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NEW STUDY REVEALS MRSA BACTERIA COMMON AMONG PIGS AND FARM WORKERS

Earlier European Studies Suggested Pigs as Source of Human Infection; Congress Needs to Compel Government Action

Washington, DC – A new study published in *Veterinary Microbiology* found methicillin-resistant *Staphylococcus aureus* (MRSA) prevalent in Canadian pig farms and pig farmers, pointing to animal agriculture as a source of the deadly bacteria.

The *Veterinary Microbiology* study (Khanna et al. 2007) is the first to show that North American pig farms and farmers commonly carry MRSA. The study looked for MRSA in 285 pigs in 20 Ontario farms. It found MRSA at 45% of farms (9/20) and in nearly one in four pigs (71/285). One in five pig farmers studied (5/25) also were found to carry MRSA, a much higher rate than in the general North American population. The strains of MRSA bacteria found in Ontario pigs and pig farmers included a strain common to human MRSA infections in Canada.

An estimated nine million Canadian hogs will be imported into the United States this year.

A study published last month in the *Journal of the American Medical Association* (JAMA) (Klevens et al. 2007) estimated almost 100,000 MRSA infections in 2005, and nearly 19,000 deaths in the United States. In comparison, HIV/AIDS killed 17,000 people that year.

Until recently, conventional wisdom had MRSA pegged as an opportunistic infection occurring mainly in hospitals. The JAMA study found that even healthy people are developing MRSA infections. The *Veterinary Microbiology* study points to pig farms as a possible source of these resistant infections, as have earlier European studies.

Members of the Keep Antibiotics Working coalition (KAW), including medical, agriculture, and environmental experts, are calling for Congress to compel the U.S. Food and Drug Administration (FDA) to study whether the use of human antibiotics in animal agriculture is contributing to the reported surge in MRSA infections and deaths in the United States.

“Identifying and controlling community sources of MRSA is a public health priority of the first order,” said Richard Wood, Executive Director of Food Animal Concerns Trust and Steering Committee Chair of Keep Antibiotics Working. “Are livestock farmers and farms in the United States also sources? We don’t know for sure, because the U.S. government is not systematically testing U.S. livestock for MRSA.”

“Last summer, when we raised the MRSA issue, the FDA told us that it had no plans to sample U.S. livestock to see if they carry MRSA,” said David Wallinga, MD, Director of the Institute for Agriculture and Trade Policy’s Food and Health Program. “Given the latest science that hog farms may generate MRSA, we need Congress to give FDA and other relevant agencies the necessary funding and a sense of urgency. Sampling needs to be done as soon as possible.”

U.S. veterinarians are documented as carriers of MRSA. A 2005 survey of attendees at an international veterinary convention in Baltimore, MD, who were tested for MRSA found that of the 27 who tested positive, 23 were from the United States.

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In Europe, MRSA has been shown to be transmitted from pigs to farmers, their families, veterinarians, and hospital staff treating farm-infected patients. The same pig strain that was detected in Canada has been associated in Europe with serious human illness including skin, wound, breast, and heart infections, as well as pneumonia.

The heavy use of antibiotics in industrialized livestock operations can select for resistant bacteria, such as MRSA. A study in Europe documented that pig farms routinely using antibiotics were more likely to have MRSA than farms with limited antibiotics use.

Proposed federal legislation, The Preservation of Antibiotics for Medical Treatment Act, sponsored by Senate Health Committee Chairman Edward Kennedy (D-MA) and Senators Olympia Snowe (R-ME), Susan Collins (R-ME), Sherrod Brown (D-OH) and Jack Reed (D-RI) in the Senate (S. 549) and Rep. Louise Slaughter (D-NY), the only microbiologist in Congress, and 34 other House members in the U.S. House of Representatives (H.R. 962), would phase out the use of antibiotics that are important in human medicine as animal feed additives within two years. The American Medical Association, the Infectious Diseases Society of America, and the American Academy of Pediatrics are among the more than 350 health, agriculture, and other groups nationwide that have endorsed this bill.

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Annotated bibliography:

Khanna et al. 2007. Methicillin-resistant *Staphylococcus aureus* colonization in pigs and pig farmers. *Veterinary Microbiology* doi:10.1016/j.vetmic.2007.10.006. The prevalence of MRSA colonization in farms in Ontario, Canada, was 45%.

Klevens et al. 2007. Invasive methicillin-resistant *Staphylococcus aureus* infections in the United States. *JAMA* 298:1763-1771. In 2005, there were an estimated 100,000 MRSA infections, and nearly 19,000 deaths.

de Neeling et al. 2007. High prevalence of methicillin-resistant *Staphylococcus aureus* in pigs. *Veterinary Microbiology* 122:366–372. Eighty-one percent of Dutch pig farms had pigs carrying MRSA and 39% of pigs at slaughter carried MRSA. All MRSA were tetracycline resistant and many of the bacteria were resistant to other antibiotics.

Ekkelenkamp et al. 2006. Endocarditis due to methicillin-resistant *Staphylococcus aureus* originating from pigs [Article in Dutch]. *Nederlands tijdschrift voor geneeskunde* 150:2442–2447. A 63-year-old transplant patient was admitted with endocarditis due to pig strain MLST type 398.

Hanselman et al. 2006. Methicillin-resistant *Staphylococcus aureus* colonization in veterinary personnel. *Emerging Infectious Diseases* 12(12):1933-1938. Available from http://www.cdc.gov/ncidod/EID/vol12no12/06-0231.htm. Vets averaged 7% MRSA colonization, with large animal vets 16% and small animal vets 4% colonization. No MRSA was detected in non-vets.

Huijsdens et al. 2006. Community-acquired MRSA and pig farming. *Annals of Clinical Microbiology and Antimicrobials* 5: 26–29. Mother developed MRSA mastitis and 3 family members, 3 co-workers, and 8 of 10 pigs tested positive.

van Duijkeren et al. 2007. Transmission of methicillin-resistant *Staphylococcus aureus* strains between different kinds of pig farms. *Veterinary Microbiology* [in press]. Eleven percent of pigs from 31 farms were positive for MRSA with antimicrobial medication of pigs a risk factor.

Voss et al. 2005. Methicillin-resistant *Staphylococcus aureus* in pig farming. *Emerging Infectious Diseases* 11:1965–1966. Pig farmers had 760 times as much MRSA as patients admitted to hospital. Transmission was demonstrated between animal and human, family members, and nurse and patient in hospital.

Witte et al. 2007. Methicillin-resistant *Staphylococcus aureus* ST398 in humans and animals, Central Europe. *Emerging Infectious Diseases* 13(2):255-258. Described human infections, skin, wound, and 3 nosocomial pneumonia infections with MRSA strain ST398.