

Dynamics of methicillin-resistant *Staphylococcus aureus* (MRSA) in Swiss fattening pigs during the productive period

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Key words

LA-MRSA, Transportation, Slaughterhouse, Public Health, Prevention, Swine

Aim of the study

The prevalence of MRSA in Swiss slaughter pigs increased in the period from 2009 to 2012 from 2.0% to 18.1%. Effective measures to combat further spread of MRSA in the Swiss pig population can only be developed, if detailed insights into the specific factors, such as entry way, dissemination of this agent within the herd up to slaughter are known. Thus, the aim of this project was to track the MRSA status of selected Swiss fattening farm throughout the entire process from fattening to slaughter, including transport of the animals and as well as MRSA carriage by farmers. Thereby, critical control points and potential intervention measures could be identified.

Material and methods

Pigs from four Swiss pig farms were recurrently tested for the presence of MRSA between May and December 2014 during a production cycle. In total, 1'728 nasal swabs from 390 pigs and 592 environmental wipes were collected from the four studied farms, as well as from three additional farms from which samples were taken only in pigs being transported.

Results and significance

Intermittent colonisation throughout the entire production cycle was conspicuous in the tracking of MRSA in individual pigs. The intermittent colonisation might point even to a repeated contamination in a MRSA-positive environment rather than a transiently colonization. Further studies are needed to investigate the underlying factors of MRSA contamination versus colonisation in pigs. Transportation and processes at the slaughterhouse turned out to be critical control points for the spread of MRSA. The most probable sources of MRSA are lorries, lairages and/or contact to other pigs, either transported together on the same lorry or in contact at slaughterhouse. The necessity for defining a MRSA status at the herd level instead of the level at the individual pig is clearly demonstrated in our study. The further spread of MRSA could be prevented by defining farms as MRSA positive or negative and allowing the trade of animals only within herds of the same status. With the implementation of these measures, also further dissemination of LA-MRSA into healthcare facilities and the community via humans with close contact to these animals, i.e., farmers, veterinarians and slaughterhouse workers could be prevented. The determination of the MRSA prevalence in Swiss pig herds based at the moment on single pig testing at slaughter, which leads to an imprecise estimation of prevalence at the farm level.

Publications, posters and presentations

Bangerter, P.D. (2015) Longitudinal study on methicillin-resistant *Staphylococcus aureus* colonisation and transmission in Swiss pig farms. Dissertation, Vetsuisse Fakultät Universität Bern

Bangerter, P.D.; Sidler, X.; Perreten, V.; Overesch, G. (2015) Longitudinale Untersuchungen zu MRSA in Schweinebeständen in der Schweiz, Symposium Antibiotikaresistenz in der Lebensmittelkette, BfR, 02-03.11.2015, Berlin, Germany

Bangerter, P.D.; Sidler, X.; Perreten, V.; Overesch, G. (2016) Longitudinal study on the colonisation and transmission of methicillin-resistant *Staphylococcus aureus* in pig farms. *Vet. Microbiol.* 2016; 183: 125-134

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