Test and validation

2024WP3_Blu_001
Status: Evaluation report

Technical functionality
Menu card category

Problem owner:
Blue Plasma

Involved:
Wageningen Research

Ammonia and odor reduction with PAW

An exploratory trial using plasma-activated water (PAW) in an existing chemical air scrubber

BLUE PLASMA

Broad knowledge question
This project focuses on addressing emissions and odor nuisance in livestock farming by testing plasma-activated water (PAW) as an alternative to traditional air scrubbers. It aligns with the question of how innovative technologies can make the agrifood sector more sustainable and environmentally friendly. The challenge is to investigate how effective PAW is in reducing ammonia emissions and odor formation. Existing systems using sulfuric acid face issues with odor, pollution, and complex waste processing.

Approach
Blue Plasma conducted measurements at a pig farm in Liessel, Brabant. Emission reduction was measured at the inlet and outlet of an air scrubber using plasma-activated water, following a standardized protocol developed by Wageningen Research. The chemical analyses were performed at a Wageningen Research laboratory.

Objective
The objective was to determine the effectiveness of PAW in reducing ammonia emissions and odor formation, and to collect data to support broader adoption of this technology. This exploratory study serves as a first step to evaluate the functioning of PAW and lays the foundation for potential larger-scale research next year.

Results and reflection
This exploratory trial indicated that PAW can achieve a comparable ammonia reduction to a chemical air scrubber (>95%). Due to the short duration of the trial, the disinfecting effect (and reduction of odor) of PAW was not sufficiently demonstrated. Although the results provide valuable insights, this was an independent study conducted by Blue Plasma and not an official Wageningen Research study. The results provide sufficient grounds for larger follow-up trials in 2025.