

# Aymaqin™

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Sulforaphane Producing Supplement

**Directions for Use:** One chewable tablet daily for dogs of all sizes, six months and older. Tablets should be given on an empty stomach at least two hours after a meal or one hour before a meal.

**To order,** contact your Nutramax representative, visit [Vet-EZ-Order.com](http://Vet-EZ-Order.com), or call 1-888-886-6442



**nutramax**<sup>®</sup>  
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U.S. Patent Nos. 9,421,183 and 10,583,178

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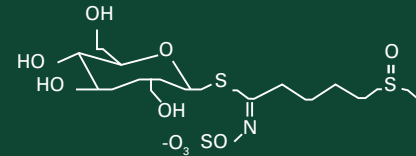
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# Avmaquin™

Sulforaphane Producing Supplement

## What is sulforaphane?

Sulforaphane is a phytochemical obtained from the consumption of cruciferous vegetables, most notably **broccoli**. It is produced from necessary ingredients found in these vegetables: glucoraphanin, the glucosinolate precursor to sulforaphane, and myrosinase, an enzyme that interacts with glucoraphanin to convert it to sulforaphane.



## Glucoraphanin

Myrosinase



## Sulforaphane

Tasty Chewable Tablets

Maitake Mushroom Extract and Beta-Glucans



Formulated with Broccoli Seeds and Sprouts

Proudly Made in the USA

# What is Avmaquin™?

**Avmaquin™ Sulforaphane Producing Supplement** is a tasty and convenient way to administer the ingredients, glucoraphanin and active myrosinase enzyme, to promote **sulforaphane production** specifically in dogs. Avmaquin™ helps support cells against insults caused by oxidative stress by **increasing the production of selected cytoprotective Phase 2 detoxification and antioxidant enzymes**, thus promoting overall health and wellness.

Nutramax has scientifically studied the bioavailability of Avmaquin™ in dogs to determine appropriate levels of administration of glucoraphanin for **sulforaphane production in dogs**.

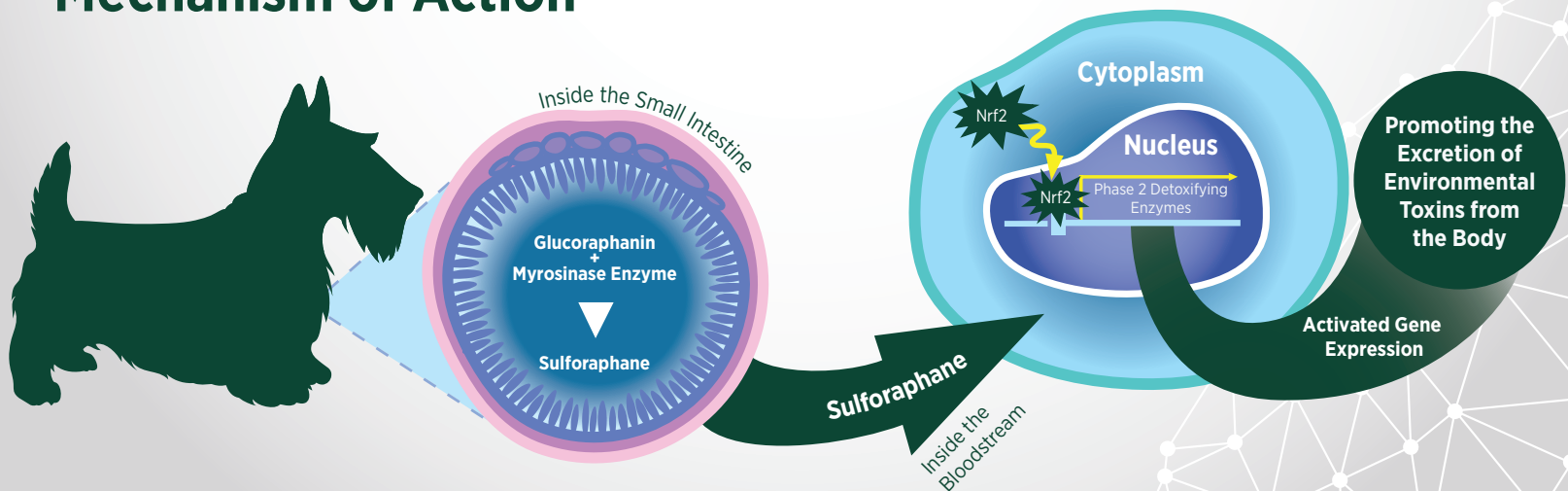
## Why sulforaphane?

