

Grilling and Cancer Risk: What You Need to Know for a Healthier Barbecue

Five simple steps to keep in mind so you can grill safely and reduce cancer-causing compounds.

June 8, 2025 By American Institute for Cancer Research and Cara Rosenbloom

Key Takeaways for Healthy Grilling:

- Grilling meat at high temperatures can produce potential cancer-causing compounds. That doesn't mean grilling season is over! You can learn how to grill safely to reduce these cancer-causing compounds.
- American Institute for Cancer Research (AICR) outlines five simple steps to keep in mind for safer grilling, such as using marinades, cooking at lower temperatures and removing any char from meat before eating it.
- Balance your plate by serving up lots of grilled vegetables and fruits. These fresh options do not create cancer-causing compounds when grilled. Filled with fiber, vitamins and antioxidants, they are known as cancer-fighters and should fill a good portion of your plate.

Summer often means a lot of burgers and hotdogs, since about 80 percent of Americans own a backyard grill or barbecue. And while grilling is a beloved tradition, it's also a time when AICR likes to remind everyone about safe grilling techniques to reduce cancer risk. Understanding how to grill safely can help you reduce your exposure to cancer-causing compounds without giving up your favorite summer foods.

In the 2024 AICR Cancer Risk Awareness Survey, only 20 percent of Americans reported being aware of the link between grilled meats and cancer. Interestingly, awareness is down since the last time this was surveyed in 2019, when 26 percent said they were aware of the risk. It's time to

change that statistic.

The truth? Grilled meat is linked to cancer risk, and AICR wants to continue to educate Americans about safer alternatives. Grilling does not need to be off the menu! Read on to learn how to optimize your grilling techniques to reduce cancer risk, while still enjoying your summer favorites.

HCA and PAHs in Grilled Meat

Grilling meat, poultry or fish with intense heat or open flames can lead to formation of potential cancer-causing compounds (carcinogens). Two problematic compounds are:

- Heterocyclic amines (HCAs): These form when muscle proteins in meat, poultry and fish react with high heat. Specifically, HCAs are created when amino acids (the building blocks of proteins), sugars and creatine or creatinine (substances found in muscle) react at high temperatures.
- Polycyclic aromatic hydrocarbons (PAHs): These occur when fat and juices drip onto flames, producing smoke that deposits PAHs on the surface of food. PAHs can occur in meat, poultry and fish.

Research shows that both HCAs and PAHs can cause changes in DNA that may lead to cancer. While more research is needed to directly link grilled meat to cancer in humans, the presence of these carcinogens is enough to raise concern.

DID YOU KNOW? Grilled vegetables, fruits, tofu and cheese (such as halloumi) do not carry the same risk of formation of HCAs and PAHs as grilled meat. Toss these on the grill more often.

Red and Processed Meat: Still a Known Risk

Whether grilled or not, excessive intake of red and processed meat increases the risk of [colorectal cancer](#). Red meat includes beef, pork and lamb. Processed meats are any red meat that is smoked, cured or salted, such as hot dogs, sausages, ham, bacon and pepperoni.

[AICR recommends:](#)

- Limiting red meat to no more than 12–18 ounces of cooked meat per week (tip: for a good visual estimate, the size of the palm of your hand is about the size of 3 ounces of meat)

- Avoiding processed meats as much as possible. Save hot dogs and other processed meats for special occasions
- Choosing more plant-based foods such as tofu, tempeh and beans

Try creating meals by following [AICR's New American Plate](#) model, which advises filling at least two-thirds of your plate with vegetables, fruits, whole grains and legumes.

Safe Grilling Tips: AICR Grilling Guidelines

The good news? You don't have to give up grilling or barbequing to protect your health. With a few science-backed strategies, you can enjoy the flavors of summer while minimizing harmful compounds. Here's how to grill meat safely.

Tip One: Marinate

Marinating means soaking your meat in a liquid sauce before you cook it. The flavorful sauce is called a marinade. Studies show that marinating meat, poultry or fish for at least 30 minutes can significantly reduce the formation of HCAs. The protective effects may come from:

- Antioxidants in herbs and spices that may stop HCAs from forming. Studies show that rosemary, garlic and turmeric lower HCA levels.
- Acidic ingredients like vinegar, wine or citrus juice alter the pH of the meat, which reduces the formation of HCAs and PAHs.
- The barrier effect of marinades, which shield meat from intense heat.

MARINADE TIPS: Avoid sugary marinades that can burn easily and create more charring. Try a marinade with olive oil, lemon juice, garlic, herbs and spices for a delicious and protective punch. Not only will it reduce HCAs, but it also makes your meal more flavorful. Try any of these delicious AICR [marinades](#).

Tip Two: Pre-Cook Your Protein

PAHs are deposited onto the meat by smoke. You can reduce the amount of PAHs by reducing the time your meat is exposed to a flame. This can be done by partially pre-cooking meat in a microwave, oven or stovetop before transferring to the grill. Pre-cooking also reduces the risk of HCAs and foodborne illness from undercooked meat.

Tip Three: Keep Heat Low and Go Lean

Cooking over a lower flame helps prevent charring and flare-ups. High flames and burnt bits are prime sources of HCAs and PAHs. To further reduce risk:

- Trim visible fat from meat to avoid flare-ups
- Move coals to the side and cook food in the center of the grill
- Flip meat frequently to avoid burning
- Cut away any charred parts before serving

Tip Four: Cut into Smaller Portions

Instead of grilling large slabs of meat, cut meat into smaller pieces and thread them onto skewers with vegetables. Smaller portions cook faster, reducing the time exposed to high heat.

Plus, combining meat with colorful vegetables helps shift the focus of your meal toward cancer-fighting plant foods. Try salmon kabobs with bell peppers and cherry tomatoes or chicken skewers with zucchini and red onion. The variety adds flavor, color and nutrition.

Tip Five: Enjoy Grilled Vegetables and Fruits

No HCAs are created when you grill [vegetables and fruits](#), making them a safer choice. Plus, plant foods are rich in fiber, vitamins and phytochemicals that help reduce cancer risk.

Here are some produce picks perfect for the grill:

- Vegetables: asparagus, mushrooms, zucchini, eggplant, corn, bell peppers, onions

- Fruits: pineapple, peaches, mangos, watermelon

Toss veggies in olive oil and seasonings before grilling or try fruits on skewers for a naturally sweet dessert.

Reduce Cancer Risk When Grilling

One of the simplest ways to lower cancer risk at your cookout is to shift the focus away from red and processed meats. Try these alternatives:

- Fish and seafood: Light, quick-cooking and delicious with citrus or herb marinades
- Poultry: Choose chicken or [turkey](#) and marinate before grilling
- Plant-based burgers or skewers: Made from legumes, tofu or tempeh
- Portobello mushrooms: Meaty, satisfying and ideal for grilling
- Cheese: Try cheeses that hold their shape on the grill, such as halloumi, kasseri or provolone

A Smarter, Healthier Summer Grilling Experience

Grilling doesn't have to be off-limits when it comes to health. With smart choices and a few simple techniques, you can enjoy all the flavor of barbecue season while reducing exposure to harmful compounds and supporting long-term wellness.

By marinating wisely, choosing lean meats, loading up on vegetables and limiting processed meat, you'll be serving up meals that are not just delicious, but protective too.

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