

Bex-Tox[®] Dry

The Ultimate Defense Against Mycotoxins

Composition

- ✕ Yeast Cell Wall (*Saccharomyces cerevisiae*)
- ✕ Bentonite
- ✕ Sepiolite

Bextral

What are Mycotoxins?

- X Harmful substances produced by fungi as secondary metabolites
- X In animal feed, they can seriously harm livestock health, reducing growth, immunity, and productivity.
- X Managing mycotoxins is vital to keep feed safe and animals healthy.



5 main toxins in animal feed

Aflatoxins: Produced by *Aspergillus* species, often found in grains like corn. They are highly toxic, causing liver damage and cancer in animals.

Ochratoxin A: Produced by *Aspergillus* and *Penicillium* species, commonly found in cereals. It affects kidney function and can suppress the immune system

Zearalenone: Also from *Fusarium* species, often found in corn and other grains. It mimics estrogen, causing reproductive issues in livestock.



Fumonisin: Produced by *Fusarium* species, particularly in corn. They disrupt cell signaling, leading to diseases such as equine leukoencephalomalacia and porcine pulmonary edema.

Deoxynivalenol (DON or vomitoxin): Another toxin from *Fusarium*, common in wheat, corn, and barley. It can cause feed refusal, vomiting, and immune suppression

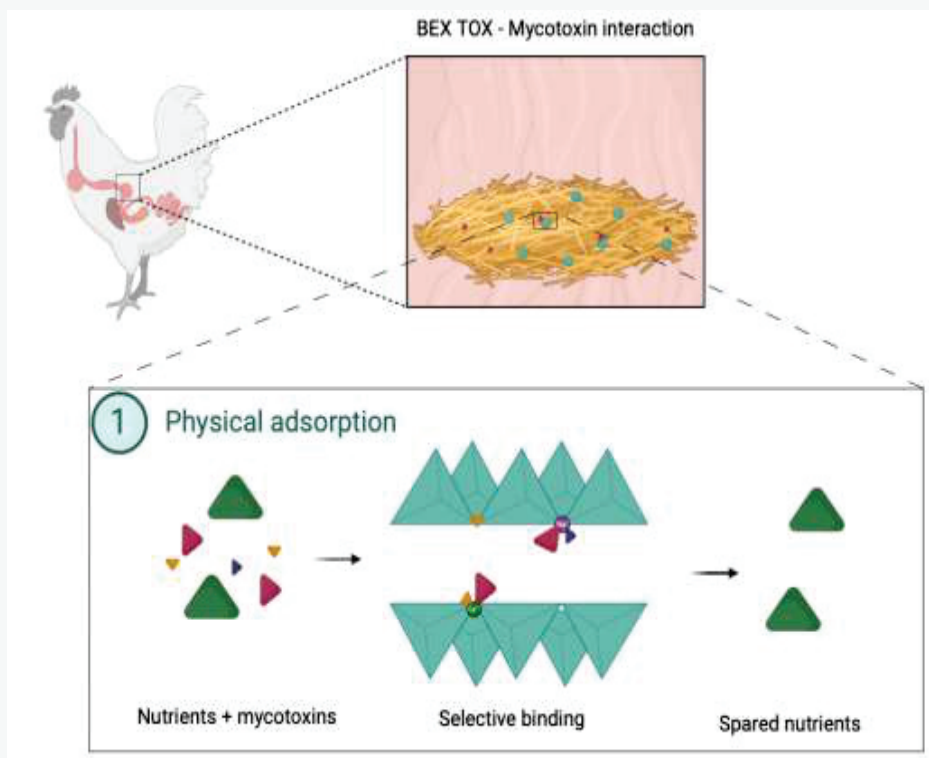
Mycotoxin effect on animal health

- X Mycotoxins are different in structure which gives them different affections at different stages of animal development
- X Due to their varied nature and effects, different strategies are required to mitigate the negative impacts of these mycotoxins.