Sulforaphane offers numerous **health-promoting** benefits, which are likely due to its positive effect on multiple cellular pathways that **support and maintain balance in the body**. Sulforaphane supports cellular detoxification by stimulating Nrf2 which causes production of certain Phase 2 enzymes. Nrf2 upregulates protective enzymes and proteins to protect cells from insults. The production of these enzymes also promotes antioxidant activity against free radicals, which can damage DNA, proteins, and lipids, thereby reducing oxidative stress.

## What are Phase 2 enzymes?

The body's detoxification system consists of two major pathways, serving to manage cellular stress and imbalance in the body. Phase 1 enzymes, also known as Cytochrome P450 enzymes, initially process toxins entering the body into metabolites. Then, **Phase 2 enzymes** further support cellular health by **detoxifying these potentially harmful metabolites** to enhance excretion from the body. NQO1 is an important Phase 2 enzyme.

## Mechanism of Action



# Cellular Health in the Bladder

## The prevalence of transitional cell issues is rising



Knapp DW, et al. ILAR J. 2014;55(1):100-118.

**Certain environmental exposures can increase the likelihood of chronic health issues and abnormal cellular changes in dogs.** Examples of these environmental threats include exposure to pesticides (containing benzene), lawn herbicides, as well as urban dwelling.

Exposure to lawns treated with herbicides has been associated with an increased risk of developing bladder issues in dogs. A study found a significantly higher risk of developing a specific bladder issue in Scottish Terriers exposed to lawn herbicides.<sup>1</sup>

<sup>1</sup> Glickman LT, et al. J Am Vet Med Assoc. 2004; 224(8):1290-1297



## Breeds predisposed to bladder health issues:

Scottish Terriers • West Highland White Terriers  
Shetland Sheepdogs • Beagles • Wire Fox Terriers

**Scottish Terriers are one breed that has a higher chance of developing bladder cell issues<sup>2</sup>.** A study in Scottish Terriers found that consumption of vegetables at least 3 times per week decreased the chance for development of bladder cell issues<sup>3</sup>. Cruciferous vegetables (broccoli) serves as a source of the potent phytochemical sulforaphane that may offer numerous cellular health benefits.

<sup>2</sup> Knapp, DW, Ramos-Vara JA, Moore GE, et al., ILAR J. (2014) 55:100-18

<sup>3</sup> Raghavan M, et al. J Am Vet Med Assoc. 2005;227(1):94-100.

**Avmaquin™ Sulforaphane Producing Supplement provides the necessary ingredients, glucoraphanin and an active myrosinase enzyme, to promote sulforaphane production in dogs; therefore supporting cellular detoxification and promoting cellular and bladder health in dogs.**

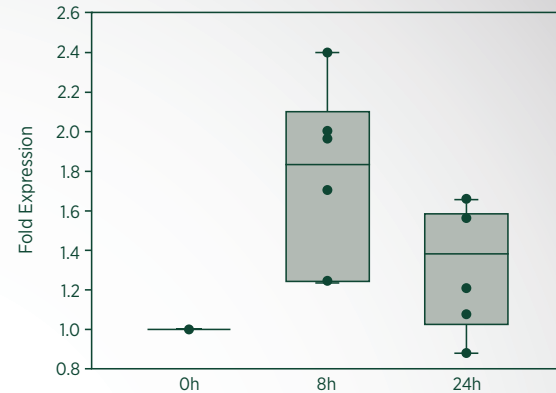
# Key Points of Avmaquin™

- 1 Bioavailable
- 2 Bioactive
- 3 Synergistic

# 2

Avmaquin™ is also **bioactive** in dogs, with NQO1 levels rising after administration.

