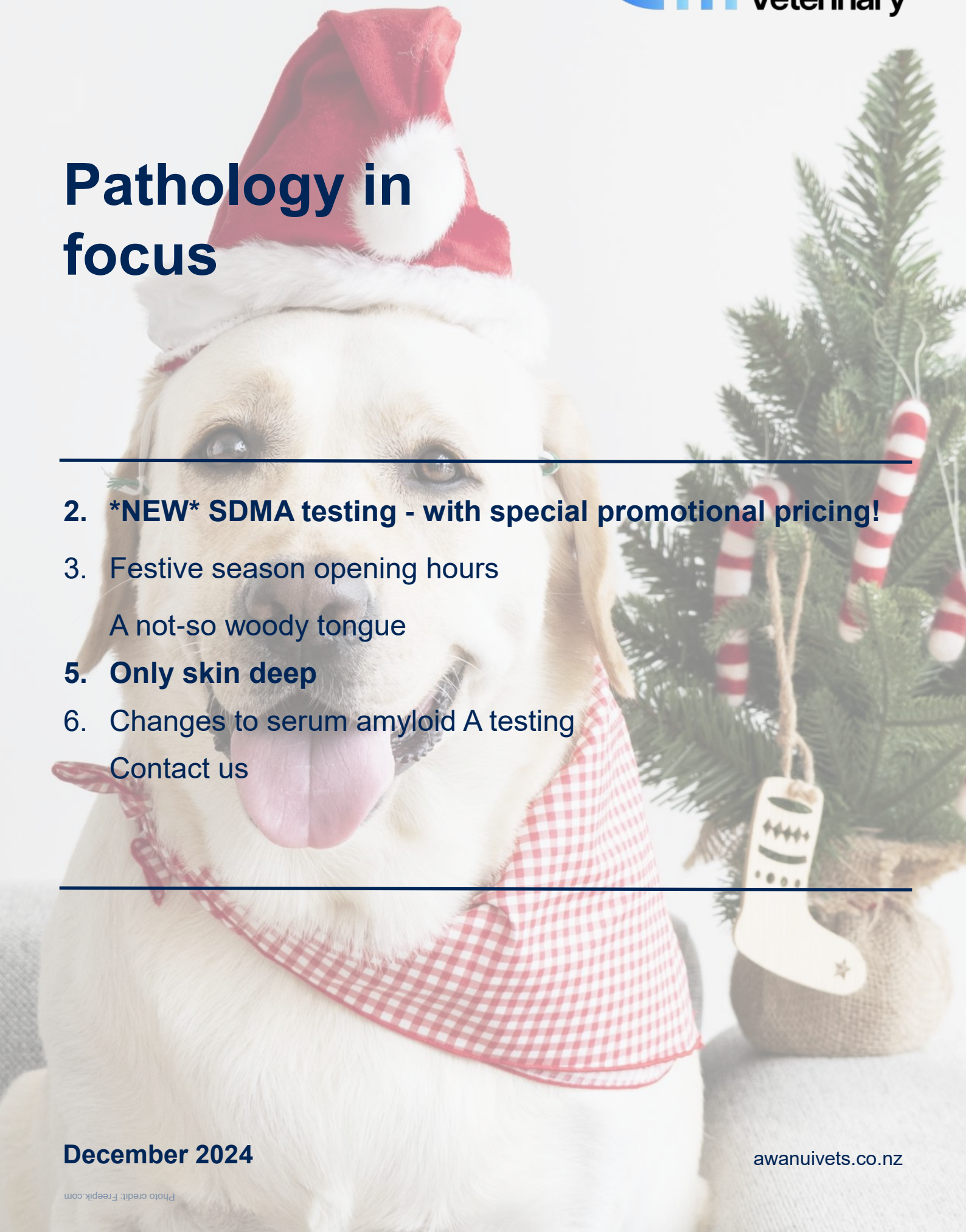
Awanui Veterinary

# Pathology in focus





**December 2024**

awanuivets.co.nz

Photo credit: Freepik.com

NEW

# SDMA testing

**- with special promotional pricing!**

A reminder for you of our new immunoturbidometric assay for SDMA, an important advancement in assessing renal function in dogs and cats. Take advantage of special introductory pricing, available until the end of January!

Here's a summary of the key points and how they might impact clinical practice:

## Understanding SDMA and its benefits

**What is SDMA?** SDMA (symmetric dimethylarginine) is a biomarker that indicates declining glomerular filtration rate (GFR). It's more sensitive than serum creatinine in detecting early renal dysfunction.