Symptoms	AFB1	OTA	DON	T2	FB1	ZEA
Anorexia	+	+	+++	+++	+	
Growth	+++	+	+++	++	+	
Hepatic injury	+++	+			++	
Kidney injury		+++			+	
Abortions, infertility, vulvovaginitis					+	+++
Pulmonary edema					+++	
Immunosupresion	+++		++	++	+++	

BEX TOX: Physical adsorption

BEX TOX puts together carefully selected bentonite and sepiolite that bind mycotoxins through electrostatic interactions. Its porous structure ensures optimal adsorption. Mycotoxins are excreted, reducing toxicity while nutrients are absorbed.



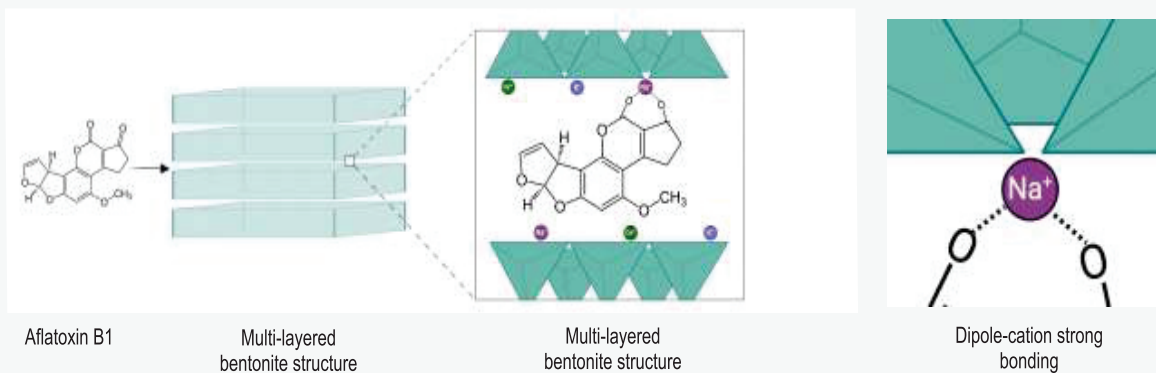
Bentonite adsorbants

Structure: Bentonite is mainly made up of montmorillonite, a type of clay that has a layered structure. These layers create a large surface area that can trap mycotoxins effectively.

Water Interaction: When bentonite comes into contact with water, it swells and expands. This expansion increases the spaces between its layers, allowing it to capture more mycotoxins.

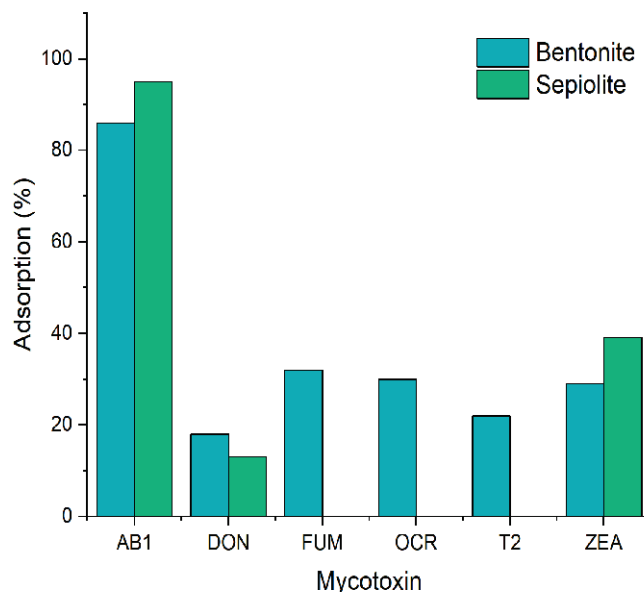
Surface Area and Cation Exchange: Bentonite has a high capacity to adsorb mycotoxins because of its large surface area and the ability to exchange ions.

Non-Toxic: Bentonite is safe for use in animal feed. It undergoes rigorous testing to ensure it is free from harmful contaminants like heavy metals or dioxins. This ensures that it does not pose any health risks to livestock.



