



Improving pig system performance through a whole system approach

THE CHALLENGE

As one of the most important factors affecting performance and welfare of pigs is their barn environment, the majority are housed in controlled-environment buildings.

Much theoretical data on environmental requirements of pigs is available. However, the practical implementation of this knowledge can be limited by existing control systems. In “modern” pig barns, automated systems for feeding and ventilation control are already present, these seldom exchange information work as stand-alone solutions with many limitations. In order to improve animal welfare, automated systems are needed that make use of existing data from climate control and feeding, capture animal behaviour and combine this information with up-to-date technical sensor data. This allows to actively influence husbandry conditions utilising early detection of unusual stress situations, behaviours or abnormal eating patterns and integration into a decision support system.

SENSORS AND THE VALUE THEY BRING TO THE ANALYSIS OF PIG FARMS



photo sources: © Drägerwerk AG & Co. KGaA, Lubeck. All rights reserved, VIVOTEK Inc.

- The best available sensor for pig health and welfare is the animal itself. Pigs' behaviour can provide information about their barn environmental situation, food and water adequacy, health, welfare and production efficiency.
- Direct visual observation of animal behaviour to detect environmental challenges is a task for a skilled stockperson.
- Interpretation can be very subjective and limited by the low daily contact time and sheer number of animals which must be supervised.
- Machine vision technique provides an automated, non-contact, non-stress and cost-effective way to achieve animal behaviour monitoring requirements.

- Technical sensors which enable the measurement of physical and chemical environmental conditions in the barn (e.g. air temperature, air velocity, pollutant gas levels) can provide concrete information on the current and historic housing situation.

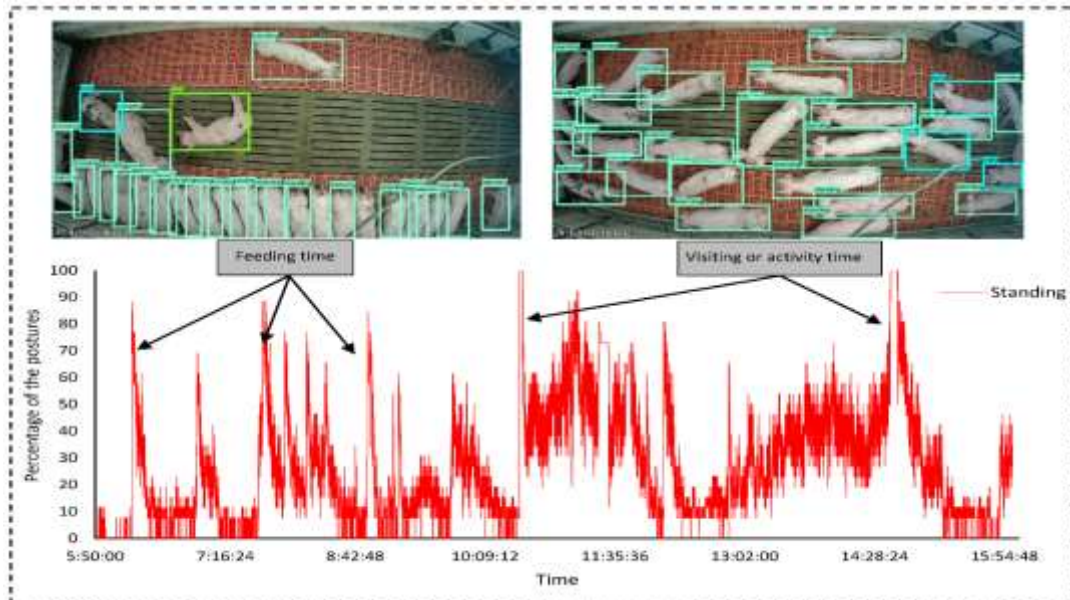


photo sources: <https://doi.org/10.3390/s19173738>

- Image processing and machine learning techniques can provide information about the thermal experience of pigs in a barn. This can be a useful supporting technology to improve control of the ventilation system for better barn climate, thermal comfort and welfare of pigs.
- Continuous and real-time monitoring of the behaviour of a group of pigs can be used as an early warning system to reduce the cost of production, limiting losses from disease and mortality and improving the job satisfaction of owners and staff.
- Development of new technologies and sensors is therefore an important step towards the establishment of an automated intelligent system to enhance pigs' welfare and health.