



THE TOXIN BINDER
SINCE 1992

A product by
excellens inc.



HAYCO GROUP OF COMPANIES est 1950

Over 60 years of manufacturing world class products



Paradise Garden
Event Pavilion



Company History and Profile

The Hayco Group of Companies have been evolving for more than half a century. Starting as an engineering outfit and cereal processor, the groups have diversified into varied businesses. Throughout it's evolution, the company has practiced the values of financial prudence, involvement and above all, respect for everyone, customers and employees alike.

Mission

To provide value to our customers through the provision of quality goods and services. The organization will ensure that all people with whom we come in to contact will experience courtesy, respect and integrity of the highest order from every member of our team.

Product Lines and Business

Processed foods, food stabilizers, food emulsifiers, feed phosphates, toxin binders, agri-fertilizers, plastic packaging, furnitures, accessories, restaurants, convention centers and property development.



FOOD PARK . OFFICE . PADS



excellens inc.

OVER 200,000 TONS DELIVERED

Neutra-X

THE TOXIN BINDER

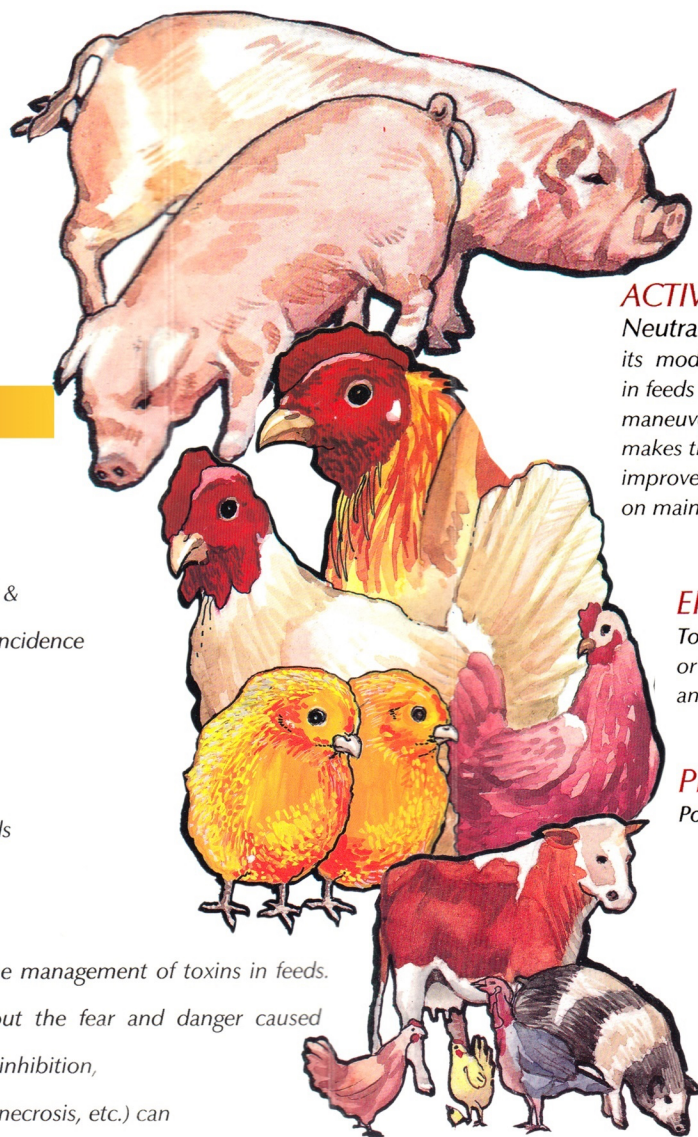
"the trusted brand by the livestock industry since 1992"

BACKGROUND

the occurrence of the growth of toxigenic molds and bacteria in feedstuff such as corn, sorghum, peanuts soybeans, fishmeal, meat & bone meal, etc. is quite common during transport or storage. The incidence of contamination is even higher in warm and humid countries.

Thus feedstuffs analyzed negative for molds or bacteria may, in a short duration of time, reach a high unacceptable level. When this happens the usual remedies will only eliminate the molds and bacteria but not the toxins that have already been produced.

