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**Development of the Lesion-Detect system: Can Gross Lung Lesions Automatically Identified in Slaughterhouses?**

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**Abstract:**

The importance of monitoring respiratory health in pigs is well known as respiratory problems are causing significant economic damage to the European pig industry every year. Currently, the Pig Health Monitoring Scheme (PHMS) is a system that is used internationally to evaluate the health status of pig herds at slaughter. The current PHMS system is expensive and inefficient due to the need for highly trained staff to undertake manual data collection. Automating these health inspections via image analysis techniques could make it more efficient and economically viable. Thus, this project (financed as part of the larger aWISH project) aims to (1) create an automated and cost-effective method of assessing the respiratory health of pigs at slaughter and (2) use this information to assess the general welfare status of pigs. The machine vision system that is being developed will mimic the work of human inspectors by utilizing 2D cameras. A prototype system for monitoring lung lesions has been installed already at a commercial slaughterhouse in Spain in late 2023. The current hardware installed actually contains two cameras. Camare 1 is a more ‘wide-angle’ camera providing a more inclusive view of the slaughterhouse area while camera 0 is a more closely focused camera, providing a more detailed view of the lung samples. The current technical problems faced by the research team is related to the ability of the cameras to get the images of the lung/liver samples perfectly focused. Unfortunately, slaughterhouse kill chain speed evidently influenced the definition of the image taken by camera 0. To solve this problem, the speed of image capture rate was increased by reducing the camera exposure time. 17,000 images have been collected already and experiments have also been undertaken to validate the relationship between the visual assessment scoring system used during PHMS inspections (gold standard) and the images interpreted by the image analysis system (Lesion-detect).

**Keywords:** smart technologies, ICT tools, image analysis, pneumonia