Who gets the antibiotics?

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At Temple University School of Medicine in Philadelphia, a medical resident and avid bike rider in his late 20s noticed a nasty red swelling in his groin. A day and a half later, it had grown as big as a lime.

He went to the hospital, where doctors drained the abscess and cultured the bacteria in it. It turned out he had a powerful, drug-resistant infection called MRSA, or Methicillin-resistant Staphylococcus aureus. He endured surgery, a round of intravenous antibiotics and two relapses, but recovered fully before returning to treat patients.

Meanwhile, almost 30 miles to the north, Bucks County farmer Mark Scheetz, 42, starts his morning routine by making sure his herd of about 50 pigs has enough water and feed: a mixture of ground corn and soybean meal enriched with vitamins, minerals and -- every third day -- terramycin, an antibiotic his veterinarian recommends for preventive use.

Scheetz's pig farm and Temple's hospital seem like worlds apart, but some -- including Temple's chief of infectious diseases, Thomas Fekete -- think antibiotics in animal feed speed up the process by which disease-causing microbes become resistant to these drugs.

Fekete discussed his concern and argued in favor of a new congressional bill -- the Preservation of Antibiotics for Medical Treatment Act -- at a July town hall meeting at Philadelphia's Academy of Natural Sciences. If passed, the PAMTA bill would prohibit antibiotics identical or similar to those humans take from being used on farms for nontherapeutic

purposes. Farmers and others oppose the measure, saying animals will get sicker and antibiotic use might increase.

Antibiotic-resistant infections are becoming more common in people.

In the eight-county Philadelphia region, the number of hospitalized patients with drug-resistant infections of all kinds quadrupled over the last decade, from 1,673 in 1998 to 7,012 in 2007, according to a Philadelphia Inquirer analysis of hospital billing records. Resistant infections include not only MRSA, but also pneumonia, food poisoning and tuberculosis.

Microbes can develop resistance any time antibiotics are used, explained UCLA infectious disease expert Brad Spellberg, whose book on the subject, "Rising Plague," hit the shelves this month. A therapeutic dose kills enough germs to restore the body to health, but doesn't eliminate every last bacterium. The survivors, and their descendants, often have genetic traits that allow them to better withstand the next pharmaceutical assault.

Routine antibiotic use on farms quickens this process, the bill's proponents argue. If the drugs were reserved for treating illness, microbes would be exposed to them less often, and it would take longer for the bacterial population to develop resistance.

Resistant infections are dangerous because they're harder to stop early, so they more often cause serious illness or death. A 2007 study in the Journal of the American Medical Association estimated that 20,000 people in the U.S. die from MRSA alone each year. That's more than the number who die annually from HIV, the virus that causes AIDS.

Faced with these sobering statistics, the American Medical Association, the Union of Concerned Scientists and the Pew Charitable Trusts, which

sponsored the academy meeting, support the PAMTA bill, which was introduced in March. But others, including the American Farm Bureau and the American Veterinary Medical Association, don't think it's such a good idea.

The Pennsylvania Farm Bureau, the state's largest farm group with nearly 47,000 farm and rural family members, "strongly opposes legislation" that restricts key antibiotics for farm use, bureau spokesman Mark O'Neill said via e-mail. "The proposed bill would handicap veterinarians, livestock producers, and poultry producers in their efforts to maintain animal health."

Modern, conventional farms use antibiotics in three ways, explained Penn State extension veterinarian Dave Wolfgang. Low levels of some antibiotics -- most commonly penicillin, tetracycline and a group of drugs called ionophores, which are not prescribed to people -- are sometimes added to animal feed to alter animals' gut microbe community and make digestion more efficient. This improves the animals' health and makes them grow faster, Wolfgang said.

Farmers give somewhat higher "subtherapeutic" levels -- still 10 to 20 times lower than what would be given to a sick animal -- if the entire herd or flock is at risk of a disease outbreak. And high, therapeutic doses of antibiotics are also given to ailing individual animals, usually by injection or IV.

Restricting preventive use can lead to more animal illnesses down the line, Penn State professor of veterinary medicine Bhushan Jayarao said, citing the case of Denmark. Concerned about resistance, the Scandinavian nation prohibited growth-promoting and subtherapeutic antibiotic use in the late 1990s. Later on, the amount used to treat disease went up.

If swine farmer Scheetz's experience is any indication, preventive antibiotic use, combined with good hygiene, can contribute to healthier livestock. His pigs live in a large barn with natural ventilation, and he checks on them several times a day, immediately separating and treating sick ones. The result, he said, is a healthy herd with "maybe one sick pig every year."

The Farm Bureau and many livestock veterinarians, including Wolfgang and Jayarao, maintain that although antibiotics have been used in agriculture for decades, this use has never been linked conclusively to human disease. More research is needed to understand possible connections, Jayarao said.

Research, however, does suggest that farms breed resistant bugs. Scientists have detected MRSA in farmed pigs and their caretakers, who carry the microbe at a much higher rate than the general human population.

Chickens given antibiotics in their drinking water were more likely to carry resistant Campylobacter, a germ that causes food poisoning. Beef and dairy cattle also harbor resistant bacteria.

And, in recent years, scientists have found resistant bacteria in waste lagoons, groundwater and soil on or near farms using antibiotics.

Shelley Hearne, the Pew Health Group's managing director, thinks that's more than enough justification to restrict farm antibiotic use.

"On the human medical side, we're used to the idea that we must use antibiotics sparingly," Hearne said at the Philadelphia town meeting. "We don't put them in our children's breakfast cereal."

The FDA can cancel drugs for particular uses, but doing so can drag on

for years, added molecular biologist Margaret Mellon, director of the Union of Concerned Scientists' Food and Environment program. The PAMTA bill would quicken the process by removing layers of administrative and judicial review.

However, because it may take years to rally congressional support for PAMTA -- which has been introduced, unsuccessfully, three times since 2003 -- the bill's proponents are also pressing the FDA to adopt more sweeping restrictions on agricultural antibiotics, said Vince Morris, communications director for the House Rules Committee.

And, while some farmers, food suppliers and restaurant chains, including McDonald's and Chipotle, have voluntarily restricted nontherapeutic antibiotic use, Mellon thinks individual efforts are not enough to fix the problem.

"Government action is really necessary" to protect public health, she said.

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