

Cobalazorb



Preplex® prebiotic

Disruptions to the intestinal microbiota population can cause a dysbiosis. This can result in an imbalance of serum folate and cobalamin via several mechanisms, including the following:

- Overgrowth of folate-producing bacteria can impact serum folate levels which can potentially 'mask' concurrent low serum cobalamin levels⁷.
- Certain intestinal bacteria species also utilise dietary cobalamin and thus an overgrowth of these bacterial populations leads to competitive uptake of cobalamin. This in turn reduces the amount of cobalamin available to the animal and may lead to a decrease in serum cobalamin levels⁵.

Cobalazorb contains Preplex® prebiotic – a combination of fructo-oligosaccharide (FOS) and acacia (gum arabic). FOS has a simple structure and is therefore rapidly fermented whereas acacia has a more complex structure and is fermented more slowly.

This combination provides a prebiotic effect along a greater length of the intestinal tract, helping to support a healthy gastrointestinal microbiota and thus aiding the maintenance of optimum serum folate and cobalamin levels.



Cobalazorb

Supporting normal serum cobalamin and folate levels in dogs and cats.

Each capsule contains:

- 0.5mg cyanocobalamin (PXN-B12)
- 0.2mg folic acid (vitamin B9)
- Preplex® prebiotic
- Artificial chicken flavour

Directions for use

Weight (kg)	Number of capsules
<10kg	½ capsule per day or 1 capsule every other day
10-20kg	1 capsule daily
>20kg	2 capsules daily

- The number of capsules can be increased or decreased to maintain normal cobalamin (vitamin B12) levels
- For use in dogs and cats
- Capsules can be administered whole or opened and sprinkled onto food

References

1. Simpson KW, Fyfe J, Cornetta A et al. Subnormal concentrations of serum cobalamin (vitamin B12) in cats with gastrointestinal disease. *J Vet Intern Med* 2001; **15**: 26-32.
2. Simpson K, Morton D, Batt R. Effect of exocrine pancreatic insufficiency on cobalamin absorption in dogs. *Am J Vet Res* 1989; **50**: 1233-1236.
3. Toresson L, Steiner JM, Suchodolski JS, Spillmann T. Oral cobalamin supplementation in dogs with chronic enteropathies and hypcobalaminemia. *J Vet Intern Med* 2016; **30**: 101-107.
4. Toresson L, Steiner JM, Olmedal G, Larsen M, Suchodolski JS, Spillmann T. Oral cobalamin supplementation in cats with hypcobalaminemia: a retrospective study. *J Feline Med Surg* 2017; **1**:1098612X16689406 [Epub ahead of print]
5. Dukowicz AC, Lacy BE, Levine GM. Small intestinal bacterial overgrowth: a comprehensive review. *Gastroenterol Hepatol* 2007; **3**: 112-122.
6. Heilmann RM, Grütznher N, Iazbik MC, et al. Hyperhomocysteinemia in greyhounds and its association with hypofolate and other clinicopathologic variables. *J Vet Intern Med* 2017; **31**: 109-116.
7. Aslania F, Mazza JJ, Yale SH. Megaloblastic anemia and other causes of macrocytosis. *Clin Med Res* 2006; **4**: 236-241.



Available in boxes containing 60 capsules



Cobalazorb For Dogs and Cats

Oral cobalamin
(vitamin B12)
supplementation



Cobalazorb has been designed to help support normal serum cobalamin (vitamin B12) and folate (vitamin B9) levels in dogs and cats, helping them to enjoy a happy, healthy life.

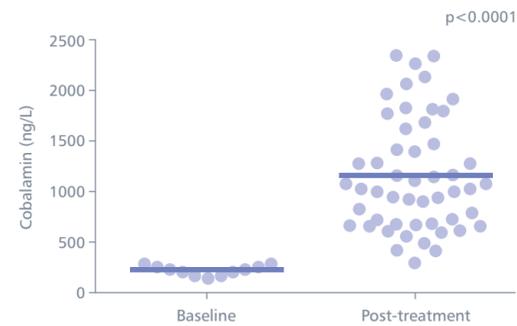
Cobalamin (vitamin B12)

Cobalamin is a water-soluble vitamin that plays an important role in many physiological processes including cellular metabolism, DNA synthesis, amino acid metabolism, fatty acid metabolism and erythrocyte formation.

