



SADIA SWINE MANURE LAGOON TREATMENT

THE PROBLEM

SADIA, a major integrated hog producer located in the Santa Catarina province of Brazil requested permission to conduct a test to determine the effectiveness of Nordevco Associates' technology to improve conditions in their manure storage lagoon at a facility located in Concordia. Nordevco's solution was applied by the producer and all testing and analyses were carried out jointly by EMBRAPA, the arm of the Brazilian Federal Government responsible for the research and development of new technologies and practices in the hog and poultry industries, and CNPSA, the National Center for Hog and Poultry Research.

OUR APPROACH

BactiDomus[®] Technology Bio4Swine was applied at a rate of .06 kgs/square meter of lagoon surface area (total surface area 144 m²) through the lagoon inflow pipe by farm staff on November 20, 1996. No changes were made to normal farm operations and the barn pits were cleaned and emptied into the lagoon on a regular basis during the treatment.

THE TECHNOLOGY

Nordevco's BactiDomus[®] Technology was developed by a diversified group of research scientists working together at Universities in Belgium and France. Their goal was to create a mechanism with the flexibility to deliver biological solutions to a range of environmental issues more effectively and efficiently

The foundation for the success of the BACTIDOMUS Technology was the development team's clear understanding that for any carrier material to be successful it had to meet specific underlying needs of the organisms:

- Regardless of the organisms used, they would be cultured in a sterile laboratory and would require time to acclimate to the environment they were activated in.
- Microorganisms, like humans, do not exist or thrive in isolation of each other but rather rely on others for stimulation and competition;
- Organisms prefer to grow and live in colonies or flocs and prefer to attach to something to anchor these colonies;
- Individual species of microorganisms do not work in isolation to break down organic compounds. To successfully break down any organic completely to CO₂ and H₂O, a variety of different organisms are required;

The result of that work is the BactiDomus[®] Technology which is based on the use of an inorganic limestone-like porous carrier material. The porosity of the material allows it to be bathed in a nutrient broth, absorbing key micro-nutrients that act as an initial food source when the product is activated. It is then impregnated with a range of different naturally occurring and non-pathogenic organisms, selected for their ability to breakdown specific organic contaminants.

The organisms selected for inclusion are selected based on the understanding that each contaminated environment can be aerobic, anaerobic or facultative anaerobic. Therefore, aerobic, anoxic and anaerobic organisms are selected and used in each product to ensure that they can function successfully in a broad range of environments.

The carrier material's large surface area to size ratio provides the organisms with both internal and external floc points where they grow and create large effective colonies of biodegraders working together to break down the organic contaminant into carbon dioxide and water.

The carrier material's hydrophilic nature allows it to absorb both the water and contamination. This provides a steady strong contact between the imbedded organisms and organic contaminant. This ensures that the organisms have a continuous food source as they grow and create flocs within the protective confines of the capillary network of the carrier material.

THE RESULTS

The results of the testing clearly indicate that the Bio4Swine had a significant positive effect on the lagoon. Noticeable results were reflected in the first sampling and testing conducted six days after the initial application of Bio4Swine. The last analysis, conducted two months after the single application of Bio4Swine: indicates significant changes to the lagoon. Total solids were reduced by in excess of 80% (fixed solids by in excess of 75% & volatile solids by in excess of 85%) and COD was reduced by more than 90%. In addition, the nutrient levels in the lagoon water were also significantly reduced with NH₃ reduced by 85%, Total Nitrogen by 40% and total Phosphorus by more than 90%.

Date	11/20/96 (initial)	11/26/96	12/06/96	12/20/96	1/07/97	1/21/97
Parameters						
pH	7.32	7.05	7.26	7.08	7.42	7.35
Total Solids	34,072	9,702	7,411	5,274	5,962	5,417
Fixed Solids	12,477	4,230	3,170	2,576	2,985	2,802
Volatile Solids (mg/l)	21,593	5,471	4,241	2,698	2,977	2,615
COD (mg/l)	32,150	16,200	3,996	3,250	2,600	2,705
NH ₃ (mg/l)	3,000	400	500	300	300	400
Total Nitrogen (mg/l)	1,975	1,210.2	1,169.9	1,034.3	1,165.1	1,119.9
Total Phosphorus (mg/l)	1,954.3	476.2	176.5	151.8	164.8	151.8

Note: All sampling and analyses were carried out by EMBRAPA and CNPSA.

PHONE: 1-204-261-1801
 FAX: 1-204-269-9097
 EMAIL: INFO@NORDEVCO.NET
 WWW.NORDEVCO.NET