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Can MRSA be transmitted through the pig production chain ?

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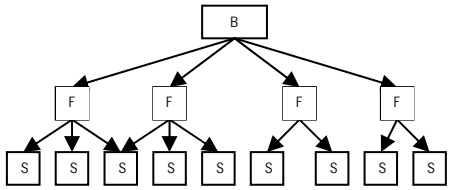
Introduction

Methicillin resistant *Staphylococcus aureus* (MRSA) has been found in pigs in The Netherlands since 2004. As of the structure of the pig industry in The Netherlands, MRSA has the possibility to spread to a large number of other farms by trade of animals. The higher prevalence of MRSA-positive finishing farms (70 % positive compared to farms without finishing pigs, Broens et al., 2008) might be due to the transmission within the pig production chain.



Production pyramid of pigs in The Netherlands
(B=breeding farm, F=farrowing farm and S=finishing farm)

Objective

To gain insight in the transmission of MRSA from breeding to farrowing to finishing farms in a pig production chain

Materials and Methods

- Sample size: 20 complete chains (so far sampled: 10 complete en 5 incomplete chains (40 farms))
- 20 nasal swabs from pigs from each age group (sows, gilts, suckling piglets, weaned piglets and finishing pigs)
- Microbiological analysis on pooled samples (4-6 swabs per pool)
- Determination by PCR, *spa* typing and antimicrobial susceptibility testing
- A farm is positive if at least one of the pool samples is tested positive

Results

- MRSA was found on all types of farms (breeding, farrowing and finishing)
- Pig production chains were completely negative, completely positive or 'mixed' (examples below)

80% of farms that purchase animals from MRSA-positive farms are MRSA-positive
33% of farms that purchase animals from MRSA-negative farms are MRSA-positive
(OR=7.2; 90% CI=1.1-67.6; *P*=0.08; exact logistic regression)

- Seven different spa types were identified and all strains were resistant to tetracycline
- Strains from related farms were, predominantly, from the same *spa* type and had similar resistance patterns

MRSA spreads through the pig production chain supporting a top-down control strategy

Recommendations

- Other risk factors should be studied, as farms on the top of the chain were tested positive ➡ **see my other poster for more about this**
- Experiments should be performed to study the transmission within farms

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