Smart ways to live well
Prevention
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The Superbug in Your Supermarket

About 2 years ago, dozens of workers at a large chicken hatchery in Arkansas began experiencing mysterious skin rashes, with painful lumps scattered over their hands, arms, and legs. "They hurt real bad," says Joyce Long, 48, a 32-year veteran of the hatchery, where until recently, workers handled eggs and chicks with bare hands. "When we went and got cultured, doctors told us we had a superbug." Its name, she learned, was MRSA, or methicillin-resistant Staphylococcus aureus. This form of staph bacteria developed a mutation that resists antibiotics (including methicillin), making it hard to treat, even lethal. According to the CDC, certain types of MRSA infections kill 18,000 Americans a year--more than die from AIDS.

Soon coworkers at the nearby processing plant, where hundreds of thousands of chicken carcasses are prepped daily for sale, began finding the lumps. Dean Reeves, 50, an 11-year employee, went to the hospital with an excruciating bump on her thigh she thought was a spider bite. It wasn't: She, too, had contracted MRSA, as had her husband, Bill, 46, who also works at the facility. Since late 2007, Dean has had monthly relapses. Even the safety glasses, gloves, and smocks workers wear (along with upgraded regular cleaning of equipment) aren't enough to protect them, says Bill. "We work so fast, we often stick ourselves with knives or scissors and get blood on us from head to foot." When a swelling rose over one of his eyes, he was told he might go blind; if the infection progressed to his brain, he'd die.

Did any food safety agency test for MRSA in this plant's chickens, which were then sold to the public and served on American dinner tables? Did any government organization determine the source of the outbreak? Calls to the USDA, CDC, and Arkansas Department of Health yielded a no to both questions; the poultry company that owns the operation did not respond to multiple requests for a comment from Prevention. Yet in recent years, studies have found MRSA in retail cuts of pork, chicken, beef, and other meats in the United States, Europe, and Asia.

To get answers, we investigated how MRSA has entered our food supply with limited government response; we considered the massive use of antibiotics in agriculture and its role in creating resistant microbes like MRSA; and we examined the safety of supermarket meat. Here, we offer our findings and expert advice to protect you and your family.

Are You At Risk?

You've probably heard of people contracting certain strains of MRSA in hospitals, where it causes many illnesses: postsurgical infections, pneumonia, bacteremia, and more. Others encounter different types of the bug in community centers such as gyms, where skin contact occurs and items like sports equipment are shared; this form causes skin infections that may become systemic and turn lethal.

Then in 2008, a new source and strain of MRSA emerged in the United States. Researcher Tara Smith, PhD, an assistant professor of epidemiology at the University of Iowa, studied two large Midwestern hog farms and found the strain, ST398, in 45% of farmers and 49% of pigs. The

startling discovery-- and the close connection between animal health and our own that it implied--caused widespread publicity and much official hand-wringing. To date, though, the government has yet to put a comprehensive MRSA inspection process in place, let alone fix our problematic meat-production system.

You may not have the same close contact with meat that a processing plant worker has, but scientists warn there is reason for concern: Most of us handle meat daily, as we bread chicken cutlets, trim fat from pork, or form chopped beef into burgers. Cooking does kill the microbe, but MRSA thrives on skin, so you can contract it by touching infected raw meat when you have a cut on your hand, explains Stuart Levy, MD, a Tufts University professor of microbiology and medicine. MRSA also flourishes in nasal passages, so touching your nose after touching meat gives the bug another way into your body, adds Smith.

Tainted Meat Exposed

Extensive research in Europe and Asia has found MRSA in many food animal species, and in the past year, US researchers have begun testing meat sold here. Scientists at Louisiana State University Agricultural Center tested 120 cuts of locally purchased meat and found MRSA in 4% of the pork and 1% of the beef. A University of Maryland scientist found it in 1 out of 300 pork samples from the Washington, DC, area. And a study in Canada (from which we import thousands of tons of meat annually) found MRSA in 9% of 212 pork samples. The percentages may be small, but according to the USDA, Americans eat more than 180 million pounds of meat every day. "When you consider the tiny size of the meat studies, the fact that they found any contamination at all is amazing," says Steven Roach, public health program director for Food Animal Concerns Trust.

In some cases, the tainted meat probably came from infected animals; in others, already infected humans could have passed on MRSA to the meat during processing. Regardless of where it originated, even a small proportion of contaminated meat could mean a tremendous amount of MRSA out there. "We need more US research to figure out what's going on," says Roach.

MRSA is so common in the United States that it accounts for more than half of all soft-tissue and skin infections in ERs. The CDC estimates that invasive MRSA infections (those that entered the bloodstream) number more than 94,000 a year. Even more troubling, if you add up the other types of illnesses MRSA can cause, including urinary tract infections, pneumonia, and inpatient skin infections, the total could be 8 to 11 times more than that, reports a study by epidemiologist William Jarvis, MD, of the Association for Professionals in Infection Control and Epidemiology. The numbers are high and rising: From 1996 to 2005, MRSA-related hospitalizations increased nearly tenfold.

