

New Zealand and Australian RealPCR™ results indicate co-infections with multiple pathogens are common in companion animals.

What is RealPCR™ and how can it help the veterinarian?

Real-time PCR is a molecular diagnostic technique used to monitor the PCR reaction progress in real time. With this technique, a relatively small quantity of DNA and/or RNA can be quantified. It amplifies a target section of the nucleic acid to a sufficient level to allow for the **detection of specific infectious agents.**

Real-time PCR increases sensitivity, produces **faster results** and allows testing for many different pathogens in a single sample. Quantification of nucleic acid is an extra advantage of the real-time PCR, which provides clients with detailed information to support a diagnosis.

Many organisms are difficult to culture, or may need an extended incubation period. In contrast, **RealPCR™** has a **rapid turnaround time of 1-3 days***, providing meaningful results to contribute to a final diagnosis in a relatively short time period.

A positive **RealPCR™** result means the target DNA or RNA of an organism was found in the test sample. A negative result means nucleic acid of that organism was not found, (although this may be because the amount of genetic material was below the level of detection). As with any lab test, results need to be interpreted closely with animal's clinical signs, treatment history, and in conjunction with other diagnostic tests such as serology and microbiology. Detection of an organism alone is not necessarily proof it is the primary cause of clinical signs. Typically, PCR is recommended for **sick animals**, to rule in or rule out infectious agents.

Why do panels have advantages over single tests?

Several infectious agents can interact with each other and the immune system in ways that can exacerbate the severity

of disease caused by other organisms or complicate the response to treatment. More complete knowledge of the agents involved promotes a rapid overall diagnosis and implementation of the most appropriate treatment schedule.

RealPCR™ test panels allow for testing of a range of common infectious agents associated with syndromes such as diarrhoea and upper respiratory disease. **Results from the analysis of clinical submissions in New Zealand, and a report from Australian submissions, indicate co-infections with more than one pathogen are common.**

Co-infections in New Zealand cases are surprisingly common.

Co-infection is the simultaneous infection of a host by multiple pathogen species. Results from clinical submissions from New Zealand indicate **co-infections**, or infections with two, three or more pathogens at the same time, **are common**. The most recent New Zealand data shows 21.5% of canine diarrhoea panel submissions and 26.8% of feline diarrhoea panel submissions which tested positive on RealPCR™ were also found to be positive for more than one infectious agent (Figs 1 & 2). In other words, one in five dogs and one in four cats with a positive panel result recorded co-infection. More striking data is apparent in submissions of the feline upper respiratory disease panels (Figs 3) with 50% of positive feline panels demonstrating co-infections, i.e. **one in two cats showed evidence of co-infection.**

Comparable co-infection rates are recorded in New Zealand as well as Australia.

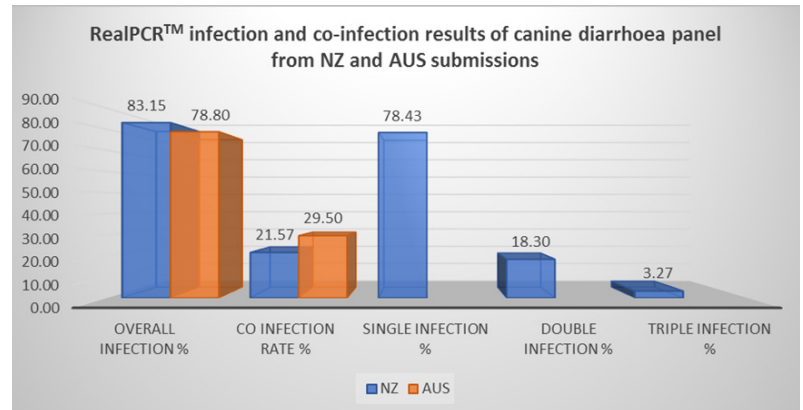
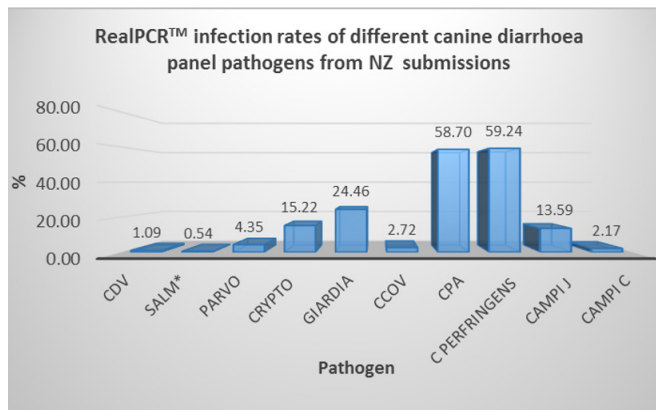
Comparison of the Australian IDEXX technical report with New Zealand data confirmed similar co-infection rates in all the reported panels (Figs 4).