The development of Neutra-X ushers in the breakthrough in the management of toxins in feeds. Contaminated feeds can now be fully and safely utilized without the fear and danger caused by the toxin. Thus the effects of the toxic metabolites (e. g. mitotic inhibition, immunosuppression, carcinogenesis, teratogenesis, hepatocellular necrosis, etc.) can now be controllable; weakness, unthriftiness, anorexia, and sudden deaths due to aflatoxicosis becomes manageable with Neutra-X



ACTIVITY

Neutra-X binds and adsorbs the toxins produced from molds and bacteria into its modified bond formation. This chemisorptive complex modulates toxin contamination in feeds from being ingested and absorbed by the livestock. The toxins are maneuvered out of the animal through the excrements. This sorbent activity of Neutra-X makes the entire contaminated feeds safe for use. Even in uncontaminated feedstuffs, improvement in feed conversion ratio will be noted through the use of Neutra-X on maintenance level.

EFFICACY

Toxin binder for feeds contaminated with toxigenic species of molds or bacteria. Increased feed conversion ratio through improved digestion and absorption of feed nutrients.

PHYSICAL DESCRIPTION

Powder form, cream, white color, very fine, free-flowing, odorless, tasteless.

DOSAGE

PREVENTIVE MAINTENANCE DOSE : 1 kg. per ton
MODERATE TOXIN CONTAMINATION : 2 kg. per ton
SEVERE TOXIN CONTAMINATION : 3 kgs. per ton

Manufactured under strict global quality standard.



a quality product of:

Excellens inc.

a member of Hayco Group
SINCE 1950

"60 yrs. of manufacturing world class products"

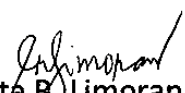
CERTIFICATE OF ANALYSIS & PRODUCT SPECIFICATION

PRODUCT	Neutra-X Toxin Binder
TECHNICAL DESCRIPTION	Hydrated Sodium Calcium Aluminosilicate
CAT-ION EXCHANGE CAPACITY	38.70 MEQ (Non expandable)
COLOR	Light cream
CLAY TYPE	Dipolar
FINENESS	85% Passing 200 Mesh
PORE SIZE	2.5 Angstrom
BULK DENSITY	32-36 lbs/ft ³

CHECMICAL ANALYSIS	PRODUCT SPECIFICATION	ACTUAL ANALYSIS
SiO ₂	60-65%	62.80%
Al ₂ O ₃	10-12%	11.35%
Fe ₂ O ₃	1-2%	1.20%
CaO	0.5-2%	1.43%

DATE ISSUED: January 7, 2020
EXP DATE: January 01, 2023
BATCH NUMBER: 7-A-2020: A

Analyzed by:


Lolita R. Limoran

Quality Assurance Laboratory Chemist

SWITCH TO NEUTRA-X NOW!

- Consumed by integrators and farms since 1992
- Rapidly binds and absorbs mycotoxins
- Broad working spectrum
- No absorption of other nutrients
- Extensively tested in vitro and in vivo and proven highly effective
- Stable during feed production and ingestion
- Low inclusion rate
- Price competitive

PRODUCT DESCRIPTION

BRAND	NEUTRA-X
TECHNICAL DESCRIPTION	Hydrated Sodium Calcium Silicate
BINDING PROPERTIES	No binding of vitamins and other feed nutrients due to incompatible electrical charges and cationic interchange properties with said ingredients
CATONIC EXCHANGE CAPACITY	38.70 MEQ (Non expandable)
COLOR	Light cream
CLAY TYPE	Dipolar
FINENESS	44 microns
PORE SIZE	2.5 A
BULK DENSITY	32-36 lbs/ft ³

NEUTRA-X IN-VITRO PROTOCOL AND FINDINGS

MECHANISM OF AFLATOXIN CHEMISORPTION

Several test compounds were reacted with Neutra-X in vitro. Binding was determined by high pressure liquid chromatographic analysis of extracts of the supernatants and desorbed Neutra-X pellets were sequentially washed with methanol, chloroform and hexane. Test compounds homologous to aflatoxin B₁ and aflatoxin G₁ (i.e. aflatoxins B₂, G₂, B_{2a}, Q₁, P₁, M₁, M₂ and M_{2a}) were tightly bound to Neutra-X, whereas those that contained a dihydrofurofuran fused to an aromatic ring did not show any marked interaction and binding. Coumarin, 4-methylumbelliferone, esculetin, xanthoxin, aflatoxicol, and tetrahydroxydeoxyaflatoxin B₁ were initially bound, but significantly desorbed from the Neutra-X pellet. These findings suggest that Neutra-X has a preference for compounds containing a β -ketolactone or an α bislactone (e.g. aflatoxins B and G series). Model compounds of aflatoxin B₁ and tetrahydrodeoxyaflatoxin B₁ were synthesized. The compounds which did not contain the bisfuran were comparable to the corresponding aflatoxins in their chemisorption to Neutra-X. A proposed mechanism of aflatoxin chemisorption by Neutra-X is the formation of a complex by the β -carbonyl system of the aflatoxins with uncoordinated "edge site" aluminium ions in Neutra-X.

