



sorbatox

totally natural complexed hydrated aluminium silicate for all feeds

Irresistible and irreversible binder of mycotoxins

kiotechagil
Performance in aquaculture & agriculture

sorbatox

Sorbatox attracts and irreversibly binds toxins due to its natural characteristics:

It is a **hydrated sodium calcium aluminium silicate** of kaolinitic origin. This gives the natural mineral a very stable structure in the high moisture content of the digestive tract, with no affinity to absorb nutrients or other complex molecules, other than mycotoxins.

It has a **very high aluminium silicate content** (35%) which increases the number of binding sites within the mineral, rapidly attracting the mycotoxins and binding them firmly so that they pass through into the faeces without colonising the animal.

- It has an **acidic pH of 5** which, together with the high aluminium silicate content, gives Sorbatox a higher number of negatively charged sites capable of binding higher levels of mycotoxins. In addition, the lower pH does not buffer the natural digestive acids and helps prevent the risk of salmonellosis or colibacillosis.

principles of mycotoxicosis

Mycotoxins are secondary metabolites of toxigenic fungi produced from mould development. These are the most common forms of toxins but endo and exo toxins can also be produced by intestinal bacteria.

Most mycotoxins are stable molecules not destroyed by conventional feed processing, including extruded feed. If consumed by the animal they circulate in the blood, appear in milk and muscle tissue and concentrate in the liver and other organs.

Symptoms may be sub-clinical, where they may be vague, or chronic, depending on the amount and duration of exposure. The effects are generally seen as:

- reduced feed intake
- reduced growth and feed conversion
- immune and reproductive abnormalities



toxin family and health risk:

Genus	Mycotoxin	Problem	Clinical Effect
Aspergillus	Aflatoxin	Intake/growth	<ul style="list-style-type: none"> • Reduced feed intake • Poor FCR • Microscopic liver lesions • Vomiting/diarrhoea • Slower piglet growth due to toxins in sow milk
	Ochratoxin	Unexplained reduction in growth	<ul style="list-style-type: none"> • Liver/kidney damage • Bleeding/diarrhoea • Early abortion • Accumulates in meat
Fusarium	Tricothecenes: - T2 - Deoxynivalenol (Don/vomitoxin)	Intake/growth	<ul style="list-style-type: none"> • Oral lesions in beak of poultry • Feed refusal • Vomiting • Immune suppression
	Zearalenone	Breeding problems	<ul style="list-style-type: none"> • Damage to reproductive organs • Swelling of mammary glands and atrophy of the ovaries • Poor foetal development • Death of embryo at 1-3 weeks
	Fumonisin	Pigs Horses	<ul style="list-style-type: none"> • Pulmonary oedema • Reduced intake • Affects central nervous system • Once neurological signs are observed death usually follows
Penicillium	Ochratoxin/Citrinine		<ul style="list-style-type: none"> • Liver/kidney damage • Bleeding/diarrhoea • Early abortion • Accumulates in meat

mode of action

Sorbatox is a high purity hydrated aluminosilicate of 100% natural origin, with a high aluminium content and a low pH. These features give it a large number of negatively charged sites within the multi lateral matrix structure capable of binding higher levels of mycotoxins.

The advantage of a high aluminium content is that a high concentration of aluminium ions is able to replace the quadric - charged silicon ions with triply - charged aluminium ions. This results in lower +ve charges for Sorbatox and a higher number of -ve charged sites.

The acid pH of Sorbatox supports the high cation value which cannot be exchanged easily, unlike more alkaline products which do not contain free cations and can exchange easily. The acidic value does not buffer the natural intestinal acidity and is compatible with the use of acidifiers such as Salkil and Bact-A-cid in the feed.

Toxin binding is not a process that destroys the mycotoxins and the process does not work very effectively in dry feed. The binding effect requires an aqueous environment, such as the chime of the digestive tract, where the Sorbatox particles become charged and the mycotoxins, although only sparingly soluble in water, become mobile. Speed of action is essential at this point and this is where the high number of negatively charged sites is important to attract and bind the free toxins within the lattice structure making them harmless to the animal before they can have a systemic effect.