**Advantages over creatinine:** SDMA levels can rise before creatinine levels do, making it a useful early marker for kidney disease. Since SDMA is not affected by muscle mass, it can be more accurate in detecting renal issues in patients with varying muscle conditions.

**Correlation with GFR:** There is a good correlation between SDMA, creatinine, and GFR. However, SDMA tends to increase before urine concentrating ability is lost, which might not be reflected by creatinine levels alone.

## Interpretation of SDMA results

**Reference intervals:**

- Feline: 8 – 18 µg/dL
- Canine: 7 – 16 µg/dL

*Note: The reference intervals for SDMA with Awanui's assay are slightly higher compared to other reference laboratory assays due to the different methodologies used.*

**Special considerations:**

- Younger animals and Greyhounds**:** These may have slightly increased reference intervals for SDMA.
- Hyperthyroid cats: SDMA can be more sensitive than creatinine in detecting early changes in renal function. However, when USG is consistently < 1.035, both SDMA and creatinine concentrations independently can predict renal azotaemia. High SDMA levels in hyperthyroid cats before treatment might also predict post-treatment renal azotaemia.
- SDMA results should be evaluated alongside creatinine levels and a complete urinalysis for a comprehensive assessment of renal function (if not already requested, a creatinine test will be conducted on the same sample for interpretation purposes).
    - High SDMA with normal creatinine: This can indicate early renal disease. It's important to monitor trends over time and assess changes in urinalysis.
    - Mismatch between SDMA and creatinine: A significant discrepancy (e.g., SDMA is 2-3 times the upper limit of the RI while creatinine is within RI) warrants further investigation. This could suggest other underlying conditions, such as neoplasia.

## Recommended clinical approach

- Single test results should not be used in isolation. Serial measurements and trends over time are crucial for diagnosing and managing renal disease.
- Always combine SDMA results with creatinine, urinalysis, and clinical findings for a holistic view of the patient's renal health.
- In cases where SDMA levels are markedly elevated while creatinine levels remain normal, additional diagnostics may be needed to rule out or identify other conditions affecting renal function.

*By understanding and using SDMA alongside other diagnostic tools, you can enhance early detection of renal issues and provide more effective care for your patients.*

## Sample requirements

Serum or heparinised plasma, with results available within two working days.

## Pricing

Only $28.58 (ex. GST) each for samples received before close of business on 31 January 2025. After this time regular pricing of $31.75 (ex. GST) will apply.

For the full information sheet, including references, please visit our website **here**.

# Festive season

## - opening hours

Thank you for choosing Awanui Veterinary as your preferred supplier of diagnostic laboratory services this past year. Your business and support mean a lot to us, and we look forward to working with you again in 2025.

Please find our opening hours over the Christmas and New Year period below. All laboratories will resume normal working hours from Friday 3 January.

**Attention Dunedin clients: The laboratory will be **closed Saturday December 14** because of scheduled intermittent power outages. Due to a campus-wide electrical shutdown over the Christmas period, our Dunedin laboratory will be **closed on Friday and Saturday, 27-28 December**, as well as the statutory holidays.**

### Christmas week:

- 23 - 24 December: **Open**
- 25 - 26 December: **Closed**
- 27 - 28 December: **Open***

### New Year week:

- 30 - 31 December: **Open**
- 1 - 2 January: **Closed**
- 3 - 4 January: **Open**

Please note that if you're placing consumable orders online before Christmas, delivery times may be longer than usual due to the higher volume of shipments nationwide. Orders made during the Christmas and New Year period may also experience delays in processing because of public holidays and reduced staffing levels.

All of our staff wish you and your families a happy, safe, and relaxing time over the Christmas and New Year holiday season.

Meri Kirihimete,
**The Awanui Vets team**

# The not-so woody tongue

**Wilson Karalus**

### Clinical history

A three-year-old dairy cow presented for severe ulceration of the dental pad and hard palate, towards the back of her mouth near the base of the tongue (Figure 1). Hypersalivation was noted and she had evidence of ulceration of both nostrils, with clear nasal discharge and enlargement of the mandibular lymph nodes. There were no other lesions present, however she was lethargic with a decrease in milk production. No evidence of pyrexia was noted. She was vaccinated for bovine viral diarrhoea (BVD) when young.

MPI were contacted to investigate the case due to the possibility of exotic disease. The duty incursion investigator was able to exclude vesicular disease based on epidemiological and clinical findings, and an endemic cause for these unusual lesions was sought.

