

Clinofix®

Proven mechanically activated double action toxin prevention programme and immune enhancer



Mycotoxins in poultry:

The presence of fungi in animal food is most common beginning with pre-harvest and post-harvest of the raw materials, during transportation, storage and manufacturing of feed especially in corn.





Mycotoxins are produced by the synthesis of toxins present in different fungal species in feed during favourable conditions like moisture, temperature and weather fluctuations. Mycotoxins affect poultry bird by inhibiting enzymatic action there by reducing protein synthesis leading to immunosuppression. Fungal toxins enters the body of poultry bird through gut causing toxicity called mycotoxins and usually affects bursa of Fabricius and Thymus.

Mycotoxin infections in poultry farming results in greater economic loss with frequent susceptibility to diseases, immunosuppression and increased use of medicines.

Role of Mycotoxin adsorbents:

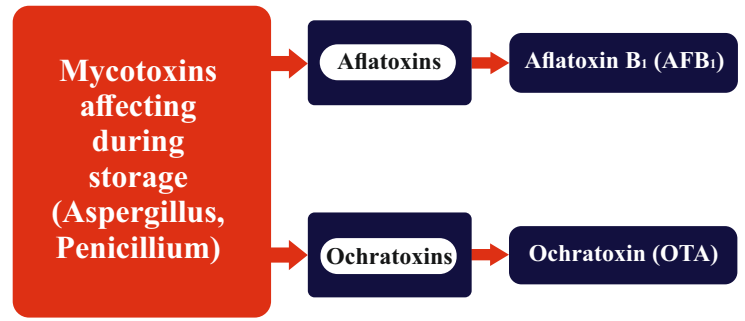
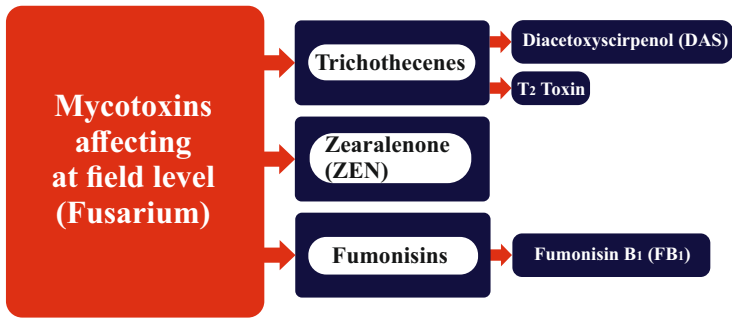
Use of mineral adsorbents to curb mycotoxins is a common phenomena in poultry production especially in the nutrition and to control contamination due to fungus. Use of adsorbents in poultry prevents mycotoxins thus improving the quality of poultry production. Generally adsorbents binds mycotoxins present in the feed without disturbing gastrointestinal tract of the bird and eliminates through faeces.

Mycotoxins presence in different feed raw materials affecting poultry:

| | Aflatoxins | Fumonisin | Trichothecenes | Ochratoxins |
|---|-------------------|------------------|-----------------------|--------------------|
|  Sorghum | ✓ | | | ✓ |
|  Wheat | ✓ | | ✓ | ✓ |
|  Corn | ✓ | ✓ | ✓ | ✓ |
|  Rye Barley Oat | | | ✓ | ✓ |

Mycotoxins affecting poultry:

Mycotoxins most commonly affecting poultry are Aflatoxins (AFB₁, AFB₂, AFG₁, AFG₂), Ochratoxin A (OTA) and Citrinin, Trichothecenes: Type A: Toxin T-2, Diacetoxyscirpenol (DAS), Fumonisin (FB₁, FB₂).



Aflatoxins:

Aflatoxins affects immunity in poultry which leads to loss of appetite, leg weakness, hepatic injury, loss of defence mechanism and disorders in blood clotting. The major organ of target during aflatoxicosis challenge is the liver function. During Mycotoxicosis, major challenge is liver function of the bird. Since the liver is the primary organ of synthesis of fat-soluble vitamins (A, D, E and K) and nourishment of these vitamins are affected severely resulting in nutritional deficiencies of poultry bird.

Fumonisin:

Birds affected with Fumonisin results in decreased body weight & egg production, increased gizzard weight and increased mortality in poultry. Fumonisin causes damage from the mouth down to the other parts of the digestive tract resulting in the refusal of feed by the bird. Necrotic lesions and ulcers in the oral mucosa, reddening of the GI mucosa, different colour spots on the liver, atrophy of the spleen and other lymphoid organs and visceral hemorrhages are the clinical symptoms.

