An innovative approach for analysing and evaluating poultry farms odour related to animal health and welfare

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Abstract

Volatile organic compounds (VOCs) produced by pathogens, host-pathogen interactions and biochemical pathways were explored in several study as biomarkers for their capacity of diagnosing pathologies in livestock and in humans. VOCs are present everywhere such as in blood, breath, faeces, sweat, skin, urine and vaginal fluids and their qualitative and quantitative composition is influenced by pathophysiological responses to infections, toxins or endogenous metabolic pathway perturbations. In poultry, VOCs analysis has been explored to evaluate air quality in sheds but they have never been monitored to determine if birds were affected by enteric pathologies. These enteric disorders represent one of the most important groups of diseases they affect poultry and cause illness, mortality and economic losses. For this reason, monitoring the health status of broilers and an early detection of any health problem is of great importance in intensive farming, especially nowadays that antibiotics are banned.
Nowadays, the preventive use of antibiotics in intensive farming system is common and this management practice involves spreading of drugs in the environment, contributing to the phenomenon of antibiotic resistance.
The prompt reaction to any change in health, welfare and productive status is the key for the reduction in drugs usage and for the improvement of animal wellbeing.
Due to the high priority of this issue, it is of great importance the early detection of any health problem in intensive farming. Precision Livestock Farming, through the combination of cheap technologies and specific algorithms, can provide valuable information for farmers starting from the huge amount of data collected in real time at farm level
This study was aimed to the application of a PLF diagnostic tool, sensible to the variation of volatile organic compounds, to promptly recognise enteric problems in intensive farming, supporting veterinarians and enabling specific treatments in case of disease.

Keywords: early warning system; poultry welfare; health problem; PLF; volatile organic compounds.