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The surveillance programme for methicillin resistant *Staphylococcus aureus* in pigs in Norway 2025

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Content

Summary

The surveillance programme in 2025 did not detect any pig herds with MRSA. In total, 524 herds were included in the survey, of which 58 were genetic nucleus or multiplier herds, 11 herds were central units of the sow pool herds, 19 were of the largest farrow to grower or farrow to finish herds, and the remaining 436 were herds with more than 10 sows.

Introduction

The Norwegian Food Safety Authority (NFSA) is owner of the surveillance programme for MRSA in swine and perform the practical sampling. The Norwegian Veterinary Institute is responsible for planning, laboratory investigations and reporting of the programme.

There are several varieties of Methicillin resistant *Staphylococcus aureus* (MRSA), some of which are associated with animals (especially pigs) and are collectively referred to as LA-MRSA (livestock associated MRSA). LA-MRSAs have become widespread in pig populations around the world, thereby representing a risk for dissemination to the human population.

All types of MRSA can be transmitted between humans and animals. However, not all types are well adapted for establishing in other species than their original host. MRSA is not typically associated with disease in animals or healthy humans, but it is important to prevent transmission, especially to health institutions such as hospitals and nursing homes where the bacteria can cause severe infections that are difficult to treat.

The commercial Norwegian pig population is characterized by being essentially closed due to negligible imports of live pigs (1). The population is based on a pyramidal structure with genetic nucleus herds at the apex, and with a unidirectional downward trade of live animals. The number of herds with breeding sows were about 781 (preliminary numbers) during 2025 (2).

Surveys that were conducted in 2008 (3), 2011 (4) and 2012 (5) indicated a very low prevalence of MRSA-positive pig herds in Norway. MRSA belonging to the LA-MRSA clonal complex CC398 *spa*-type t034 was detected in pig samples for the first time in 2011 (anonymous study, 4). In 2013/14, three clusters of LA-MRSA CC398 positive pig herds were detected (6), in eastern and southwestern Norway, respectively, and measures to eradicate LA-MRSA from positive pig herds were imposed. The rationale behind this strategy was to avoid the pig population becoming a reservoir of MRSA with the potential of zoonotic transmission. This has also been followed up in the Norwegian National Strategy against Antibiotic Resistance from 2015 (7) and in 2024 (8) stating as a goal that “LA-MRSA will not be established in the Norwegian pig population”.

The LA-MRSA eradication strategy includes restrictions on trade of live animals upon suspicion, depopulation of pigs in LA-MRSA positive pig herds, thorough cleaning and disinfection of premises, negative samples from the environment and mandatory down-time before restocking with pigs from MRSA negative herds. After restocking, samples are collected from animals and the environment several times to assess the effectiveness of MRSA eradication.

A comprehensive surveillance program of MRSA in the pig population was implemented in 2014. Sampling description and overview of results are described in the annual reports (9).

In total, nine pig herds have been found positive through the MRSA surveillance programme in 2014 - 2025 (Figure 1). Additionally, contact tracing from positive herds or from persons have detected a total of 75 MRSA positive herds, bringing the total number of pig herds found positive for MRSA to 84 in this time period (9). In all LA-MRSA positive herds, measures to eradicate MRSA were imposed.

Aims

The objective of the surveillance programme is to identify MRSA positive pig herds with the intention of contract tracing and eradication of LA-MRSA, as the overall goal is to keep the Norwegian pig population free of LA-MRSA.

Materials and methods

In 2025, the following were to be sampled by the NFSA: all of the genetic nucleus and multiplier herds (n = 61) and the central unit herds of the sow pools (n=11), the 20 largest farrow to grower or farrow to finish herds with more than 10 sows according to the Registry of Production subsidies as of 1st of October 2025, and herds with more than 10 sows (n =430) according to the Registry of Deliveries of carcasses. Each local NFSA is expected to use their local knowledge and add herds missing in the lists, as the production subsidies registry is not complete. The genetic nucleus and multiplier herds, as well as the sow pool herds and the largest commercial sow herds, were to be sampled twice. Sampling was conducted throughout the whole year.

Pigs were sampled by using sterile SodiBox™ cloths moistened with sterile saline water. A part of the cloth was rubbed firmly against the skin behind both ears of the pig (about 5x5 cm on each side). Each cloth was used for 20 pigs, and a total of three cloths, representing 60 pigs distributed in all rooms and all age groups (except suckling piglets), were used per herd. The three cloths were analyzed as one pooled sample. In addition, in each herd two cloths were used for environmental samples taken in all rooms with pigs. Each cloth was used on about 15 control points (about 10x10 cm per location) representing furnishings, feeders, water nipples, windowsills, door handles, tools, boots, ventilation system etc. These two cloths were analyzed as one pooled sample.