Ochratoxins:

Chicken affected by ochratoxins exhibit decreased egg

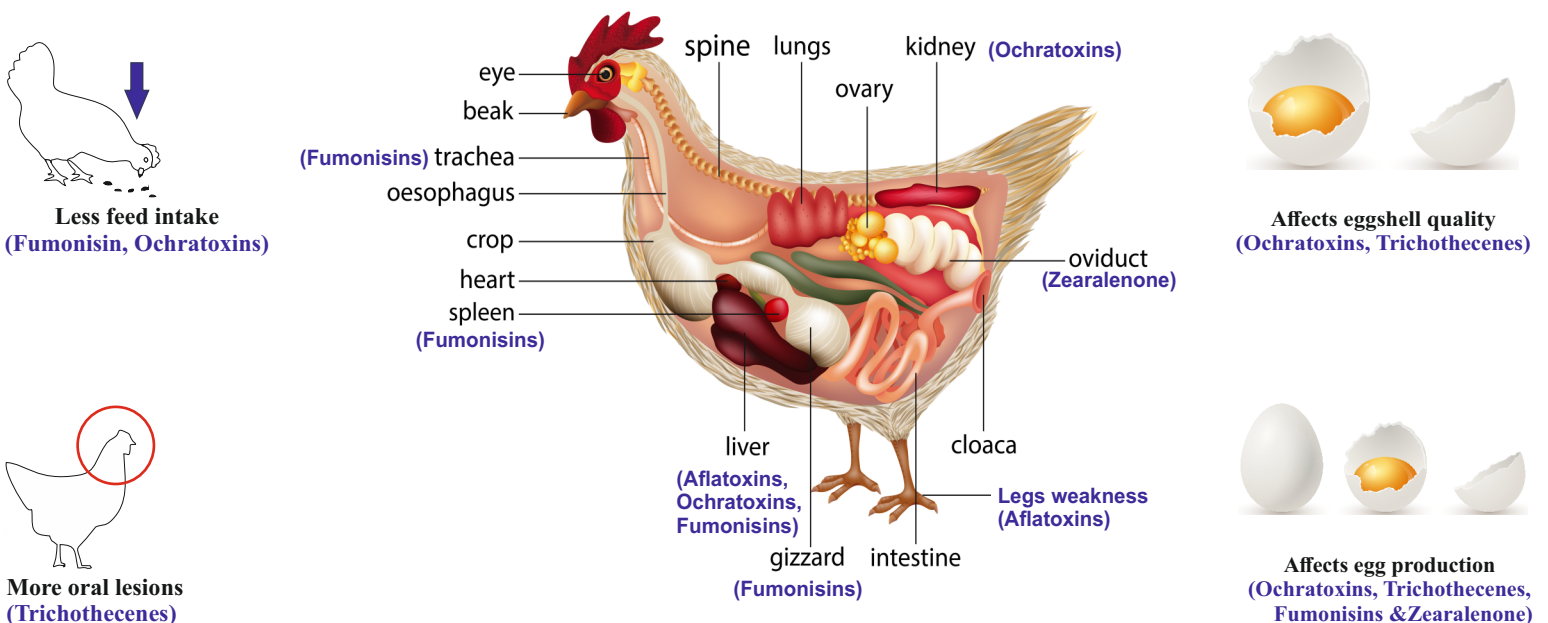
production, overall growth of the bird, reduction in feed intake, poor quality of eggshell, polydipsia and damage to kidneys. Ochratoxins are mainly nephrotoxic causing damage to the kidneys, also causes damage to liver, immunogenic and bone marrow.

Trichothecenes:

Type A Trichothecenes (Toxin T-2, Toxin HT-2, diacetoxyscirpenol) cause severe economic loss to the poultry industry. Normally birds affected by Type A Trichothecenes results in reduced body weight and egg production, poor quality of eggshells, oral lesions and immunosuppression. Toxin T-2 is highly toxic to chickens since their LD₅₀ values are low.

Zearalenone:

Zearalenone enhances other mycotoxins harmful to poultry during co-contamination which especially aggravates the damage caused by Deoxynivalenol. Zearalenone affects the reproductive tract of poultry especially presence of cystic oviduct, prolapse of the rectum and inflammation. Also frequent occurrence of cracked eggs in layers and breeders are found.



Composition:

| |
|-------------------------------|
| Nano Zinc |
| Clinoptilolite |
| Organic Acids |
| Yeast Beta Glucans |
| Silybum Marianum |
| Fumonisin Esterase |
| Mannan Oligosaccharides (MOS) |

Clinoptilolite:

Clinofix is a gift from the nature with 95% of Clinoptilolite. Clinofix maintains selective binding characteristics with no quartz. Clinoptilolite in Clinofix is having unique firm crystalline structure with powerful negative charges (ion exchange power).

Mechanism of Clinoptilolite:



Mannan Oligosaccharides (MOS):

Mannan Oligosaccharides (MOS) are composed of complex carbohydrate molecules derived from the outer cell wall of *S.cerevisiae* mainly capable of activating immune system of poultry bird. MOS is used as an alternative to antibiotic growth promoters (AGPs). Addition of MOS considerably reduces pathogenic bacteria, reduction in cell sloughing on the villi, maintains GI tract & aid to tissue repair.

Silybum Marianum:

Silybum Marianum an alternative phytobiotic is a plant extract used in poultry production system. Silybum improves growth in broilers, increases egg quality and production in layers, also used as antioxidant and enhances the immune system in breeders.

