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**MITIGATING AIR EMISSIONS FROM
ANIMAL FEEDING OPERATIONS
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**Feeding a Combination of Acidogenic
Materials and Cation Exchangers Reduces
Manure Ammonia Emissions and Improves
Laying Hen Performance**

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Earth Net LLC

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

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System Summary:

Feeding a combination of acidogens and indigestible cation exchangers reduces manure ammonia emission rates by sequestering ammonium in the manure. Average reductions of up to 68% have been noted in production environments. Reduced levels of ammonia in the production environment improve bird and worker health, reduces bird mortality, and improves productivity.

Applicability and Mitigating Mechanism:

- Ammonia emissions are reduced through the use of alternative feed components.
- The technology is suitable for use in any layer housing system.
- Mitigation of manure ammonia emissions is due to a combination of reduced manure pH and cation exchangers present in the manure.

Limitations:

- Overfeeding acidogenic materials can adversely affect performance and productivity.
- Effective levels of acidogens are typically well below the threshold level at which adverse effects would be noted.
- No adverse effects due to overfeeding cation exchangers have been noted.
- Cation exchange capacity, buffering capacity, and selectivity for ammonium are critical to the performance of this system.
- Acceptable ratios of acidogen to cation exchanger depend on acidogen pKa and cation exchanger buffering capacity.

Cost:

Suitable acidogens and cation exchangers are available in the marketplace. Gypsum/zeolite blends are commercially available as a pre-mix. Implementation of gypsum/zeolite blends depends on feed bin availability, while admixing sodium bisulfate and either zeolite or humate can be done through a microbin system.

Per-ton feed costs are increased when the system is utilized, but increased feed costs are more than offset by reduced hen mortality, improved feed conversion and egg production, and reduced per-dozen production costs.