The main source of vitamin B12 for dogs and cats comes from dietary sources involving the formation of cobalamin complexes with gastric and pancreatic intrinsic factors, before finally being absorbed via transport across specialist receptors in the terminal ileum. There are many factors that can contribute to disruptions in this pathway resulting in hypcobalaminemia.

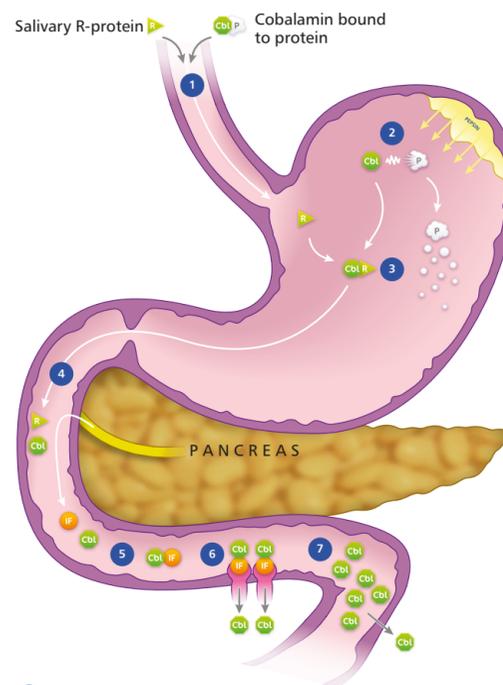
Dogs and cats with hypcobalaminemia often show signs of gastrointestinal disturbances although it can be difficult to distinguish if this is a cause or effect of the deficiency¹.

Historically, veterinary surgeons have been advised to supplement parentally in all cases of hypcobalaminemia². Cobalazorb contains high levels of cobalamin to support the maintenance of normal cobalamin serum levels, as hyper-supplementation has been shown to aid an absorption mechanism independent of intrinsic factor³.



Results from a 2016 study showing the effects of oral cobalamin supplementation in 51 dogs diagnosed with hypcobalaminemia³. The mean value is represented by the blue horizontal line.

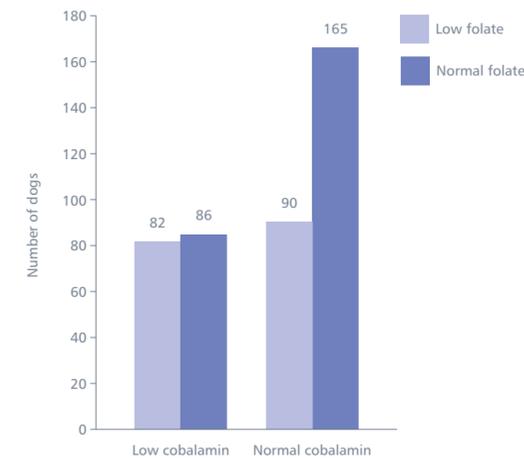
Absorption of cobalamin



- 1 Ingestion of cobalamin bound to protein and production of salivary R-protein.
- 2 Gastric pepsin breaks cobalamin-protein bond, allowing digestion of protein and release of cobalamin.
- 3 Cobalamin binds to R-protein.
- 4 R-protein-cobalamin complex is broken down by protease enzymes.
- 5 Cobalamin binds to intrinsic factor produced by the pancreas.
- 6 Uptake of cobalamin via the cobalamin-intrinsic factor receptors in the ileum.
- 7 When intra-luminal levels of cobalamin are very high, cobalamin can be absorbed by separate pathways independent of the intrinsic factor receptors.

Hypofolataemia

In a recent study, 49% of hypcobalaminemic dogs were also found to have concurrent subnormal serum folate concentrations⁵.



