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A Guide to Grilling Food

Grilling or barbecuing meat at high temperatures leads to the production of heterocyclic amines (HCAs) and polycyclic aromatic hydrocarbons (PAHs). These compounds are known as "mutagens," which damage DNA and may increase the risk of developing cancer. HCAs are formed when amino acids and sugars present in meat react under high temperatures. Additionally, liquid fat drips into the flame of a barbecue and creates smoke filled with PAHs, coating the surface of the meat.

While the best way to avoid the risks associated with grilling is to use other cooking methods when possible, there are several simple ways to balance the effects of grilling your favorite foods.

Choose Meat Wisely

Emphasize leaner cuts of meat. Less fat drippings mean less smoke and less exposure to PAHs. Further, removing the skin from poultry before cooking will reduce HCA formation.

Marinate

Not only does marinating meat impart more flavor, but it can also be protective against carcinogenic compounds. Acid-containing marinades (e.g., those containing vinegar or lemon/lime juice) are best to reduce the formation of HCAs. It is also important to note that traditional barbecue sauces, which tend to have a high sugar content, can increase formation of HCAs. If using these sauces, they should be added to foods after they have been cooked.

Add Herbs and Spices

Herbs and spices have been shown to reduce the formation of HCAs when meats are grilled. Mint, onion, turmeric, garlic, rosemary, ginger, thyme, and red chili pepper are all great choices. These herbs can be used in marinades, mixed into ground meats, or used as a dry rub.

Avoid Overcooking or Charring

The amount of time your meat contacts the grill makes a difference. Try quicker-cooking proteins like fish or shrimp, or cut your meats into smaller

pieces to reduce cooking time (meat and vegetable kebabs are a great solution). Rotate meat frequently to allow the center to fully cook without overheating the surface. Blackened or charred areas of meat can be removed to reduce exposure to HCAs and PAHs.

Try Grilling Other Food Groups

Fruits and vegetables have been shown to inhibit the activity of HCAs and reduce DNA damage caused by these compounds. Fortunately, antioxidant-rich produce can also be delicious when grilled. Try zucchini, bell peppers, sweet potatoes, apples, peaches, pineapple, or even watermelon for a unique addition to your meal.

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