The samples were submitted to the Norwegian Veterinary Institute and analyzed for MRSA by enrichment in 300 mL Mueller Hinton broth with 6.5% NaCl at 37ºC for 18-24 h. From the culture obtained in the Mueller Hinton Broth, 10 µL were streaked on Brilliance™ MRSA2 Agar (Oxoid) and incubated at 37ºC for 18-24 h. The 95% confidence interval (CI) was calculated based on a binomial distribution.

Results and Discussion

Altogether 524 herds were included in the 2025 MRSA surveillance.

Samples were received from:

- 32 and 26 genetic nucleus and multiplier herds, respectively. From these 58 herds, samples were received three times from one herd, twice from 47 herds and once from 10 herds.
- 11 sow pool herds. Two herds were sampled once, while the remaining nine herds were sampled twice.
- 19 herds stated by the NFSA to be of the largest farrow to grower or farrow to finish herds, of which ten were sampled twice and nine were sampled once.
- A total of 436 herds with more than 10 sows, of which 2 were sampled twice.

MRSA was not detected in samples from any of the 524 herds included in the 2025 surveillance (95% CI: [0-0.70]).

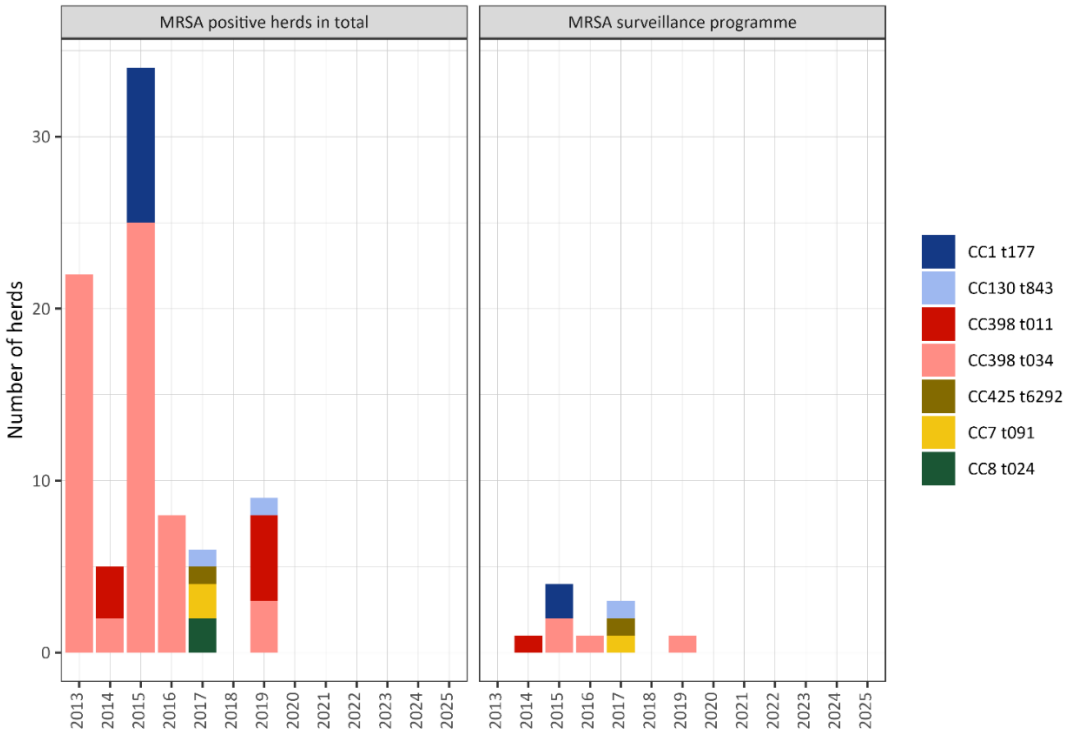

Figure 1. Number of pig herds positive for methicillin resistant *Staphylococcus aureus* (MRSA) in Norway in 2013-2025. The herds detected by the MRSA surveillance programme in pigs are shown to the right, while figure to the left also include herds detected through contact-tracing. There have been no findings since 2019. Colours of bars refer to the clonal complex and *spa*-type of the isolates, *mecC* gene detected for CC130 and CC425, m*ecA* gene for the others.

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