Results from a 2017 study showing the prevalence of concurrent hypcobalaminemia (serum cobalamin concentration <math>< 251 \text{ ng/L}</math>; reference interval [RI] 251–908 ng/L) and hypofolataemia (serum folate concentration <math>< 7.7 \mu\text{g/L}</math>; [RI] 7.7–24.4 $\mu\text{g/L}</math>) in a sample of 423 dogs⁵.$

Folic acid (vitamin B9)

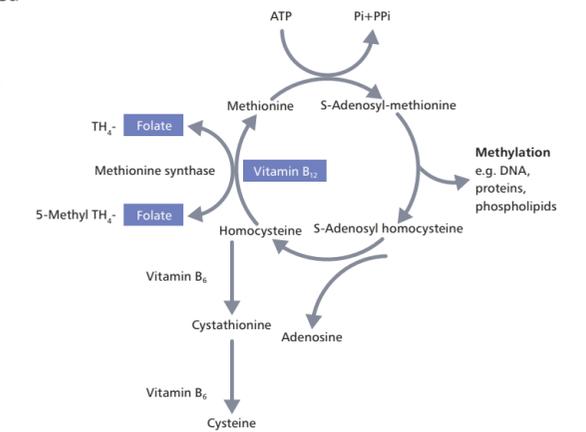
Folic acid is a synthetic form of folate, another important water-soluble B vitamin that is essential for DNA synthesis and repair thus playing a key role in cell division and growth. As a result, proliferating cells such as erythrocytes, leukocytes and enterocytes have a high requirement for folic acid.

The majority of a dog and cat's daily folic acid requirement is obtained from their diet and absorbed in the proximal small intestine. However, certain intestinal bacterial populations are also able to produce folate, thus a gastrointestinal dysbiosis can affect serum folate levels⁵.



The synergistic relationship between cobalamin and folic acid

Folate and cobalamin have a synergistic relationship and are cofactors in several important cellular metabolic processes. One of these processes is the metabolic pathway that converts the amino acid methionine to cysteine – a necessary step in the production of glutathione, an essential antioxidant.



If there is a deficiency of either one of these vitamins then this pathway is interrupted resulting in elevated serum levels of homocysteine (hyperhomocysteinaemia) and disturbances in the methionine metabolic pathway⁶.



Pro-Kolin Enterogenic

Pro-Kolin Enterogenic acts to support the intestinal mucosal barrier, modulate the intestinal immune system, normalise the microbiota balance and support normal serum cobalamin levels.

Ingredients

Each 4g sachet contains:

- *Enterococcus faecium* PXN 33 – 1×10^9 CFU
- 0.5mg Cyanocobalamin (PXN-B12)
- 708mg Bentonite-montmorillonite
- Preplex® prebiotics
- Mannan-oligosaccharide
- Alpha-glucan butyrogenic
- Beta-glucan
- MPS Protect (mucopolysaccharide starch)



Directions for use

Pro-Kolin Enterogenic should be administered for at least 30 days, and continued for as long as considered necessary. It is supplied in a 4g sachet and may be sprinkled onto food.

Available in boxes of 30 sachets.

Weight of pet (kg)	Sachets per day	
		
<5kg	1/2	
5-15kg	1	
15-35kg	2	
>35kg	3	



Pro-Kolin Enterogenic

For Dogs and Cats

Long-term management of gastrointestinal sensitivities

References

1. Brouns F, Kettlitz B, Arrigoni E. Resistant starch and "the butyrate revolution." *Trends in food science and technology* 2002; **13**: 251-261.
2. Nofrarias M, Martínez-Puig D, Pujols J, Majó N, Pérez JF. Long-term intake of resistant starch improves colonic mucosal integrity and reduces gut apoptosis and blood immune cells. *Nutrition* 2007; **23**: 861-70.
3. Toresson L, Steiner JM, Suchodolski JS, Spillmann T. Oral cobalamin supplementation in dogs with chronic enteropathies and hypcobalaminemia. *J Vet Intern Med* 2016; **30**: 101-107.
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5. Newman KE, Newman MC. Evaluation of mannanoligosaccharide on the microflora and immunoglobulin status of sows and piglet performance. *J Animal Science* 2001; **79**: 189-191.



