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Study finds swine farming is a risk factor for drug-resistant staph infections

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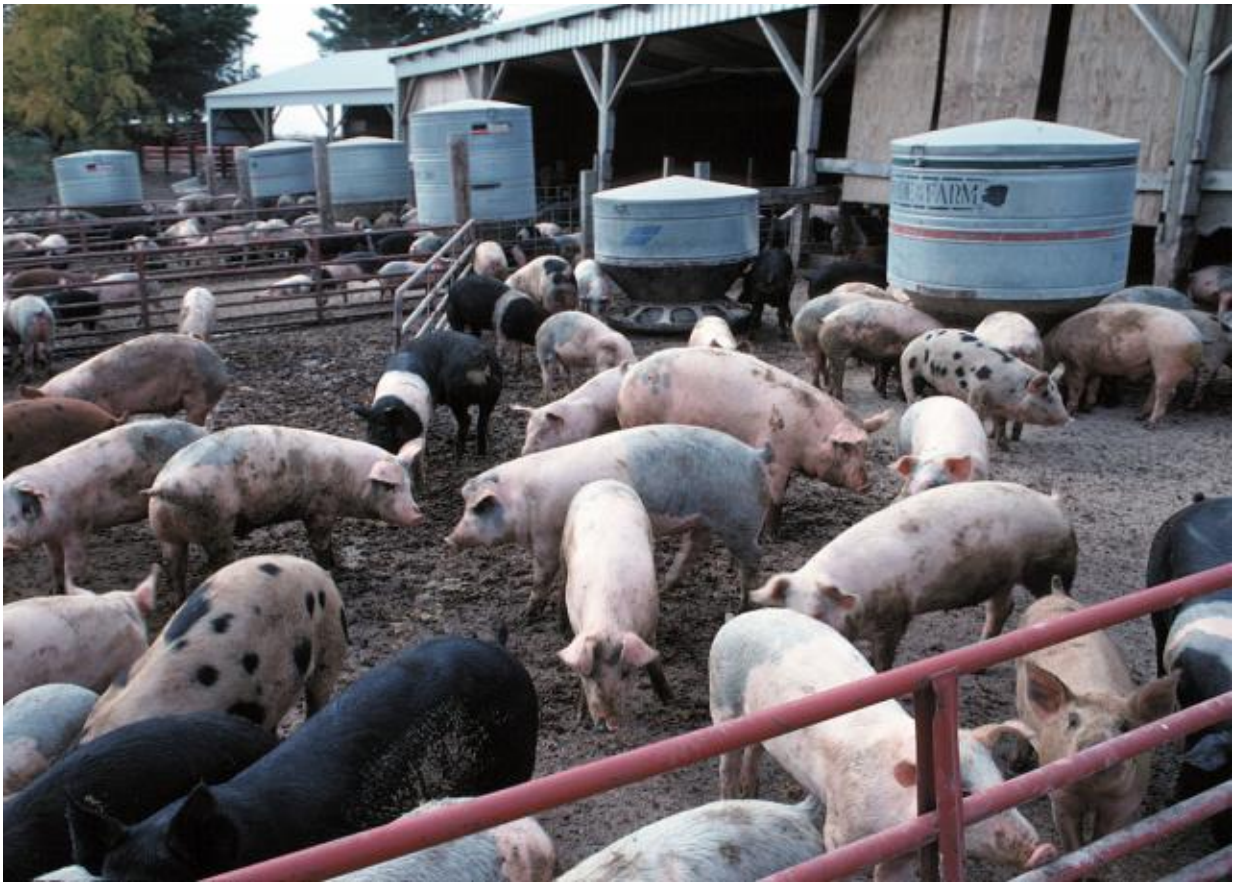

A new Univ. of Iowa study reports swine farmers are six times more likely to have staph bacteria than others. Credit: Lynn Betts, USDA Natural Resources Conservation Service

Swine farmers are more likely to carry multidrug-resistant *Staphylococcus aureus* (*S. aureus* or "staph") than people without current swine exposure, according to a study conducted by a team of researchers from the University of Iowa, Kent State University, and the National Cancer Institute.

The study, published online in the journal *Clinical Infectious Diseases*, is the largest prospective examination of *S. aureus* infection in a group of livestock workers worldwide, and the first such study in the United States.

S. aureus is a type of bacteria commonly found on the skin as well as in the noses and throats of people and animals. About 30 percent of the U.S. population carries these bacteria, which can cause a range of skin and soft tissue infections. Although most infections are minor, *S. aureus* can sometimes cause serious infections.

Increasingly, drug-resistant strains of *S. aureus* are emerging, including methicillin-resistant (MRSA), tetracycline-resistant (TRSA), or multidrug-resistant (MDRSA) strains. And while previous studies have shown that certain strains of *S. aureus* are often associated with swine, cattle, and poultry exposure, little is known about livestock-associated staph carriage and infection in the United States.

The study authors note the research helps keep farmers safe by raising awareness about a potential health issue in swine operations. *S. aureus* does not present an economic concern for swine farmers since pigs generally are unaffected by staph infections.

"*S. aureus* does not typically make pigs sick, but they can act as carriers and transmit the bacterium to farmers," says Tara Smith, corresponding author on the study. "While carriage of *S. aureus* isn't itself harmful, individuals who harbor the bacterium in their nose, throat, or on their

skin are at risk of developing an active staph infection, and they can also pass the bacterium to other family or community members. Individuals who may be immunocompromised, or have existing conditions such as diabetes, are especially at risk from staph infections."

For the study, the researchers followed a group of 1,342 Iowans, including individuals with livestock contact and a community-based comparison group, for 17 months. The participants were recruited from 53 of Iowa's 99 counties and lived in rural areas or small towns. Nose and throat swabs were collected from participants at the beginning of the study to determine if they carried *S. aureus*. Participants who experienced skin infections during the study period also were assessed for *S. aureus*.

Overall, 26 percent of the participants carried *S. aureus*. However, the investigators found that farmers with livestock exposure, particularly swine exposure, were more likely to carry MDRSA, TRSA, and livestock-associated *S. aureus* than those who weren't exposed to livestock.

"Current swine workers were six times more likely to carry multidrug-resistant *S. aureus* than those study participants without current swine exposure," says Smith. The study is based on research that Smith, currently an associate professor at Kent State University, conducted while she was a faculty member at the UI College of Public Health.

"Swine workers are also at risk of becoming infected with these organisms," Smith adds. "One hundred and three potential *S. aureus* infections were reported, and included infections with livestock-associated strains of this bacterium."

There currently is no method to prevent or eliminate carriage of *S. aureus* in animals or their human caretakers, meaning constant re-

exposure and possibly transmission can occur between livestock and farm workers. Those workers can then pass staph to their family or community members.

"Iowa ranks third nationally in overall livestock production and first in swine production," notes Smith. "Transmission of staph between pigs and farmers and into the broader community could complicate efforts to control *S. aureus* transmission statewide, and have effects nationally due to the travel of pigs and people carrying these bacteria."

Provided by University of Iowa

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