SCD Probiotics®

Case Study Summary – SCD Odor Away™ effects on NH_3 gas emissions from pig housing and liquid swine manure samples in Lithuania

Livestock Operations – Swine (CSS-004-2010)

Industry: Livestock Operations
Application: Direct spraying to animal house and manure
Where: Baisigola, Lithuania
When: 2010
Product: SCD Odor Away™
Customer: PATC, Lithuania (LVA Lithuanian Animal Institute), Licensee of SCD Probiotics®

Background

Swine manure can be an excellent source of nutrients for crop production. The key to proper management is determining the nutrient content of the manure, the percentages of those nutrients that are available to the plant, and the nutrient requirements of the plant. In order to achieve this, it is important to manage odor associated to swine manure. The odor that is detected from a swine operation is a complex mixture of gases. Many of the same compounds that cause odor on a hog farm also affect the indoor air quality in the buildings. As a result, many practices that help control odor also improve air quality.

This study focuses on reducing odor in actual liquid manure samples. The results of the study will be beneficial to the swine operation in terms on how to properly manage air quality in the farm, reduce complaints from establishments near the area, and may produce good quality fertilizers once odor is controlled.

Methodology

In a pig farm, a study was conducted in two ways: 1) by spraying SCD Odor Away in the swine barn and 2) by adding SCD Odor Away under laboratory conditions to a concentrate taken from fresh liquid swine manure samples.

The barn included breast-feeding sows (27 individuals) and pigs (205 individuals). The total number of individuals was 232 and the total weight of the animals in the barn was 6,835 kg. The barn had 22 stalls and the total floor area for all of one barn stall was 352.0 m². Sheds in

different pens of pigs were regarded in two groups (K and E that stands for control and experimental). Diluted and concentrated SCD Odor Away was used on corresponding number of treatments.

Fresh fluid was collected (semisolid) as a fattening pig dung sample. The total amount of manure taken was 145 L. Manure was immediately brought to the lab for experimental procedures, placed into containers with experimental (E) and control (K) groups correspondingly (Figure 1). SCD Odor Away concentrate was diluted directly to the manure and parameters were measured such as air temperature (°C), relative humidity (%), light (lux), atmospheric pressure (mb), air velocity (m/s), CO2 concentration (ppm) and manure temperature. NH_3 gas emissions from each container were also measured. Measurement of the parameters was done and probiotic was re-added until improvements from ammonia emissions improved and eventually disappeared.