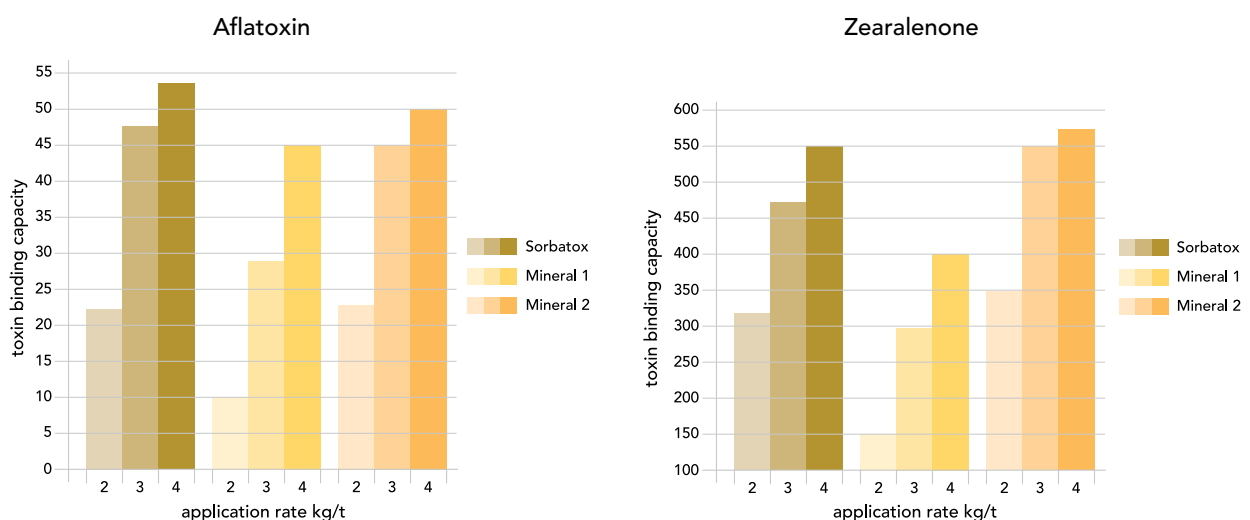
- **Sorbatox has a low sodium cation content** which prevents it from causing a sodium imbalance, which can impair phosphate availability.
- **Sorbatox has high activity** against Aflatoxins and Ochratoxins. These toxins can severely damage the liver and kidneys. By protecting the liver in particular, this organ is able to effectively counter other toxin types more effectively.
- **Sorbatox has significant activity against Fusarium** toxins such as Zearalenones, Vomitoxins and T-2 toxins, at lower levels than Aspergillus toxins.
- **Sorbatox has been shown not to bind nutrients** such as vitamins. The mineral base is categorised as Non-Expandable, unlike Bentinites and Monmorillonites, which may expand in an aqueous medium such as the intestinal fluid.
- **The particle size of Sorbatox** gives the product an enormous surface area – 10-12m²/g- making even the lowest dose equivalent to an international size football pitch.
- **Sorbatox is economical and cost effective** compared to other mineral binders, mixed binders or fermentation by-products.

trial results

In Vitro trials to determine comparative toxin binding capacity* of different agents.

