

# CLINOMIX<sup>®</sup> MYCOTOXIN BINDING AGENT & STOCK REMEDY

REGISTERED WITH THE SOUTH AFRICAN DEPARTMENT OF AGRICULTURE

Reg. No. G1085 ACT/WET 36 of 1947

## PRODUCT INFORMATION & TEST REPORTS



COWS

HORSES



PIGS

SHEEP



[www.pratleyminerals.com](http://www.pratleyminerals.com)



# PRODUCT INFORMATION

## 1. DESCRIPTION

Clinomix is a high-tech zeolite based feed additive which through rigorous testing is registered with the South African Department of Agriculture as a stock remedy (Reg No. G 1085). Due to the product's unique cation exchange, molecular sieving and surface structure, considerable benefits are realised when Clinomix is included in animal feed rations.

## 2. PRIMARY BENEFITS

### ***2.1. Mycotoxin Binding:***

Clinomix is an extremely effective mycotoxin binder. Dangerous mycotoxins which may be present in certain feeds are effectively bound when using Clinomix. Bound mycotoxins can then safely pass through the gastro intestinal tract without the danger of these harmful toxins being absorbed into the animal's body. Efficacy tests demonstrating the effectiveness of Clinomix may be referenced later in this document.

### ***2.2. Increased NPN (Urea) For Ruminants:***

Microorganisms in the rumen convert simple nitrogen compounds into protein. Nonprotein nitrogen (NPN) is then converted into ammonia and then into amino acids and proteins. NPN (primarily urea) in the feed generates high levels of ammonia which can be toxic. Clinomix effectively absorbs this excess ammonia. The addition of Clinomix into the feed thereby allows the farmer to feed more NPN (urea) with all its economic advantages.

### ***2.3. Very Effective At Curing Diarrhea/Scours:***

Clinomix has been shown to effectively alleviate acute and chronic diarrhea / scouring. This is particularly beneficial when breakouts occur in feedlots and high-density farms.

#### ***2.4. Odour & Manure Control:***

Clinomix in the feed significantly reduces both odour and faecal moisture. This leads to more hygienic living conditions ultimately resulting in healthier animals. The droppings are also much easier to handle.

#### ***2.5. Feed Flow & Anti Caking Properties:***

Clinomix in the feed is an effective flow and anti-caking agent. When pelletizing feed (e.g. dog foods), this property keeps the feed free-flowing and ingredients uniform within the mix. All this whilst also binding mycotoxins.

#### ***2.6. Reduced Antibiotic Requirement Improved Health and Lower Mortality:***

In Europe where zeolite is commonly fed, antibiotics are seldom used. The unique microporous structure of Clinomix is thought to have a “probiotic” effect thereby providing a suitable environment within the animal gut where beneficial intestinal flora can flourish. Invitro studies have shown that the production of some natural antibiotics by non pathogenic microbes is significantly increased. All of this ultimately improves animal health and lowers mortality.

#### ***2.7. Value Added Manure / Compost:***

Clinomix in the feed leads to drier and less odourous manure. Clinomix also increases the compost’s water retention and its holding capacity for Nitrogen and micronutrients in the growth zone. The soil has increased ion exchange capacity, increased K and Ca and better aeration. These are significant benefits which farmers should advertise when selling compost.

#### ***2.8. Rumen Buffer:***

Clinomix buffers the rumen, increases stock digestion and reduces the incidence of ruminal acidosis. This is especially important when converting grazing animals to high energy grain diets. It will also help in preventing acidosis related ailments like laminitis.

### 3. PHYSICAL PROPERTIES & STRUCTURE

Appearance: Cream coloured granular powder (reflective whiteness 80% (MgO=85%))

Main Phase: >90% Clinoptilolite Zeolite (XRD Analysis)

Specific Gravity : 2.2g/cm<sup>3</sup>

Bulk Density: 1.05g/cm<sup>3</sup>

Moisture Content: <7.3% (5.7% is free water)

### 4. DOSAGE

Include 30kg – 50kg of Clinomix per 1000kg's of feed. Up to 7% may be necessary when addressing problems such as diarrhea or ammonia “bloat”. No withdrawal is necessary. It is recommended that Clinomix be fed continuously.

