SUPERBUGS INVADE AMERICAN SUPERMARKETS

ENVIRONMENTAL WORKING GROUP

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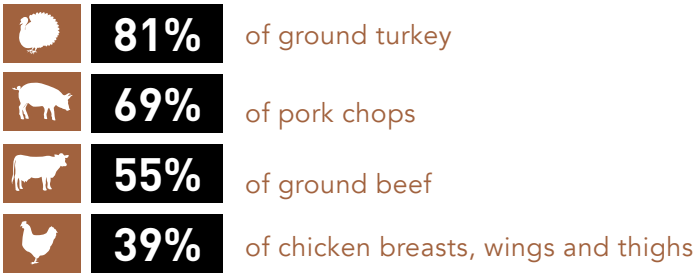
About EWG
The mission of the Environmental Working Group (EWG) is to use the power of public information to protect public health and the environment. EWG is a 501(c)(3) non-profit organization, founded in 1993 by Ken Cook and Richard Wiles.

SUPERBUGS INVADE AMERICAN SUPERMARKETS

BY DAWN UNDURRAGA

ANTIBIOTIC-RESISTANT BACTERIA ARE NOW COMMON IN THE MEAT AISLES OF AMERICAN SUPERMARKETS. THESE SO-CALLED SUPERBUGS CAN TRIGGER FOODBORNE ILLNESS AND INFECTIONS THAT ARE HARD TO TREAT.

An analysis by the Environmental Working Group has determined that government tests of raw supermarket meat published last February 5 detected antibiotic-resistant bacteria in:



These little-noticed tests, the most recent in a series conducted by the National Antimicrobial Resistance Monitoring System, a joint project of the federal Food and Drug Administration, Centers for Disease Control and Prevention and U.S. Department of Agriculture, found that supermarket meat samples collected in 2011 harbored significant amounts of the superbug versions of salmonella and *Campylobacter*, which together cause 3.6 million cases of food poisoning a year.

Moreover, the researchers found that some 53 percent of raw chicken samples collected in 2011 were tainted with an antibiotic-resistant form of *Escherichia coli*, or *E. coli*, a microbe that normally inhabits feces. Certain strains of *E. coli* can cause diarrhea, urinary tract infections and pneumonia. The extent of antibiotic-resistant *E. coli* on chicken is alarming because bacteria readily share antibiotic-resistance genes.

Not surprisingly, superbugs spawned by antibiotic misuse -- and now pervasive in the meat Americans buy -- have become a direct source of foodborne illness. Even more ominously, antibiotic misuse threatens to make important antibiotics ineffective in treating human disease. In the past, people who became ill because of contact with harmful microbes on raw meat usually recovered quickly when treated with antibiotics. But today, the chances are increasing that a person can suffer serious illness, complications or death because of a bacterial infection that doctors must struggle to control.

The proliferation of antibiotic-resistant bacteria poses special dangers to young children, pregnant women, the elderly and people with weakened immune systems.

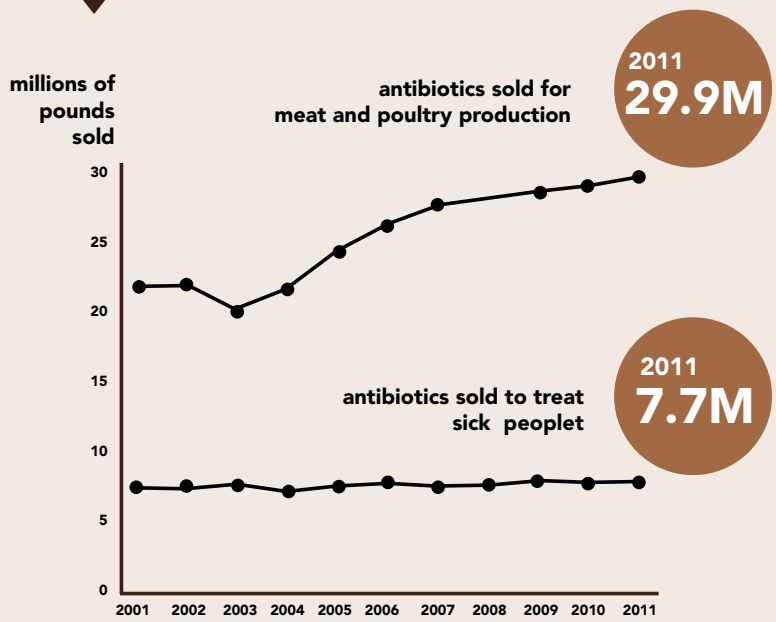
Among the most worrisome recent developments:

- The federal tests published in February determined that **9 percent** of raw chicken samples and **10 percent** of raw ground turkey sampled from retail supermarkets in 2011 were tainted with a superbug version of salmonella bacteria. Antibiotic resistance in salmonella is growing fast: of all salmonella microbes found on raw chicken sampled in 2011, **74 percent** were antibiotic-resistant, compared to less than 50 percent in 2002. These microbes, frequently found on chicken and turkey and occasionally on beef and pork, commonly cause diarrhea

and in extreme cases can lead to arthritis.

