



DIGESTIVE HEALTH

in Dogs & Cats



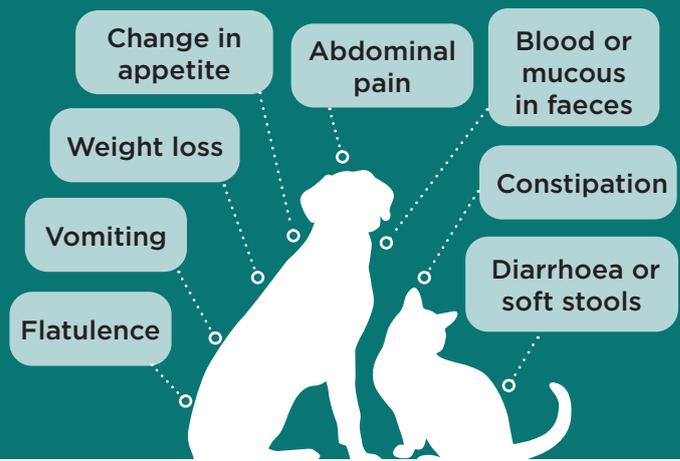
2023 edition for professional reference only

? DID YOU KNOW?

Antibiotics are dispensed in 1 in 3 veterinary consults across Australia,¹

with antibiotic-associated diarrhoea (AAD) frequently presenting as a complication of use.²

COMMON SIGNS OF DIGESTIVE DISORDERS⁴



THE GASTROINTESTINAL MICROBIOME

The canine and feline gastrointestinal (GI) systems are home to a community of microorganisms essential to their normal form and function. This diverse and complex collection of microorganisms, including bacteria and yeast, comprises the GI microbiome.⁷

The GI microbiome is involved in metabolism, gut epithelial health, energy balance, skin health and neuro-behavioural development.⁷ It primes and stimulates the immune system both inside and outside of the gut, aids in the defense against invading intestinal pathogens and provides nutritional benefits to the host.^{6,8} Therefore, a healthy, balanced and stable GI microbiome plays an active role in a range of vital physiological processes that are crucial for overall health.⁹

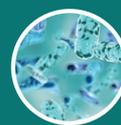
? DID YOU KNOW?

10x

The number of microorganisms and their genetic material in the GI microbiome is approximately 10 times more than the total number of cells in the host body.⁶



Similar to the human fingerprint, every dog and cat host their own unique and individual microbial profile. No two microbiomes are the same overall.⁶



Differences in composition, species richness and total numbers of bacteria occur along the length of the GIT.⁶

DIGESTIVE DISORDERS IN DOGS AND CATS

Digestive disorders are common in companion animals and cause stress to both pet and owner.³ There are a number of commonly diagnosed digestive disorders seen by veterinarians including acute gastroenteritis, colitis, pancreatitis, exocrine pancreatic insufficiency and inflammatory bowel disease (IBD).^{4,5}



AN IMBALANCE IN THE MICROBIOME

The balance between beneficial 'good' and pathogenic 'bad' bacteria in the GI microbiome of mature dogs and cats is remarkably stable. However, its composition can be influenced during the life of the animal in response to several factors such as diet, environment, medications and disease.¹⁰ An imbalance of the GI microbiome is referred to as intestinal dysbiosis.¹¹

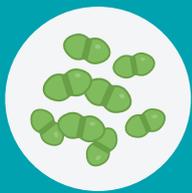
ANTIBIOTICS AND DYSBIOSIS

Antibiotic administration can induce gut dysbiosis, with broad-spectrum antibiotics causing rapid and significant drops in richness, diversity, and evenness of microorganism groups found within the GIT.¹³

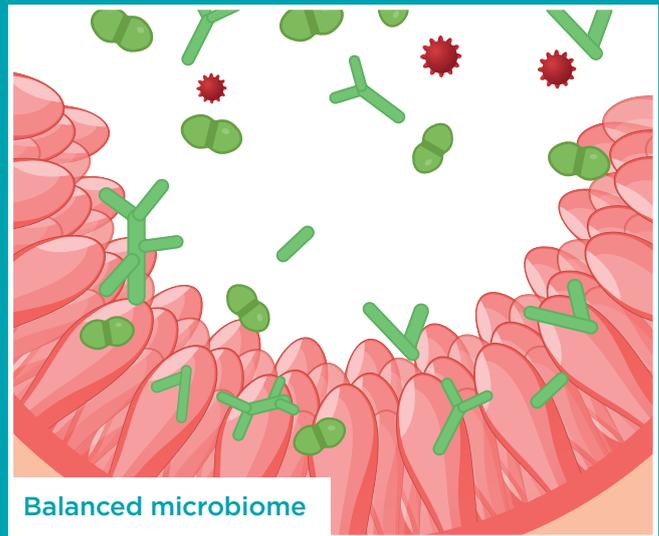
The intestinal dysbiosis can persist for several weeks to months following cessation of antibiotic treatment, and the return to the initial composition is rarely fully achieved.^{6,13}



