



# The high cost of cheap chicken

97 percent of the breasts we tested harbored bacteria that could make you sick. Learn how to protect yourself.



**W**HEN YOU SHOP at your favorite grocery store, you probably assume that the food on display is safe to take home. But in the poultry aisle, that simple assumption could make you very sick. Consumer Reports' recent analysis of more than 300 raw chicken breasts purchased at stores across the U.S. found potentially harmful bacteria lurking in almost all of the chicken, including organic brands. In fact, we were conducting our research when news of the national salmonella outbreak linked to three Foster Farms chicken plants became public. In that case 389 people were infected, and 40 percent of them were hospitalized, double the usual percentage in most outbreaks linked to salmonella.

What's going on with the nation's most popular meat? (We buy an estimated 83 pounds per capita annually.) Though 48 million people fall sick every year from eating food tainted with salmonella, campylobacter, E. coli, and other contaminants, "more deaths were attributed to poultry than to any other commodity," according to an analysis of outbreaks from 1998 through 2008 by the national Centers for Disease Control and Prevention (CDC). Here's what you should know before buying your next package of chicken:

### Dangerous bacteria

It's unrealistic to expect that the uncooked chicken you buy won't contain any potentially harmful bacteria. That's one reason we advise you to prevent raw chicken or its juices from touching any other food and to cook it to at least 165° F. Yet some bacteria are more worrisome than others—and our latest tests produced troubling findings. More than half of the samples contained fecal contaminants. And about half of them harbored at least one bacterium that was resistant to three or more commonly prescribed antibiotics.

Public-health officials think that the resistance to antibiotics in general is such a major concern that last September the CDC released a landmark report outlining the dire threat it poses to our health. Antibiotic-resistant infections are linked to at least 2 million illnesses and 23,000 deaths in the U.S. each year. And if antibiotic-resistant bacteria continue their scary spread, they could lead to deadly infections after routine surgery or even a seemingly innocuous cut because the drugs that doctors prescribe will have lost their effectiveness.

Our tests showed that those resistant bacteria are commonly found in chicken at your local grocery store. We collected samples in July 2013, months before the Foster Farms salmonella outbreak triggered a public-health alert from the Department of Agriculture (USDA). It turned out that we had purchased a package of the tainted chicken and that our tests

## 48 million people fall sick each year from eating tainted food.

found a strain of salmonella (known as Heidelberg) that matched one of those linked to the outbreak.

Salmonella bacteria come in many strains. To understand their differences, think of all of the different breeds of dogs, says Lance Price, Ph.D., a professor in environmental and occupational health at the George Washington University School of Public Health and Health Services in Washington, D.C. "All dogs are the same species, but a Chihuahua and a pit bull behave differently," he says. The drug-resistant Heidelberg strain of salmonella

associated with the Foster Farms outbreak is more likely than other strains to cause disease. Antibiotic resistance by itself doesn't make a pathogen more virulent, but when it occurs in a virulent strain such as the Heidelberg, something inherently dangerous suddenly becomes even worse—a bacterium that Price says acts "like a pit bull with rabies."

Most of the illnesses caused by Foster Farms chicken produced symptoms typical of any salmonella infection—nausea, vomiting, severe stomach cramps, diarrhea, and a low-grade fever, says Christopher Braden, M.D., director of the division of foodborne, waterborne, and environmental diseases at the CDC. What was different was that the outbreak sent about twice as many people to a hospital as a typical salmonella outbreak does. About 20 percent of people with salmonella end up hospitalized; almost 40 percent of those sickened by the Foster Farms-produced chicken did, Braden says.

Rick Schiller, 51, was one of those unlucky victims. Last September the San Jose, Calif., resident woke up at 2 a.m. "I've never felt so sick in my life," he recalls. In addition to vomiting and diarrhea, he had terrible stomach pain. His symptoms worsened during the next few days, and his abdominal pain became so



**CHICKEN INVESTIGATION** The Foster Farms facility in Livingston, Calif., is one of three plants linked to a salmonella outbreak that made headlines across the country last fall.



severe that his fiancée rushed him to an emergency room.

