

# Ask *the* Experts

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Providing answers to science questions  
Send questions to [tst@nsta.org](mailto:tst@nsta.org)

**Q** My mom always warns me that I should never eat undercooked hamburgers, but we serve our grilled steaks medium rare. Isn't that dangerous too? And what about other meats such as pork chops and chicken?

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**A** This is an excellent question, and it shows that you are reasoning and thinking like a scientist. Your mother is correct to warn you about eating undercooked hamburgers.

Hamburger may be contaminated with a pathogenic strain of *Escherichia coli* O157:H7 (*E. coli*). This deadly microbe can make anyone sick, but it presents a special risk to young children and the elderly who get sick more easily and experience more severe symptoms. This is why hamburgers should be cooked until they are well-done. A meat thermometer should be used to determine when the burger is well-done (the inside of the burger should be no less than 71°C).

Hamburger presents a higher risk than steak because hamburger is made from chopped meat. This means that if *E. coli* are present in the hamburger, they may be anywhere in the piece of meat—on the outside, in the middle of the burger, or anywhere in between.

If a steak contains *E. coli*, however, the chances are very high that the bacteria are on the outside of the steak. *E. coli* can also be found inside of a steak due to the process known as “blade tenderization,” which is used to make lower grade cuts of beef tenderer. Experts who have studied blade tenderization have concluded that eating medium-rare, blade-tenderized steak does not represent a significant health risk.

Although pathogenic *E. coli* are generally not found in pork or chicken, other pathogens such as *Salmonella* can contaminate these foods. Like steak, pork chops and chicken are generally intact pieces of muscle, and so any pathogens are likely located on the surface of the muscle, where they can be easily killed by heating. The United States Department of Agriculture recommends that pork and chicken be

cooked to 77°C for best food quality.

There is one more important bit of information you need to make sure you prepare meat safely—do not cross-contaminate cooked meat with juices from raw meat. This could happen during a cookout if you use the same plate to take your burgers or chicken out to the grill and to bring them back to the table. To avoid cross-contamination, use two different plates (one to take the uncooked meat to the grill, and another to bring the cooked meat back into the house). Also, wash your hands after handling raw meat so that you don't cross-contaminate any other surfaces with your own hands.

If you have more food safety questions, you can consult these two useful websites: [www.foodsafety.gov](http://www.foodsafety.gov) and [www.fightbac.org](http://www.fightbac.org). And don't forget to keep asking great questions like this one.

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