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THE PROBLEM

The increased population density in modern animal production systems has made them vulnerable to various transboundary infectious agents that threaten productivity of the meat industry.

Even though more effective drugs and vaccines have reduced the direct burden of livestock diseases, the total impact of animal health threats may actually be increasing, because in a globalized and highly interconnected world, the effects of diseases extend far beyond animal sickness and mortality. Therefore, early diagnosis and establishment of reliable countermeasures to infectious disease outbreaks is essential to limit severe biophysical and socio-economic consequences.
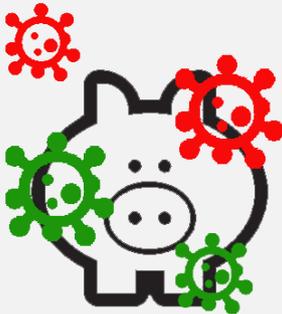
To date, the time between initial disease outbreak, sample transportation and laboratory confirmation of the etiologic infectious agent *can be up to several weeks or months*. Thus, the need for the development of mobile diagnostic units has been recently recognized. Reliable and simple diagnostic testing directly on site would enable rapid local decision making which is crucial to prevent further spreading of the disease.

THE TECHNOLOGY

SWINOSTICS addresses these challenges and needs, by developing a novel field diagnostic device, based on advanced, proven, bio-sensing and photonics technologies to tackle emerging and endemic viruses causing epidemics in swine farms in Europe that lead to relevant economic damages. The diagnostic device will allow immediate threat assessment at the farm level, with the analytical quality of commercial and institutional laboratories. The device will be portable and will provide results in 10 minutes for 5 samples simultaneously, making it highly suitable for use in the field. The modular construction of the device would allow future upgrades to increase capacity if so desired.
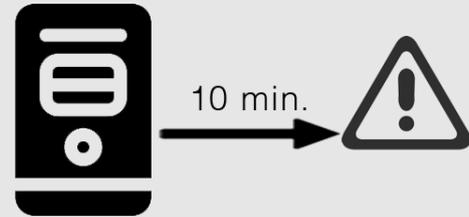
THE SOLUTION

The overall concept underpinning the project is that of a device for early, field-based, detection of important swine diseases (ASFV, PRRSV, H1N1, PPV, PCV2 and CSF). The device will use swine oral fluid samples as its main input, even though, it will be compatible with the use of other types of samples, such as faeces, blood or nasal swabs. The use of oral fluids as the main input diminishes the time needed for the analysis and simplifies the sample collection, allowing also the collection of wild boar samples.