



Gastrointestinal

For Dogs and Cats

Supporting
digestive
function



About ADM Protexin Limited

ADM Protexin Limited is part of the ADM Nutrition division. Based in Somerset, UK, the company offers innovative, research based, natural healthcare and probiotic supplements for human, pet and production-animal use with distribution in over 80 countries. ADM Protexin Ltd are the developer and manufacturer of UK market-leading products such as Pro-Kolin⁺ and Synbiotic DC, and are leading experts in the field of veterinary probiotics.

Our Focus on Research

ADM Protexin Limited are proud to invest in an in-depth program of pre-clinical and clinical research and product development. We work with clinical research organisations, leading universities, first opinion practices and referral centres. This includes *in-vitro*, early stage development concept exploration and clinical trials.

One study, published in the Journal of Veterinary Internal medicine, showed that Synbiotic D-C was effective at reducing the incidence of digestive disturbance in shelter dogs by approximately 30% and reduced the number of dogs requiring veterinary intervention by 45%. This is the largest study ever conducted using probiotics in dogs!

What is the Microbiota?

The microbiota describes the collection of microorganisms that inhabit the gastrointestinal (GI) tract. The main function of the microbiota is to protect the host against pathogenic bacteria. A balanced intestinal ecosystem is important for maintaining GI health. The term 'dysbiosis' describes an imbalance of the microbiota, which results in a disturbance of GI homeostasis.

Causes of Dysbiosis

Any factor that affects the GI tract environment can cause a dysbiosis to develop. Common examples include:

- Antibiotics – indiscriminately kill both beneficial and pathogenic bacteria that colonise the GI tract.
- Gastrointestinal disease – changes in motility, substrate or pH can affect bacterial populations.
- Stress – for example, kennelling and travelling. Cortisol causes an increase in intestinal pH which favours the growth of pathogenic bacteria.
- Dietary change or indiscretion– sudden changes in the diet or scavenging.

Symptoms of Dysbiosis

A severely disrupted microbiota means that there can be an overgrowth of pathogenic bacteria – potentially triggering undesirable symptoms. An effective protocol can help minimise the impact of microbiota imbalances.



Pro-Kolin⁺

Supporting digestive function



Pro-Kolin⁺ is a leading probiotic supplement for supporting digestive function in dogs and cats. Pro-Kolin⁺ is a paste preparation that provides an optimum blend of ingredients to support the intestinal microbiota whilst also addressing the symptoms associated with digestive disturbances.

Probiotics

Probiotics have been defined as “live micro-organisms which when administered in adequate amounts confer a health benefit on the host” by the World Health Organisation (WHO)¹.

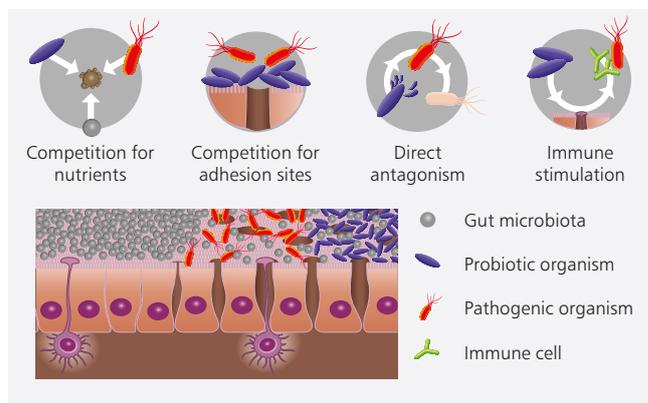
Pro-Kolin⁺ contains the bacterium *Enterococcus faecium*.

The functions of probiotics can include:

Competitive exclusion – probiotics compete with pathogenic bacteria for nutrients and adhesion sites on enterocytes.

Lactic acid production – probiotics such as *E. faecium* produce lactic acid, and the resulting decrease in luminal pH helps to inhibit the growth of pathogens such as *E.coli* and *Salmonella* spp., which prefer a more alkaline environment.

Immune effects – probiotics have been shown to activate and modulate both the specific and adaptive immune responses.



Proposed mechanisms of action of probiotics

Kaolin and Pectin

Kaolin is a naturally-derived clay that acts as a binding agent to improve stool consistency. Kaolin is the only clay mineral that doesn't undergo partial degradation in the acidic medium of the stomach². Pro-Kolin⁺ is formulated to provide an optimal level of kaolin.

Pectin is a soluble fibre that is rapidly fermented in the colon. As well as being an effective prebiotic, pectin is also known to have a soothing effect on the gut lining.



Pro-Kolin⁺



Available in 15ml, 30ml and 60ml syringes

Preplex® prebiotics

Prebiotics are non-digestible carbohydrates which beneficially affect the host by selectively stimulating the growth and/or activity of beneficial bacteria³.

Preplex prebiotic is unique to ADM Protexin Limited providing a combination of fructo-oligosaccharide (FOS) and acacia (gum arabic).

FOS is able to enter the colon intact because it is not digested by enzymes in the small intestine. In the colon, certain beneficial bacteria (*Bifidobacterium* spp. and *Lactobacillus* spp.) ferment FOS readily, which leads to an increase in their numbers. Since FOS has a low molecular weight it is utilised in the proximal colon.

Acacia has a highly branched and complex structure, and so it is fermented more slowly in the distal colon.