### 5. PACKAGING

- 25kg bags
- 50kg bags



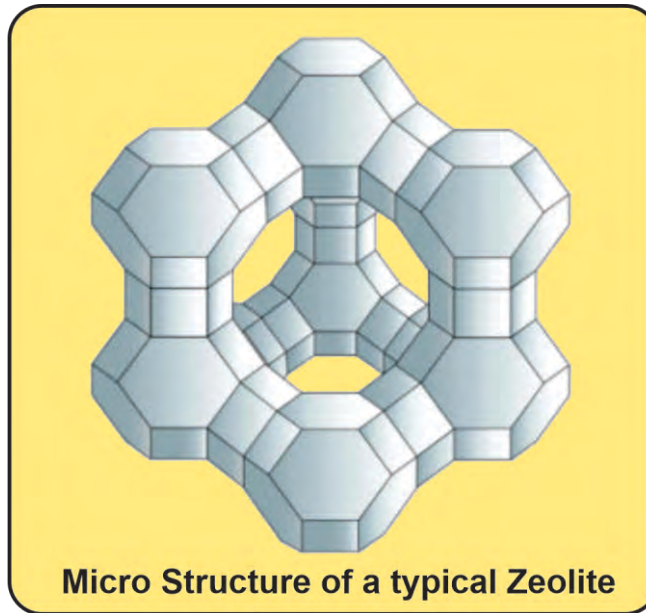
25kg bag  
(Product Code 99079)



50kg bag  
(Product Code 99070)

## ***6. PHYSICAL STRUCTURE***

Clinomix is manufactured from a naturally occurring high purity “clinoptilolite”. The three dimensional open framework “honeycomb” structure encloses a hollow core with an extremely powerful negative charge density. This gives rise to Clinomix's unique absorption and ion-exchange capabilities.



# TEST REPORTS

## 1. CLINOMIX MYCOTOXIN BINDING TRIALS

Efficacy tests were conducted to determine to what extent Clinomix binds various mycotoxins. Tests were conducted by Senior Analyst S. Davey at the SANAS approved SGS Agri Food Laboratory.

### Method

An animal feed sample was spiked with an amount of toxin. Samples were then tested using High-Performance Liquid Chromatography (HPLC) to obtain an initial value of toxin present in the feed. Samples were then treated with a dose of Clinomix. Following treatment, toxin levels were again ascertained using HPLC. Toxin levels before and after treatment were then compared to determine to what extent Clinomix binds the various mycotoxins.

### Results

The results concluded that Clinomix is extremely effective at binding mycotoxins. In a sample in which the initial aflatoxin count was 4196 µg/kg, following treatment with Clinomix the total aflatoxin levels dropped to below 4 µg/kg. Table below provides a summary of the mycotoxin binding effect of Clinomix.

MYCOTOXIN NAME	TOXIN AMOUNT PRESENT BEFORE CLINOMIX TREATMENT (µg/kg)	TOXIN AMOUNT PRESENT AFTER CLINOMIX TREATMENT (µg/kg)	% BOUND BY CLINOMIX (EXPRESSED AS A % OF INITIAL LEVEL OF CONTAMINATION) (%)
Aflatoxin B <sub>1</sub>	3217	<1	99.9
Aflatoxin B <sub>2</sub>	309	<1	99.9
Aflatoxin G <sub>1</sub>	376	<1	99.9
Aflatoxin G <sub>2</sub>	294	<1	99.9
<b>Total Aflatoxin</b>	<b>4196</b>	<b>&lt;4</b>	<b>99.9</b>
Deoxynivalenol (DON)	381 mg/kg	<0.10 mg/kg	99.9
Zearalenone (ZON)	50828	2496	95.1
T2	110	77	30
HT2	100	69	31
T2/HT2	210	146	30.5

## ***2. TOXICOLOGY REPORT***

A toxicity study was conducted by the University of Pretoria's, Faculty of Veterinary Sciences Onderstepoort to determine the toxicity of Clinomix. Tests were carried out by Dr. I.B.J Van Rensburg and Dr. A. Immelman.

### Method

An LD<sub>50</sub> test was conducted using laboratory rats dosed for 10 days with varying amounts of Clinomix.

### Results

The results concluded that the toxicity of Clinomix is so low that an LD<sub>50</sub> value could not be determined.

### 3. CLINOMIX PERFORMANCE TRIALS ON LAYING HENS

A test was conducted to determine what benefits Clinomix has on laying hens. The test was conducted by the “Animal and Dairy Science Research Institute”, based in Irene South Africa. Testing and analysis were conducted by M.D. Olver.



#### Method

One hundred and twenty, 4-month-old, single-combed, brown Hy-Line pullets were fed two isocaloric diets containing 16 or 13,5% protein with and without 5% Clinomix in four treatments with thirty hens per replicate. The hens were housed in individual cages in a naturally ventilated laying house and fed the four different diets for 476 days.

