

GOOD GRILLING GUIDE

Now that summer is just around the corner, it's time for BBQ! BUT, what's the deal with carcinogens and grilling?



Two harmful chemicals can form during the grilling process (National Cancer Institute, 2010):

1. **Heterocyclic amines (HCA)** form when protein found in meats are cooked over high heat (i.e. grilling or broiling).
2. **Polycyclic aromatic hydrocarbons (PAH)** form when fat and juices from meat drip down to the bottom of the grill causing smoke (which contains PAH). As the smoke rises, PAH gets into the surface of the meat.

DOES GRILLING INCREASE CANCER RISK?

According to the National Cancer Institute (2010), exposure to high levels of HCA and PAH can cause cancer in animals; however, **whether it can cause cancer in humans is unclear** (Sugimura et al., 2004). Studies have found an association (*not* cause and effect link) between well-done, fried or barbequed meats with increased risks of colorectal, pancreatic, and prostate cancer.

The American Cancer Society specifies **avoiding red meat** at high temperatures, which causes carcinogens and **may increase risk of abdominal, colorectal, and other cancers** (Harvard Health Publications, 2008).

BUT I LOVE BBQ ...

It's hard to give up barbequing completely, but there are ways to BBQ more healthfully!

1. Limit the red meat.

- Grill white proteins such as **poultry or fish**.
- A study estimated that swapping ONE serving a day of red meat for poultry would **cut the risk of stroke by 27%** (Liebman, 2013)!



2. Make veggies the main attraction.

- Have a huge variety of veggies and fruits for people to munch on.
- Veggies are high in cancer-fighting phytochemicals, which may help inhibit the effects of the carcinogens caused by grilling.
- Kebabs with colourful peppers, onions, pineapple, and smaller pieces of meat is

an effective and tasty way to increase your vegetable intake.

3. Marinade with vinegar or lemon.

- Marinades cut down on the smoke that sticks to the surface of the meat (thus, reducing PAH).
- **Thin marinades made with vinegar and lemon** is better than *thick* marinades, which have a tendency to char.
- If you're using honey, sugar or a tomato product, apply it at the last minute of grilling to avoid burning/charring.

4. Cut the cooking time.

- Several recommendations advise **microwaving the meat on “high” for 60-90 seconds**, then discarding the juices PRIOR to grilling.
- Precooked meats = less time on the hot grill = less potential exposure to the harmful chemicals!
- **Continuously turn meat over** to reduce HCA formation. Grill at a lower heat and flip once per minute until cooked.



5. Remove the charred bits.

- Cut off and throw away any parts that become charred prior to eating.

6. Create an aluminum foil barrier.

- Place your meat on top of a piece of foil that has a few small holes over the grill. This will help keep juices from dripping down and creating additional unwanted smoke.

Sources: Harvard Health Publications. (2008). Safe summer grilling tips. *Belvoir Media Group*.

Liebman, B. (2013). Six reasons to eat less red meat: The latest links to heart disease, cancer, and diabetes. *Nutrition Action Health Letter*.

National Cancer Institute. (2010). Chemicals in meat cooked at high temperatures and cancer risk. *National Institutes of Health*.

Sugimura T, Wakabayashi K, Nakagama H, Nagao M. Heterocyclic amines: Mutagens/carcinogens produced during cooking of meat and fish. *Cancer Science* 2004; 95(4):290–299.