Schiller's doctor ordered a stool culture, which revealed salmonella Heidelberg. It was one of the strains identified in the Foster Farms outbreak. Schiller had bought two packages of Foster Farms chicken thighs, and his fiancée prepared a meal for him using one of them. The other package, which was still in his freezer, had a plant code that matched one associated with the outbreak.

### Tainted chicken

Our investigation suggests that potentially harmful bacteria are common on raw chicken. We bought 316 chicken breasts from major national grocery chains, big-box stores, and regional markets in 26 states, and tested them for six bacteria. They were salmonella, campylobacter, and staphylococcus aureus, which are some of the most common bacterial causes of food poisoning; E. coli and enterococcus, which are typical measures of fecal contamination; and klebsiella pneumoniae, a bug that's naturally present in our stomach

## Bacteria can live on surfaces for hours and even for days.

but that can cause infections such as pneumonia. Where we found those bacteria in our chicken samples, we conducted additional tests to determine what the strains were and whether they were resistant to antibiotics.

We tested 252 samples from conventionally produced chickens and 64 from brands that use no antibiotics in raising chickens, including 24 organic samples. (See "The Bacteria Count," on page 34.) Our findings were similar to what the Food and Drug Administration sees in its National Antimicrobial Resistance Monitoring System of retail meat. Here are more highlights from our exclusive study:

- Every one of the four major brands we tested (Perdue, Pilgrim's, Sanderson Farms, and Tyson) contained worrisome amounts

of bacteria, even the chicken breasts labeled "no antibiotics" or "organic."

- Almost none of the brands was free of bacteria. And we found no significant difference in the average number of types of bacteria between conventional samples and those labeled "no antibiotics" or "organic."

- More than half of the chicken breasts were tainted with fecal contaminants (enterococcus and E. coli), which can cause blood and urinary-tract infections, among other problems.

- Enterococcus was the most common bacterium we found, occurring in 79.8 percent of our samples. Next was E. coli, in 65.2 percent of them; campylobacter, 43 percent; klebsiella pneumoniae, 13.6 percent; salmonella, 10.8 percent; and staphylococcus aureus, 9.2 percent.

- About half of our samples (49.7 percent) tested positive for at least one multidrug-resistant bacterium, and 11.5 percent carried two or more types of multidrug-resistant bacteria.

- Of the 65.2 percent of samples testing positive for E. coli, 17.5 percent of the bugs were "ExPEC" bacteria, a nasty type of E. coli that's more likely than other types to make you sick with a urinary-tract infection.

