

For additional information,
please contact:

USA OFFICE

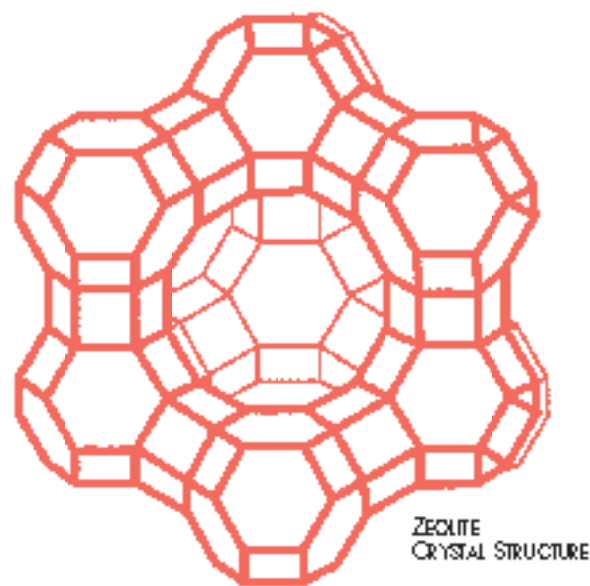
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Innovation for Animal
Agriculture

ZAR-MIN DESCRIPTION

ZAR-MIN Feed Additive is a processed aluminosilicate belonging to a class of naturally occurring minerals called zeolites. There are over 600 natural zeolite occurrences in the world. There are 10 different structural types of natural and man-made zeolites that differ in the way the alumina and silica are stacked. The zeolite used in **ZAR-MIN** is classified as a clinoptilolite (clino) and has a complex and open honeycomb structure that does not "swell" within the digestive tract. The **ZAR-MIN** natural zeolite was selected due to its excellent absorption characteristics, high ion exchange capacity and high surface area. These properties make **ZAR-MIN** "selective" to mycotoxins, yet do not interfere with the bioavailability of vital nutrients in the GI tract (Pond 1984, 1989). These properties provide the basis of why **ZAR-MIN** is desirable for use in dairy rations.

BENEFITS IN DAIRY RATIIONS

ZAR-MIN offers the following benefits when used as an anti-caking agent and as an additive to aid in mycotoxin control programs:

- Highest ion exchange capacity — 1.75 meq. per gram
- Excellent ionic buffering characteristics
- Does not bind minerals and vitamins
- Creates no problems with palatability
- Reduces free ammonia in rumen
- Is not a complex carbohydrate extract (mannan oligosaccharides)
- Research tested, field proven
- Versatile product — use in TMR, complete feeds, pelleted feed
- Free of dioxins
- Does not swell up in the rumen like bentonite
- Improves flowability and pellet binding
- Superior anti-caking agent
- Improves feed storage and handling

RESEARCH FINDINGS - FOR DAIRY USE

- Increased growth and weight gain — *Mumpton & Fishman, 1977*
- Reduced free ammonia in the rumen — *Henkan, et. al., 1984*
- Altered rumen fermentation — increased milk production — *Rosset, 1993; Henkan, 1984*
- Reduces incidence of scours in calves — *Kondo, 1969*
- Reduces aflatoxin concentrations in milk production from cows fed contaminated feed — *Harvey, 1991*

FEEDING INSTRUCTIONS

Normal feeding program:

10-40 lbs. per ton of feed — 4-6 oz. per head per day.

If mycotoxins are present:

Include **ZAR-MIN** at 6-8 oz. per head per day
Reduce **ZAR-MIN** at 4-6 oz. per head per day after 2-3 weeks, in conjunction with other management procedures.

ZAR-MIN is a product of ZEO, Inc.
For distribution see contact panel.

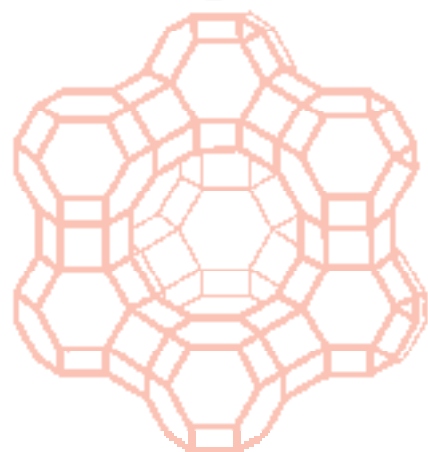
ZAR-MIN[®]

FEED ADDITIVE

Anti-Caking Agent

MYCOTOXINS IN DAIRY ANIMALS

Prevention and Management



The human and animal health problems associated with mycotoxins were recorded over 3,000 years ago by the Egyptians. Over 100 different molds are known to produce mycotoxins, and about 400 different mycotoxins have been identified. Since the 1960's research has determined that several of the toxins are severe carcinogens in humans and animals.

Mycotoxins are highly toxic chemicals produced by mold growth on feed stuffs. The conditions for mold to produce toxic mycotoxins are not fully understood. In general, the feed must be 77°F, have at least 14% moisture, and have a small amount of air present.

MOLDS AND MYCOTOXINS

The most widely studied mycotoxin producing molds and fungi are *Aspergillus*, *Fusarium*, and *Penicillium*. Each of these molds produce many different toxins.

The mycotoxins associated with ruminant health problems are aflatoxin, ochratoxin, zearalenone, vomitoxin, T-2, HT-2, and DAS. A combination of the toxicity of the individual mycotoxin, dose, exposure time, age, and general health of the animal will determine the severity of the ruminant's reaction to these toxins. The presence of more than one toxin in the feed may also trigger an adverse reaction.

SYMPTOMS OF MYCOTOXICOSIS

- Reduced dry matter intake and/or feed refusal
- Reduced milk production
- Rough hair coat
- Increased abortions
- Decreasing conception rate
- Silent heats

- Pregnant cows displaying heat
- Unexplained incidence of disease
- Diarrhea
- Under-nourished or parasitic appearance

PREVENTING MYCOTOXIN PROBLEMS

- Assume there are no safe levels of mycotoxins
- Look for signs of mold growth in grains and silage
- Clean feed storage and feeding areas regularly
- Store grain at less than 14% moisture
- Use mold inhibitors if grain quality questionable
- Test questionable grain for mycotoxins
- Monitor animals for signs of mycotoxin poisoning
- Request mycotoxin analysis from supplier
- Watch for "hot spots" in silage and bunker
- Monitor grain screenings for mycotoxins
- Avoid storing feed for long periods

CONTROLLING MYCOTOXIN PROBLEMS

If contaminated feed is suspected:

- Take cows off suspected feed
- Have feed checked by lab
- Destroy contaminated feed, if practical
- Use caution while working with contaminated feed

Suggested changes in rations:

- Increase trace minerals, Se, Ni , and Mn
- Increase levels of vitamins A, B, D, E, and K
- Increase protein levels
- Maintain feed flowability
- Use ZAR-MIN (Title 21 FDA CFR 582.2727 and/or 582.2729) at 6-8 oz. per head per day rate; taper to 4-6 oz.