DTU Vet
National Veterinary Institute

STATENS SERUM INSTITUT

DTU

A simulation model for the spread of LA-MRSA within a pig herd

Anna Irene Vedel Sørensen[1], Anette Boklund[1], Nils Toft[1], Jesper Larsen[2] & Tariq Halasa[1]

[1]Section for Epidemiology, National Veterinary Institute, Technical University of Denmark

[2]Microbiology and Infection Control, Statens Serum Institute

Objectives

- Study the mechanisms of MRSA spread and persistence within a pig herd.
- Examine the short and long term consequences and cost-effectiveness of different control strategies.

Materials and methods

- Mechanistic Monte Carlo simulation in R.
- Parameterization by existing data, data harvested in other part of the OHLAM project and expert opinions.

Background

- Livestock-associated methicillin-resistant *Staphylococcus aureus* (LA-MRSA) is an opportunistic human pathogen.
- LA-MRSA has main reservoir in pigs, but it has also been isolated from other animals and the environment.
- In 2014, LA-MRSA was found in 68% (N=207) and 63% (N=70) of the Danish production and nucleus/multiplier herds.*

*Source: Danish Food and Veterinary Administration.

Possible influence of …

Transmission of MRSA between stable units?

Emission of MRSA from a pig herd through air?

Emission of MRSA with pigs?

Transmission of MRSA within a unit?

Emission of MRSA with humans leaving the herd?

Transmission of MRSA within a pen?

Different routes of introduction?

Perinatal transmission from sow to offspring?

Spread of MRSA with humans and equipment?

Persistently colonized pigs?

Possible interventions…

Hygiene interventions among staff?

Cleaning and disinfection?

Use of probiotics?

Test-and-isolate until slaughter?

Test-and-cull among super-carrier pigs?

Changes in antimicrobial consumption patterns?

Acknowledgements

- This project is part of a larger project, OHLAM, funded by the Danish Ministry of Food, Agriculture and Fisheries.
- The OHLAM project includes participants from National Veterinary Institute and Statens Serum Institute.

Technical University of Denmark

DTU VET
National Veterinary Institute
Section for Epidemiology
Technical University of Denmark

Bülowsvej 27
1870 Frederiksberg C

Corresponding author:

Anna Irene Vedel Sørensen
PhD. student

Phone: +45 35 88 61 67
Email: anvso@vet.dtu.dk