

AVANT - PRESS RELEASE

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“Viable Alternatives to Colistin and Zinc Oxide Urgently Needed for European Swine Industry”

AVANT, a recently launched European funded research project, aims to bring new technologies and products closer to the market that will allow modern pig farms to wean healthy piglets without the use of antibiotics, or at least with very limited use. This will help combat porcine diarrhoea, make farming more productive and cost efficient, and reduce the risk of antimicrobial resistance in pig production, with consequent benefits to public health.

The Coronavirus pandemic has catapulted zoonotic infections into the public sphere. Humans and animals share eco systems where virus, fungi and bacteria can be transmitted between animals and humans with or without vectors. Preventing the transmission of diseases to humans from animal husbandry is crucial in stopping zoonotic infections, some of which can be deadly to those with compromised, undeveloped immune systems, or pre-existing conditions.

Traditionally, the same antibiotics have been used to combat bacterial diseases in both human and veterinary medicine. Since there are only a limited number of antibiotics available worldwide, it is critical to preserve their efficacy. Certain antibiotics which are deemed as being essential to human health are labelled as Highest Priority-Critically Important Antibiotics (HP-CIAs). One of them is colistin, an older drug that has been used for many years to treat porcine diarrhoea caused by enterotoxigenic *Escherichia coli* (ETEC).

Despite being classified as HP-CIA, colistin is used in pigs because ETEC has developed resistance to other antibiotics of lower medical importance. However, there is an increasing concern about the use of colistin in pig production because of the risk of emergence of colistin resistance in pigs and possible subsequent transmission to people, who depend on this antibiotic to treat severe bacterial infections in human medicine.

The development of antimicrobial resistance due to widespread overuse of antimicrobial drugs is a global public health problem. There is growing evidence that antimicrobial use in livestock contributes to multidrug-resistant bacterial infections in humans. This has increased consumer demand and governmental pressure to reduce antimicrobial consumption. Accordingly, the European Union (EU) and the World Health Organisation (WHO), under the *One Health* programme, have earmarked, as crucial, the need to find alternatives to antibiotics. Yet alternatives are not readily available for all disease conditions.

The only other valid alternative to colistin that has been used widely across veterinary practices to treat porcine diarrhoea, is zinc oxide. Despite its effectiveness, and use as a mineral feed additive, the therapeutic use of this heavy metal is being phased out due to its detrimental effects on the environment and people. Above all, the use of zinc oxide has also been associated with the occurrence of livestock-associated methicillin-resistant *Staphylococcus aureus* (LA-MRSA), a zoonotic pathogen in modern livestock production. **This draws attention to the urgent need to find alternatives to colistin and zinc oxide that AVANT is advancing on.**

Treating diarrhoea is essential to the welfare of the piglets during the weaning period, with an additional economic implication for the farmer through the loss of animals during this phase. The weaning period of the piglet is the most stressful event for the animal due to their undeveloped digestive systems and growth retardation caused by separation trauma from their mothers, amongst other things, when put together with a large number of similar-aged animals in what is known as 'batching'.

AVANT Scientific Project Co-ordinator, **University of Copenhagen Professor Luca Guardabassi**, said that he felt honoured to co-ordinate a multi-sectorial consortium comprised of highly-qualified academic and industrial partners across nine European countries working towards the goal of reducing antimicrobial use by demonstrating safe and effective alternatives.