#### Results

Hens that were fed the Clinomix diet laid more eggs than those that were not fed the Clinomix diet. On average each hen laid 26 more eggs over a 68 week laying period than hens that were not fed Clinomix. Hens that were fed the Clinomix diet laid their first eggs earlier than those that did not receive Clinomix. See results in table below.

DAYS BEFORE LAYING FIRST EGG	
DIET	DAYS BEFORE FIRST EGG
16% Protein + Sand	181
13% Protein + Sand	178.8
16% Protein + Clinomix	174.3
13% Protein + Clinomix	174.3



Faecal moisture content of hens that were fed Clinomix was significantly lower than those that did not receive Clinomix. See table below.

Distal and proximal intestinal pathogenic colony counts were very significantly lower in hens fed Clinomix. Trial analysis concluded that this could mean that hens fed with Clinomix were healthier and less susceptible to disease than those not fed with any Clinomix. (See table below).



<b>MEAN FAECAL MOISTURE % AND PATHOGENIC BACTERIAL COLONY COUNTS OBSERVED IN HENS FED WITH AND WITHOUT CLINOMIX</b>			
<b>DIET</b>	<b>FAECAL MOISTURE %</b>	<b>PROXIMAL INTESTINE</b>	<b>DISTAL INTESTINE</b>
16% Protein + Sand	72.8	388	4333
13% Protein + Sand	73.7	376	4350
16% Protein + Clinomix	67.6	62	1700
13% Protein + Clinomix	68.4	63	1673

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For  
**CLINOMIX SAFETY DATA  
SHEET (SDS)**  
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[www.pratleyminerals.com](http://www.pratleyminerals.com)

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# CLINOMIX<sup>®</sup> MIKOTOKSIENBINDINGS- MIDDEL & VEEGENEESMIDDEL

GEREGISTREER BY DIE SUID-AFRIKAANSE DEPARTEMENT VAN LANDBOU  
Reg. Nr. G1085 ACT/WET 36 of 1947



KOEIE

PERDE



VARKE

SKAPE



## PRODUKINLIGTING & TOETSVERSLAE



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# PRODUKINLIGTING

## 1. BESKRYWING

Clinomix is 'n voerbymiddel met 'n zeoliet basis, wat na streng toetse geregistreer is as 'n veegeneesmiddel by die Suid-Afrikaanse Departement van Landbou (Reg Nr. G 1085). Die produk se unieke kationuitruiling, selektiewe molekuleskeiding en oppervlakstruktuur, bied aansienlike voordele wanneer Clinomix in veevoer gemeng word.

## 2. PRIMÊRE VOORDELE

### **2.1 Mikotoksien Binding:**

Clinomix is 'n baie effektiewe mikotoksienbinder. Gevaarlike mikotoksiene, wat in sekere voermiddels kan voorkom word effektief gebind wanneer Clinomix gebruik word. Verbinde mikotoksiene kan dan deur die spysverteringskanaal beweeg sonder dat hierdie skadelike gifstowwe in die dier se liggaam geabsorbeer word. Daar word later in hierdie dokument na doeltreffendheidstoetse van Clinomix verwys.

### **2.2 Verhoogde Proteïen Omskakeling Vir Herkouers:**

Mikro-organismes in die rumen skakel stikstof om in proteïen. “Nie-proteïndraende stikstof” (NPN) word dan omskakel in ammoniak en daarna in aminosure en proteïene. Hoë ammoniakvlakke wat veroorsaak word deur die gebruik van nie-proteïndraende stikstof soos ureum, kan in groothoeveelhede skadelik en selfs giftig wees vir die dier. Clinomix absorbeer hierdie oormaat ammoniak effektief. Die byvoeging van Clinomix in voer stel die boer dus in staat om meer NPN (nie-proteïndraende stikstof) te voer.

### **2.3 Baie Effektief Vir Die Behandeling Van Diarree/Loopmaag:**

Dit is bewys dat Clinomix effektief is vir die verligting van akute en kroniese diarree/loopmaag, veral wanneer dit uitbreek in voerkrale en hoëdigheidsplase.

### **2.4 Reuk-en-Mis Beheer:**

Clinomix gemeng in voer verminder beide slegte reuke en oormatige klam mis. Dit bevorder meer higiëniese lewensomstandighede wat uiteindelik tot gesonde diere lei. Dit vergemaklik ook die hantering van die mis.

### **2.5 Voer Vloeibaarheid:**

Clinomix gemeng in voer verbeter die vloeibaarheid en verminder ook samekoeking van die voer. Wanneer die voer in pilvorm gemaak word (b.v. hondekos), hou hierdie eienskap die voer vrylopend en die bestandele bly eenvormig binne-in die mengsel (Dit alles terwyl mikotoksiene ook verbind word).