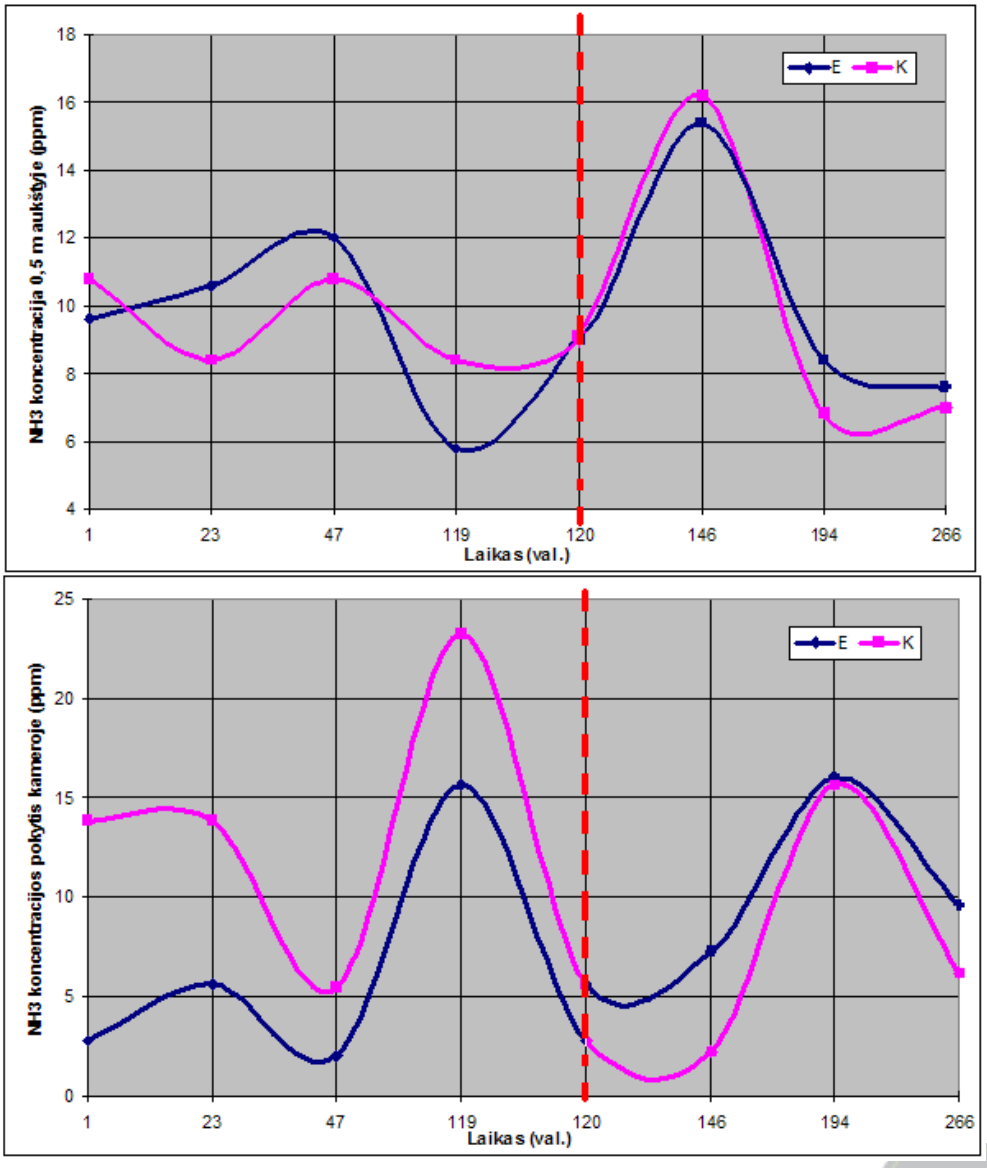
Figure 1: Experimental vessels with manure

Results

The NH_3 gas concentration of 0.5 meters measured in open space and NH_3 gas evaporation from the floor (chamber) after group substitution, respectively showed lower to higher averages. In open space E group resulted with a 14.04% than K; while in floor, E group of NH_3 concentration has an average of 26.15% (Figure 2) that is less than the increase on group K. It is thought that ammonia concentrations measured in the open space could be the result of a strong foreign element adjusted (e.g. the movement of pigs caused by changes in airflow). Further, there could be reliability of the data for NH_3 emission measurements from the floor (Figure 2) of the chamber because it was protected from the airflow changes. The results both imply that more experiment is needed when actual spraying in a barn is conducted; however,

the results would be a good step to design more efficient experimental methods of similar subject.

Figure 2: Ammonia concentration variations in the barn, 0.5 m (top) and the change in emissions from the barn floor (bottom) before and after the K, E group substitutions. * *Laikas (val.) means Time (hour).*



In the laboratory experiment, it is verified that factors that can't be controlled in the field could be avoided since the results were positive. It could be seen that SCD Odor Away seems effective at reducing foul odors by reducing emissions of NH_3 gas. Throughout the 380 hours study, (with adding SCD Odor away twice), ammonia emissions were reduced by an average of

19.6% compared with controls. The measurements of the barn showed a significant impact on NH_3 emission by SCD Odor Away (Figure 3).

Figure 3: Ammonia concentration change from the manure vessels (dotted line separates the re-filling phase of SCD Odor Away). ** Laikas (val.) means Time (hour).*