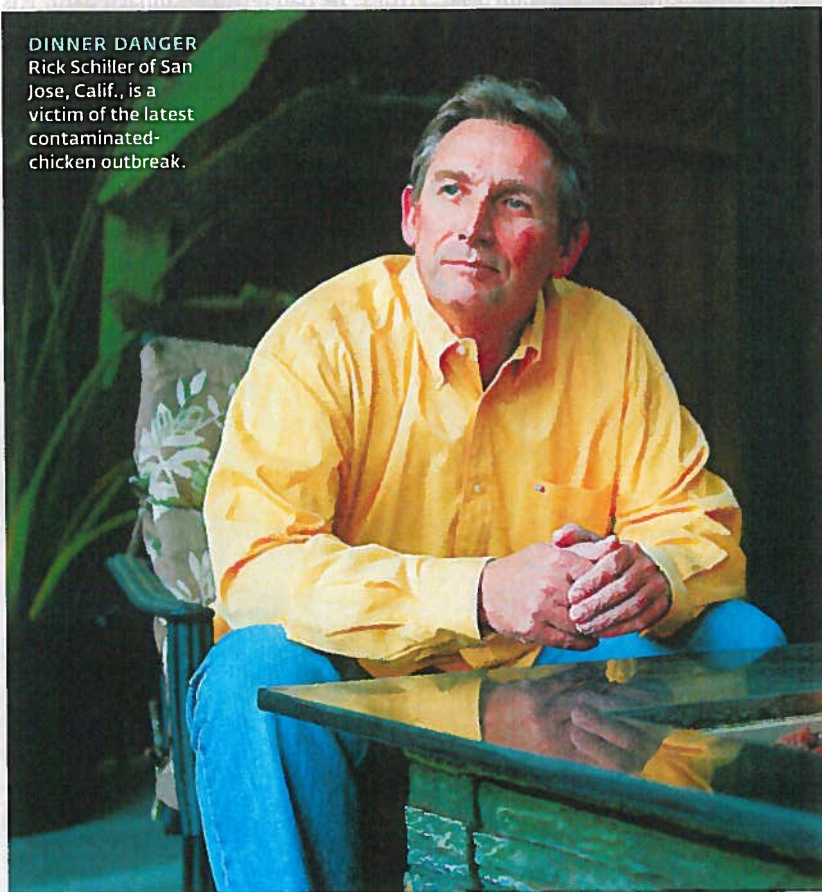
### A new level of caution

How does all of that contamination make its way into those nicely packaged chicken breasts displayed on store shelves? According to public-health expert J. Glenn Morris Jr., M.D., director of the Emerging Pathogens Institute at the University of Florida, it's perfectly common for a chicken's intestinal tract to carry salmonella and/or campylobacter, and when they're contained there, they don't harm the animal. But they can be transferred to the meat during the slaughtering process. Or if a chicken living in cramped conditions regularly comes into contact with feces, the bacteria can cling to its skin and make their way onto your dinner plate.

The most obvious way that people become infected with bacteria from raw chicken is through cross-contamination in the kitchen, Morris says. You take it out of the package, get bacteria on your hands, then touch the handle of your faucet, trash bin, or kitchen cabinet. Once they have bacteria on them, the pathogens can live on those surfaces for hours and sometimes days.

Even if you keep your kitchen very clean,

**DINNER DANGER**  
Rick Schiller of San Jose, Calif., is a victim of the latest contaminated-chicken outbreak.





# Confusing chicken labels decoded

Read labels carefully. Terms are sometimes misleading, and chicken produced in different ways are often sold next to each other (in packages labeled "natural" and "no antibiotics," for example), according to a new CONSUMER REPORTS shopping survey. For more details about these labels and others, go to [GreenerChoices.org](http://GreenerChoices.org).



## ORGANIC

The chicken was fed a vegetarian diet with feed produced without genetically modified organisms or toxic synthetic pesticides. Chickens cannot be organically raised with antibiotics, though they can be treated up until their first day of life. Access to the outdoors is required, but there are no specific standards for the size of the outdoor area, the size of the door leading there, or the amount of time the birds spend outdoors. Annual inspections are required.

## NO ANTIBIOTICS

Never given antibiotics, including in the egg. "Raised without antibiotics" means the same thing. No inspections are required.

## CERTIFIED HUMANE

The chickens are raised according to guidelines from Humane Farm Animal Care. There are standards for the environment the birds are raised in and for minimizing their stress and

injuries during transportation and slaughter. They may or may not have access to the outdoors. Annual inspections are required.

## NO HORMONES

Hormone use is prohibited in chickens, so even if a product doesn't come with this claim, it will be free of added hormones as well as steroids.

## AMERICAN HUMANE CERTIFIED

Requirements to minimize stress and suffering of the birds are very close to the basic industry standard. Birds are not required to have access to the outdoors. Inspections are required.

## CAGE-FREE

Essentially meaningless. No chickens raised for meat in the U.S. are kept in cages. Neither does it mean that the birds have access to the outdoors. No inspections are required.

## NATURAL

Meaningless. The product is minimally processed and contains no artificial ingredients, but no inspection is

required to verify that. (See "The Most Misleading Label," below).

