

QUANTIFICATION OF FUNCTIONAL BACTERIA INVOLVED IN THE DEAMMONIFICATION PROCESS ON A NITRAMMOX® REACTOR

Gabrielli Vaz Sampaio*, Alice Chiapetti Bolsan, Gabriela Bonassa, Miriam Domingues Guimarães, Cecília Paulina Johann Dammann, Jean Carlos Fries, Gustavo da Silva Matos, Naiana Gabiatti, Airton Kunz, Marina Celant de Pra

**Universidade Tecnológica Federal do Paraná - Brazil
Embrapa Suínos e Aves - Brazil
gabriellisampaio@alunos.utfpr.edu.br*

Abstract: Anaerobic ammonium oxidation (ANAMMOX) is the process of oxidizing ammonia into nitrogen gas through the reduction of nitrite. Even though the bacteria involved in the ANAMMOX process are not found pure in the environment, they are always in consortium with other bacteria, especially those involved in the nitrogen cycle. ANAMMOX shows a granular shape, which allows the nitrifying bacteria to form a biofilm around them. Furthermore, they have a unique characteristic that is an intracytoplasmic compartment called the anammoxosome, which is believed to be a barrier against diffusion, enabling the transformation of the substrate into nitrogen gas, by specific enzymes. Fluorescent in situ Hybridization (FISH) is a quantification technique through the incorporation of oligonucleotide probes to determine the species present in the analyzed process. Therefore, the objective of the present work was to evaluate the functional bacteria existing in samples from a deammonification reactor called NITRAMMOX® operating on a lab-scale. Samples were collected and performed as described by standard protocols, and slides were analyzed under a fluorescence microscope. Following, the images were treated in the ImageJ software, where it was possible to observe the presence of nitrifying bacteria and ANAMMOX, elucidating the symbiosis between these two species. In brief, the FISH technique proves to be useful for the determination of the microbiota involved in the deammonification process.

Keywords: FISH, quantification, ANAMMOX, probes, microbiota.



Video presentation