The SNAP *Giardia* Test provides sensitive and specific detection of *Giardia* antigen in dogs

Study shows the VetScan, Witness, and Anigen *Giardia* tests demonstrate poor sensitivity and specificity for *Giardia* antigen

Introduction

Giardia is a single-celled protozoan parasite that causes intestinal infections in both dogs and cats. Dogs become infected when they ingest *Giardia* cysts that may be present in water or other areas of the environment that have been contaminated with feces.[1]

Symptoms are more visible in puppies and younger dogs than in older dogs and can be acute, transient, intermittent, or chronic in nature. In some cases, dogs will exhibit diarrhea that is soft, frothy, greasy, and with a strong odor or excessive mucus.[2]

Rapid diagnosis of giardiasis in dogs with diarrhea is very important and several in-clinic tests are available to detect *Giardia*-specific antigens in the feces. However, a direct comparison of the sensitivity and specificity for antigen detection between these different tests has not yet been performed.

IDEXX Laboratories conducted a study to determine the performance of four in-clinic diagnostic tests for detection of *Giardia* antigen in canine feces: the SNAP® *Giardia* Test, the VetScan® Giardia Rapid Test (Abaxis), the Witness® Giardia Test (Zoetis), and the Anigen® Rapid CPV/CCV/Giardia Test (BioNote).

Study design

Study samples were sourced from fecal samples submitted to IDEXX Reference Laboratories for ova and parasites testing using centrifugal flotation that included identification of *Giardia* cysts. They were further tested for *Giardia*-specific antigen using the Thermo Scientific™ ProSpecT™ *Giardia* Microplate Assay.

Because discordant results between testing for cysts and antigen are possible, positive samples were defined as those testing positive by both reference methods while negative samples were defined as those testing negative on both reference methods. A total of 95 positive samples and 81 negative samples were identified.

These samples were then tested using the four in-clinic tests following manufacturers' protocols. For calculation of sensitivity and specificity, test results were compared to the results obtained by the reference methods.

Results

In-clinic test	Sensitivity	Specificity
SNAP *Giardia* Test	89.2%	100%
VetScan Canine Giardia Rapid Test	71.0%	83.1%
Witness Giardia Test	63.7%	86.8%
Anigen Rapid CPV/CCV/Giardia Test	78.5%	70.1%

Table 1. Comparative performance of in-clinic *Giardia* antigen test kits

The performance of all four in-clinic tests is shown in Table 1. The SNAP *Giardia* Test had higher sensitivity and specificity than any of the other three tests.

In addition, the VetScan Canine Giardia Rapid Test produced invalid results on 6 samples for failing to develop positive control line (representative images shown in Figure 1). One of them also failed on the Witness Giardia Test. These 6 samples were excluded from calculation of sensitivity and specificity, even though all had valid results by the SNAP *Giardia* Test and the Anigen test.

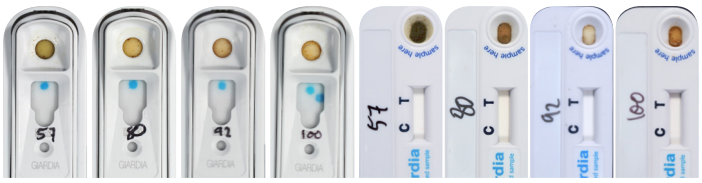

Figure 1. Four representative samples with valid SNAP *Giardia* Test results and invalid VetScan Canine Giardia Rapid Test results.

Summary and conclusions

- The Witness test missed nearly 4 in 10 samples that were positive for the presence of both *Giardia* cysts and *Giardia*-specific antigens; the Vetscan test missed nearly 3 in 10; the Anigen test missed 2 in 10.
- The Witness, Vetscan, and Anigen tests also incorrectly identified 13–30% of *Giardia* cyst-free and *Giardia* antigen-free dogs as positive.
- The Abaxis VetScan Canine Giardia Rapid Test was found to be prone to having invalid test results.
- Poor-performing *Giardia* tests could lead to misdiagnosis and delay the initiation of appropriate therapy in a dog with diarrhea caused by giardiasis.
- IDEXX ELISA-based tests have proven accuracy in the field for nearly 20 years and continue to demonstrate superior accuracy in the veterinary practice.

References

1. Payne PA, Artzer M. The biology and control of *Giardia* spp. and *Tritrichomonas foetus*. *Vet Clin North Am Small Anim Pract.* 2009; 39(6):993–1007.
2. Ballweber LR, Xiao L, Bowman DD, Kahn G, Cama VA. Giardiasis in dogs and cats: update on epidemiology and public health significance. *Trends Parasitol*. 2010;26(4):180–189.