



Effectiveness of Three Manure Pit Additives in Commercial Scale Manure Channels and Simulated Outdoor Storage



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The Message

- Three manure pit additives, American BioCatalysts, Pit Boss and Westbridge, were tested in commercial scale manure channels and simulated outdoor storage.
- Odour threshold reduction ranged from 0 to 11% for the indoor phase and from 0 to 66% after the outdoor storage phase.
- The additives provided some benefits but were unable to improve all aspects of the manure.

Introduction

- Pit additives should desirably:
 - ✓ reduce nuisance odour
 - ✓ reduce manure pit gas emission
 - ✓ improve solubilization and reduce solids
 - ✓ retain nutrients and micronutrients
 - ✓ reduce manure strength
- Additives testing should represent commercial pig production conditions:
 - ✓ full scale channels
 - ✓ manure addition by pigs
 - ✓ no manure mixing



Air sampling set up during indoor trials

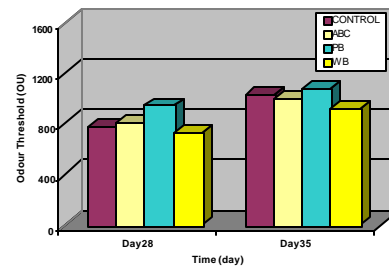
Objectives

- To evaluate the effectiveness of three manure additives in reducing odour threshold, gas concentrations, solids and manure strength and in maintaining nutrient and micronutrient content.

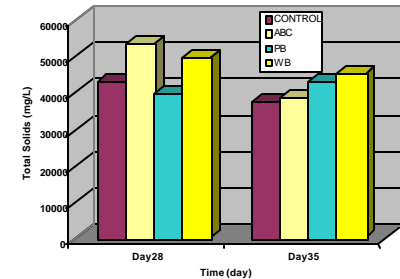
Experimental Set Up

- Three additives:
 - ✓ ABC (American BioCatalysts : bacteria and enzymes)
 - ✓ Pit Boss (PB : copper sulfate mixture)
 - ✓ Westbridge (WB : organic amendment)
- Indoor trials:
 - ✓ 2 room cycles, 8 replicates per additive
 - ✓ 3 weeks of manure accumulation, 2 weeks of pretreatment and 5 weeks of treatment
 - ✓ Air and slurry samples on weeks 4 & 5
- Outdoor trial:
 - ✓ plastic tubs simulating lagoons, 4 replicates per additive with manure from the first indoor trial
 - ✓ Air and slurry samples taken after 4 weeks of storage
- Parameters evaluated:
 - ✓ Air: odour threshold, CO₂, NH₃ and H₂S levels
 - ✓ Manure: solids, nutrients, micronutrients and COD

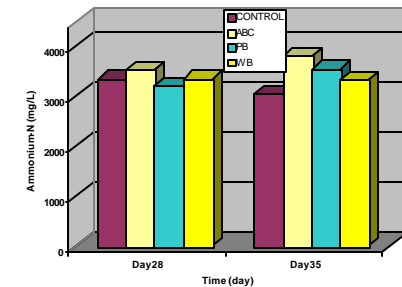
Results



Odour threshold for combined indoor trials



Total solids concentration for combined indoor trails



Ammonium concentration for combined indoor trails

Conclusions

- Odour threshold was reduced by:
 - ✓ 0 to 11 % for indoor trials
 - ✓ 0 to 66% for outdoor trial
- No additive had an impact on solid reduction or solubilization.
- All the additives had a positive impact on nutrient retention and availability.

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