### Laboratory testing

Serum was collected and testing for BVD and malignant catarrhal fever (MCF) were both negative. A biopsy of

*Figure 1. Ulceration of the hard palate towards the back of the oral cavity.*

the area was then collected and submitted to Awanui for processing and analysis. MPI paid for all laboratory testing as part of the usual exotic disease investigation process.

## Histology findings

Within the submucosa of the oral cavity were large colonies of Gram-negative bacteria surrounded by bright eosinophilic hyalinized material forming radiating, club like projections (Splendore-Hoeppli material) (Figure 2). These were surrounded by large numbers of neutrophils, which were further surrounded by dense aggregates of macrophages, with fewer lymphocytes, and plasma cells. The overlying oral mucosa was intact, with no evidence of pustule, or vesicle formation.

## Diagnosis

The presence of Gram-negative bacteria surrounded by Splendore-Hoeppli is almost pathognomonic for *Actinobacillus lignieresii* the agent responsible for Woody tongue in cattle.

## Discussion

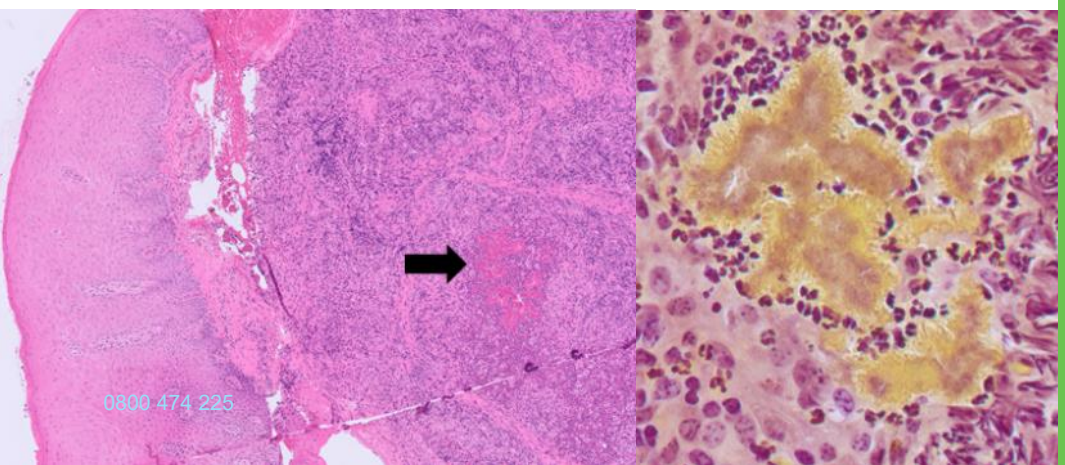
The combination of oral ulceration, with classical microscopic appearance is compatible with an uncommon presentation of oral actinobacillosis (woody tongue) due to infection with Actinobacillus lignieresii. This bacterium is part of the normal oral and rumen flora of cattle and trauma to the tongue, or oral mucosa through ingestion of rough plants/forage, or through teeth abrasions is thought to be the primary route of infection. Most clinicians will be familiar with 'woody tongue' in its typical form, where it leads to a very firm, hard, tongue, with clinical signs of drooling, loss of production, and lethargy (Uzal., et al 2016). However, a more uncommon presentation can occur, where oral ulcers are seen as the main lesion. Other reported sites include the involvement of the parotid, retropharyngeal, mandibular, and occasionally more distant lymph nodes (Caffarena., et al 2018). Infection may also extend into the overlying skin which becomes ulcerated and forms draining lesions. Other even less common sites include the oesophagus, lung, and peritoneum, as well as the walls of the forestomachs (Kasuya., et al 2017).

Actinobacillosis can be treated with broad spectrum antibiotics, with streptomycin the preferred antibiotic. Due to the issue of withholding periods when using antibiotics, another commonly used treatment includes sodium and potassium iodide. These treatments are also less costly than antibiotics, another reason for their employment. Sodium iodide can be given intravenously, and often only requires one dose, at 1g/12kg live weight as a 10% aqueous solution to produce resolution of clinical signs. Follow up doses can be given at 7 and 14 days if required (Parkinson., et al 2010). However, if repeated doses are used then the cow must be monitored for

signs of iodine toxicity. Potassium iodide can be given orally at 6-10 g/day for 7-10 days, while again monitoring for signs of toxicity. Clinical evidence of iodine toxicity includes the appearance of dandruff, along with anorexia and coughing. The prognosis is generally good following treatment and signs of improvement are usually seen within 48 hours of treatment (Parkinson., et al 2010).