- In the same federal tests, a superbug version of the *Campylobacter jejuni* microbe was detected on **26 percent** of raw chicken pieces. Raw turkey samples contained numerically fewer of these microbes, but **100 percent** of those examined were antibiotic-resistant. The *Campylobacter jejuni* pathogen is a common cause of diarrhea and in severe cases can trigger an autoimmune disease that results in paralysis and requires intensive care treatment.
- In 2006 FDA scientists found superbug versions of a particularly troublesome strain of *E. coli*, responsible for more than 6 million infections a year in the U.S., on **16 percent** of ground turkey and **13 percent** of chicken. Fully **84 percent** of the *E. coli* bacteria identified in these tests were resistant to antibiotics.
- In its own tests of raw pork, published last January, Consumer Reports magazine found that **63 percent** contained a superbug version of *Yersinia enterocolitica*, a microbe that can cause long-lasting bouts of diarrhea.
- In 2011 tests, researchers at Northern Arizona University and the Translational Genomics Research Institute found that **74 percent** of store-bought raw turkey samples were tainted with *Staphylococcus aureus* bacteria resistant to at least one antibiotic. Of these staph bacteria, **79 percent** were resistant to **three or more** types of antibiotics. Staph can cause skin infections in exposed cuts or produce toxins that cause foodborne illness.

MOST DRUGS GO TO LIVESTOCK



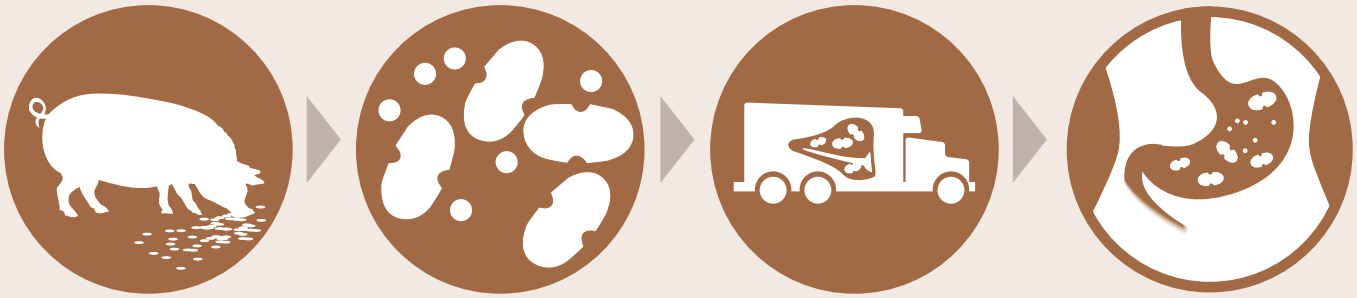
Source: Pew Charitable Trusts. 2013. Record-high antibiotic sales for meat and poultry production. Available: http://www.pewhealth.org/other-resource/record-high-antibiotic-sales-for-meat-and-poultry-production-85899449119

A significant contributor to the looming superbug crisis, according to scientists and health experts, is **unnecessary** antibiotic usage by factory farms that produce most of the 8.9 billion animals raised for food in the U.S. every year. Industrial livestock producers routinely dose their animals with pharmaceuticals, mostly administered with limited veterinary oversight and frequently without prescriptions, to encourage faster growth or prevent infection in crowded, stressful and often unsanitary living conditions.

Overuse of antibiotics in people, often for colds and other viral illnesses, has contributed to antibiotic resistance, too, but responsible doctors generally take care not to prescribe them unnecessarily.

Pharmaceutical makers have powerful financial incentives to encourage abuse of antibiotics in livestock operations. In 2011, they sold nearly 30 million pounds of antibiotics for use on domestic food-producing animals, up 22 percent over 2005 sales by weight, according to reports complied by the FDA and the Animal Health Institute, an industry group. Today, pharmaceuticals sold for use on food-producing animals amount to nearly 80 percent of the American

SUPERBUGS FROM FARM TO FORK



Animals receive unnecessary antibiotics

Bacteria become resistant to antibiotics

Bacteria travel on meat from farm to stores

Meat may cause hard-to-treat illness

antibiotics market, according to the Pew Campaign on Human Health and Industrial Farming. Pew calculates that the market for antibiotics for treatment of people has been flat for some years, hovering at around 7.7 million pounds annually.

As the superbug problem has exploded into a full-fledged global health crisis, medical authorities worldwide are sounding increasingly urgent alarms.