AFLATOXIN DEGRADATION BY ALUMINOSILICATES

Aluminosilicates are chemically complex materials, exhibiting a variety of functional properties. These materials possess sizable surface areas, high porosity, and variable cation exchange activities, along with active sites that can interact with an immobilized certain guest molecules via weak electrostatic forces or through the formation of strong covalent bonds. Recently, we observed that many inorganic materials that bind aflatoxin also exhibit the ability to chemically degrade molecules (to different extents) upon desorption of the complex. Aflatoxin bound to Neutra-X was much more resistant to removal. These data along with previous in vivo studies support the conclusion that the protective action of Neutra-X may be related to the stability of the Neutra-X-aflatoxin sorption complex. Chemical treatment by aluminosilicates may represent another approach to detoxification.

SUMMARY AND CONCLUSIONS

Our findings indicated that Neutra-X selectively chemisorbs aflatoxins in aqueous solutions and prevents aflatoxicosis in chickens. The basic mechanism seems to involve sequestration of aflatoxins in the gastrointestinal tract and selective chemisorption (tight binding) to Neutra-X that results in a reduction in aflatoxin bioavailability (and toxicity).

FEEDING TEST ON BROILER CHICKS UTILIZING NEUTRA-X AS TOXIN SORBENT

OBJECTIVE To determine chemisorptive properties of Neutra-X on broiler chicks through measurement of the bioavailability of radioactive aflatoxin to the liver and blood.

PROCEDURE AND RESULTS 280 broiler chicks were divided into 7 groups. Birds in groups 1-3 were provided non-treated feed. Birds in groups 4-7 were placed on Neutra-X-treated feed at day 1. Total aflatoxin in the 20-ppb group was composed of 10 ppb of C-aflatoxin B₁ and 10 ppb cold aflatoxin B₁. Total aflatoxin in the 80-ppb groups was composed of 10 ppb of C-aflatoxin B₁ and 70 ppb cold aflatoxin B₁. Between days 13 and 14, feed consumption was determined per pen. Based on an average feed consumption per bird of 25 kg/24-hr period, total amount of aflatoxin (C-aflatoxin B₁ + aflatoxin B₁) required to deliver a dose of 20 ppb and 80 ppb were 0.5µg/bird and 2.0µg/bird, respectively. Appropriate amounts of aflatoxin in 0.15 g of feed were placed in gelatin capsules (capable of dissolving in the crop) and were introduced into the esophagus in each chick. Immediately after dosing, the birds were returned to their pens and offered their respective diets. Samples of liver and blood were taken from

treatment groups 2-7 at 0.5, 1.0, 2.0, 4.0 and 6.0 hours and counted for radioactivity. Parameters of absorption and elimination of radioactivity relative to peak concentrations of the control (100%) and area-under-the-curve (AUC) were computed by the curve-fitting program ESTRIP. These values were used as a measure of the bioavailability of radioactivity to the liver and blood.

Addition of 0.5% Neutra-X in the diet of chicks significantly reduced the percentage of radioactivity in the blood (Figure 1) and the liver data (not shown) throughout the treatment period (80-ppb treatment group). The relative AUC (as measure of bioavailability) was decreased in the presence of 0.5% Neutra-X to 8.7% and 5.3% of control in the blood; 20.6% and 14.6% of control in the liver at 20 and 80 ppb aflatoxin, respectively. In the presence of 0.1% Neutra-X, the relative AUC was decreased to 22.5% and 15.4% of control in the blood and 32.55 and 17.4% of control in the liver at 20 and 80 ppb aflatoxin, respectively (Figures 2 and 3).

CONCLUSION The findings suggest that Neutra-X acts to rapidly bind aflatoxin in the gastrointestinal tract of the chickens, thus preventing its normal absorption by the blood and distribution to the liver.