Differentials for typical actinobacillosis include Actinomyces bovis the causative agent of 'lumpy jaw', or other less common bacterial infections including Nocardia spp. and Staphylococcus aureus (Botryomycosis). However, the differential list for this case was slightly different due to the presentation. In New Zealand, the main differentials for oral ulceration include BVD, MCF, and infectious bovine rhinotracheitis (IBR). Other important differentials to always keep in the back of our minds include exotic diseases such as foot and mouth disease, and vesicular stomatitis. This case highlights the importance of keeping these exotic diseases on our minds, and contacting MPI whenever we have a possible exotic disease presented to us.

*Figure 2. Within the submucosa of the oral cavity are nodules of pyogranulomatous inflammation surrounding, brightly eosinophilic Splendore-Hoeppli material (arrow), H&E 20x (left). Within the material, there are Gram-negative colonies of bacteria, Gram-stain 40x (right).*



*Acknowledgements to Dr. Murray, Franklin Vets, and Dr. Taylor, MPI for this case.*

## References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# Only skin deep

**Arefeh Ravanbakhsh**

## Case history

A three-month-old intact female Staffordshire Bull Terrier was presented to the veterinarian for evaluation of multifocal areas of alopecia. Pruritus was not reported. Multiple skin scrapes of the affected areas were collected for cytological evaluation, and hair plucks collected for ringworm culture and potassium hydroxide (KOH) preparation.

## Cytological findings

The skin scrapes were moderately cellular and of good diagnostic quality. The smears contained an abundance of superficial keratin and fragments of hair shafts on a mild to moderately hemodilute background (Figure 1A). Non-degenerate neutrophils were mildly increased compared to the degree of blood contamination (Figure 1B). Scattered in the background and occasionally associated with broken hair shafts were frequent small (2 –4 micrometre) basophilic rounded-to-oval structures with surrounding thin, clear halos (Figure 2). Bacteria were not identified. The cytology interpretation was mild neutrophilic inflammation with presence of fungal arthrospores, most consistent with dermatophytosis.

Microscopy of the KOH preparation was positive for fungal spores and hyphae. Culture results came back as positive for *Microsporum canis*.

## Discussion

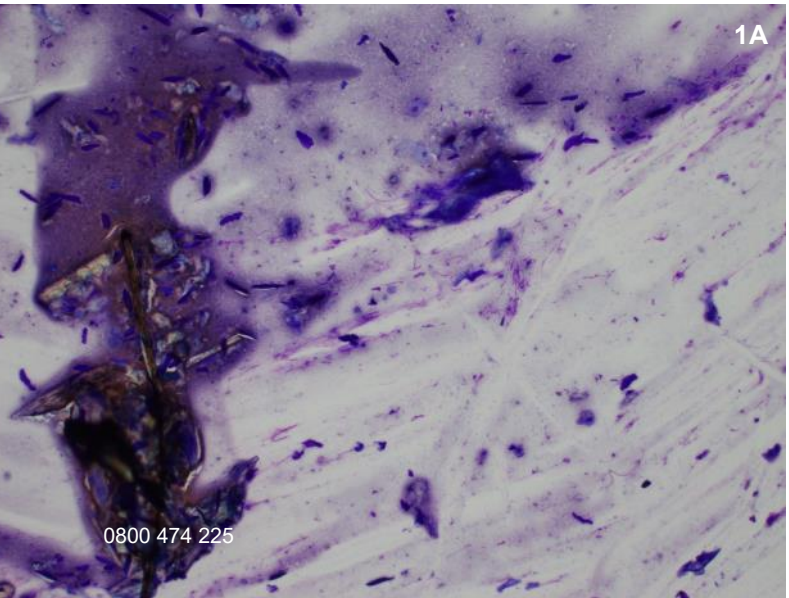
*Microsporum* and *Trichophyton* species are the most common dermatophytes associated with ringworm infections in animals (Valenciano and Cowell, 2019). In cats, most cases are due to *Microsporum canis* infections. Transmission can occur via direct contact with an infected animal or contact with infected fomites. Dermatophytes have zoonotic potential. Anthroponosis is possible but uncommon (Caruso et al., 2002).

