Case Studies & Technical Review

Odors and gases that build up in manure have negative effects on the health of both workers and livestock. Ammonia gases in particular are known to have detrimental effects on livestock productivity. Chronic exposure to even low levels of ammonia is a critical factor in lowered animal productivity within swine production facilities. In various industry research studies, chronic exposure to ammonia has been correlated with reductions in average daily gain and feed efficiency, as well as increases in disease and medication costs.

SHAC Feed Additive is effective in reducing both odors and the high concentrations of harmful ammonia gases to which swine are continuously exposed.

CERTIFICATION AND SAFETY

The Canadian Food Inspection Agency (CFIA) has approved SHAC Liquid Feed Additive for Swine (Reg.# 480573) and SHAC Granular Feed Additive for Swine (Reg.# 480549) as effective treatments for the reduction of odors and ammonia.

CASE STUDIES

UNIVERSITY OF GUELPH STUDY

Efficacy trials using SHAC Feed Additive were conducted by the Department of Animal and Poultry Science at the University of Guelph, in partnership with Canadian Ortech Environmental Ltd.

Olfactometer analysis conducted within the test rooms indicated that odor threshold values (odor units) were an average concentration of 284 ppm at hog breathing height in the treated rooms, versus 684 ppm in the untreated control rooms.

Results within control and treated barns indicated:

- 58% reduction in odors with SHAC Feed Additive treatment (Fig. 1)
- 25% reduction in carbon dioxide levels was also reported. (Fig. 2)

Figure 1: Odor reductions reported during SHAC Feed Additive treatment.

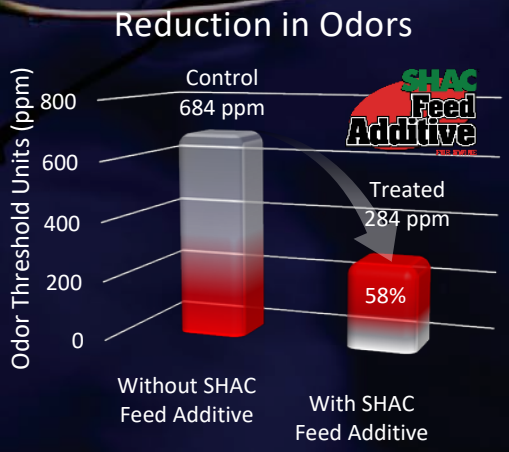
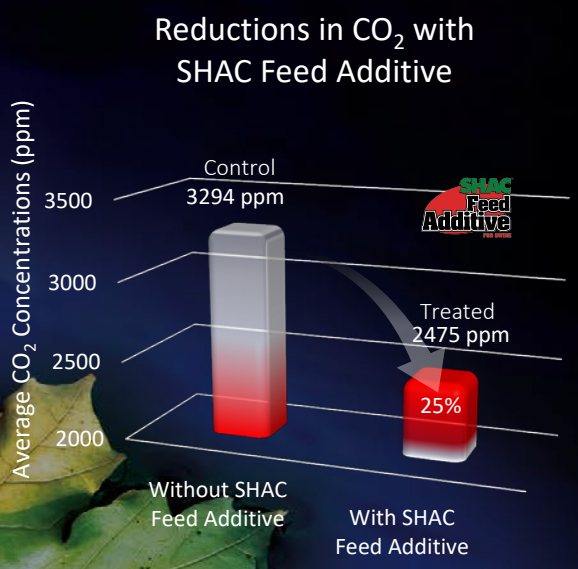


Figure 2: Reduction in carbon dioxide levels reported during Feed Additive treatment in finisher groups



INDEPENDENT BARN TRIALS

Various independent swine production facilities took part in a study using SHAC Feed Additive at different stages of the production cycle.
Ammonia gas concentrations were selected as the key air quality parameter for monitoring purposes, as the presence of high levels of ammonia has effects on health and productivity.

Trials were conducted by measuring the concentration of ammonia gases on either a before-treatment / after-treatment basis; or on a control-group / test-group basis. Using either method, consistent ammonia gas reductions were observed and reported.

Significant reductions in average ammonia concentrations were achieved with Feed Additive treatment as summarized in Fig. 3:

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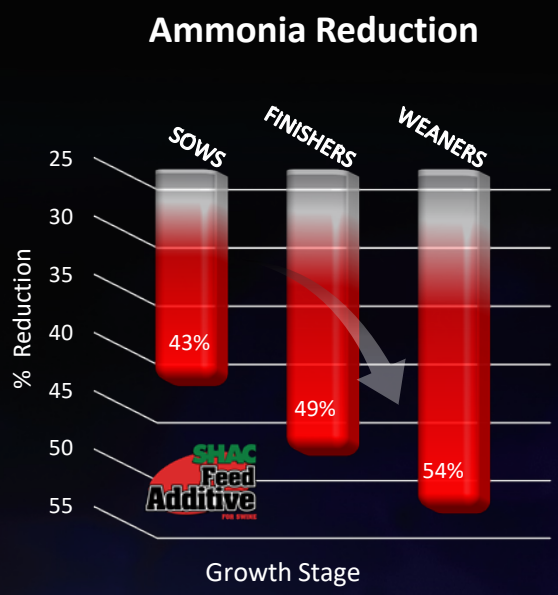
Figure 3: Average ammonia reductions reported during Feed Additive treatments at different growth stages.



THE BENEFITS OF AMMONIA REDUCTION

SHAC Feed Additive has been researched and proven to significantly reduce ammonia gases and odor levels in confined hog operations. Industry research indicates many possible benefits of reducing ammonia levels within the barn environment, including the following:

- Improved average daily gain
- Improved feed efficiency
- Reduced incidence of disease
- Reduced medication costs

HOW FEED ADDITIVE WORKS

SHAC Feed Additive is composed of liquefied oxidized lignite, and contains a high quality source of humic acids – complex compounds derived originally from peat. Humic acids are known to act by a variety of mechanisms to retain elements and certain compounds within the complex structure.

Ammonia gases result from the breakdown of uric acid into ammonium and volatile ammonia. It is hypothesized that in the presence of humic acids, the formation of ammonium (which is significantly less volatile than ammonia) will occur more frequently, thereby reducing the volatilization of such compounds from manure.

The absorptive properties associated with humic acids are also thought to promote retention of uric acid and ammonium, thereby retaining valuable nitrogen compounds within the manure. Lower concentrations of free urea due to the adsorption capacity of the product would therefore result in reduced ammonia volatilization.

Best results will be observed by using SHAC Feed Additive in conjunction with SHAC Manure Digester in swine production facilities as well as lagoon systems.

The additional benefits of humic acid treatments, being numerous, include the stimulation of microbial communities. SHAC treatments encourage the decomposition of organic matter by stimulating beneficial resident microbial communities present in manure. Stimulation of these microbial communities results in digestion of organic solids at optimum rates, thereby reducing offensive odors.

Humic substances also play a role in the detoxification of heavy metals. Heavy metals complexed by humic substances are generally considered less 'bio-available' within an environment and thus, less inhibitory to the microbial populations. This mechanism encourages the growth of beneficial microbial communities responsible for remediation and decomposition.

SHAC FEED ADDITIVE BENEFITS

- CFIA approved
- Safe and easy to use
- Significant ammonia and odor reduction
- Improved animal health
- Improved working conditions

For additional information, or to find a dealer or SHAC Authorized distributor near you. Please contact SHAC Solutions Inc. 1-888-533-4446 or visit us at www.shac.ca

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