The federal government's Interagency Task Force on Antimicrobial Resistance warned last year that "drug choices for the treatment of … infections are becoming increasingly limited and expensive, and, in some cases, nonexistent."

Also last year, Dr. Margaret Chan, director general of the World Health Organization, said that if important antibiotics become useless, "things as common as strep throat or a child's scratched knee could once again kill."

Slowing the spread of antibiotic resistance will require concerted efforts, not only by doctors, patients and veterinarians but also livestock producers and big agribusinesses.

SUPERBUGS IN MEAT

EWG's research has determined that the risk of bringing a superbug into a kitchen varies by type of meat and how it was raised. Some types of meats are more contaminated than others. The overall picture is disturbing.

In the most recent round of federal tests, scientists used *Enterococcus* bacteria, normally found in human and animal intestines, as a gauge. For one thing, their presence can indicate contact with fecal matter. For another, *Enterococcus* bacteria easily develop and transmit antibiotic resistance. Counting the number of antibiotic-resistant *Enterococcus* on a particular meat sample can signal that other microbes on the meat are also likely antibiotic-resistant.

The scientists determined that startlingly high percentages of store-bought meat samples were contaminated with antibiotic-resistant forms of *Enterococcus faecalis.*

Enterococcus faecalis and the related species *Enterococcus faecium* are the third leading cause of infections in intensive care units of American hospitals.

Fully 87 percent of store-bought meat collected by federal scientists in the most recent round of tests was contaminated with both normal and antibiotic-resistant *Enterococcus* bacteria, evidence that most of this meat likely came in contact with fecal matter at some point. To be safe, consumers should treat all meat as if it may be contaminated, mainly by cooking thoroughly and using safe shopping and kitchen practices (see EWG's downloadable Tips to Avoiding Superbugs in Meat).

MEAT SAMPLES TAINTED WITH INDICATOR BACTERIA

	TURKEY	PORK	BEEF	CHICKEN
Total samples tested	480	480	480	480
Number of samples contaminated with *Enterococcus faecalis*	392	334	269	186
Number of samples containing *Enterococcus faecalis* resistant to at least 1 antibiotic	389	332	263	185
Percent of meat samples containing antibiotic-resistant *Enterococcus faecalis*	**81%**	**69%**	**55%**	**39%**

Scientists study *Enterococcus* bacteria on meat to gauge fecal contamination and the spread of antibiotic-resistance traits.

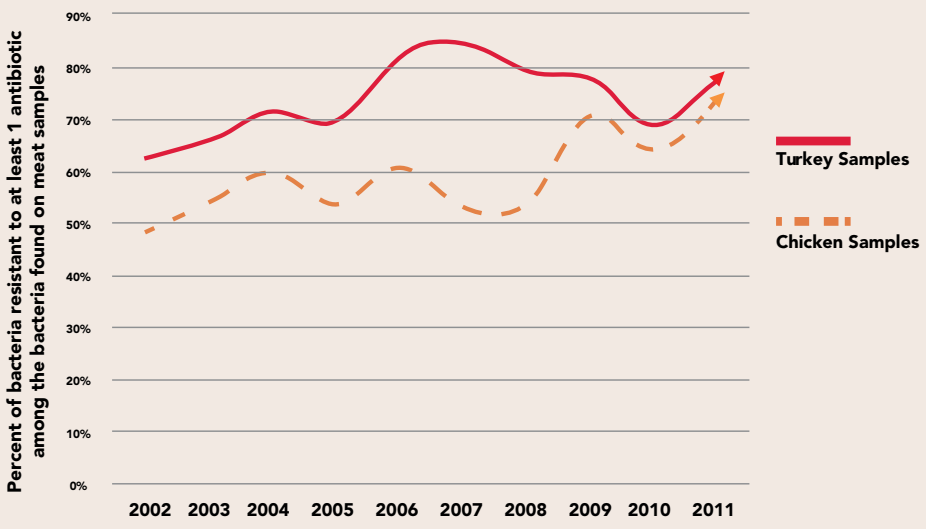
Source: EWG calculations based on data drawn from the National Antimicrobial Resistance Monitoring System 2011 Retail Meat Report, published Feb. 5, 2013

SUPER SALMONELLA ON THE RISE

Salmonella bacteria are often found on chicken and turkey that have been contaminated with animal feces. People can also encounter these microbes through cross-contamination – for instance, when salad greens are sliced on a cutting board that has been used to chop raw meat -- or by touching infected birds or reptiles. Infants have been known to contract salmonella by touching raw meat in a shopping cart. Salmonella-caused illnesses kill 400 people a year and cause 23,000 hospitalizations. They can lead to chronic arthritis.

