

Air Quality on the Farm: Testing Strategies to Minimize Ammonia Release

Isaac Hefty, DeKalb High School, Auburn, IN, USA

Research Question

- How can I effectively reduce ammonia in chicken barns for better health, production, and fertilizer.

Hypothesis

- The 100% zeolite variable will decrease the ammonia the most compared to the control and maintain a level that is healthy for people and animals.

Why?

- I completed my project to encourage farmers to use a natural fertilizer over a synthetic fertilizers, keep birds healthy, and save farmers money.

Data Analysis and Results

- All eight of Zeolites tests were better than the controls percentage change of ammonia. In trial 3 day 5, the PPM of ammonia got all the way down to 10.
- Coop N Compost's hour 7 test was worse than the control, but the rest were better
- Ammosorb had five tests that were worse than the control while 3 were better.
- Lime had all eight of it's tests worse than the control.
- Coop Recuperate' s hour 7 test was worse than the control, but the rest were better.
- Ammonium Sulfate's hours 1 and 2 better than the control while the other six were worse than the control.

Methodology

- I put fresh chicken manure into airtight containers to mimic the manure in a chicken barn.
- I put 1 cup of each variable into its respected trials.
- Using an ammonia tester to get accurate results, I tested each container.



Interpretations and Conclusions

- My hypothesis was correct, The 100% Zeolite variable reduced the ammonia the most compared to the control and maintained a level of ammonia that is healthy for people and animals.
- Zeolite undergoes a cation exchange with the NH_3 resulting in NH_2 . NH_2 is not a non-harmful gas, and it has no smell.
- Zeolite can be as cheap as 1 cent per square foot to apply when buying in bulk. This is very affordable for farmers to use for their own chicken barns.