## FREE-RANGE

There is no definition of "outdoors." And there are no requirements as far as the size of the outdoor area (it can be a small concrete slab), the size of the door to the outside, or the amount of time the birds spend there. Chickens can still be raised in crowded conditions. No inspections required.

## NO GMOS

If you see the "Non GMO Project Verified" label, the feed contains less than 0.9 percent of GMO crops. Verification is required.



## PASTURE-RAISED

Although not a legal definition, it should mean that the birds are raised on grassy pastures. "Animal Welfare Approved" is the only verified label requiring that animals are pasture-raised. But products with that label are not widely available.

you could still be exposed to illness-causing bacteria if you don't cook the chicken to an internal temperature of 165° F. It's vital that you check using a meat thermometer.

In spite of those warnings, the latest salmonella outbreak shows just how difficult it can be to prevent spreading bacteria from chicken and making people sick. In October a Costco store in California recalled more than 22,000 cooked rotisserie Kirkland Signature Foster Farms chickens and 951 Kirkland Farm containers of rotisserie chicken soup, leg quarters, and chicken salad after discovering that some of the cooked birds may have harbored strains of the outbreak-related salmonella. But neither Costco nor Foster Farms recalled the raw chicken sold to consumers.

Christopher Braden of the CDC hesitates to put the blame for the Foster Farms outbreak on the victims. The theory that

the people sickened in the outbreak had all handled the raw meat in a careless way, "doesn't ring true to me," he says, not with an outbreak that big.

According to James R. Johnson, M.D., a professor of medicine in the division of infectious diseases and international medi-

cine at the University of Minnesota, you don't have to ingest a lot of bacteria to become sick. It's possible that simply touching the plastic wrapping on the outside of chicken packages might expose you to harmful bacteria, Johnson says.

A 2010 study led by CDC scientists found that 13 percent of children younger than 3 were potentially exposed to raw meat or poultry products while riding in a grocery store shopping cart.

## THE MOST MISLEADING LABEL

A Consumer Reports survey on chicken safety found that more than half of the 1,005 U.S. residents polled thought that "natural" chickens didn't receive antibiotics or genetically modified feed. Forty-two percent thought the word meant that the birds were raised outdoors. More than one-third thought "natural" was equal to "organic." But it doesn't mean any of those things. You should simply ignore "natural" claims.

## The better chicken to buy

Our tests did not find brands or types of chicken breasts that had less bacteria than the rest. At the moment, the only way to protect yourself from becoming sick is to remain vigilant about safe handling and cooking, says Urvashi Rangan, Ph.D., toxicologist and executive director of the Consumer Reports Food Safety and Sus-

