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**Weight-Detect instrument predicted impending respiratory infection a week before clinical signs appeared**

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**Abstract:**

Regularly monitoring the growth rate of pigs is a standard industry practice. Weight monitoring on pig farms is usually done periodically using electronic scales, but new technologies are now available on farms that will enable farm managers to continuously and automatically monitor the weight of pigs in the pens. One of these systems (Weight-Detect, WD, PLF Agritech, Brisbane, Australia) has been introduced on a commercial pig farm in Spain as part of the EU funded aWISH project (HEurope grant 101060818) to (1) assess the applicability and feasibility of the technology and (2) use this information to assess the general welfare status of pigs. The machine vision based weight and behaviour monitoring system has been described before in various publications. The WD unit was installed in early 2024 and manual weight recordings were undertaken periodically using an electronic scale (WA08, Meier-Brakenberg, Extertal, Germany) to validate the WD system. In terms of absolute values, the three (3) manual measurements indicated that the WD system was able to predict the average pen weight of the pigs with 1% (1.0 kg), 0.5% (0.6 kg) and 2.3% (2.8 kg) precision respectively, despite the fact that standard deviations of the group were 13.3 kg (range 31.0 kg), 9.5 kg (range 27.8 kg) and 11.0 kg (range 36.0 kg), respectively. The pigs were uneven in this study pen which made weight prediction challenging as explained in previous articles. Despite the unfavourable experimental conditions, the WD unit performed well. More importantly, this case study demonstrated that the WD unit was able to detect weight reduction in pigs six days before the clinical signs of a respiratory disease infection were noticed. According to the WD measurements the study pigs achieved an average daily gain (ADG) of 915 g/d between the 20/03/24 and 16/04/2024. However, between the 16/4/2024 and 30/04/2024 their ADG dropped dramatically to 227 g/d. The animals were diagnosed with respiratory disease on the 22/04/24, six days after the dramatic reduction in ADG was recorded by the WD system. This two weeks of ADG stagnation has caused an approximate 10-day delay in reaching the desired slaughter weight, inflicting approximately 1,20 Euro/pig financial loss to the producer. These results highlight the WD system’s ability to alert livestock managers about impending health problems before clinical signs appear, so appropriate mitigation measures can be implemented to reduce the negative impacts on welfare and production performance.

**Keywords:** smart technologies, ICT tools, image analysis, weight detection, profitability