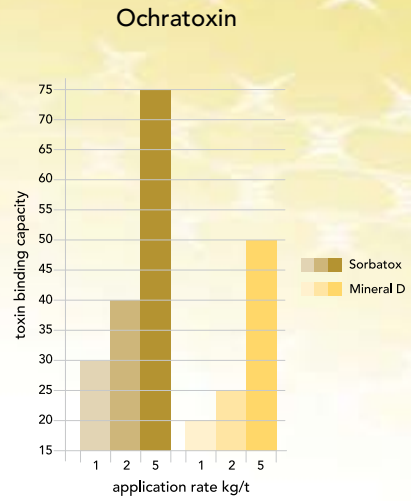
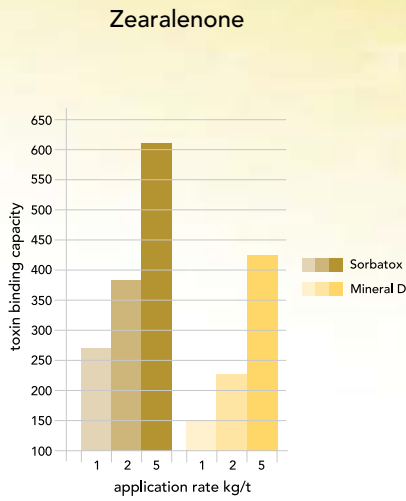
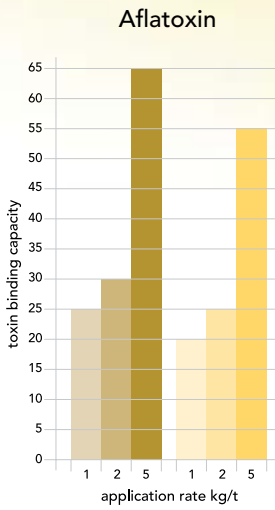
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Sorbatox compared to other aluminium silicate based products in artificially contaminated feed

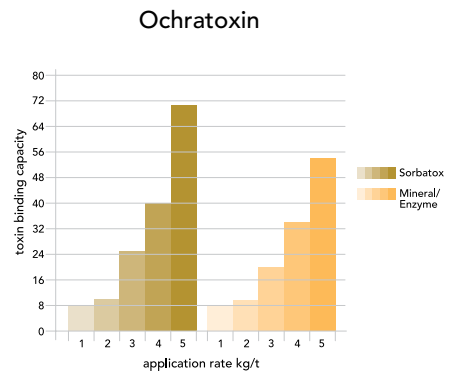
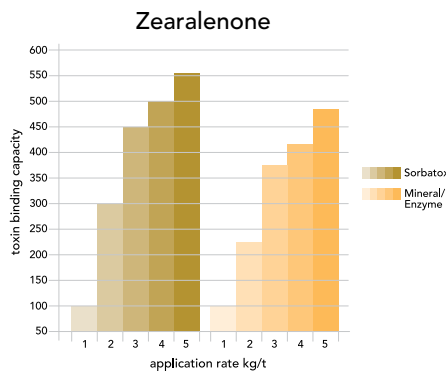
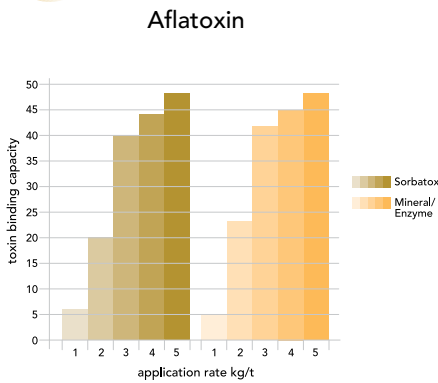