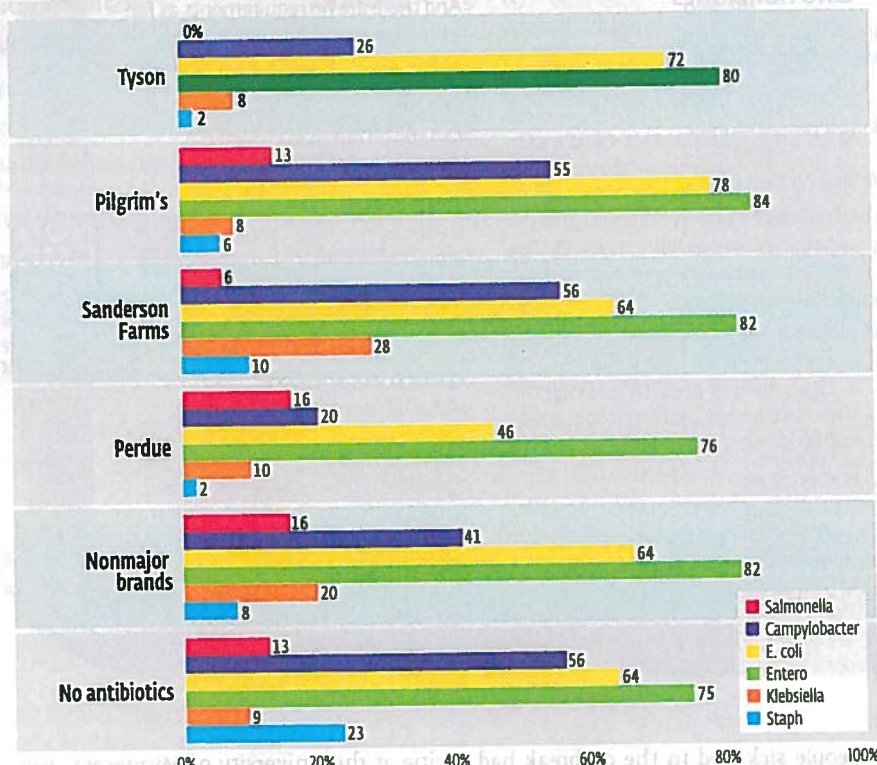


## The bacteria count

Below, the percentage of chicken breasts that tested positive for campylobacter, salmonella, enterococcus, E. coli, staph, and klebsiella. We analyzed 316 raw samples of skinless, boneless chicken breasts, thin-sliced breasts, breast tenderloins, and skin-on, bone-in breasts from the four major brands (Perdue, Pilgrim's, Sanderson Farms, and Tyson); nonmajor brands (including store brands and minor brands), as well as a sampling of "no antibiotics" and "organic" brands. Samples were purchased in 26 states throughout the U.S.

### ► Levels of contamination

Overall there was no difference in the total occurrence of all bacteria between conventional brands and those labeled "no antibiotics" or "organic." All contained worrisome levels of bacteria.



### ► Resistance to antibiotics

Our tests reveal that superbugs can be found in about half of the chicken we tested, from stores across the country. Our test results found that 49.7 percent of our samples contained at least one multidrug-resistant bacterium, and 11.5 percent had at least two. (Multidrug-resistant bacteria are defined as those that are resistant to three or more classes of drugs that they would normally be susceptible to.) The adjacent table shows the percentage of each bacteria that was multidrug-resistant. The bacteria we found were significantly more resistant to classes of antibiotics approved by the FDA for chicken production than for those not approved for such use.



Bacteria	% multidrug-resistant
Salmonella	38.0
Campylobacter	13.0
E. coli	40.0
Enterococcus	26.0
Klebsiella pneumoniae	8.5
Staphylococcus aureus	3.6*

\*One staph aureus was a methicillin-resistant staph aureus (MRSA).

tainability Center. (See "Do You Practice Chicken Safety?" on page 36.) For more on food safety and sustainability, go to [ConsumerReports.org/cro/chicken0214](http://ConsumerReports.org/cro/chicken0214).

Still, there are good reasons for selecting chickens raised without the use of antibiotics. Buying those products supports farmers who keep their chickens off unnecessary drugs, and that's good for your health and preserves the effectiveness of antibiotics. Chickens without antibiotic resistance to salmonella and other dangerous pathogens can't pass antibiotic-resistant bugs on to you, says Robert Lawrence, M.D., the Center for a Livable Future Professor at the Johns Hopkins Bloomberg School of Public Health.

### A good drug gone wrong

Antibiotics are perhaps one of modern medicine's greatest tools, but the rise of antibiotic resistance threatens to undermine the disease-fighting power of those miracle drugs. If bacteria such as the ones found in our chicken samples become resistant to even more drugs, it could mean that antibiotics we now use to treat life-threatening illnesses from salmonella and other foodborne infections could become useless.

Most deaths associated with antibiotic-resistant bacteria arise from the misuse of antibiotics for people, but the use of antibiotics in agriculture also plays an important role, says Braden at the CDC. In the 1940s farmers noticed that poultry that had been fed antibiotics grew faster than those raised without them. That discovery led them to start feeding chickens low doses of antibiotics to promote growth, not just to treat the sick ones, and thus allowed farmers to increase production. But research suggests that this practice, now widespread, might not be that cost-effective, says Michael Crupain, M.D., M.P.H., director of the Consumer Reports Food Safety and Sustainability Center.

