I prefer:

X ORAL presentation

□ POSTER presentation

**Enviro-Detect instrument used to measure environmental conditions within a Spanish livestock building**

Thomas BANHAZI\*1,2, Annamaria BANHAZI1, Clive PHILLIPS1,3, Josep REIXACH4, Angela Ramon PEREZ5, Pol Llonch OBIOLS5, Jarissa MASELYNE6,

1InnoTech Vision ApS., Tiele, Denmark, 2Wroclaw University of Environmental and Life Sciences, Wroclaw, Poland; 3EMU, Tartu, Estonia; 4Selección Batallé S.A., Girona, Spain; 5UAB, Barcelona, Spain; 6ILVO, Merelbeke, Belgium Contact email: [thomas.banhazi@plfag.com](mailto:thomas.banhazi@plfag.com)

**Abstract:**

The importance of monitoring the concentrations of various airborne pollutants within livestock buildings cannot be overemphasized, as environmental management is a critical component of good livestock management in these days. Furthermore, various airborne pollutants can negatively impact on the health and welfare of livestock and on the work conditions of farm workers. A variety of instruments can be used currently to undertake relevant measurements, but often various technologies need to be installed and operated separately to obtain all relevant information. One system (Enviro-Detect, ED, PLF Agritech, Brisbane, Australia) has been identified and introduced on a commercial pig farm in Spain as part of the EU funded aWISH project (HEurope grant 101060818) to (1) assess if a single instrumentation can be used to measure all relevant environmental parameters in livestock buildings, (2) assess the applicability and feasibility of the technology and (2) use this information to assess the general welfare status of pigs. This integrated environmental monitoring system (ED) has been described before in various publications. The ED unit has been installed in late 2023 and reports have been sent to the producer weekly to alert them about the prevailing conditions in the livestock building. Available dataset recoded between 22/12/23 and 20/01/24 indicated that thermal conditions were quite adequate for the pigs during this winter period as the air temperatures within the building were relatively high 17.8 ± 2.0 oC and on average approximately 7.8 oC higher than outside temperatures (10.0 ± 5.4 oC). This “temperature lift” (TL) provided by this livestock building is greater than TLs observed in other countries with Mediterranean climate. The livestock building also reduced the extremes of temperatures internally as indicated by the difference in ‘range’ of the internal and external temperatures (16.5 and 31.9 oC, respectively). The measured internal relative humidity was 64.1 ± 11.7 % and not noticeably different when compared to the external humidity levels 68.2 ± 18.7. Both ammonia (6.3 ± 2.1 ppm) and airborne particle concentrations (10.8 ± 0.1 µg/m3) were low, indicating an optimal environment for the pigs to maximise production efficiency. Carbon dioxide concentrations (1190 ± 350 ppm) suggested that ventilations rates were controlled to provide a reduced ventilation rate during the winter period. These results highlighted the ED system’s ability to continuously monitor and assess the environmental conditions within livestock building, allowing farm managers to implement corrective actions if/when required.

**Keywords:** smart technologies, ICT tools, image analysis, ammonia, dust, temperature, humidity