I prefer:

× ORAL presentation

□ POSTER presentation

**The effectiveness of plant biomass extract coating preparation on the air quality in poultry houses**

Dorota Witkowska1\*, Joanna Adamska2,3, Radosław Pankiewicz2, Joanna Żebrowska4, Daria Murawska1

\*lead presenter

1dorota.witkowska@uwm.edu.pl, University of Warmia and Mazury in Olsztyn, Faculty of Animal Bioengineering, Department of Animal Welfare and Research, Poland

2Adam Mickiewicz University in Poznań, Faculty of Chemistry, Department of Environmental Physicochemistry, Poland

3Research and Implementing Company Acrylmed, Poland

4Institute of Veterinary Hygiene, Olsztyn, Poland

**Abstract:**

**Background/Objective:** The aim of this study was to evaluate the effect of a coating preparation based on an alkyd dispersion and plant biomass extracts (*Origanum* L., *Rosmarinus* L.), intended for painting floors and walls, on mitigation of aerial contaminants in poultry houses on a laboratory scale.

**Methods:** The experiment was performed during Ross 308 broiler chickens (♂) rearing to 42 d. Birds were housed in 3 separate, climate-controlled and identically equipped rooms (120 birds in each): 1. control group (C); 2. experimental group with oregano (O); 2. experimental group with rosemary (R). The measurements of air quality were conducted every 3d: 1. The level of dust fractions (PM1-10, TSP) – by gravimetric method, using a mass profiler (μg/m3); 2. Total count (cfu/m3) of bacteria, *Enterobacteriaceae*, staphylococci and fungi – by sedimentation or aspiration methods; 3. Concentration (ppm) of volatile compounds – by Fourier Transform Infrared Spectroscopy, using the portable Gasmet DX4030 device and Calcmet Pro software.

**Results:** Throughout the entire research cycle a beneficial tendency was found for lower concentrations of all dust fractions in the R and O groups (P < 0.01-0.05), and the lowest values were noted in the R room. Similar trends were found in case of microbiological contaminants. Their levels were the highest in the C room (P < 0.01-0.05), and when R group the biggest reduction of aerial microorganisms was observed. There was also a reduction of NH3 in O and R rooms (P < 0.01-0.05) starting from week 2, when a trace amount of this gas already appeared. No statistical differences were found in the concentration of CO2 and other volatile gas admixtures.

**Conclusion:** The developed product based on plant biomass extracts used in poultry houses in the form of a coating for floors and walls can contribute to reducing environmental resistance and thus improving the welfare and health of poultry. The next steps based on this research will be try to use the potential applications of tested treatment in farm scale.

**Keywords:** coating preparation, plant biomass, oregano, rosemary, contaminants mitigation, poultry house

Research was financed by the Fast track – Agrotech 7/1.1.1/2020 project, number POIR.01.01.01-00-2176/20-00, title: „Development of products for improvement of the poultry welfare based on the plant biomass extracts”.

Conference fee was funded by the Minister of Science under „the Regional Initiative of Excellence Program”.