### **2.6 Verminderde Antibiotika Behoeft, Verbeterde Gesondheid En Verlaagde Sterftesyfer :**

In Europa, waar zeoliet algemeen gevoer word, word antibiotika selde gebruik. Die unieke mikroporeuse struktuur van Clinomix word geag om 'n "probiotiese" effek te hê en voorsien dus 'n geskikte omgewing binne die dier se maag waar voordelige ingewandsflora kan floreer. In-vitro studies het getoon dat die produksie van sommige natuurlike antibiotikas by nie-patogeniese mikrobe aansienlik toeneem. Dit verbeter uiteindelik die diere se gesondheid en verlaag die sterftesyfer.

### **2.7 Mis/Kompos Met Toegevoegde Waarde:**

Clinomix in die voer dra daartoe by dat die mis droër is en verminder die reuk. Clinomix verhoog ook die kompos se water-retensievermoë en die hou vermoë van stikstof en mikronutriënte in die groeistreek van die plant. Die grond het dan verhoogde ionuitruilvermoë, verhoogde K en Ca en verbeterde belugting.

### **2.8 Grootpens/Rumen buffer:**

Clinomix dien as 'n rumenbuffer, verbeter spysvertering en verminder die voorkoms van rumenasidose (suurpens). Dit is veral belangrik wanneer herkouers van grasweiding na 'n hoë-koolhidraat, graandieet oorgeskakel word. Clinomix help ook om asidose-verwante kwale soos laminitis te voorkom.

### 3. FISIESE EIENSKAPPE & STRUKTUUR

Voorkoms: Roomkleurige korrelrige poeier (weerkaatsende witheid 80% (MgO=85%))

Hooffase: >90% Clinoptilolite Zeoliet (XRD Analise)

Relatiewe Digtheid : 2.2g/cm<sup>3</sup>

Massadigtheid: 1.05g/cm<sup>3</sup>

Voginhoud: <7.3% (5.7% is vry water)

### 4. DOSERING

Meng 30kg – 50kg Clinomix per 1000kg se voermiddel. Tot op 7% mag benodig word om probleme soos diarree of Ammonia “opgeblaasheid” te behandel. Geen onttrekking word benodig. Dit word aanbeveel dat Clinomix voortdurend gevoer word.

### 5. VERPAKKING

- 25kg sakke
- 50kg sakke



25kg Sak  
(Produkkode 99079)



50kg Sak  
(Produkkode 99070)

## 6. FISIËSE STRUKTUUR

Clinomix word vervaardig van 'n hoogs suiwer "clinoptilolite" wat natuurlik voorkom. 'n Hol kern met 'n uiters kragtige negatiewe lading word omring deur 'n drie-dimensionele oop raamwerk "heuningkoek" struktuur. Dit lei tot Clinomix se unieke absorpsie en ion-uitruiling vermoëns.



# TOETSVERSLAE

## 1. CLINOMIX MIKOTOKSIENBINDINGS-PROEWE

Effektiwiteitstoetse is gedoen om te bepaal tot watter mate Clinomix die verskeie mikotoksiene bind. Toetse is gedoen deur Senior Analitikus S. Davey by die SANAS goedgekeurde SGS Agri Voer Laboratorium.

### Metode

'n Dierlike voermonster is gedokter met 'n bepaalde hoeveelheid toksiene. Monsters is daarna getoets met Hoë-werksverrigting Vloeistof Chromatografie (HPLC) om 'n aanvanklike waarde te kry van toksiene teenwoordig in die voer. Monsters is daarna met 'n dosis van Clinomix behandel. Na behandeling, is toksienvlakke weer bepaal met die gebruik van HPLC. Toksienvlakke voor en na behandeling is vergelyk om te bepaal tot watter mate Clinomix die verskeie mikotoksiene bind.

### Resultate

Die uitslae het bevind dat Clinomix baie effektief is om mikotoksiene te bind. In 'n monster waar die aanvanklike aflatoksientelling 4196 µg/kg was, het die totale aflatoksienvlakke na behandeling met Clinomix tot onder 4 µg/kg gedaal. Die tabel hieronder toon 'n opsomming van die Mikotoksien bindingsvermoë van Clinomix.