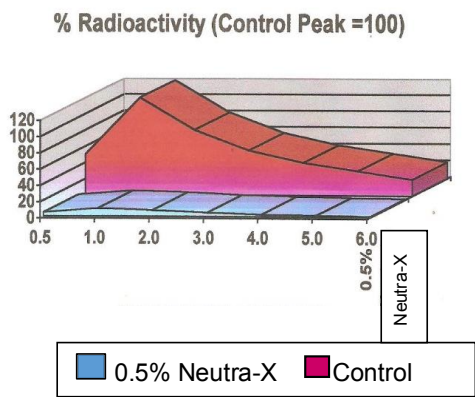


Figure 1. C-aflatoxin B1 in blood of broiler chicks fed the equivalent of 80 ppb aflatoxin (2.0 µg total aflatoxin/bird) with and without 0.5% Neutra-X in their diet. Data represent percentage of radioactivity relative to peak concentration of the control (100%) over a sampling period of 6 hours (5).

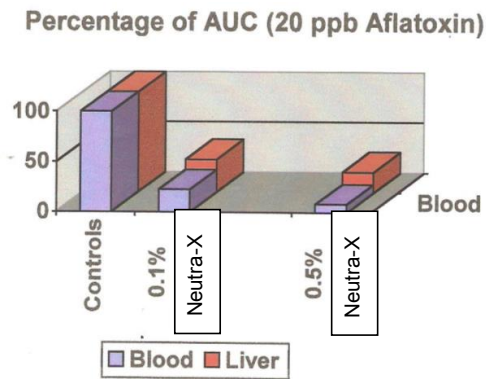


Figure 2. Relative bioavailability of C-aflatoxin B1 to blood and liver of chicks fed the equivalent of 20 ppb total aflatoxin (0.5 µg/bird) with and without 0.1% and 0.5% Neutra-X in their diet. Data expressed as percentage of AUC (area-under-the-curve) where control AUC = 100% (5).

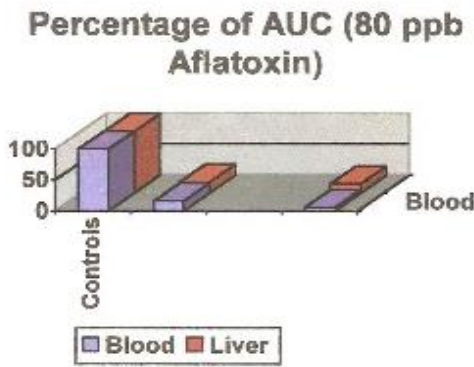


Figure 3. Relative bioavailability of C-aflatoxin B1 to blood and liver of chicks fed the equivalent of 80 ppb total aflatoxin (2.0 µg/bird) with and without 0.1% and 0.5% Neutra-X in their diet. Data expressed as percentage of AUC (area-under-the-curve) where control AUC = 100% (5).

EFFECT OF VARIOUS LEVELS OF NEUTRA-X ON BROILER PERFORMANCE

OBJECTIVE To determine the effects of Neutra-X at various levels (0, 2 and 5 kg per ton of feed) on feed consumption, body weight, feed conversion, efficiency and mortality of broilers.

METHODOLOGY A total of 15,000 birds were equally distributed at random into three treatments consisting of 5 replicates each. Birds on treatment 1 were given basal diet with Neutra-X at the rate of 5 kg/ton of feed. Birds on treatment 2 were given basal diet with Neutra-X at the rate of 2 kg/ton feed. Birds on treatment 3 were given basal diet without Neutra-X (control). US Soya containing 0.8 ppb T₂ and 20 ppb aflatoxin was used in the diet.

PERFORMANCE AT 42 DAYS

Treatment	BW, g	FCR	FC, g	Mortality, %
1	1,658	1.98	3,283	5.88
2	1,646	2.01	3,308	3.33
3	1,585	2.04	3,233	7.50

CONCLUSION

- Inclusion of 5kg Neutra-X/ton of feed significantly improved the performance of broilers in terms of body weight, feed conversion, efficiency and mortality.
- In terms of mortality, improvements can be observed even at lower levels of Neutra-X (2kg/ton).

