

# Advances in Patient-Side Companion Animal Parasite Screening

January, 2017

Beth Thompson, VMD

## Abstract

On-site parasite screening devices are used in human and veterinary medicine for diagnosis and treatment of helminth and protozoan infections. Little advancement has been made over the last fifty years in diagnostic techniques, until now. The need for improved speed, economics, and safety along with lessening environmental impact are factors in driving new methods and ideas for parasite testing for humans. Understanding advances in human parasitology and adapting them, when appropriate, for use in veterinary diagnostics speeds improvements in canine and feline healthcare. This paper presents data on a new screening test and outlines the associated benefits first realized by physicians, but now available to veterinarians.

## The Need for In-Hospital Parasite Screening

Intestinal parasitic infections are a consistent cause of morbidity in dogs and cats and. Roundworms and hookworms are public health concerns. Patient-side accurate diagnosis of parasitic disease and fast initiation of appropriate therapy is important for optimizing patient health, reducing zoonotic risks, and supporting the human-animal and client-veterinarian bond. Maintaining or improving microscopic parasite evaluation requires consistent practice of fecal assessments, and supports the concept of performing regular fecal evaluations in-house.

## Current In-Hospital Fecal Examination Practices

In-clinic fecal screening is most efficiently done by fecal floatation. Centrifugation remains the more time-consuming gold standard but requires adequate space, ventilation and is not practical for all clinics. The disadvantages of currently available stand-alone fecal floatation devices include:

- ***Time management due to sample instability:*** Fresh feces must be prepared and examined rapidly after prep regardless of other hospital and patient needs. Additionally, solutions bought in bulk may expire or become contaminated with age; adversely affect test results.
- ***Harsh and/or toxic chemicals:*** Common fecal analyzers contain zinc sulfate or sodium nitrate, both environmental contaminants. Zinc sulfate is used as an herbicide for moss and has mild to moderate toxicity for humans. It is highly toxic to freshwater fish and invertebrates.<sup>1</sup> Sodium nitrates are commonly found in human food but are toxic to aquatic animals and should not be released into the environment.<sup>2</sup> Formalin, a combination of formaldehyde and methyl alcohol is a third chemical fixative with high toxicity to humans and animals that needs to be disposed of in accordance with applicable local, state, and Federal law<sup>3</sup>.

- **Distortion of parasites:** Both zinc sulfate and sodium nitrate can form crystals which distort eggs<sup>4</sup>.
- **Inconsistent Testing Protocols:** Multiple-step devices increase potential errors ranging from inappropriate sample size, inadequate storage, degradation or contamination of additional solution, insufficient equipment maintenance, delayed parasite examination and more.
- **Staff health risk:** Fecal contamination of the workplace due to spills and mishandling of devices as well as exposure to harsh chemicals pose safety risks.

### The Latest Alternative to Traditional Companion Animal Parasite Screening

A human parasitologist who recognized the worldwide need for a fast, economical, cleaner, and more environmentally friendly alternative to traditional fecal tests, developed Paratest® and ECO Grenfix®. One of 15 Innovative new medical devices chosen by the World Health Organization for the Second Global Forum for Innovative Devices in 2010, Paratest® now offers veterinary hospitals:

#### **Proven Stability and Testing Flexibility**

In one study, Paratest® bottles from the same production batch were subjected to three different temperatures equivalent to room, refrigeration and greenhouse before use in fecal analysis. The same study looked at seven bottles produced over the past 2 years. Using one fecal sample, Paratest® yielded the same result for all seven bottles, showing that when stored at room temperature, Paratest® is stable before the addition of biological samples for up to two years. For prepared biologic samples, findings were consistent in samples examined immediately and up to 2 weeks post-preparation (see Table 1).<sup>5</sup>

**Table 1: Bottle Production Age and Relation to presence of preserved, intact parasitic ova.**

Bottle/Production	Immediate Exam	Exam at 1 week	Exam at 2 weeks
Bottle V/ One week	Intact/Preserved	Intact/Preserved	Intact/Preserved
Bottle P/ One month	Intact/Preserved	Intact/Preserved	Intact/Preserved
Bottle Q/Three months	Intact/Preserved	Intact/Preserved	Intact/Preserved
Bottle R/ Six months	Intact/Preserved	Intact/Preserved	Intact/Preserved
Bottle S/One Year	Intact/Preserved	Intact/Preserved	Intact/Preserved
Bottle T/ One and one half years	Intact/Preserved	Intact/Preserved	Intact/Preserved
Bottle U/ Two Years	Intact/Preserved	Intact/Preserved	Intact/Preserved

***The Best Safety Profile for People and the Environment***

The patented Greenfix® solution contained within Paratest® is completely biodegradable and contains no harsh or toxic chemicals. The specific gravity is close to water, allowing for proper separation and filtration of ova and parasites. Greenfix® avoids crystal formation and egg distortion seen with traditional solutions. Samples can confidently be examined per hospital or patient needs instead of test requirements. There are no fecal contaminated coverslips to handle as in the passive floatation method. The technician squeezes a drop of the solution on a slide and touches only a clean coverslip.

***Proven Accuracy***

In comparative studies, Paratest® demonstrated its biodegradable solution and unique 266µm pore filter membrane produced similar or better diagnostic efficiency compared with (sodium nitrate) tests in detection of protozoa and helminth parasites,<sup>6,7</sup> (See Table 2)

**Table 2: Mt. Airy Animal Hospital Study Comparing Paratest® to Fecal Floatation in 36 Patients**

	% Overall Accuracy	% Accuracy Canine	% Accuracy Feline
Paratest®	100.00%	100.00%	100.00%
Flotation Method (Sodium Nitrate)	89.99%	92.00%	81.82%

***Consistent Convenience and Ease of Use***

Paratest® is a contained system with clear identification of lot number and production date. That means reduced concerns about using outdated material. It can be stored at room temperature for up to 2 years. Processed fecal samples can be reviewed or reviewed again with the same sample integrity for up to 15 days. Paratest® requires just 2 grams of feces and reduces environmental contamination both in hospital and in the environment– without centrifugation. It requires little space and is(almost) odor-free.

**Conclusion:**

Parasite screening for companion animals continues to be a mainstay for preventive health. Challenges for human parasitologists and physicians, who often work in rural or underprivileged areas of the world, have supported advances in accurate, more efficient and environmentally healthier parasite screening tests. Such needs reflect those of veterinary practices, as well. Paratest® is the result of one researcher answering that need for speed, efficiency, cost consciousness, and environmentally sensitive methods of parasite detection. Research indicates that these benefits can be utilized by veterinarians as well as physicians -- here, and around the world.

## Footnotes/Reference

- 1 <http://npic.orst.edu/factsheets/zns04gen.html>
  - 2 <http://www.inchem.org/documents/icsc/icsc/eics1120.htm>
  - 3 [https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=10076](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10076)
  - 4 Samples, O., Sample Collection and Testing from Head to Tail, Wild West Veterinary Conference, Reno, NV 2012.
  - 5 DaSilva, G.P; Comparative Analysis of the Effectiveness of Different Liquid Preservative in Intestinal Parasites of Diagnosis Coproparasitological, 2012, Course Biomedicina DK Diagnostics
  - 6 Fontenele, A.L, da Placido, P, et. Al, Coproparasitological Diagnosis: Comparative Study Between Paratest® and Faust & Cols. Methods, 2008.
  - 7 Mt. Airy Animal Hospital Blind Study Comparing Paratest® to Fecal Floatation in 38 cases  
unpublished data 2014.
-