

## NEW: Updated IDEXX Canine and Feline Diarrhoea RealPCR™ Profiles from IDEXX Reference Laboratories

IDEXX Canine and Feline Diarrhoea RealPCR™ Profiles include the quantitative measurement of *Clostridium perfringens* Alpha-toxin gene (*cpa*) and *Clostridium perfringens* enterotoxin gene (*cpe*)

### Background

*Clostridium perfringens* is a gram-positive, spore-forming, anaerobic bacterium that has been associated with outbreaks of diarrhea in many species, including dogs and cats. There are 5 major toxigenic types (A, B, C, D and E) of *C. perfringens* based on production of major toxins. Alpha-toxin ( $\alpha$ -toxin, CPA), the main lethal toxin of *C. perfringens*, is a phospholipase that causes hydrolysis of cell membranes and cell lysis resulting in destruction of enterocytes and diarrhea. Each major type of *C. perfringens* may also express a subset of other toxins, including *C. perfringens* enterotoxin (CPE), which interacts with epithelial cell tight junction proteins and results in intestinal leakage contributing to diarrhea.

### Study

*Clostridium perfringens* Alpha-toxin (CPA) gene has been a component of both the IDEXX Canine and Feline Diarrhoea RealPCR™ Profiles since they have been available. This PCR test detects the gene that encodes production of CPA. The positive rate of this gene has been approximately 35 % in both dogs and cats; this has led to questions of what does a positive result mean. We compared the PCR prevalence of CPA gene in healthy dogs and cats to dogs and cats with diarrhea. At the same time, the PCR prevalence of the messenger RNA (mRNA) for CPA was also compared. During the same study, we also compared the PCR prevalence of the CPE gene and the mRNA of CPE in healthy dogs and cats to those with diarrhea.

### Results

A reassuring finding of the above study was that when the CPA or CPE gene was detected, mRNA for each of the toxins was also detected, which indicated that active transcription of the genes was occurring and toxin produced. The PCR prevalence of the CPA and CPE genes were significantly higher in dogs and cats with diarrhea compared to healthy animals. However, the PCR prevalence of CPA gene in healthy dogs and cats was still over 50 %, and for the CPE gene, the prevalence was approximately 10 % in healthy animals.

### Establishing quantitative cutoffs

Based on the high PCR prevalence of the CPA and CPE genes in healthy animals, a quantitative cutoff was established to increase the clinical utility of a positive result. When the number of copies of the CPA or CPE genes is above the established cutoff (300.000), then the toxin is more likely to be associated with clinical disease. In our study, the number of healthy animals that had CPA and CPE gene copies above the cutoff was very low (CPA gene: dogs 4 %, cats 13 %; CPE gene: dogs 2 %, cats 0 %). In animals where the number of copies of the CPA gene or CPE gene is below the cutoff, this toxin is unlikely contributing to diarrhea.

The quantitative CPA gene and quantitative CPE gene RealPCR™ tests are included in our IDEXX Canine and Feline Diarrhoea RealPCR™ Profiles.

#### Canine Diarrhoea Profile

*Giardia* spp., *Cryptosporidium* spp., *Salmonella* spp., *Clostridium perfringens* enterotoxin gene (quantitative), *Clostridium perfringens* Alpha-toxin gene (quantitative), Canine enteric Coronavirus, Canine Parvovirus 2 and Canine Distemper virus

#### Feline Diarrhoea Profile

*Tritrichomonas foetus*, *Giardia* spp., *Cryptosporidium* spp., *Toxoplasma gondii*, *Salmonella* spp., *Clostridium perfringens* enterotoxin gene (quantitative), *Clostridium perfringens* Alpha-toxin gene (quantitative), Feline Coronavirus (FeCoV) and Feline Panleukopenia Virus

Sample material: 5 g faeces · Turn-around-time: 1 – 3 days

## IDEXX Reference Laboratories

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