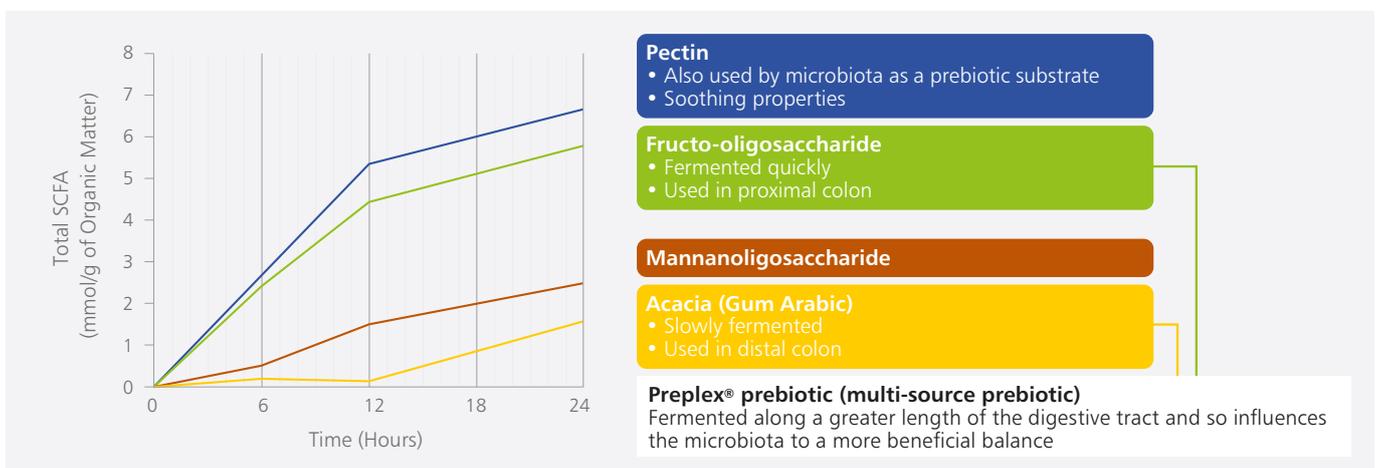
Directions for use

- Easy to use syringe
- Highly palatable
- Give by mouth for as long as considered necessary



Weight of pet (kg)	Volume	Frequency
Pro-Kolin 15ml & 30ml		
<5kg	2ml	Twice daily
5-15kg	3ml	Twice daily
15-30kg	5ml	Twice daily
>30kg	7ml	Twice daily
Pro-Kolin 60ml		
25-35kg	6ml	Twice daily
35-45kg	8ml	Twice daily
>45kg	10ml	Twice daily

Graph to show the Total Short-Chain Fatty Acid (SCFA) Production from Prebiotic Substrates by Canine Microbiota



Graph adapted from Sunvold *et al.* (1995)⁴ and Vickers *et al.* (2001)⁵

Synbiotic D-C

The natural response to gastrointestinal microbiota imbalance



Synbiotic D-C

Probiotics are beneficial bacteria that can help to re-establish the normal microbiota. They are particularly effective when delivered together with a prebiotic, a source of nutrition that stimulates their growth.

Synbiotic D-C is a high-strength probiotic and prebiotic combination containing:

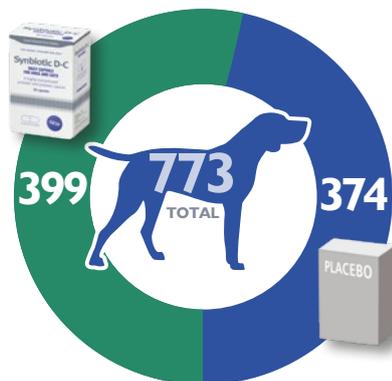
- *Enterococcus faecium* probiotic that is proven to survive through the GI tract. Each capsule contains 2×10^9 colony forming units (CFU).
- Preplex® prebiotics – combination of fructo-oligosaccharide (FOS) and acacia (gum arabic) that provides a food source for the beneficial bacteria thereby promoting their survival within the GI tract.

Synbiotic DC can be used for short-term or long-term cases, or as a prophylactic in situations of anticipated dysbiosis.

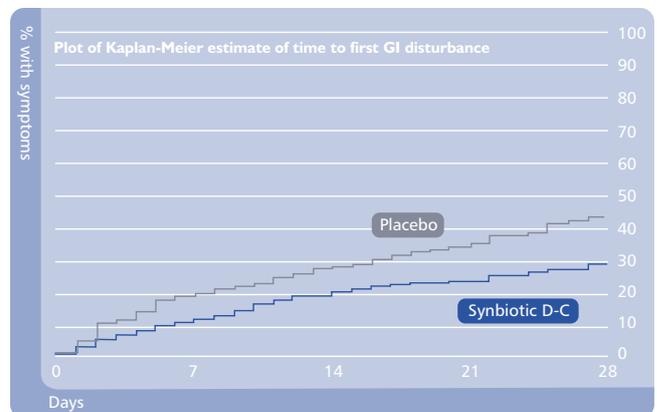
Clinical Study

Efficacy of Synbiotic D-C on the incidence of GI disturbances in a canine rehoming shelter.

Prospective double-blind, randomised, placebo-controlled trial.



By day 14, 18.8% of dogs in the Synbiotic D-C group and 27.2% in the placebo group had experienced at least one episode of GI disturbance ($p=0.0022$).



Results: Supplementation with Synbiotic D-C significantly decreased the incidence of GI disturbance in dogs entering the animal shelter⁶.

Directions for use

For use in dogs and cats:

- Give one capsule daily by mouth
- Capsules can be given whole or opened and the contents sprinkled onto food
- Synbiotic D-C is available in boxes containing 50 capsules



Gastrointestinal



References

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3. Gibson GR, Roberfroid MB. Dietary modulation of the human colonic microbiota: Introducing the concept of prebiotics. *J Nutr.* 1995; **125**: 1401-1412.
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