NEW CC CARDIOCARE™ PROTECTS THEIR HEART FROM THE START

Introducing new PURINA® PRO PLAN® VETERINARY DIETS CC CardioCare™. A life changing blend of nutrients with the power to support cardiac function.

VETERINARY CLINICAL NUTRITION

PURINA®
PRO PLAN®
VETERINARY DIETS

NEW

Introducing New PURINA® PRO PLAN® VETERINARY DIETS CC CardioCare™, proven to slow the progression of MMVD in the early stages.

The heart is a strong organ

A dog's heart is a strong organ that's needed to pump blood throughout the body, beating 60 to 120 times per minute[1]. In order to work efficiently, the heart requires twice as much energy than the brain[2], and mitochondria are the cell's organelles in charge of meeting these high energy demands (Figure 1).

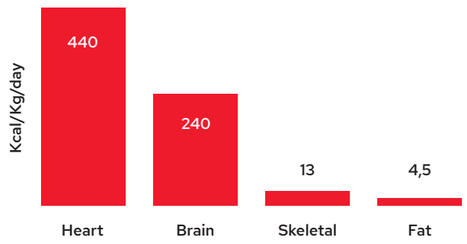


Figure 1. Specific energy demands of major organs and tissues.

Canine heart disease

A heart murmur can be a common disturbance in young dogs, and although a murmur will often subside with age, they can also be an early sign of heart disease. If respiratory symptoms such as difficulty breathing or coughing are occurring as well as the murmur, veterinarians will perform several diagnostic techniques in order to determine the underlying cardiac disease. It is important to highlight that depending on its nature, rate of progression, patient age and condition, heart disease might lead to a heart failure[3]. Myxomatous mitral valve disease (MMVD) is the most common heart disease in dogs and is characterised by a slowly progressive mitral valve degeneration associated with alterations in energy metabolism, oxidative stress, inflammation, and in advanced stages, heart enlargement[4]. In the early stages, dogs show no outward signs of disease and are considered as clinically normal. Detecting these signs in dogs in the early stages of MMVD may help prevent progression[5].

MMVD is more prevalent in smaller breeds like Poodles, Shih Tzus, or Chihuahuas; and breeds with a hereditary predisposition like the Cavalier King Charles Spaniel or Dachshunds, where almost 100% will be diagnosed with MMVD [6,7].

Heart disease classification

In 2009, the American College of Veterinary Internal Medicine (ACVIM) classified heart disease and heart failure in 4 different stages according to their severity, morphological changes and clinical signs. This classification applies to dogs with MMVD, with the objective to provide the appropriate treatment at each stage[3].

When dogs are at Stage B2 (Table 1), they may still be considered as clinically normal even though the veterinarians could hear the heart murmur getting louder. Strong evidence supports that adapting the diet at this early stage will help delay clinical signs[5].

Effective management of MMVD combines different strategies, including adequate medication, adapted clinical diet and physical activity.

STAGE	EVOLUTION OF HEART DISEASE
A	• Dogs at high risk of developing heart disease (breed predisposition, size, age, genetics)
B1	• Dogs with structural heart disease, but without clinical signs • Heart murmur can be present
B2	• Asymptomatic dogs that have more advanced mitral valve regurgitation. Heart murmur can be present • Radiographic and echocardiographic findings: increased left atrium size • Strong evidence supports initiating treatment to delay the onset clinical signs
C	• Clinical signs present: left-sided congestive heart failure, loud murmur, tachypnea, restlessness, respiratory distress or a cough • Increased heart size
D	• Clinical signs of failure refractory to standard treatment for Stage C heart failure MMVD • Increased heart size

Table 1. Staging system applied to dogs with MMVD describing the evolution of the heart disease and heart failure.

1. Haskins S, Pascoe PJ, et al. Reference Cardiopulmonary Values in Normal Dogs. Comp Med 2005;55-2:156-161
2. Wang Z, Zhiliang Y, et al. Specific metabolic rates of major organs and tissues across adulthood: evaluation by mechanistic model of resting energy expenditure. Am J Clin Nutr 2010;92:1369-77
3. Keene B, Atkins CE, et al. ACVIM consensus guidelines for the diagnosis and treatment of myxomatous mitral valve disease in dogs. J Vet Intern Med 2019;33:1127-1140.
4. Borgarelli M, Haggstrom J. Canine degenerative myxomatous mitral valve disease: Natural history, clinical presentation and therapy. Vet Clin North Am Small Anim Pract 2010;40: 651–663.
5. Li Q, Heaney A, et al. Dietary intervention reduces left atrial enlargement in dogs with early preclinical myxomatous mitral valve disease: a blinded randomized controlled study in 36 dogs. BMC Veterinary Research. 2019; 15:425
6. Häggström J, Hansson K et al. Chronic valvular disease in the cavalier King Charles spaniel in Sweden. Vet. Rec. 1992; 131: 549–553.
7. Menciotti G & Borgarelli M. Review of Diagnostic and Therapeutic Approach to Canine Myxomatous Mitral Valve Disease. Vet Sci 2017;4:47