Mineral binding - Limitations

- ✗ Not all mycotoxins bind to physical adsorbents due to limited access to layers or lack of interaction with mineral cations.
- ✗ A synergistic approach with biological controls is necessary for full protection

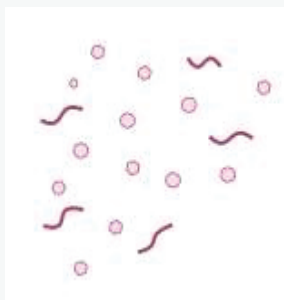


Biological control



Biodegradation

Microorganisms break down toxins into smaller molecules that can either be excreted or further adsorbed by mineral binders.



Biological Binding

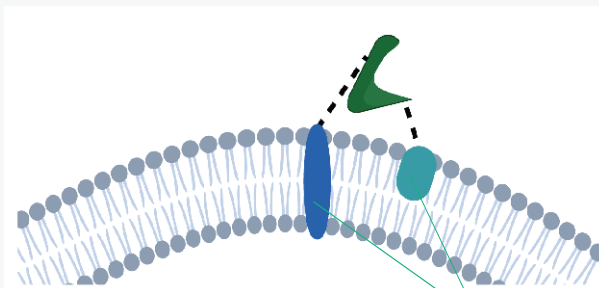
(biosorption)
Toxins are adsorbed by biological components and then excreted.

Biological Binding (Biosorption)

Yeast and yeast derivatives are highly effective in binding mycotoxins, offering several key advantages:

High Binding Capacity: The unique structure of yeast cells provides a large surface area and numerous binding sites, ensuring efficient mycotoxin absorption.

Natural and Safe: As a natural product, yeast and its derivatives are safe for use in animal feed, free from harmful contaminants like heavy metals and dioxins.



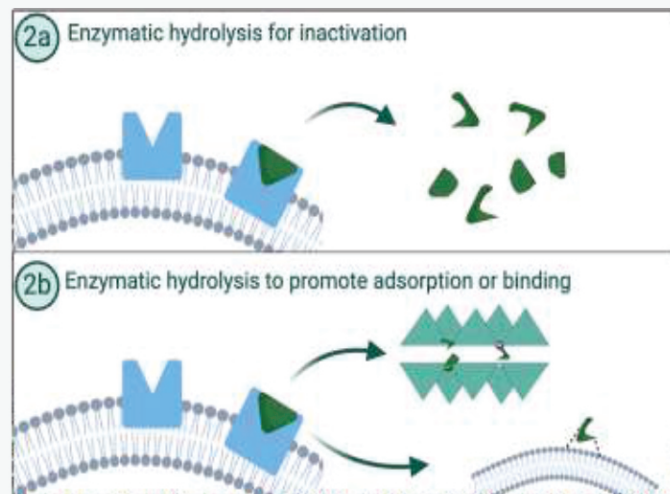
Enhances Gut Health: Beyond binding mycotoxins, yeast derivatives support overall gut health by promoting beneficial microbiota and improving digestion and immunity.

Selective Binding: Yeast cell walls contain components like beta-glucans and mannans, which selectively bind to mycotoxins, effectively neutralizing them without interfering with essential nutrients.

Biodegradation

Inactive mycotoxins are not harmful, regardless of their permanence in the digestive tract

Some mycotoxins, when degraded, can be adsorbed by the bentonite or bound to the yeast's cell membrane



