GASTROINTESTINAL

Protexin® VETERINARY | Smarter pet care, powered by biotics.

# Pro-Fibre Advanced for Dogs

High in fibre to support normal digestive function and gut health.

PETBIOTIX® GOOD GUT HEALTH

✔PROBIOTICS
✔PREBIOTICS
✔POSTBIOTICS

# The importance of dietary fibre in gut health

**Fibre is found naturally within plants (often as structural components) and is resistant to digestion by mammalian enzymes.[1] Different types of fibre can vary in their solubility and fermentability.[2]**

Simplified definitions refer to soluble and insoluble fibre.[1] Soluble fibre can dissolve in water[2] and often acts as a prebiotic, being readily fermented by microorganisms within the colon into short-chain fatty acids (SCFAs)[1,3] which play a major role in gut health.[4]

Insoluble fibre does not dissolve,[2] nor is it typically fermented; instead it provides bulking properties to the stool, essential for normal peristalsis and defecation.[2,5]

Another component of dietary fibre is resistant starch,[6] offering properties of both soluble and insoluble fibre. Resistant starch is not digested by the animal but instead acts as a prebiotic and is fermented in the large intestine to produce SCFAs, whilst also having a bulking effect on the faeces.[6,7]

# The essentials of fibre

**Fibre is an essential constituent in any diet and offers many health benefits.**

**Fibre supports a healthy microbiome**

Soluble fibre is fermented by microorganisms within the colon to produce SCFAs (acetate, propionate and butyrate),[8,9] supporting a diverse and healthy microbiome. SCFAs can reduce colonic pH, supporting growth of beneficial bacteria such as *Lactobacillus* and *Bifidobacterium* species, whilst discouraging colonisation by opportunistic bacteria such as *Clostridium perfringens*, *Salmonella* and *Escherichia coli*.[3,9-12]

**Fibre is essential for intestinal health**

Gastrointestinal cells have particularly high energy requirements, with colonocyte replacement occurring every 4-6 days.[13] SCFAs act as the primary source of energy for enterocytes and are therefore required for normal cell renewal and maintenance of intestinal health and function.[8] Butyrate is the preferred energy source of colonocytes,[14] providing 70% of their total energy requirement.[3]

**Fibre supports normal faecal consistency**[15]

A combination of insoluble and soluble fibre supports normal faecal consistency by optimising gut motility and faecal bulk as well as regulating water content.[5,16-18] SCFAs also facilitate the absorption of sodium, chloride and water in the colon.[3]

**Fibre aids satiety**

The addition of fibre to the diet has been shown to reduce voluntary food intake in dogs and rats.[19,20] Fibre's satiating effect is thought to be mediated through its ability to increase faecal bulk and viscosity.[21] Depending on its fibre length, cellulose has the ability to bind 3.5-10 times its weight in water;[22] the increase in volume and mass of ingesta is thought to create a feeling of fullness and satiety.[11,23]

# Petbiotix®

Our Petbiotix have been expertly developed to support a healthy microbiome. The microbiome is essential for the normal functioning of the gastrointestinal tract and for the gut's interaction with the rest of the body. Our Petbiotix help support the natural balance in the animal's gut and keep them at their best.

## Prebiotics

**Prebiotics selectively feed beneficial bacteria, supporting a diverse and healthy microbiome.**

Prebiotics resist being broken down by the host; instead, they reach the distal intestine where they are fermented by beneficial bacteria[24] to produce SCFAs which have been shown to provide many health benefits in humans.[4,25] Pro-Fibre Advanced contains a selection of prebiotics, some of which are also sources of soluble fibre.

### Preplex®

Preplex prebiotic is a combination of oligofructose (also known as fructo-oligosaccharide, FOS) and acacia (gum arabic). Oligofructose is a short-chain molecule. Generally, short-chain molecules are fermented fairly rapidly, whereas longer-chain structures, like acacia, would be expected to undergo slower fermentation.[24] This combination supports the growth of beneficial bacteria throughout the colon.[12,26,27]

**Prebiotic sources of soluble fibre**

### Fibersol®

Fibersol is a resistant maltodextrin which bypasses enzymatic digestion in the small intestine to act as a prebiotic to the bacteria within the colon.[28,29] Fibersol acts to support levels of beneficial bacteria such as *Bifidobacteria* spp.,[29,30] whilst additionally optimising bowel regularity, faecal moisture and volume.[29,31,32] Fibersol's slower fermentation rate[29,30] means that it has a prolonged period of SCFA production and therefore supports the microbiome for a longer duration. SCFAs are important metabolites for the maintenance of intestinal health.[4,29]

### Pectin

Pectin is a soluble fibre[20] that is fermented in the colon.[33-35] As well as being a prebiotic,[10,36,37] pectin is also known to have a soothing effect on the gut lining.