And from a biological perspective, says Lawrence at Johns Hopkins, giving antibiotics to animals that aren't sick is an invitation to disaster. Low-level exposure to antibiotics kills off the bacteria most vulnerable to the drugs and allows those resistant to antibiotics to flourish. As a result, the practice essentially breeds antibiotic-resistant bacteria in chickens, Lawrence says. They end up with campylobacter, salmonella, and enterococcus that are resistant to antibiotics. Those bacteria can spread to people, whose in-



fections then can't be treated successfully with antibiotics, he says.

About 80 percent of all of the antibiotics sold in the U.S. each year are used in animal production, but that information is not tracked in any systematic way. "We don't have good data on how the antibiotics are used on the farms," Braden says. The chicken industry uses that uncertainty to argue that their practices aren't driving the antibiotic-resistance problem. The National Chicken Council says that there are several published, peer-reviewed risk assessments showing that any threat to human health from antibiotic use in livestock and poultry production is negligible, if it exists at all. Tom Super, the council's vice president of communications, adds that, according to the FDA guidance process, the chicken industry is phasing out the use of antibiotics for growth purposes if it's medically important for treating people. He also contends that antibiotics for humans are currently used only minimally for chickens.

Even if farms feed chickens an antibiotic that's not used by humans, any resistance that develops may still have consequences for people. "Antibiotics come in families, and if one in a group is used, there may be resistance that emerges that also makes the organism resistant to others in that group, which may be used to treat humans," says Robert Tauxe, M.D., M.P.H., deputy director of the division of foodborne, waterborne, and environmental diseases at the CDC.

"Antibiotics need to be used judiciously," Braden says. "It doesn't matter if they're used on a farm or in humans." "Judicious" means that the drugs are given to chickens to treat a specific disease for which the antibiotic is known to be effective. Using antibiotics for growth promotion is not judicious use, he says.

Given all of this, eliminating antibiotics in chicken production, except to treat sick birds, might seem like a no-brainer. But implementing a ban has proved to be challenging. "The FDA has tried to put in place programs to reduce antibiotic use and has had major push-back from industry," Morris says. Louise Slaughter, a microbiologist who is also a Democratic congresswoman from New York, has introduced legislation for the fourth time to halt the overuse of antibiotics in agriculture. But those proposed rules face stiff opposition from the chicken industry and pharmaceutical firms.



**BROILER FARM** Thousands of chickens are raised together on a farm in Texas.

## Taking animals off drugs

What happens when a country takes its livestock off antibiotics?

In 2000 Denmark's pork industry ceased using antibiotics to promote the growth of its animals.

Instead of eviscerating the nation's pork industry, those moves contributed to a 50 percent rise in pork production, according to a 2012 article in the journal *Nature*. Frank Aarestrup, D.V.M., Ph.D.,

head of the EU Reference Laboratory for Antimicrobial Resistance and author of the article, attributes Denmark's success to three factors: laws banning the improper use of antibiotics, a robust system of surveillance and enforcement, and rules that prevent veterinarians from profiting from selling antibiotics to farmers.

"Farmers and their livestock can thrive without the heavy use of antibiotics," Aarestrup wrote. "With a little effort, I believe that other countries can and must help their farmers to do the same."

## The price of chicken

Here's how the cost of chicken breasts stack up. These are median prices based on what we paid when shopping for our tests.

**CONVENTIONAL**  
**\$3.68** per pound

**WITHOUT ANTIBIOTICS**  
**\$5.49** per pound

**ORGANIC**  
**\$6.99** per pound

## Chicken's hidden cost

Most chicken raised in the U.S. today comes from large-scale commercial farms optimized to produce the most meat at the lowest cost. To meet domestic and global demand, the industry slaughters almost 9 billion chickens a year.