trial results - continued

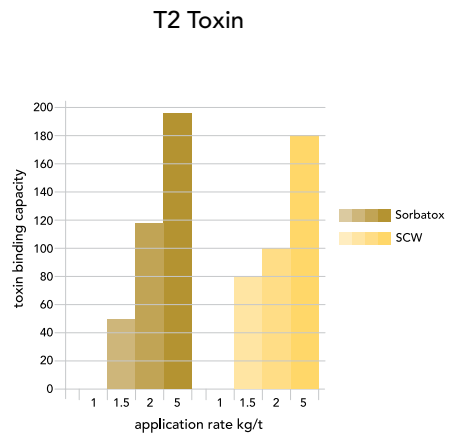
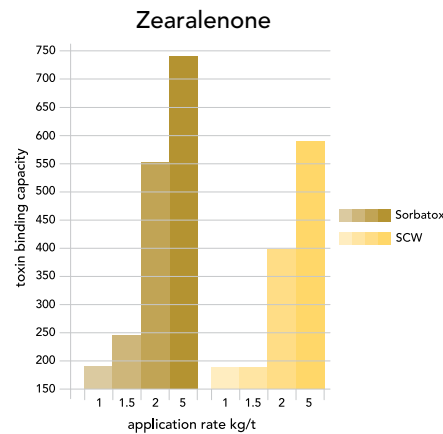
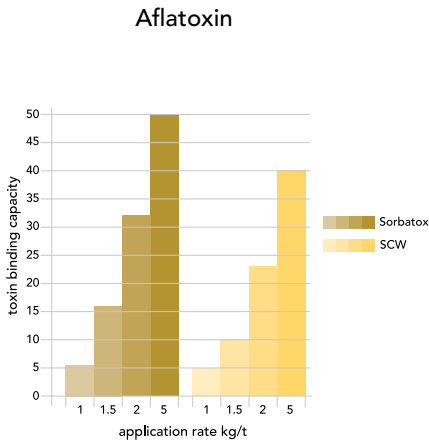
2 Sorbatox compared to mineral based aluminium silicates



3 Sorbatox compared to Mineral Product with added Enzymes

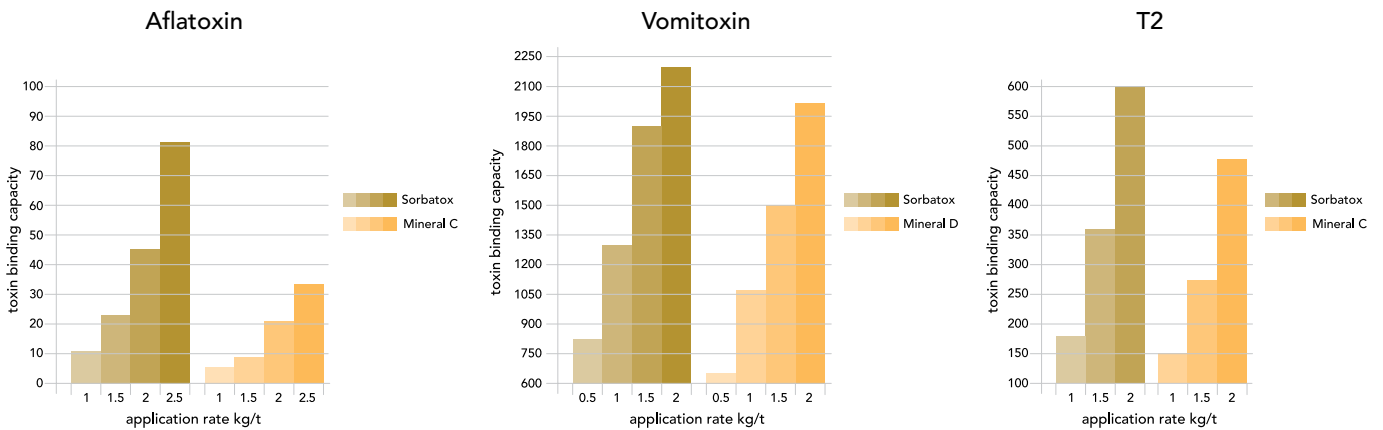


4 Sorbatox compared to Saccharomyces Cell Wall Product in artificial contamination



5

Sorbatox compared to other aluminium silicate based products in artificially contaminated feed



*toxin binding capacity = mg toxin absorbed per tonne of feed

dose recommendation

Typical inclusion rates are between 1.0 and 2.5 kg/t. When mycotoxin contamination levels are high, particularly with aflatoxins, inclusion rates up to 5 kg/t may be used.

Sorbatox should not be used whilst animals are being treated with in-feed or water soluble antibiotics based on Tilmicosin, such as Elanco Pulmotil®.

Sorbatox is dioxin free to current WHO guidelines and European legislation, and is safe to use in animal feed without withdrawal prior to slaughter.



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