Yeast extract: *Saccharomyces cerevisiae*

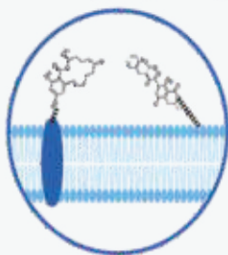
Innocuous to animals



Bioactive enzymes degrade mycotoxins



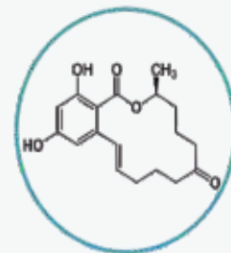
Membrane binding capacity



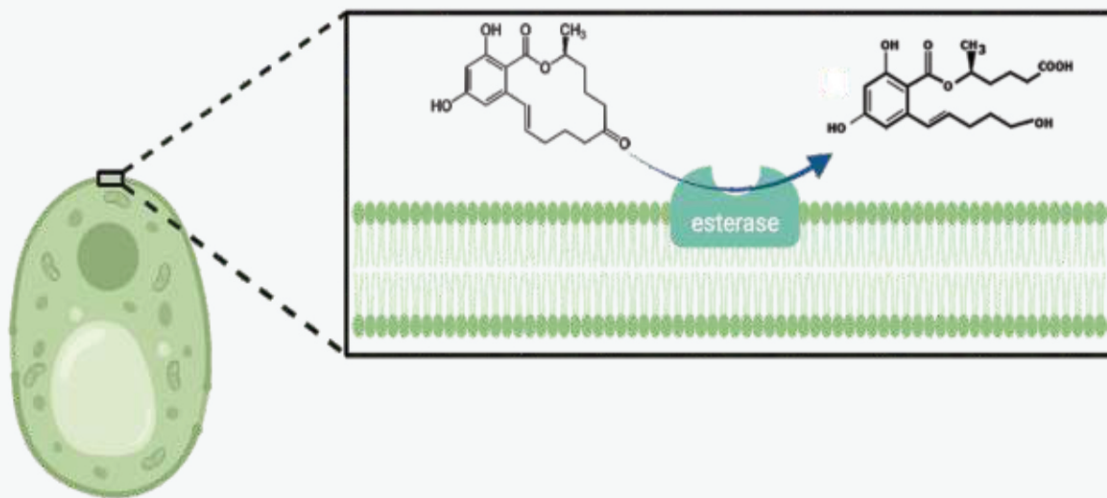
Due to β -D-glucans



90% Zearalenone degradation efficiency



Biodegradation of Zearalenone



- ✗ The Extract derived from yeast produces esterases which cleave the lactone ring due to the hydrolysis of ester groups
- ✗ The resulting detoxified form is not estrogenic in vivo and does not interact with the estrogen receptor in vitro
- ✗ Zearalenone (ZEN) possesses an estrogen-like structure capable of stimulating estrogen receptors
- ✗ A hypothetical ZEN-intermediate is theorized to occur, where an oxygen is added, adjacent to the ketonic carbon in the presence of certain fungal enzymes
- ✗ A specific esterase/lactonase opens the ring, inactivating its function

In vitro Trial Result – BEX TOX

Parameter	Aflatoxin	Ochratoxin	DON	ZEA	T2
Initial feed concentration	36.9 µg/kg	59.2 µg/kg	2.51 mg/kg	1.34 mg/kg	511 µg/kg
Final concentration	0.738 µg/kg	11.84 µg/kg	0.845 mg/kg	0.20 mg/kg	204.19 µg/kg
Adsorption percentage	98%	80%	66.31%	85.74%	60.04%

CHARACTERISTICS

- ✗ Available in 25 kg bag
- ✗ Produced in GMP+ certified facility

DOSAGE

- ✗ Poultry 500gm - 1kg / ton of feed
25gm - 50gm / Bag
- ✗ Dairy 500gm - 1kg / ton of feed
20gm - 30gm /A/D



خصوصیات:

- ✗ 25 کلو بیگ میں دستیاب ہے۔
- ✗ GMP+ سرٹیفائڈ فیکٹری میں تیار کیا گیا۔

خوراک:

- ✗ پوٹری 500 گرام - 1 کلو گرام / ٹن فیڈ
25 گرام - 50 گرام فی بیگ
- ✗ ڈیری 500 گرام - 1 کلو گرام / ٹن فیڈ
20 گرام - 30 گرام فی جانور روزانہ



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