

MRSA in pigs: a new threat to human health !?

How many and which pig farms are MRSA-positive ?



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Introduction

Methicillin resistant *Staphylococcus aureus* (MRSA) is currently the most commonly identified antibiotic-resistant pathogen in hospitals. The Netherlands is still among the low prevalence countries (<3%), however MRSA is increasing the last years. In 2004, contact with livestock, especially pigs, was identified as a risk factor for human MRSA carriage. Quick scans on pig slaughterhouses and farms showed that 23-81% of the sampled pig herds tested MRSA-positive. Antimicrobial use in Dutch intensive farming is a suggested risk factor that needs to be studied.

Objective

To estimate the prevalence and risk factors of Dutch MRSA-positive pig farms.

Material and Methods

- Sample size: 200 farms (50 farms sampled so far)
- 60 pigs (nasal swabs) → 10 pools of 6 swabs
- 5 environmental samples (picture)
 - Positive farm: at least one of the samples positive
- Questionnaire on risk factors
- Microbiological analysis and determination by PCR and *spa* typing
- Statistics: multivariable logistic regression adjusting for farm effect



Taking an environmental sample

Preliminary results

How many?

- 56% (28/50) of the farms tested MRSA-positive
- On positive farms, 58.2% of the pools and 60.0% of the environmental samples were positive
- Classification of farms based on either pool or environmental samples was strongly associated (OR=27.5; P<0.0001)
 - **promising for future monitoring and surveillance programs**

Which?

- 70% of farms with finishing pigs MRSA-positive
- 50% of farms with sows and finishing pigs MRSA-positive
- 12.5% of farms without finishing pigs MRSA-positive
- Hygiene measures associated with a lower prevalence
- Routine usage of antimicrobials not associated with a higher prevalence

Table. Risk factors for MRSA-positivity of pig farms

Variable	Category	Freq (n)	Prev (%)	OR	95% CI	P-wald
Type of farm	finishing pigs only	30	70.0	16.3	1.8-152.8	0.01
	finishing pigs and sows	12	50.0	7.0	0.7-75.7	0.11
	no finishing pigs	8	12.5	ref.	ref.	
Desinfection footbath	no	21	71.4	3.1	0.9-10.2	0.07
	yes	29	44.8	ref.	ref.	
Handwashing	no	5	80.0	3.5	0.4-33.8	0.28
	yes	45	53.3	ref.	ref.	
Desinfection of farm sections	no	45	35.6	3.5	0.4-∞	0.26
	yes	5	0.0	ref.	ref.	
Routine antimicrobial use	no	21	56.0	ref.	ref.	
	yes	29	44.0	0.5	0.2-1.5	0.20

Discussion

- Presence of MRSA in environmental samples indicates that indirect contact also is a possible transmission route for both pigs and humans
- Higher prevalence of finishing pig farms due to transmission through the pig production chain? → **see my other poster for more about this**

56% of Dutch pig farms MRSA-positive
Higher prevalence in farms with finishing pigs