*Consult the IDEXX directory of products and services for detailed turnaround time

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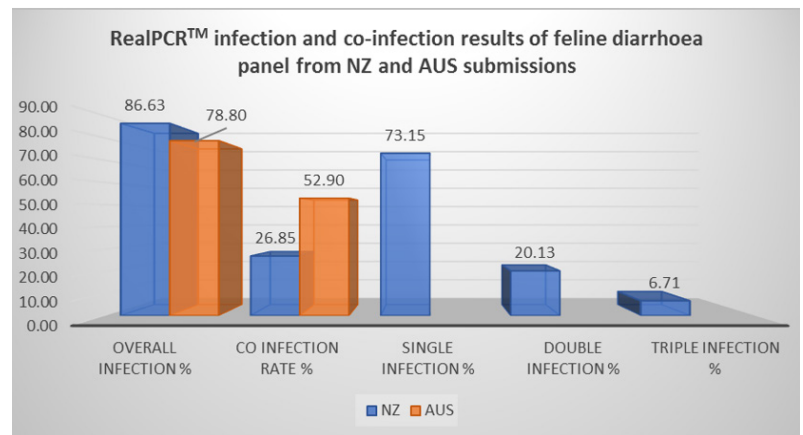
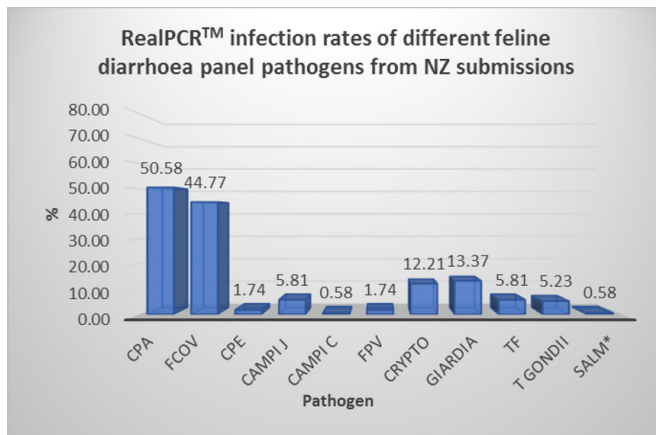
Technical Update

Fig. 1 RealPCR™ results from canine diarrhoea panel submissions from New Zealand¹.



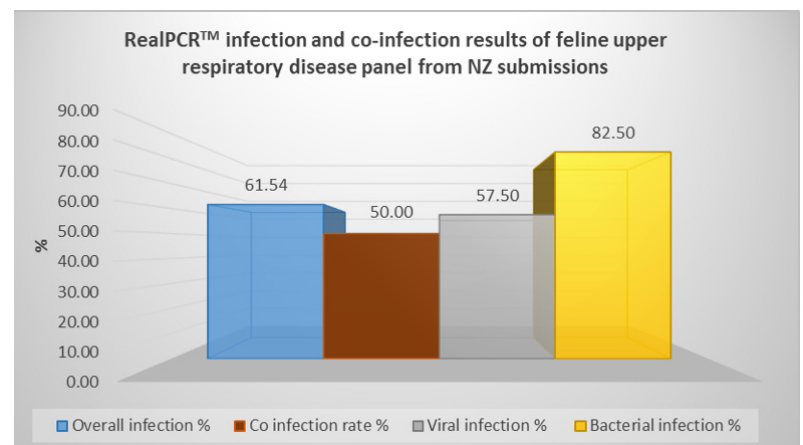
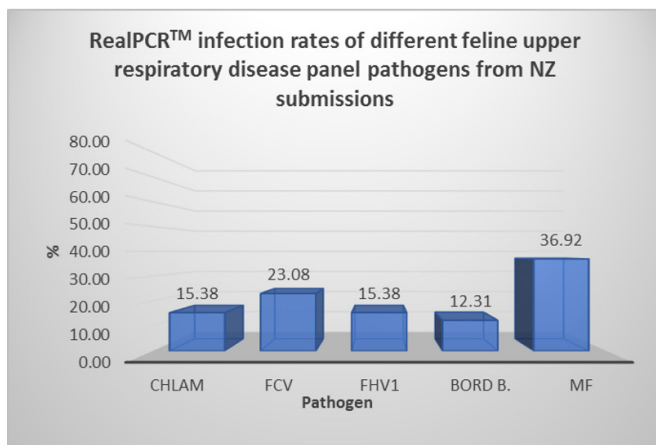
* Active infection confirmed by culture;¹ For test abbreviations see key page 3

Fig. 2 RealPCR™ results from Feline diarrhoea panel submissions from New Zealand².



* Active infection confirmed by culture; ² For test abbreviations see key page 3

Fig. 3 RealPCR™ results from Feline upper respiratory panel submissions from New Zealand³.