RECOMMENDATION

Contamination Level	Description	Dosage
Severe	a. If Aflatoxin level is below 20 ppb but presence of 0.5 ppb T ₂ is detected	5 kg/ton
	b. 20 ppb Aflatoxin and above	
Moderate	a. 20 ppb Aflatoxin and below	2 kg/ton

Note: Interaction of various types of toxins like Aflatoxin, T₂ or Ochratoxin even at low levels can be considered severe contamination. It can cause serious damage on animal performance.

MATERIAL SAFETY DATA SHEET (MSDS)

01 – IDENTIFICATION OF THE PRODUCT

Product Name: NeutraX
Supplier: Excellens Incorporated
Address: 1133 Hernan Cortes St., Mandaue City, Cebu
Phone/Fax: (032) 236 1944

02 – COMPOSITION OF THE PRODUCT

Chemical Name: Calcium, Potassium, Sodium Aluminosilicate
Chemical Formula: $(Ca, K_2, Na_2, Mg) 4Al_8Si_4O_{96} \cdot 24H_2O$

03 – HAZARDS IDENTIFICATION

Main Hazards: Not classified as hazardous. Possibility of dust generation in handling.
Health Effects(Eyes): Dust can cause transient irritation by abrasion.
Health Effects(Skin): Dust may cause irritation by abrasion.
Health Effects: Inhalation of the dust may cause irritation the mucous membrane and upper airways. Symptoms can include sneezing, coughing and breathing difficulties.

EC Safety:

S25 (avoid contact with eyes)
S22 (do not breathe dust)

04 – FIRST AID MEASURES

Eye Contact: Immediately flood the eye with plenty of water for at least 10 minutes, Holding the eye open. If irritation develops seek medical attention.

Skin Contact: Wash skin thoroughly with soap and water.

Inhalation: Move the person in open air. If irritation develops, seek medical attention.

05 – FIRE FIGHTING MEASURES

NeutraX is not combustible in case of fire & is compatible with all extinguishing media.

06 – ACCIDENTAL RELEASE MEASURES

No toxic effects. Clean and recover as suitable. Do not generate dust and collect in suitable containers for recovery or disposal. Dispose of in a landfill.

07 – HANDLING AND STORAGE

Handling: Avoid creating dust. Avoid inhaling dust.
Storage Precautions: Store in a cool dry place, out of direct sunlight.
Not classified as a Dangerous Goods for transport by road and rail.

08 – EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory Protection: Dust respirator if conditions dusty.

Ventilation: Local exhaust ventilation is recommended when dust is Likely to be generated from the handling of the material.

Eye/Skin Protection: Use goggles/face shield, pvc gloves, and normal work wear overall.

09 – PHYSICAL AND CHEMICAL PROPERTIES

Physical State (20 °C): Solid
Color: Ivory White
Odour: None
Melting Point: > 1000 °C
Boiling Point: Not relevant
Freezing Point: Not relevant
Solubility in Water: Not Soluble

10 – STABILITY AND REACTIVITY

Stability: Stable under normal conditions of use
Conditions to Avoid: Not Applicable
Hazardous Polymerization: Will not Occur
Material to avoid: Strong Oxidising Agents

11 – TOXICOLOGICAL INFORMATION

Inhalation: Inhalation of the dust may cause irritation the mucous Membrane and upper airways.
Eye Contact: This material is irritant to the eyes.
Skin Contact: The degree of irritation was insufficient to warrant Labeling as a skin irritant.

12 – ECOLOGICAL INFORMATION

Mobility: This product is not volatile and insoluble and will accumulate in the ground.
Presistence/Degradation: This product is resistant to biodegradation.

13 – DISPOSAL CONSIDERATIONS

Dispose in a landfill. Dispose of in accordance with all applicable local and national regulations.

14 – TRANSPORT INFORMATION

Not regulated.

15 – REGULATORY INFORMATION

NeutraX is approved by EU for use in the swine and poultry industry as Myco-Toxin binder (70/524/EEC). It is approved by the FDA for use in animal feeds use as anti caking agent. Natural NeutraX is inert, non toxic minerals which are classified as GRAS (generally recognized as safe) in most applications and exempted from regulations and reporting when used in accordance with good agricultural practices and when less than 2% in animal feed products.

16 – OTHER INFORMATION

This Material Data Sheet (MSDS) has been prepared in compliance with the relevant directives and regulations. The information in this MSDS should be provided to all who will use, handle, store, transport, otherwise be exposed to this product.