**NQO1 Gene Expression in Dogs after Administration of Avmaquin™**

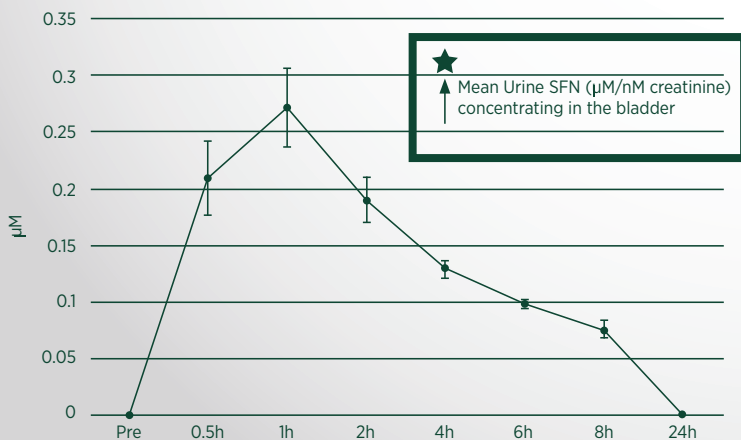


Gillette R, et al. 2020 Virtual Poster Veterinary Cancer Society Annual conference.

# 1

Avmaquin™ is **bioavailable** in dogs, with sulforaphane concentrating in the bladder for a targeted approach.

**Total Plasma SFN**

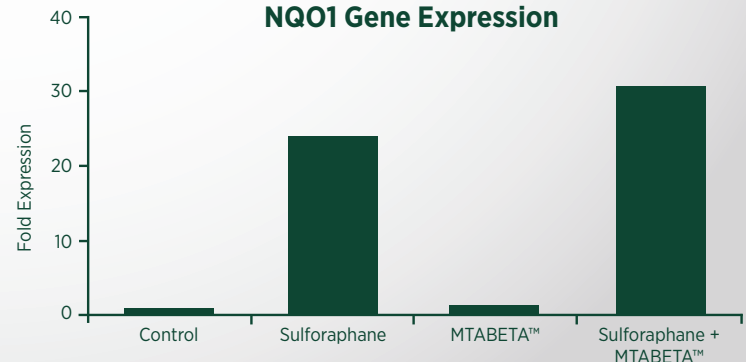


Gillette R, et al. 2020 Virtual Poster Veterinary Cancer Society Annual conference.

Avmaquin™ contains beta-glucans that work **synergistically** with sulforaphane to promote the body's own detoxification process. When cells are exposed to sulforaphane and MTABETA™, NQO1 levels are synergistically increased. This powerful Phase 2 detoxifying enzyme binds to toxins which are thereby excreted from the body.

# 3

**NQO1 Gene Expression**



Data on file. Nutramax Laboratories Veterinary Sciences, Inc. 2019.

# Ayumaquin<sup>TM</sup> vs. Broccoli

For pets to receive the health benefits of broccoli, unfortunately it is not as simple as feeding broccoli itself.

## Ayumaquin<sup>TM</sup>

Sulforaphane Producing Supplement

### Sulforaphane Production

Provides a source of sulforaphane shown to be bioavailable in dogs and induce cytoprotective Phase 2 enzymes

### Palatability

Tasty and convenient

### Amount

One tablet daily

### Preparation

Provides a reliable and consistent level of sulforaphane in dogs

## Broccoli

### Sulforaphane Production

Dependent on many factors

### Palatability

Difficult to determine

### Amount

It is very difficult to determine how much broccoli must be fed to dogs to achieve sulforaphane production

### Preparation

Heating and cooking broccoli can damage the enzyme necessary for sulforaphane production