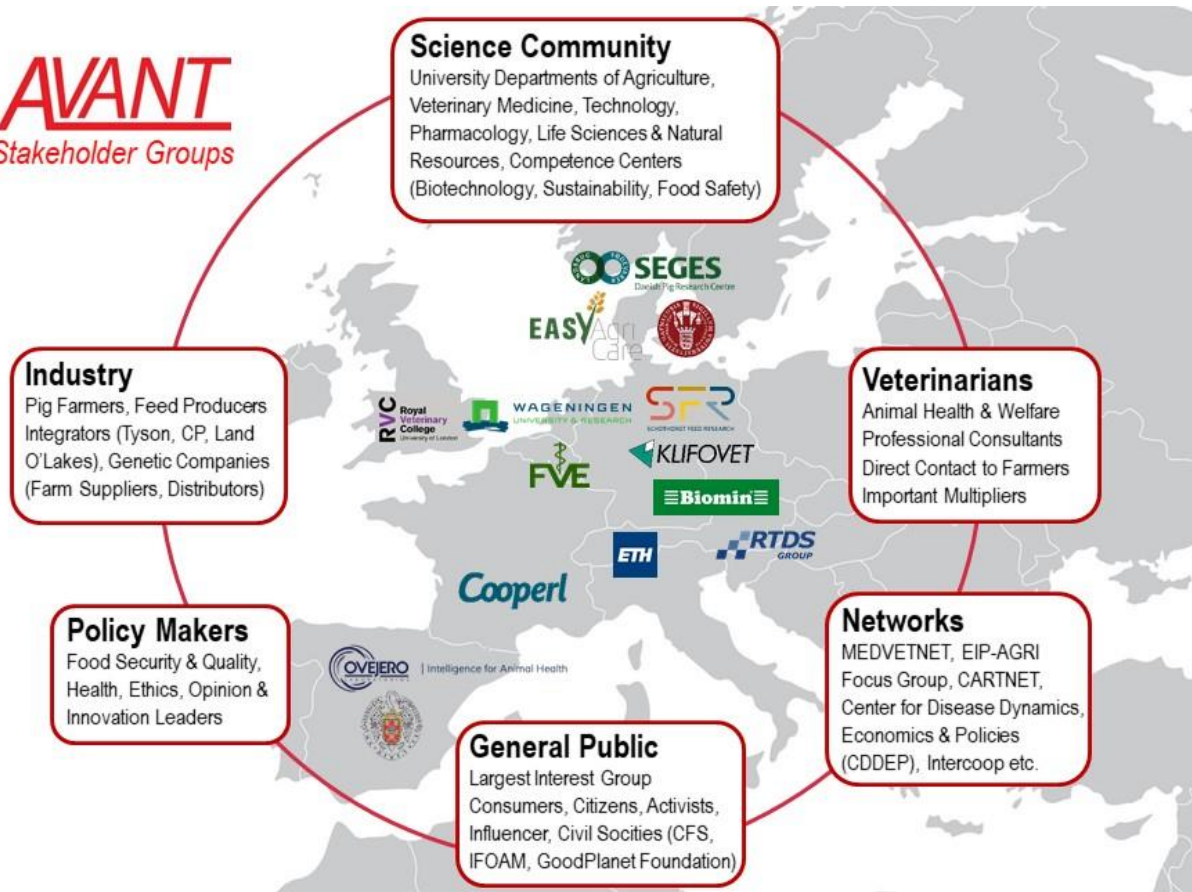
"By bringing alternatives to antimicrobials closer to the market, the AVANT project can have a tremendous impact on animal health, food safety and farm sustainability in developing unconventional veterinary products," he said.

The AVANT product portfolio includes seven interventions for which pre-clinical studies will be performed to test safety/efficacy and optimize production formulation and administration on an industrial scale. The three most promising interventions will be selected for farm trials to assess their clinical efficacy, reaching a prototype demonstration level in an operational environment, or Technical Readiness Level (TRL) seven, while TRL nine aims to prove the technology concept in an operational environment with a potential for commercialisation.

Moreover, the effects of these interventions on the reduction of antimicrobial use will be measured at farm level and predicted on a larger scale, at the EU level, by mathematical modelling. Apart from developing alternatives to antimicrobials, healthy pigs ensure better utilization of feed, which contributes to climate sustainability through lower CO₂ emissions per kilogram of pork produced.

AVANT PROJECT CONSORTIUM

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