How diet can help

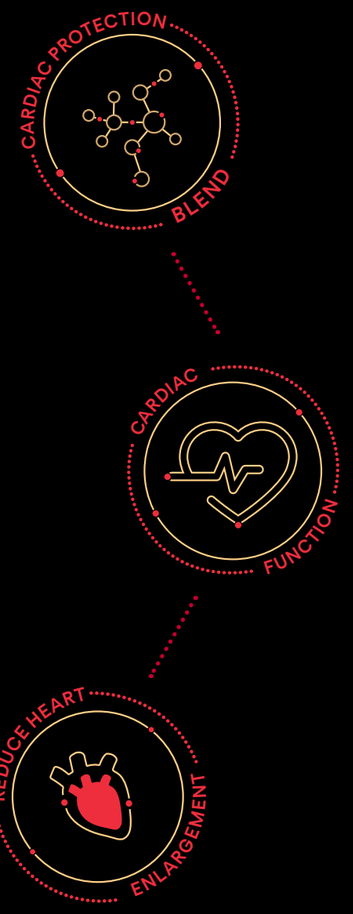
Diet should be considered as a part of the veterinary management for dogs with a cardiac condition, as it can help to slow the progression of the disease from an early MMVD stage. Once the disease progresses to congestive heart failure, dogs have a much shorter life expectancy. A key point of the nutritional management is to maintain an ideal body weight, making sure to avoid both excessive weight loss and obesity, because both can be harmful, and will help to minimize breathing problems or loss of cardiac muscle.

Introducing New Purina® Pro Plan® Veterinary Diets CC CardioCare™

CC CardioCare™ is a complete dietetic pet food for adult dogs containing an advanced blend of nutrients (Cardiac Protection Blend -CPB) proven to support cardiac function and delay the progression of heart disease from the early stages.

The innovative formula of Purina® Pro Plan® Veterinary Diets CC CardioCare™ contains:

- Medium-Chain Triglycerides (MCTs) oil as an alternative energy source for the myocytes
- Key amino acids (Methionine and Lysine) precursors of carnitine, a crucial transporter for fatty acids to get into mitochondria
- Fish oil (Omega-3 fatty acids) to help reduce inflammation
- Vitamin E to help prevent oxidative cell damage
- Magnesium which binds ATP to deliver energy to the cardiac cells
- Taurine to help maintain heart contractile function.



Recommended for

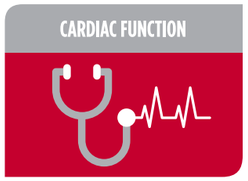
Chronic cardiac insufficiency, Mitral valve conditions (Myxomatous Mitral Valve Disease), heart murmur.

Not recommended for

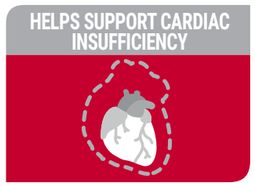
Growth, gestation and lactation.

Key benefits

Contains Cardiac Nutritional Blend composed of Amino Acids, Omega-3 fatty acids, medium chain triglycerids oil, minerals and vitamin E



Improves cardiac function in dogs with mitral heart murmur



Helps support cardiac insufficiency

Feeding Recommendations

Kg	24h
2.5	70
5	110
10	175
15	230
25	325
35	410
45	485
70	650

Analytical Constituents

Protein	26.5%
Fat content	15%
Crude ash	7.5%
Crude fibre	4.5%
Taurine	0.2%
Omega-3 fatty acids (EPA+DHA)	0.7%
Sodium	0.18%
Magnesium	0.15%
Potassium	0.6%

Composition

Rice, dried chicken protein, corn, barley, corn protein meal, medium chain triglycerides (MCT) oil (5%), dried beet pulp, dried salmon protein, cellulose, fish oil, minerals, animal fats, digest.