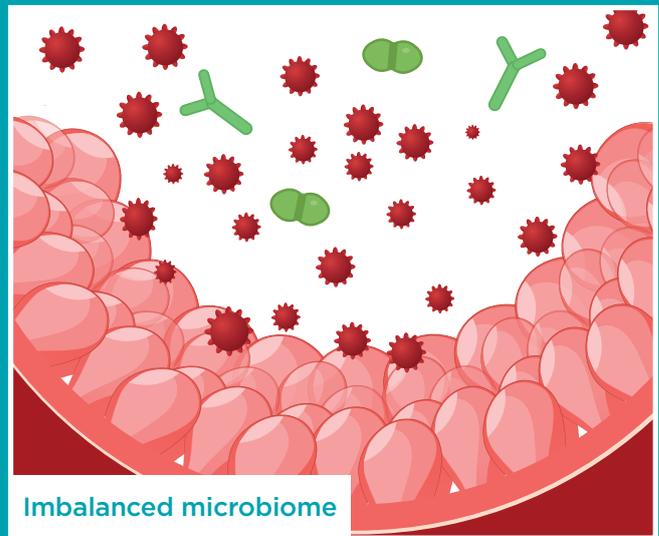
Beneficial bacteria



Pathogenic bacteria



Balanced microbiome



Imbalanced microbiome

PROBIOTICS

Probiotics are defined as 'live' microorganisms, that when administered in adequate amounts, confer a health benefit on the host.¹⁵

Although probiotics are typically unable to colonise the gut due to competition with the already established microbiota, they still have beneficial effects during their transit through the GIT.¹⁴ Probiotic bacteria produce metabolites, antimicrobial peptides, and proteins that modify the local microbiota and interact with host immunity, thus improving clinical signs of GI disorders.¹⁴

PREBIOTICS

Prebiotics are non-digestible food substances, like fibre, that support the growth and health of the host's resident beneficial bacteria. Probiotics supply an exogenous source of live bacteria to the host and when combined with prebiotics are called 'synbiotics'.

PROBIOTIC YEAST

Saccharomyces boulardii is a strain of yeast which has been extensively studied in both humans and animals for its probiotic effects.⁸ It is non-pathogenic and is antibiotic-resistant so therefore can be prescribed to patients receiving antibiotics.⁸

Within the lumen of the intestine, *S. boulardii* exerts many positive and protective effects through several different mechanisms.¹⁵

S. boulardii can restore normal short chain fatty acid balance and increase mucosal surface antibody levels, acting as an immune regulator.



RESTORING BALANCE IN THE MICROBIOME WITH PROBIOTICS

BACILLUS SUBTILIS IS AN EFFECTIVE ADJUVANT THERAPY TO THE TREATMENT OF CHRONIC DIARRHOEA IN DOGS.¹⁶

The influence of supplemental *Bacillus subtilis* C-3102 on chronic diarrhoea was studied in 40 privately-owned dogs subjected to a double-blinded, placebo-controlled trial. After a run-in period of one week, 20 dogs received either placebo or test tablets for four weeks. Each test tablet contained 1.3×10^8 CFU of *Bacillus subtilis* C-3102. Individual dogs were dosed with 6.5×10^7 CFU/100g of kibble given, based on bodyweight. Faecal and defecation characteristics were scored daily.

Bacillus subtilis C-3102 supplementation led to a more pronounced improvement in faecal consistency, a significant improvement in faecal odour and a reduction in the incidence of flatulence in dogs with chronic diarrhoea.

In conclusion, *Bacillus subtilis* is an effective adjuvant therapy to the treatment of chronic diarrhoea in dogs.

ENTEROCOCCUS FAECIUM SF68 EFFECTIVELY REDUCES DIARRHOEA DURATION IN HIGH- STRESS ENVIRONMENTS¹⁷

In a double blinded, placebo controlled study, two hundred and seventeen shelter cats were divided into 2 rooms. For 4 weeks, cats in one room received 1g (2.1×10^9 CFU) of *Enterococcus faecium* SF68 for up to a maximum of 6 days/ individual cat. Cats in the other room received a placebo product. Following a wash out period of 1 week, the treatments were reversed. A standardised faecal scoring system was assigned to the faeces from each animal daily.