### Psyllium

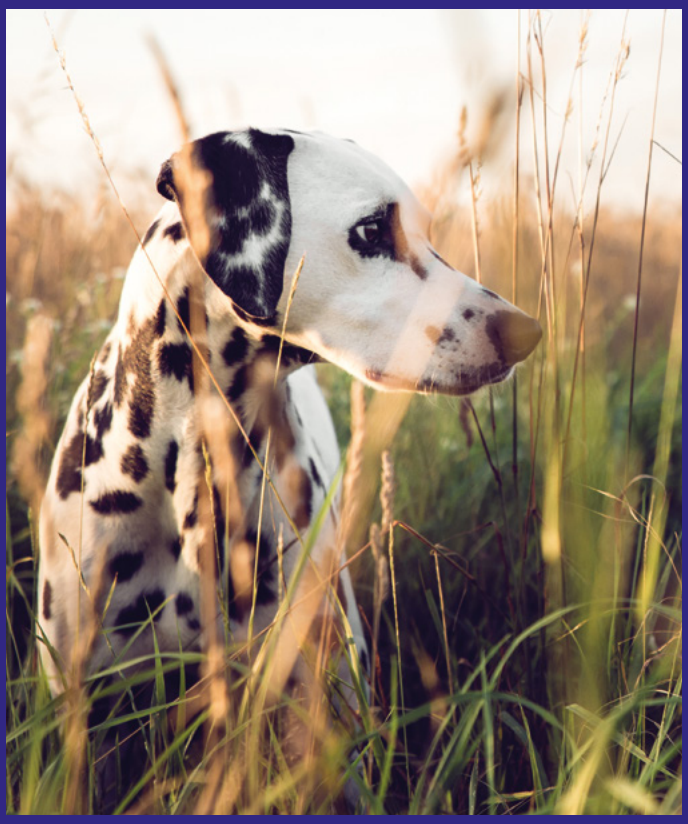
Human studies show psyllium is a soluble dietary fibre, with prebiotic potential, that has the ability to absorb water to form a viscous, gel-like substance.[15,25,38-40] In humans it has been shown to increase faecal viscosity which promotes normal intestinal transit time.[39-42]

## Probiotics

**Probiotics are live microorganisms shown to support the microbiome.**

### *Bacillus subtilis*

Pro-Fibre Advanced contains the probiotic *Bacillus subtilis* C-3102 (DSM 15544). *B. subtilis* supports a healthy microbiome, aids digestion of nutrients and assists with control of faecal odour.[43-46] Additionally, *B. subtilis* has been shown to help maintain gut mucosal immunity and normal faecal consistency.[43,44,47,48]
The viability of the probiotic following processing and storage, along with acid stability, has also been verified.[47]



## Postbiotics

**Postbiotics are inactivated microorganisms which remain bioactive in the gut, providing health benefits.**

### CitriStim

CitriStim is an inactivated yeast (*Pichia guilliermondii*) acting as a source of mannan-oligosaccharides (MOS) and beta-glucans.
It supports the gastrointestinal immune system and optimises gut function and integrity.
CitriStim can help limit adherence of certain microorganisms to the intestinal wall, aiding their excretion.[49,50]

**Beta-glucans**
have been shown to stimulate the innate immune system in dogs.[55,56]

**Mannan-oligosaccharide (MOS)**
is prebiotic which, as well as being fermented by the microbiome to produce SCFAs, is able to bind to fimbriae on certain pathogenic bacteria,[51,52] including *E. coli* and *Salmonella* spp., thereby reducing their adhesive properties.[52,53] MOS, when given for 10 days, has been shown to reduce faecal shedding of *E. coli*.[54]

# Introducing Pro-Fibre Advanced

Pro-Fibre Advanced provides sources of soluble and insoluble fibre, alongside additional ingredients which support microbiome, immune and gut-barrier health.

## Additional ingredients

### Insoluble fibre

Cellulose (a major structural component of plants) is an important insoluble fibre found in Pro-Fibre Advanced. It acts as an effective stool bulking agent,[2,3] encouraging normal gut motility and defecation, as well as satiety.[2,3,15]

### L-threonine

L-threonine is the amino acid most utilised by highly metabolic enterocytes. It is important for the production of mucosal glycoproteins which form the protective mucus layer lining the gut epithelium, ensuring gut barrier function and supporting intestinal immunity.[57,58]

## Instructions for use

Pro-Fibre Advanced should be added to the food on a daily basis for as long as considered necessary.

| Weight | Number of measures |
|---|---|
| <5kg | ½ measure (5g) per day |
| 5-20kg | 1 measure (10g) per day |
| 20-35kg | 2 measures (20g) per day |
| >35kg | 3 measures (30g) per day |

**Available in 500g tubs.**

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Smarter pet care, powered by biotics.


GASTROINTESTINAL | DERMATOLOGY | URINARY | CALMING | HEPATIC | JOINT

For information on our full range of products for dogs, cats and rabbits, please visit our website.

**For references please visit protexinvet.com/pro-fibre-advanced-refs or scan**

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