People who get MRSA need ever more powerful medication. "Staphrelated infections have become serious illnesses that can require hospitalization and stronger drugs," says Georges C. Benjamin, MD, executive director of the American Public Health Associa- tion (APHA). For hatchery worker Long, doctors went through several antibiotics, with little success. The swellings would subside, then reappear. "Every time I went back to work, I got it again, for a total of 10 times," she says.

Animal Pharm

Scientists know that antibiotic overuse in humans caused ordinary staph to become resistant, says Levy. And they know the large amounts of meds used by agriculture caused other bacteria, such as E. coli and Salmonella, to develop resistance. "Now we're looking at the relationship between

antibiotic use on farms and MRSA," he says.

It's an important mission, as industrial agriculture is the country's largest antibiotic user: Animals consume nearly 70% of these meds, perhaps more than 24 million pounds a year, says the Union of Concerned Scientists. The drugs compensate for the often unsanitary conditions in the country's 19,000 factory farms--also called concentrated animal feeding operations, or CAFOs--where about half our meat is produced. Long gone are many family farms with animals grazing on pastureland, says Bob Martin, senior officer of the Pew Environment Group. "Instead, they're packed into cramped quarters, never going outdoors, living in their waste." A swine CAFO may house thousands of hogs; a poultry operation, hundreds of thousands of chickens. "As a result, you need to suppress infection," he says.

The large amounts of antibiotics used in CAFOs include drugs critical to curing human illnesses, he says. Premixed animal feed can contain medications you may have taken, such as tetracycline and cephalosporin (Keflex is a familiar brand); you can also buy a 50-pound bag of antibiotics at a feed store to add to your animals' chow--no prescription necessary, confirms Amy Meyer, executive director of the Missouri Farmers Union.

Most of the antibiotics given to CAFO animals are not only used to fight infection, but also to stimulate growth, says David Wallinga, MD, Food and Health Program director at the Institute for Agriculture and Trade Policy. The near constant exposure to less-than-therapeutic levels of antibiotics allows the resistant bacteria to survive; they can then be transferred to people, he says. This needless use of medication is what docs try to avoid when they don't prescribe antibiotics for a simple cold. "These operations are reservoirs of antibiotic resistance," says researcher Smith.

In the areas surrounding CAFOs, docs see firsthand how MRSA impacts the community. Philip McClure, DO, practices in Trenton, MO, which is home to many hog farms. MRSA infections have risen as the number of pigs has grown, he says. "Both CAFO workers and others get them," says McClure, who treats a MRSA-related skin problem every month. That may be because you can pick up MRSA and not show symptoms for years. Meanwhile, you can pass it to others by something as simple as sharing a towel. Kim Howland, 44, a former hog CAFO worker in Oklahoma, fears she did just that, when in 2007, her husband and daughter developed MRSA skin infections. "My coworkers told me about lumps they had and I realized I could have become a carrier," she says. Howland, who left her job, wasn't tested at the time, so she'll never know if she gave MRSA to her family.

Concerned about the risks of CAFOs (including increased antibiotic resistance, pollution, and disease in nearby areas), the APHA back in 2003 called for a moratorium on building new ones.

Who's Watching Out For You?

Until recently, the CDC has acknowledged the presence of MRSA in meat but downplayed the danger. In 2008, then CDC director Julie Louise Gerberding, MD, MPH, wrote that foodborne transmission of MRSA is "possible" but, if it happens, "likely accounts for a very small proportion of human infections in the US." Liz Wagstrom, DVM, assistant vice president of science and technology for the National Pork Board, agrees, saying that this kind of transmission would be extremely rare. Neither group could provide an estimate when queried by Prevention, but considering the high numbers of MRSA infections, even a tiny percentage could be a lot of people.

One reason the CDC and the National Pork Board must guess about transmission rates--and why

we don't know exactly how many MRSA-related infections occur--is that the federal government doesn't collect data on MRSA outbreaks, says Karen Steuer, director of government operations for the Pew Environment Group. According to the US Government Accountability Office, there's no testing for MRSA on farms. And the National Antimicrobial Resistance Monitoring System tests just 400 retail cuts of meat each month for four drug-resistant bacteria--which don't include MRSA.

"These gaps in data keep us in the dark," says Steuer. Without farm-to-fork surveillance, it's difficult to connect problems at a certain farm to MRSA outbreaks. "If we don't fix this, mortality rates will go much higher," she says. "We have an impending crisis."

A rising tide of concern is firing up health care activists and congressional policy makers to contain the MRSA threat. Several ideas are on the government's table. Keep Antibiotics Working, a national coalition of health and science organizations, calls for more federal research on MRSA and meat. In Congress, Representative Rosa L. DeLauro suggests giving all supervision of food--now split among many agencies--to just one, which may improve oversight. And Representative Louise Slaughter, MSPH, reportedly Congress's only microbiologist, wants to trim agriculture's use of antibiotics only to those drugs that are not essential for human use. Earlier this year, she reintroduced the Preservation of Antibiotics for Medical Treatment Act, and Senator Edward Kennedy submitted a related bill in the Senate.

Bottom line, says Roach of Food Animal Concerns Trust, we need to think of ways to raise animals that prevent them from getting sick in the first place. And we must move quickly, adds Slaughter: "As a scientist and mother, I cannot overstate the urgency. We should be able to buy food without worrying about exposing our family to potentially deadly bacteria that no longer responds to medical treatment."