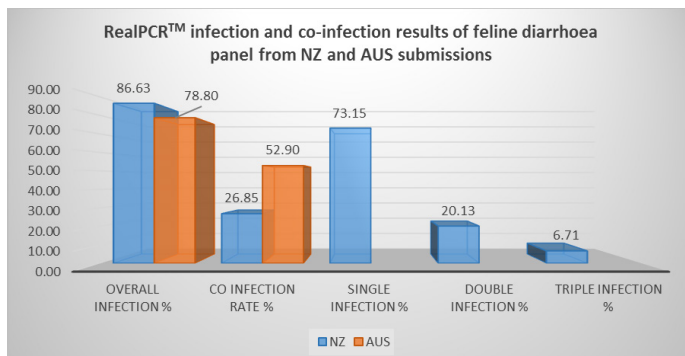
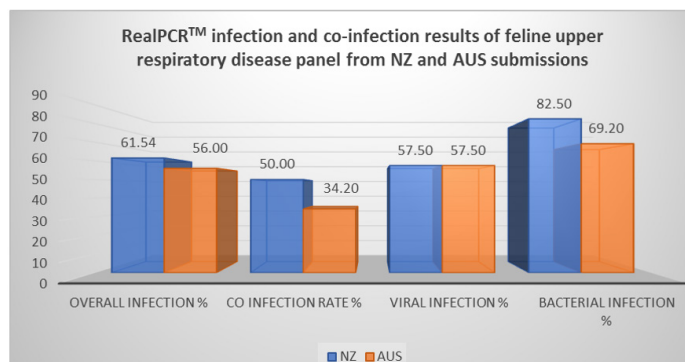
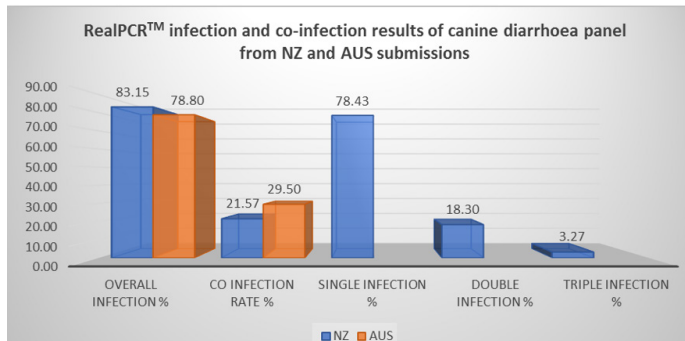
³For test abbreviations see key page 3

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Technical Update

Fig. 4 RealPCR™ co-infection results from diarrhoea and respiratory panel submissions from New Zealand compared to Australian report.



- Diarrhoea panels require between 1-5 grams of faeces in a sterile sealed container.
- For other sample types consult your directory of products and services.

Conclusion

Today, RealPCR is a modern diagnostic technique which can significantly enhance the ability of veterinarians to develop a diagnosis. Utilising the highly sensitive and specific identification of infectious agents and co-infections in sick animals presenting with common disease symptoms. PCR has special advantages in being able to identify infectious organisms which may otherwise be hard to culture, be able to confirm mixed infections, provide information on quantification of infectious agents, and has a rapid turn-around time. RealPCR™ diagnostic panels offer a powerful option for veterinarians to consider early in the diagnostic process.

^{1,2,3}Key:

CDV	Canine Distemper virus	CPA	C.Perfringens alpha toxin
Salm*	Salmonella SPP	Fcov	Feline coronavirus
Parvo	Canine Parvovirus2	CPE	C.Perfringens enterotoxin
Crypto	Cryptosporidium spp.	Campi J	Campylobacter jejuni
Giardia	Giardia SPP.	Campi C	Campylobacter coli
Ccov	Canine Enteric Coronavirus	FPV	Feline panleukopaenia virus
CPA	C.Perfringens alpha toxin	Crypto	Cryptosporidium spp.
C perfringens	C.Perfringens enterotoxin	Giardia	Giardia SPP.
Campi J	Campylobacter jejuni	TF	Tritrichomonas foetus
Campi C	Campylobacter coli	T gondii	Toxoplasma gondii
		Salm*	Salmonella SPP

Chlam	Chlamydia felis
FCV	Feline calicivirus
FHV1	Feline herpesvirus 1
Bord b.	Bordetella bronchiseptica
MF	Mycoplasma felis

What sample types are needed for RealPCR™ tests?

Sample collection is relatively simple. Always obtain the sample prior to therapy initiation. If samples are kept cool (not frozen) during storage and shipping they are stable for 10 days.

- For respiratory/conjunctival panels both a conjunctival and a deep pharyngeal swab is ideal. These can be placed in a dry, clean tube such as red top or sterile tightly sealed tube.