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Effects of EcoCal™ on Ammonia Emission from a High-Rise Layer House

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Species: Poultry (Layer)
Use Area: Animal Housing
Technology Category: Diet Modification
Air Mitigated Pollutants: Ammonia

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System Summary:

Continuous emission measurements at two mechanically-ventilated, high-rise layer houses were conducted to study the effects of EcoCal, a feed amendment designed to reduce NH₃ emissions. Data presented in this paper was collected at a commercial egg production facility in October to January. The hens in house 2 were fed EcoCal for comparison with the standard diet used in house 1. EcoCal utilizes gypsum, an acidogen, and zeolite, an indigestible cation exchanger to lower manure pH, thus reducing NH₃ emissions. Feeding a diet comprising 7% EcoCal significantly reduces manure ammonia emissions by effectively sequestering ammonium in the manure. An average difference of 51% was observed between the houses when EcoCal was implemented for about six weeks, after the house 2 emission rates appeared to have stabilized.

The application of EcoCal was expected to further NH₃ emissions more than 51%, but the test was hindered by several unexpected incidents such as a major water line break in the house 2 manure pit and disruption of feed delivery due to a major snow storm. The initial feed costs were significantly increased when EcoCal is added to the diet.

Applicability and Mitigating Mechanism:

- Decreasing manure pH reduces NH₃ emission
- EcoCal is a feed supplement for laying hens, including organic egg production.
- EcoCal consists of natural minerals such as gypsum and zeolite, to reduce manure pH and sequester more manure nitrogen

Limitations:

- Diet should be limited to less than 60% of the dietary calcium supplied by EcoCal, because greater quantities of gypsum can result in thin egg shell and lower layer productivity
- The cost of EcoCal can be variable, because it is not commercially available and delivery expense depends on geographical location.

Cost:

The gross cost of adding EcoCal was about 2.4 cents per hen per month or \$28,700/yr per 100,000 hens. The effects of EcoCal on egg production were not evaluated in this test, but any increases in egg production would offset the extra cost.