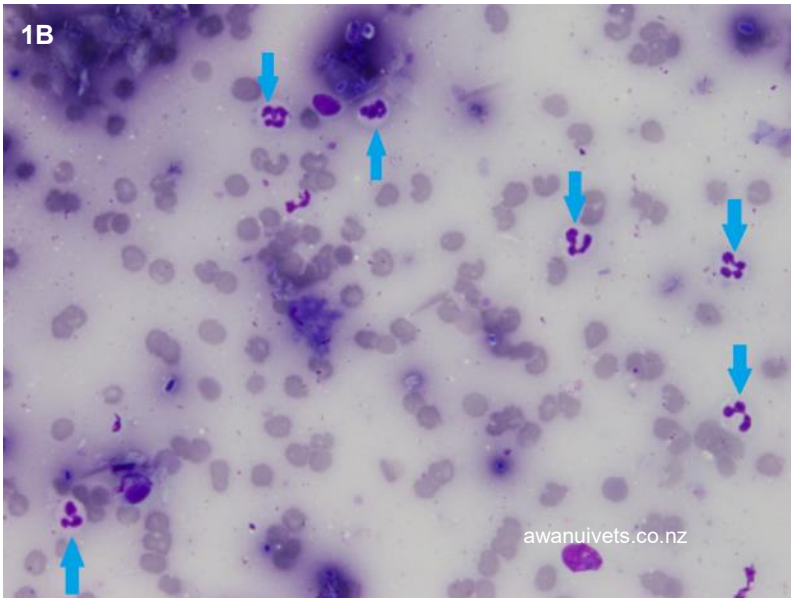
Animals most at risk of developing dermatophytosis include young animals (puppies and kittens), animals cohabitating in large groups, animals with underlying immunodeficiencies and animals under immunosuppressive therapy (Caruso et al., 2002). Other reported risk factors in cats include long-haired breeds and infestation with other ectoparasites (Caruso et al., 2002). A typical clinical presentation of dermatophytosis in dogs includes focal to multifocal areas of alopecia, crusting and papules (Logan et al., 2006). Less commonly, dermatophyte infection may present as focal or multifocal firm nodular lesions referred to as kerions. The lesions form when an infected hair follicle ruptures, releasing fungal organisms and keratin into the surrounding tissue and inciting a marked inflammatory response (Logan et al., 2006).

Cats with dermatophytosis can have more variable clinical presentations. Some are asymptomatic, while others may present with focal to multifocal areas of alopecia and crusting, often around the head, forelimbs and face. Lesions can also present as areas of broken hair shafts (Caruso et al., 2002). A less common presentation of dermatophytosis in the cat (grossly similar to a kerion) is a firm nodular lesion referred to as pseudomycetoma (Logan et al., 2006).

A cytological evaluation of an affected area can be an effective tool to provide support in diagnosing dermatophytosis with a relatively quick turnaround time. Skin scrapes can be collected by scraping in the direction of hair growth (Caruso et al., 2002). Collecting samples from the edge of active lesions is best for visualising fungal organisms (Valenciano and Cowell, 2020). The exfoliated material is then placed on a slide and allowed to air dry before staining. It is recommended

*Figure 1: A low-power image of a skin scrape smear from a puppy with multifocal areas of alopecia, showing abundant keratin debris and occasional remnants of hair shafts (A). The purple streaming material in the background is most consistent with nuclear streaming material from lysed leukocytes. A high-power image from the same lesion (B). Note the mild increase in neutrophils (blue arrows) (10x and 100x magnification A and B respectively; Diff Quick Stain)*



that the scrape be deep enough to allow for some degree of haemorrhage, as blood and serum will aid in fixing the exfoliated material on the slide (Caruso et al., 2002). An additional advantage of performing skin scrape cytology is that it may allow for the identification of other co-infections (for example Demodex and concurrent bacterial infections). However, cytology cannot conclusively determine the species of fungal spores.

Aside from cytological evaluations of skin scrapes, there are multiple diagnostic tools that can be used to aid with the diagnosis of dermatophytosis. Wood's lamp may be useful in some cases, although not all strains of dermatophyte fluoresce under a Wood's lamp. Furthermore, some bacteria and chemicals can give false-positive results. A KOH preparation of infected hair follicles is another diagnostic tool with a relatively fast turnaround time, and it uses a KOH solution to clear the keratin from hair shafts to allow for better visualisation of fungal spores and hyphae (Logan et al., 2006).

The gold standard for a diagnosis of dermatophytosis is fungal culture; however, this test has a much longer turnaround time than the others (one to three weeks).