MIKOTOKSIEN NAAM	HOEVEELHEID TOKSIEN TEENWOORDIG VOOR CLINOMIX BEHANDELING (µg/kg)	HOEVEELHEID TOKSIEN TEENWOORDIG NA CLINOMIX BEHANDELING (µg/kg)	% GEBIND DEUR CLINOMIX (UITGEDRUK AS 'N % VAN BEGIN VLAK VAN KONTAMINASIE) (%)
Aflatoxin B <sub>1</sub>	3217	<1	99.9
Aflatoxin B <sub>2</sub>	309	<1	99.9
Aflatoxin G <sub>1</sub>	376	<1	99.9
Aflatoxin G <sub>2</sub>	294	<1	99.9
<b>Totaal Aflatoxin</b>	<b>4196</b>	<b>&lt;4</b>	<b>99.9</b>
Deoxynivalenol (DON)	381 mg/kg	<0.10 mg/kg	99.9
Zearalenone (ZON)	50828	2496	95.1
T2	110	77	30
HT2	100	69	31
T2/HT2	210	146	30.5



## **2. TOKSIKOLOGIE VERSLAG**

'n Toksisiteitstudie is deur die Universiteit van Pretoria se Fakulteit van Veeartsenykunde Onderstepoort gedoen om die toksisiteit van Clinomix te bepaal. Toetse is deur Dr. I.B.J Van Rensburg en Dr. A. Immelman uitgevoer.

### Metode

'n LD<sub>50</sub> toets is gedoen met gebruik van laboratorium rotte wat vir 10 dae met wisselende hoeveelhede van Clinomix gedoseer is.

### Resultate

Die uitslae het aangedui dat die toksisiteit van Clinomix so laag is dat 'n LD<sub>50</sub> waarde nie bepaal kon word nie.

### 3. CLINOMIX WERKSVERRIGTING PROEWE OP LÊHENNE

'n Toets is gedoen om te bepaal watter voordele Clinomix op lêhenne het. Die toets is gedoen deur die "Diere en Melkery Wetenskap Navorsingsinstituut", gebaseer in Irene Suid-Afrika. (Toetsing en analisering is deur M.D. Olver gedoen).

#### Metode

Eenhonderd vier en twintig, vier maande oue, enkel-kam bruin Hy-line hennetjies is twee eenderse kaloriewaarde diëte gevoer wat 16 of 13,5% proteïen bevat het, met en sonder 5% Clinomix, in vier behandelinge met dertig henne per herhaling. Die henne was in individuele hokke gehuisves in 'n natuurlike geventileerde lêhuis en is die vier verskillende diëte vir 476 dae gevoer.



#### Resultate

Henne wat die Clinomix dieët gevoer is, het meer eiers gelê as die henne wat nie die Clinomix dieët gevoer is nie. Elke hen het gemiddeld 26 meer eiers in die 68 weeklêperiode gelê as die henne wat nie die Clinomix gevoer is nie.

Henne wat die Clinomix dieët gevoer is, het hulle eerste eiers ook vroeër gelê as die henne wat nie die Clinomix dieët gevoer is nie. Sien die resultate in die tabel hieronder.

DAE VOOR EERSTE EIER GELÊ	
DIEËT	DAE VOOR EERSTE EIER
16% Proteïen + Sand	181
13% Proteïen + Sand	178.8
16% Proteïen + Clinomix	174.3
13% Proteïen + Clinomix	174.3

Henne wat Clinomix gevoer is se mis-voginhoud, was aansienlik laer as die van die henne wat nie Clinomix gevoer is nie (sien tabel hieronder).

Distale en Proksimale ingewandspatogeniese kolonietellings was opmerklik laer in henne wat Clinomix gevoer is. Proef analisering het aangedui dat die henne wat met Clinomix gevoer is, meer gesond en minder vatbaar vir siektes was as die wat nie Clinomix gekry het nie (sien tabel hieronder).



**GEMIDDELDE MIS VOGINHOUD % EN PATOGENIESE BAKTERIËLE KOLONIE TELLINGS  
OPGEMERK IN HENNE GEVOER MET EN SONDER CLINOMIX**

<b>DIEËT</b>	<b>MIS VOGINHOUD %</b>	<b>PROKSIMALE DERM</b>	<b>DISTALE DERM</b>
16% Proteïen + Sand	72.8	388	4333
13% Proteïen + Sand	73.7	376	4350
16% Proteïen + Clinomix	67.6	62	1700
13% Proteïen + Clinomix	68.4	63	1673

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## MIKOTOKSIENBINDINGS- MIDDEL & VEEGENEESMIDDEL

GEREGISTREER BY DIE SUID-AFRIKAANSE DEPARTEMENT VAN LANDBOU  
Reg. No. G1085 ACT/WET 36 of 1947



KOEIE

PERDE



VARKE

SKAPE



*Vir*  
**CLINOMIX VEILIGHEIDSDATA**  
**(SDS)**  
*verwys na webblad:*  
**[www.pratleyminerals.com](http://www.pratleyminerals.com)**

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