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Prevalence of *Salmonella* spp. in piglet producing and rearing systems in North-Rhine-Westphalia

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Introduction

In Germany as well as in Europe, Salmonellosis is still the second most commonly recorded zoonosis (EFSA & ECDC 2017, RKI 2018). Fattening farms are committed to do frequent monitoring to reduce entry of *Salmonella* spp. in the food chain. This is regulated by law (Schweine-Salmonellen-Verordnung) since 2007. However, one problem, especially in farms with good hygienic management, is the housing of *Salmonella*-infected piglets. The purpose of our study was to investigate the prevalence of *Salmonella* spp. in piglet producing and rearing systems in North Rhine-Westphalia. The project was financially supported with resources of animal diseases fund (Tierseuchenkasse) NRW. The immediate objective was to reduce *Salmonella* burden of each farm by using individually adapted measures. The long-term objective was to evaluate general measures, which are able to permanently reduce *Salmonella* load in pig farms.

Methods

All piglet producers of North Rhine-Westphalia could volunteer for an initial survey of their *Salmonella* burden between 2016 and 2018. Each farm was analysed with regard to hygiene and biosecurity and sampling was done. Blood samples were collected from 20 sows, 10 pigs (weighted around 28kg), 10 gilts and tested for *Salmonella* antibodies using commercial ELISA test (Swine *Salmonella* Antibody Testkit; IDEXX Laboratories). Furthermore, faecal samples of each rearing unit and environmental swabs of a disinfected compartment were analysed. Each *Salmonella* isolate was serotyped and resistance test was carried out. All data were collected in a database (Microsoft Access 2016). Descriptive statistics were summarized using a commercial software program (Microsoft Excel, 2016).

Results

Overall 102 farms were visited for initial survey, 87 of them were sampled two times or more. There were different production types: sow breeders, piglet

producers, farms only with piglet rearing units, grow-to-finish farms and farrow-to-finish farms. The number of sows varied from 40 to 2000 (mean 333, median 260). Rearing units had a mean size of 1595 piglets (median 1175; min. 100, max. 9000) and fattening units had a mean size of 1055 pigs (median 780); the smallest fattening unit of 20 pigs and the biggest farm with 5000 pigs. Status survey contained the question of measures already taken against *Salmonella*. In five farms, gilts were vaccinated against *S.Typhimurium*. One farmer vaccinated only sows and five farmers vaccinated sows and gilts against *S.Typhimurium*. In three farms gilts, sows and piglets were vaccinated against *S.Typhimurium*. Two of these farms used a stock-specific vaccination; all others used a commercial live vaccine. Approximately 9100 blood serum samples were collected. Excluding samples of *Salmonella* vaccinated animals, 4596 serum samples of sows were analysed and nearly 31% of them showed an optical density (OD%) over 40%. According to „QS-Salmonella-Monitoring-System“ in fattening pigs, those samples are *Salmonella*-antibody-positive. The proportion of positive samples (OD%=40) of gilts lies about 14% and about 12% in pigs with an average weight of 28kg. In total 2630 faecal samples were collected. On 81 out of 102 farms at least one positive faecal sample was found. In total 611 samples (23%) were *Salmonella*-positive by culture. Of 751 environmental swabs, 102 contained *Salmonella* spp. Three farms had only positive environmental swabs but in 25 farms, *Salmonella* was detected in faecal as well as in environmental samples. Serotyping resulted in 12 different *Salmonella*-Serovars. Most frequently *S.Typhimurium* was detected (80.79%), followed by *S. Derby* (4.91%) and *S. Subspec. I. Rauform* (1.26%). All other serovars were only a few cases (< 1% of isolates).

Conclusion

This study shows a seroprevalence of *Salmonella* in sows in North Rhine-Westphalia on a medium level. Hence, the seroprevalence in post-weaning pigs was on a low level, the detection rate of *Salmonella* spp. by culture was quite high. All results point to the fact that reducing the risk of *Salmonella* infection by pork has to start at the basis of the production pyramid.