# *Mycoglannan Toxin Binder*

## What is Mycoglannan and how does it work?

Mycoglannan is produced from the cell walls of inactivated baker's yeast (Saccharomyces Cerevisiae), which has been grown by non-alcohol fermentation, centrifuged and then dried. It is made up of material, which forms 2 rings surrounding the yeast cell wall.
The outer layer is Mannan Protein also known as mannanoligosaccharide (MOS).
The inner layer is made up of B Glucans.

## Mannan , *Mannanoligosaccharides* or MOS.

Mannan is a non-digestible protein carbohydrate, when added to an animals total feed, its complex nature prohibits it being digested by the animal, but makes it available to be used by the good bacteria/flora of the gut. This allows the good bacteria to grow rapidly in the gut and provide an improved defence against harmful bacteria. The animal is now better able to fight against bad bugs. This is referred to as a prebiotic.
**Prebiotic -** *A Prebiotic can be described as a biological agent that stimulates preventative activity within the gut of an animal.*

**So what is the actual process?** Pathogens enter the animals gut and look for a place on the cells which line the gastrointestinal tract to bind and subsequently colonize and reproduce. To prevent the establishment of the bad bacteria, it is necessary to stop the binding process. The Mannans do this by getting between the lectins on the bad

bacteria and the sugar compounds on the intestinal lining. The lectins attach to the Mycoglannan instead of the sugars on the cell of the gut wall lining. After capturing the pathogens, the Mycoglannan is expelled naturally by the animal through the gut along with other waste materials.

Due to the production techniques, Mycoglannan material is one of the most consistent and effective MOS on the market.

## What about the B-Glucans?

The inner layer of the cell wall is made up by the extremely complex carbohydrate 1,3 1,6 Beta-glucan. It has been shown Beta-glucans interact with the immune system to increase its reaction capabilities.
These substances increase host immune defense by activating complement system, enhancing macrophages and natural killer cell function.

This is a very simplistic breakdown of how these components work, and the research in this field is ongoing. But very basically Mycoglannan works to activate the animals' immune system through the activity of beta-glucans and mannans, which are two of the main components of the yeast cell wall. These elements bind to pathogens in the digestive tract and stimulate the immune system to produce antibodies.

Mycoglannan material is a component of many specialty animal feeds over seas Many of the Sheep farmers in the UK and Ireland are using this cell wall material and finding the benefits overwhelming. They claim that the Mycoglannan material increases the amount of maternal

antibodies in the colostrum the ewes are producing, giving the lambs the best form of disease defence possible.

## Am I just as well to use other toxin binders?

I have been asked about using other forms of toxin binders such as bentonite and zeolite. Below is a study that was done in a Brazilian university -

*Carlos Alberto da Rocha Rosa DVM, Ph.D., Universidad Federal Rural de Rio de Janeiro, Brazil -Adsorbing agents - One of the strategies for reducing the exposure to mycotoxins is to decrease their bioavailability by including various mycotoxin adsorbing agents in the compound feed, which leads to a reduction of mycotoxin uptake as well as distribution to the blood and target organs. Adsorbing agents are also called binding agents, adsorbents, binders, etc. The reduction of mycotoxin bioavailability using various inorganic adsorbents – like bentonite and zeolites - has been thoroughly studied. However, some of these adsorbents can reduce nutritional value of feeds by binding trace minerals, amino acids and vitamins and reducing their bioavailability and even produce dioxins, produce undesirable side effects and they are not considered safe by the European Union. Due to the limitations of mineral adsorption, many studies have been conducted over the last decade on biological adsorbents, in an attempt to obtain greater efficacy and specificity while, at the same time, reduce the impact on nutritional quality compared to mineral adsorbents.*

*These are not binders we like to use full time, and you can now see why. Within this study it was also discovered that*

*the( Mycoglannan material) was affective in inhibiting the oestrogenic effect of ZEA(zearalenone) pathogen.*

*As more research results are published overseas, and the list of pathogens controlled by( Mycoglannan material) increases, it is being mooted that the product will eventually replace the antibiotics used as growth stimulants. Until these claims are accepted and approved by the APVMA, it would be prudent at this time to expect only the following performance claims and benefits:*
*- helps maintain a healthy immune system*
*- supports natural defense*
*- promotes a healthy gut flora*
*- maintains and promotes gut health.*

*Introducing (Mycoglannan) to an animals feed would be reasonable to assume prevention is better then cure.*

## So what pathogens are we worried about and how do they affect the animals?

Some types of gram-negative bacteria live in the gut of the horse but don't cause any problems unless the horse is sick for some other reason. At this point the bacteria start to excessively proliferate, they breach the cell wall of the
gut and get into the blood stream. When they die off, their cell walls rupture, releasing a toxin called lipopolysaccharide (LPS) into the blood stream, causing endotoxemia. E.coli and Salmonella are an example of some of these bacteria. These healthy horses will eliminate the bacteria in their manure. Other horses and foals in the paddocks may then eat the manure and so the bacteria is passed on.
Some of the conditions that can lead to edotoxemia are -
- Damage to the mucous barrier in the intestines
- Inflammation of the small intestine
- Twisted gut
- Colitis (a severe intestinal condition brought on by stress)
- Acute metritis (severe inflammation of the uterus due to infection,

usually from a retained placenta)
- Infection of the umbilicus in foals
- Insufficient ingestion of colostrum in foals.

There are many groups of mycotoxins, and below is a list of a few that are knows to affect the horses.
These are toxins that are produced from many forms of fungi and are found in cereal crops and some in dried fruits (rose-hips are a dried fruit!), and grasses and pastures, and hays.

| | | |
|---|---|---|
| Aflatoxin | Aspergillus flavus, Aspergillus parasiticus | liver disease, carcinogenic and teratogenic effects (birth defects) |
| Trichothecenes | Fusarium graminearum, Fusarium sporotrichioides | immunologic effects, hematological changes, digestive disorders, edema |
| Zearalenone | Fusarium graminearum | estrogenic effects, atrophy of ovaries and testicles, abortion |
| Ochratoxin | Aspergillus ochraceus, Penicillium verrucosum | nephrotoxicity, mild liver damage, immune suppression |
| Ergot alkaloid | Claviceps purpurea, Claviceps paspaspali | nervous or gangrenous syndromes |
| Fumonisin | Fusarium verticillioides, Fusarium proliferatum | pulmonary edema, leukoencephalomalacia, nephrotoxicity, hepatotoxicity |

Pauline from www.gravelproofhoof.org has a very good write up on mycotoxins. Please visit this site for a great read.

So to cap off on all this informantion - Mycoglannan is a toxin binder. It binds to many of the toxins before they get a chance to enter the body through the cell wall of the gut. Once bound, the body is able to eliminate the toxins via the manure.
It also enhances the antibodies the body makes to deal with the invaders, enhancing the immunoglobulin during gestation improving colostrum and transfer of immunity from mother to offspring at birth.

- Improves gut health by providing to animals with a better capacity to absorb nutrients and cope with challenging environmental conditions.
- Limits negative impact of mycotoxins on animals.
- Binds a broad spectrum of major pathogens (E.coli, Salmonella) thanks to its high content in mannanoligosaccharides (MOS), reducing their attachment onto the intestinal mucus.
- Helps to raise animal natural self defenses • Enhances humoral immune responses under challenging conditions.
- Improves cell-mediated immune response to disease
- Binds specific mycotoxins avoiding its absorption through the intestine.

I hope this information has been helpful for you in understand a little more of the problems you may be experiencing with your horses.

Please feel free to contact us if we can be of more guidance.