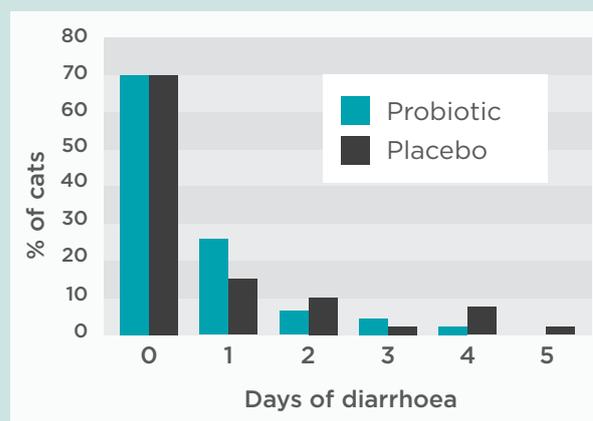


Figure 1. Distribution frequency of diarrhoea (faecal score ≥ 4) based on treatment group over the study period.

The percentage of cats with diarrhoea lasting for more than 2 days was significantly lower in the *E. faecium* SF68 room compared to the placebo room. It was proposed in this study that the decreased diarrhoea rate was likely due to inhibition of pathogenic bacteria colonisation brought about by the probiotic.

***Enterococcus faecium* SF68 may reduce the duration and frequency of diarrhoea, and support the gastrointestinal tract in environments where stress may exacerbate clinical illness.**



SACCHAROMYCES BOULARDII: AN EFFECTIVE PROBIOTIC IN THE PREVENTION AND TREATMENT OF ANTIBIOTIC-INDUCED DIARRHOEA (AAD) IN DOGS¹⁸

Twenty-four dogs of variable breed, sex and age were divided into three equal groups: groups I, II and III. Dogs in groups I and II received intramuscular (IM) injections of the antibiotic lincomycin (150mg/kg/day) until diarrhoea occurred. After the onset of diarrhoea, all dogs in group II, were given 1000mg/day of *S. boulardii* orally for 10 days. Dogs in group I (control group) did not receive *S. boulardii*. The duration of diarrhoea in group II dogs was significantly shorter than that of group I. Dogs in group III were given IM lincomycin at the same dose for 10 days together with 1000 mg/d of *S. boulardii* orally. None of the dogs in group III developed diarrhoea.

The mean values of total short-chain fatty acids (TSCFAs) in both groups I and II decreased significantly at the time of onset of diarrhoea. At both time points of diarrhoea cessation and one week after treatment, the TSCFAs were significantly higher in group II than they were in group I. A decrease in TSCFAs was demonstrated to be the cause of diarrhoea in dogs treated with lincomycin.

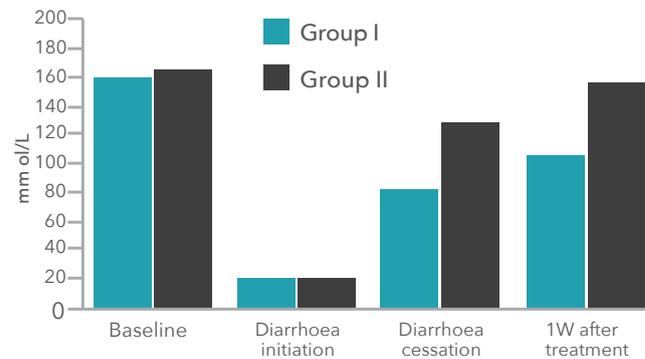


Figure 2. Mean values of TSCFAs in groups I and II. Group III did not develop diarrhoea and showed no significant change in TSCFAs 1 week post treatment vs baseline reading

S. boulardii proved to be an effective probiotic cure for AAD when given after the onset of diarrhoea, and also an effective prophylactic when given together with lincomycin from the commencement of antibiotic therapy.

HOW TO CHOOSE THE RIGHT PROBIOTIC	PAW DIGESTICARE	PAW DIGESTICARE SB	PAW DIGESTICARE FOR CATS
Re-balance gastrointestinal microbiome			
Antibiotic associated diarrhoea: prevention and treatment		✓	✓*
Acute uncomplicated GI disorder		✓	✓
During periods of stress			✓
Immunomodulation			
Modulation of chronic enteropathies (CE) in dogs ± concurrent medications		✓	
Modulation of CE in untreated cats			✓
During periods of illness such as due to feline herpesvirus			✓
Daily support for a healthy GI microbiome			
Adult cats and dogs	✓		
Establish the GI microbiome			
Puppies	✓		
Kittens	✓		

* Administer 2 hours prior to antibiotics

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