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# Bioaugmentation of Treatment System for Skatole Degradation: Bioremediation Potential for Odors Reduction at Livestock Operations

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**Species:** Swine and poultry  
**Use Area:** Treatment system  
**Technology Category:** Biological Amendment  
**Air Mitigated Pollutants:** Odors (skatole)

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## System Summary:

It has been demonstrated that bioaugmentation of bioreactor with enrichment cultures and with a pure culture of *Rhodococcus* sp. isolated from swine lagoon is a viable alternative in reducing skatole, a main malodorous compound in swine effluent. We found that bioreactor amended with pure culture can degrade skatole as well as the enriched mixed culture after certain lag period. Pure culture bioreactor required longer lag time than the mixed culture. We also utilized these microorganisms in a liquid scrubber and found them to be quite effective in degrading skatole (data not shown). Thus, bioaugmentation of treatment systems with indigenous populations may increase the efficiency of treatment systems and provide a simple, cost-effective bioremediation potential in reducing malodors emission at livestock facilities.

## Applicability and Mitigating Mechanism:

- Bioaugmentation is suitable for most treatment systems that can provide sufficient environmental conditions for growth
- Target specific (pollutant)
- Total mineralization of pollutant possible
- Sustainable technology

## Limitations:

- Requires optimum conditions for growth
- Neutral pH and ample amount of oxygen
- Need Sufficient amount of essential nutrients
- May not work in a competitive exclusion environment and broader application range

## Cost:

The cost of bioaugmentation of a treatment system is dependent upon the type of the treatment systems. These microorganisms can be easily isolated and cultivated from contaminated sites. The extent of the cost would fall mostly on the purchase of nutrients for growth. In most cases, the required nutrients for growth could be obtained from the target pollutants themselves (e.g., emissions from swine or poultry wastes).