A new USDA rule currently under consideration could make many changes in poultry production that food-safety advocates consider alarming and dangerous. It could increase the maximum line speeds at slaughter plants to 175 chickens a minute from the current maximum of 140 birds a minute. The new rule could also reassign some of the USDA inspectors' duties to plant employees. Unlike



federal inspectors, the plant employees are paid by the company, so they would have an incentive to overlook problems that might slow the lines down.

The rule would transfer more responsibility for safety to the companies that produce the chickens, allowing them to police themselves, says Tony Corbo, senior lobbyist at Food & Water Watch, a nonprofit group.

The USDA disputes the notion that the proposed new rule would have an impact on safety. And according to Dan Engeljohn, Ph.D., of the USDA, a government inspector would still be able to stop a line "if he has evidence to believe that the plant is not exercising good process control."

As of July 2013 a pilot project was being tested in 24 poultry plants. The chicken industry considers the test, called the HIMP (for HACCP-Based Inspection Models Project), a success, and backs the proposal to adopt the new rule. But the Government Accountability Project, a nonprofit whistle-blower group, has released affidavits from federal inspectors working at HIMP plants, which allege that they were pressured to overlook possible food-safety concerns to keep the lines running.

And a Government Accountability Office report from August 2013 found that

## Making chicken safer will require revamping the way it's raised.

the USDA never followed through on promises to thoroughly evaluate the program's performance at the plants involved in the pilot project and therefore lacked the necessary data to deem it a success. Yet despite this analysis, the USDA is moving forward on plans to expand the program. Advocates including Consumers Union, the advocacy arm of Consumer Reports, say that if these new rules are adopted, the bacteria problem will only get worse.

### What needs to happen

Making chicken safer to eat will require a revamping of the way that it's raised and processed. As we went to press, the USDA announced a plan to attack the problem of salmonella in meat and chicken. We are still reviewing it. In the meantime, these are our recommendations:

- The FDA should prohibit antibiotic use in food animals except for the treatment of sick ones. To that end, Congress should pass the Preservation of Antibiot-

ics for Medical Treatment Act.

- The National Organic Program should eliminate the loophole allowing antibiotics to be used in the chicken eggs up until the first day of life in organic chicken broilers.

- The USDA should classify strains of salmonella bacteria that are resistant to multiple antibiotics and known to have caused disease as "adulterants," so that chickens tainted with those strains can't be sold.

- The USDA's proposed rule to increase maximum line speeds and reduce the number of USDA inspectors at slaughter plants should be dropped.

- Congress should give the USDA authority to recall meat and poultry products that are tied by DNA fingerprinting to disease outbreaks. Currently, it doesn't have the authority to do so.

- The USDA should speed up its efforts to set strict levels for allowable salmonella and campylobacter in chicken parts. The agency expects to put that proposal out for public review and feedback this year. We say that the standards can't come soon enough.

*Note: Support for this project was provided by The Pew Charitable Trusts. Any views expressed are those of Consumer Reports and its advocacy arm, Consumers Union, and do not necessarily reflect the views of The Pew Charitable Trusts.*

## Do you practice chicken safety?

Check out how your buying and cooking habits stack up against those of 1,005 respondents in a recent Consumer Reports survey.

**57%**

**use a cutting board designated for raw meat**  
Tip Get two boards to prevent cross-contamination.

**93%**

**wash their hands after handling raw poultry**  
Tip Wash for 20 seconds using warm water and soap every time you touch raw meat—frozen or fresh—even if it means multiple washings.

**32%**

**buy chicken last at the store**  
Tip Keeping chicken cold prevents bacteria overgrowth, so hit the meat section last.

**72%**

**wash chicken before cooking**  
Tip Stop. That can increase your risk of getting sick. Bacteria can spread up to 3 feet from the sink, and those areas might not get disinfected.

**65%**

**put chicken in a plastic bag at the store**  
Tip It's always a good idea to prevent the juices from contaminating other food.

**30%**

**use a meat thermometer**  
Tip Get one—82 percent said they cooked chicken to 165° F, the recommended internal temperature. But without a thermometer, you don't know.