Research behind the Cardiac Protection Blend (CPB)

Dietary intervention can help slow progression and heart enlargement in dogs within the early stages of myxomatous mitral valve disease (MMVD)[1].

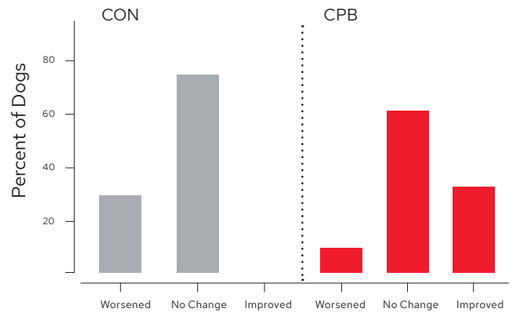


Figure 1. Percentage of MMVD dogs showing changes of at least one grade in mitral regurgitation after 6 months of feeding control diet (CON) or treatment diet (CPB), compared to baseline.

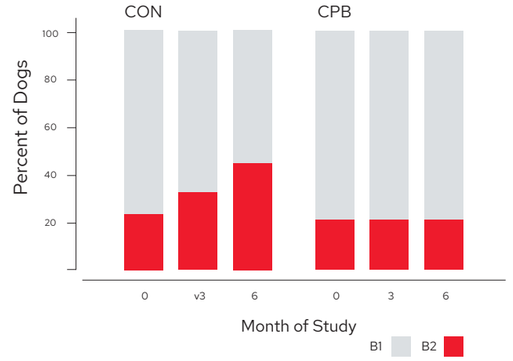


Figure 2. Progression of the disease in control diet (CON) and treatment (CPB) groups showed as percentage of MMVD dogs classified with ACVIM Stage B1 or B2 at 0- 3- and 6- months of the study.

Objective

The objective of the study was to evaluate the clinical impact of a diet formulated with a cardiac protection blend (CPB) designed to address metabolic alterations, and progression of naturally occurring early preclinical stage MMVD in dogs.

Methodology

19 small breed dogs with early stage of MMVD and 17 healthy dogs were enrolled into a 6-month dietary study intervention. All dogs were randomly assigned to either a control diet (CON) or CPB-supplemented diet.

Metabolomics, a systematic study of chemical processes concerning metabolites, were evaluated and heart measures were collected at baseline, 3 months and 6 months to analyze the effect of diet on progression of MMVD.

Heart measures included: degree of mitral regurgitation (MR) and different echocardiographic variables as left atrial diameter (LAD) and aortic diameter (LA/Ao).

Results

During the 3rd and 6th months of study measurements, there were no significant changes in any parameter for healthy dogs independently of the type of diet assigned; whereas for MMVD dogs there was a significant interaction in diet by time.

After 6 months of study, 60% of MMVD CPB-diet dogs showed a trend of decreases (2.9%) in both LAD and LA/Ao. And 30% of MMVD CPB-diet dogs showed a reduction of MR (Figure 1).

MMVD CON-diet dogs showed a significant increase in LAD (10.8%) and LA/Ao (9.5%) at 6 months, compared to baseline. And 37 % of MMVD CON-diet dogs showed progression of ACVIM stage B1 to B2 while none MMVD CPB-diet dogs showed progression of disease stage by the end of the study (Figure 2).

CPB had positive impacts in metabolic pathways in MMVD dogs:

- Improved fatty acid use for energy
- Reduced inflammation
- Reduced oxidative stress

Clinical outcomes

This is the first dietary intervention that investigates the benefits of a cardiac protection blend, showing a potential clinical application to prevent progressive cardiac disease.

- 37% of MMVD CON-diet dogs, showed MMVD progression from B1 to B2, while none of CPB-diet dogs showed progression of the disease.
- 30% of MMVD CPB-diet dogs showed a reduction of mitral valve regurgitation.
- After the 6th month of study, MMVD CON-diet dogs showed a 10.8% increase of left atrial diameter (LAD) while CPB-diet dogs showed a 2.9% of reduction.

Conclusions

The study successfully demonstrated that a blend of nutrients, designed to address metabolic changes associated with MMVD in dogs, was able to slow or reverse cardiac changes within early and preclinical stage of the MMVD.

1. Li Q, Heaney A, et al. Dietary intervention reduces left atrial enlargement in dogs with early preclinical myxomatous mitral valve disease: a blinded randomized controlled study in 36 dogs. BMC Veterinary Research. 2019; 15:425

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