There are few options for collecting samples for fungal culture. It can be performed on hair plucked from affected areas, or a toothbrush can be used to comb hair gently onto paper. The toothbrush and the brushings can both be submitted for fungal culture. Although hair specimens are the more commonly collected samples for mycology culture, fresh biopsy samples can also be used. A histological evaluation of an affected lesion, with or without the use of a special stain, may be useful as well, particularly in nodular lesions. Histopathology can also aid in ruling out other neoplastic and inflammatory conditions that may mimic dermatophytosis clinically.

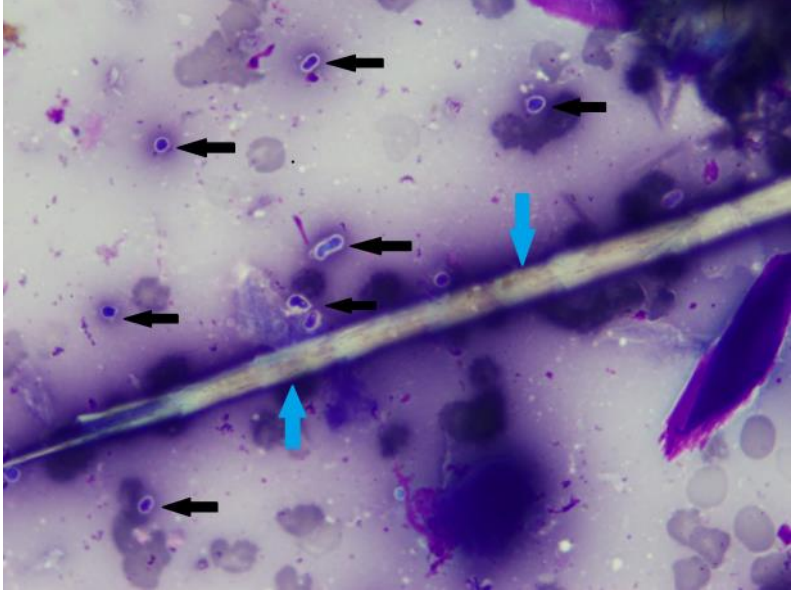


*Figure 2. A high-power image of a skin scrape smear from a puppy with multifocal areas of alopecia. Black arrows point to multiple arthrospores. Blue arrows outline a remnant of a hair shaft. (100x magnification; Diff Quick Stain)*

In conclusion, skin scrape cytology can be a good tool in the diagnosis of ringworm in animals. Its quick turnaround time is an advantage when it is used to provide support for suspected dermatophytosis cases, and this in turn allows for a quicker initiation of therapy and reduces the chance of contagion. Ideally, it should be used in conjunction with fungal culture in suspected dermatophytosis cases.

### References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# Changes to serum amyloid A testing


**Sandy Weltan**


Serum amyloid A is a major acute phase protein in many species. We have recently upgraded to a veterinary specific test (Vet-SAA) which is adapted to react to SAA in multi-species, including horses, dogs, cats, ruminants and rabbits. The reporting units have also changed from ug/mL to mg/L to comply with WHO International Standard NBSc code: 92/680.

SAA is useful for detecting and monitoring inflammation, due to its rapid response and marked increase (10x or more) above the normal reference interval. Because of the non-specificity of an acute phase protein (APP) response, a clinical decision limit is more useful. The interpretation of results for the new test is different from those reported previously and will be provided for each test result.

**Horses:** The clinical decision limit suggested for VET-SAA in horses is >30 mg/L. The peak is usually at 36-48 hrs. The average concentration with non-inflammatory disease is 45.1 mg/L. Horses with inflammatory disease generally have a marked increase in amyloid A levels (>250 mg/L).

**Cats:** The clinical decision limit suggested for VET-SAA in cats is >20 mg/L. Interestingly, a small percentage of hyperthyroid cats have VET-SAA concentrations close to

this cut-off. The most likely explanation is that those cats have concurrent inflammatory disease. SAA was shown in a previous study to have low sensitivity for some diseases, notably immune mediated anaemia but that was using the previous LZ-SAA and sample numbers were low.

**Dogs:** CRP has been the APP of choice in dogs for a long time. SAA is also a major acute phase protein in dogs and the VET-SAA has been shown to give comparative results SAA peaks later than CRP (3 and 1 day, respectively) and decreases later (7 and 3 days, respectively). The clinical decision limit suggested for VET-SAA in dogs is 63.8 mg/L.


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