The rise of antibiotic-resistant salmonella has heightened the

ANTIBIOTIC-RESISTANT SALMONELLA IN POULTRY



Source: Chart prepared by EWG. EWG calculations based on data drawn from the National Antimicrobial Resistance Monitoring System's 2011 Retail Meat Report, published Feb. 5, 2013

risks that people will succumb to severe infection, hospitalization and death. In less than a decade, the proportion of antibiotic-resistant salmonella bacteria found on raw chicken has dramatically increased – from 48 percent in 2002 samples to **74 percent** in 2011 samples.

About 20 percent of the salmonella microbes detected on chicken samples collected in 2002 were resistant to at least three drugs. By 2011, that number had risen to **45 percent**. The proportion of antibiotic-resistant germs among all salmonella found on raw turkey rose from 62 percent in 2002 to **78 percent** in 2011.

SUPER CAMPYLOBACTER ON THE RISE

Campylobacter is one of the most common causes of diarrheal illness in the U.S. As well, it can trigger Guillain-Barre syndrome, an autoimmune disease that usually requires intensive care treatment and can lead to paralysis. *Campylobacter* germs cause 2.4 million foodborne illnesses and 124 deaths a year. The CDC reports that the rate of *Campylobacter* infections per 100,000 population increased by **14 percent** between 2006-2008 and 2011.

The most recent round of federal meat tests found that **26 percent** of raw chicken pieces contained an antibiotic-resistant form of *Campylobacter*. Of all the *Campylobacter* microbes found on the raw chicken samples, **58 percent** were resistant to at least one antibiotic, and **14 percent** were resistant to several antibiotics. Most alarmingly, all *Campylobacter* found on turkey were resistant to at least one antibiotic.

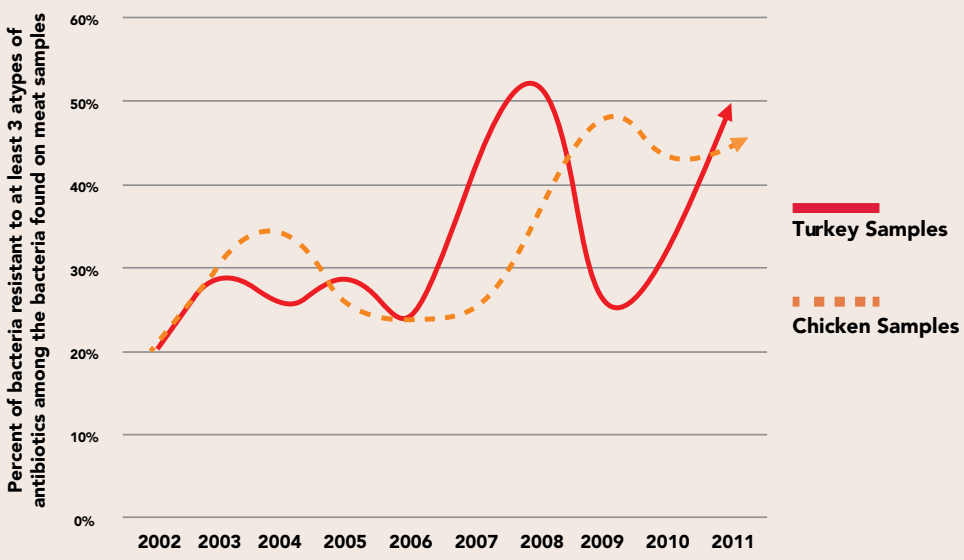
FIGHT SUPERBUGS

For more than 40 years, scientists and health experts have known that dangerous microbes were developing the ability to defeat valuable drugs. As far back as 1970 the FDA concluded that dosing livestock with unnecessary antibiotics spurred development of superbugs. Last year, the agency recommended that important antibiotics in farm animals "should be limited to those uses that are considered **necessary** for assuring animal health." It said that dosing animals with drugs solely to promote growth was "an injudicious use of these important drugs."

Nevertheless, the FDA's efforts to curb antibiotic abuse consist of only voluntary guidance documents – not regulations that carry the force of law. EWG takes the position that the FDA must take more aggressive steps to prevent superbugs from proliferating and livestock producers from squandering the effectiveness of vital medicines.

Big agribusinesses must take responsibility for

MULTI-DRUG-RESISTANT SALMONELLA IN POULTRY



Source: Chart prepared by EWG using data drawn from the National Antimicrobial Resistance Monitoring System's 2011 Retail Meat Report, published Feb. 5, 2013

their actions by exercising the same restraint shown by good doctors and patients: use antibiotics only by prescription for treatment or control of disease.

EWG recommends that consumers assume that all meat is contaminated with disease-causing bacteria. They can avoid superbugs in meat by eating less factory-farmed meat, by buying meat raised without antibiotics and by following other simple tips in EWG's downloadable **Tips to Avoiding Superbugs in Meat.**

For more information on the health and environmental consequences of various meats, see ewg.org/meateaterguide.

Make your voice heard! Click here to find out how you can help preserve the effectiveness of antibiotics.