Fumonisin Esterase:

Fumonisin Esterase produced from genetically modified strain *Komagataella phaffi* which is intended to degrade fumonisin mycotoxins contamination in feed for poultry.

Fumonisin Esterase uses:

- Detoxification of fumonisin by biotransformation
- Reduction of the general negative effects of fumonisins on the liver
- Prevents fumonisin induced problems
- Esterase significantly reduces the concentration of fumonisin in faeces and various points in the digestive tract
- Esterase increases the concentration of the degradation products

Beta-glucans:

Beta-glucans are naturally occurring polysaccharides known for its best health benefits derived from microbial source of yeast *Saccharomyces cerevisiae*.

Beta-glucans uses:

- Yeast β -glucans increases resistance against pathogens by activating innate & adoptive immune systems
- β -glucans supplementation of the broiler chicken diet results in larger lymphoid organs which are precursor cells involving in protecting bird from virus infections
- Supplementation of the diet with Yeast β -glucans in young chickens protects birds against Salmonella disease
- β -glucans increases antibody titers after vaccination
- Boosts overall bird performance

Nano Zinc:

Nano Zinc in Clinofix is a organic mineral which is best alternative suggested to be used in poultry feed supplements. Nano Zinc is of the size from 1–100 nm and due to such small size, there is an enormous increase in surface area leading to effective biological responses.

Benefits of Nano Zinc in Clinofix:

- Develops immunity against pathogens in layers especially improves survival of *E.coli* challenged old laying hens
- Essential for growth, maintenance and other functions like bone development, feather development, enzyme structure and function, and appetite control in poultry
- Nano Zinc supplementation in breeder diets enhances immunity of their progeny
- Nano Zinc supplementation in broilers and layers improves immunity
- Layer birds supplemented with Nano Zinc had increased thymus weight and improved livability of progeny
- Nano Zinc strengthens eggshell quality in layer birds especially older birds
- Nano Zinc helps in increasing body weight, feed intake and feed efficiency in broilers

Organic Acids in Clinifix:

Mode of Action:

Organic Acids action on pH sensitive bacteria



Organic Acids enter the cell wall & break down DNA & lowers pH

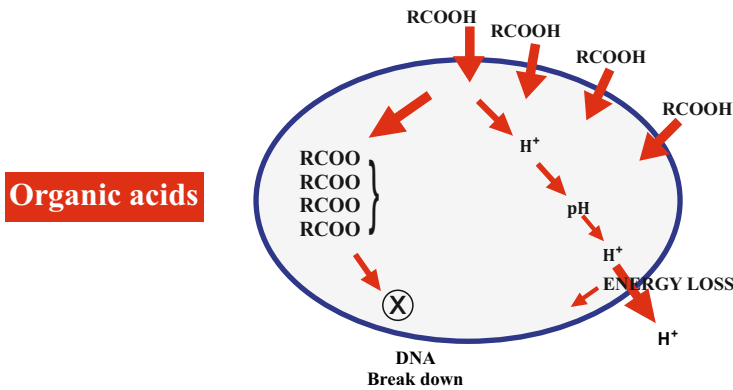


Cell wall tries to regain the internal pH to neutrality with active transportation of H⁺ out of the cell



Leads to severe loss of energy resulting in bacterial wall breakdown

Bacterial pathogenic cell wall



Organic acids

Benefits of Organic Acids in Clinifix:

- ◆ Effectively inhibits growth of most Gram +Ve bacteria, moulds & yeasts
- ◆ Effective against E.coli, Salmonella, Clostridium & Pseudomonas bacterial species
- ◆ Treat the raw materials & control pathogens during the production of feed resulting in high quality feed
- ◆ Improved conditions for digestion
- ◆ Favours optimal enzymatic activity
- ◆ Prevents lumping of feed
- ◆ Helps in optimum weight gain in broilers

Clinifix: New generation Growth promoter, Toxin binder and Immune enhancer:

| Binding Mycotoxins, Endo & Exo toxins, heavy metals & Nh4+ | Protection against pathogenic bacteria | Immunological enhancement | Antioxidant properties | Growth promoter |
|---|--|--|------------------------|-------------------------------|
| Clinoptilolite MOS (Mannan Oligosaccharides) Fumonisin Esterase | Clinoptilolite MOS (Mannan Oligosaccharides) Nano Zinc Organic acids β-glucans | Clinoptilolite MOS (Mannan Oligosaccharides) Silybum marianum Nano Zinc | Silybum Marianum | Silybum Marianum Nano Zinc |

Clinifix Key Functions:

- ◆ Less diarrhoea
- ◆ Feed anti-caking effect
- ◆ No binding of vitamins
- ◆ Better Calcium absorption
- ◆ Effective Ammonia binding
- ◆ Effective binding of Mycotoxins

Inclusion Rate:

- 500 gm to 1 kg per tonne of complete feed (< 14% moisture in feed)
- 1 kg to 1.5 kg per tonne of complete feed (> 14% moisture in feed)



Presentation: 25 Kg



Manufactured under technical guidance of:

Biocetisch B.V

184/Overschiestraat, 1062 XK, Amsterdam, The Netherlands.

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