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Pro-Kolin Enterogenic

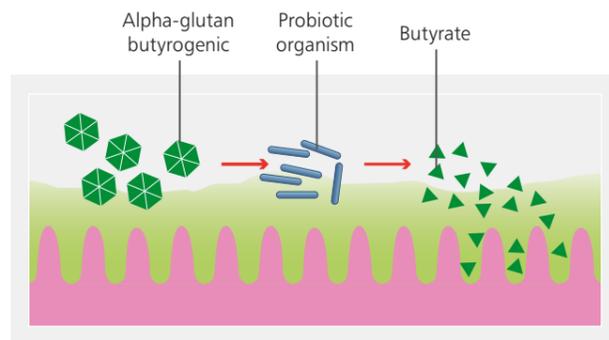
Long-term management of gastrointestinal sensitivities



Pro-Kolin Enterogenic acts to support the intestinal mucosal barrier, modulate the intestinal immune system, normalise the microbiota balance and support normal serum cobalamin levels. This helps to effectively manage long-term gastrointestinal sensitivities, so that dogs and cats can enjoy a happy, healthy life.

Alpha-glucan butyrogenic

This is a resistant starch that is fermented by the microbiota to produce butyrate (a short-chain fatty acid). Butyrate is the preferred energy source for colonocytes¹.



Increased butyrate levels result in²:

- Maintenance of mucosal barrier integrity
 - ↑Goblet cells and mucus production
 - ↓Cell damage and apoptosis
- Mucosal regeneration
 - Maturation of epithelial cells
 - Maintain normal cell phenotype
- An increase in the body's own anti-inflammatory processes.



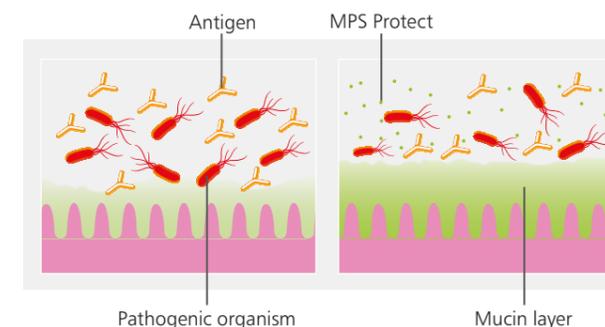
Cobalamin PXN-B12 (vitamin B12)

Reductions in serum cobalamin levels are a common finding in animals with gastrointestinal disturbances and can be due to malabsorption or dysbiosis of the intestinal microbiota. Recent studies in dogs³ and cats⁴ have demonstrated that oral cobalamin is an effective means of maintaining normal serum cobalamin levels in animals with long-term gastrointestinal disturbances.



MPS Protect

MPS Protect is a mucopolysaccharide that reinforces the intestinal mucin layer. The intestinal mucin layer provides a barrier against antigens and pathogenic bacteria.



Probiotics

Pro-Kolin Enterogenic contains the *Enterococcus faecium*. Probiotics work by competitive exclusion, immune stimulation and lactic acid production.

Prebiotics

Pro-Kolin Enterogenic contains four different prebiotics to support the beneficial microbiota already present in the gut.

- Preplex[®] prebiotic – a combination of fructo-oligosaccharide (FOS) and acacia (gum arabic). FOS has a simple structure and is therefore rapidly fermented whereas acacia has a more complex structure and is fermented slower. This combination provides a prebiotic effect along a greater length of the intestinal tract.
- Mannan-oligosaccharide (MOS): Supports the intestinal microbiota and, when used long-term, is able to bind to fimbriae on certain pathogenic bacteria, including *E. coli*⁵.
- Beta-Glucan: Supports the intestinal immune system.

