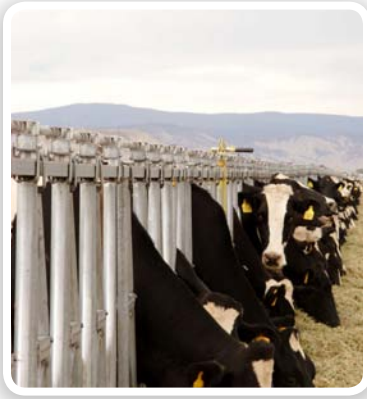


Zeolite Products for Dairy Animal Waste Management



“It has been estimated that animal agriculture is responsible for 50% of the ammonia entering the environment”

“Nitrogen added by manure may be less than plants require, but phosphorous levels in soils may be too high, and excess added phosphorous run off can contaminate surface water”

Dairies are under increasingly intensive pressure from state and federal regulators to control air and water emissions.

St. Cloud Zeolite is a unique naturally occurring mineral product which offers the Dairy industry a cost effective solution to its most pressing regulatory problem.

Most of the remediation methods under consideration are capital intensive and cost prohibitive. Natural clinoptilolite zeolite is a proven, low cost, low impact solution that effectively binds ammonia and creates improved, stable N:P ratios in the manure.

Numerous research efforts conducted worldwide have shown the benefit of zeolite in selectively capturing ammonia and preventing its release into the atmosphere. The ammonia rich manure minimizes phosphorous runoff in ground water systems and allows a higher application rate.

In addition, **St. Cloud Zeolite** absorbs moisture resulting in lower fly populations and reduces heat and ventilation requirements in confinement barns.

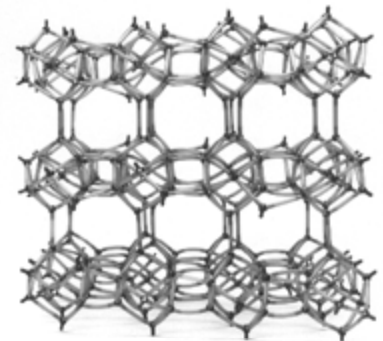
Properties of St. Cloud Zeolite

Because of its unique properties, St. Cloud Zeolite is also in use as a feed additive where it has been shown to improve animal health, increase feed efficiency, enhance the uptake of nutrients and beneficial minerals, and performs as an effective rumen buffer.

Tests have also shown **St. Cloud Zeolite** to be an effective adsorbent of aflatoxin.

St. Cloud Zeolite is often referred to as a molecular sieve, with its molecular structure consisting of a rigid, resistant framework of an aluminum and silica atoms, connected by oxygen atoms with exchangeable calcium and potassium cations.

St. Cloud Zeolite is a low clay, low sodium mineral which behaves as a proactive molecular sieve, attracting and binding compounds including ammonia and other unwanted constituents from air and water.



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St. Cloud Zeolite also holds water, or urine, molecules in this same lattice structure, which helps reduce manure moisture levels. This improves material handling and increases value for manure as a fertilizer.

The spongelike structure also will hold ammonia molecules in its open frame, which it then releases as a plant root systems exceed the surface tension holding it to the **St. Cloud Zeolite** particles.

Results with St. Cloud Zeolite

Research shows:

- **St. Cloud Zeolite** in a ruminant diet increased rumen pH, reduced liver abscesses, and reduced the amount of manure nitrogen lost by 65%
- The addition of 6.25% zeolite to manure slurry reduced ammonia loss by 55%
- The inclusion of up to 2% zeolite in a poultry diet resulted in a 40% increase in manure nitrogen and an 102% improvement in manure TKN:P ratios.
- Zeolite amended soils resulted in reduced nitrogen leaching through the root zone and a doubling of water holding capacity.