

# Heterocyclic Amines

## What are heterocyclic amines ?

Heterocyclic amines (HCAs) are chemical compounds formed during the cooking of meat, fish or poultry, especially if the meat is cooked using high temperatures such as grilling, or for long periods of time.

## Studies to date

HCAs have been shown to cause certain types of cancer in laboratory studies carried out on animals such as rats and mice. The amount of HCAs fed to lab animals are hundreds of thousands of times higher than those found in the human diet. To date no clear relationship between HCA consumption and cancer has been found in human studies.

## Steps to reduce the amount of HCAs in foods

You can take easy steps to reduce HCAs in your diet while still enjoying grilling and a balanced diet that includes meat:

- Use moderate to low heat when grilling, roasting or pan-frying.
- Minimize grilling time by using smaller cut-sizes such as kabobs and by cooking meat to less doneness. Enjoy meat that is cooked medium-rare to medium doneness (145°F to 160°F/ 63°C to 71°C). Keep in mind that for food safety, ground beef needs to be cooked to an internal temperature of 160°F (71°C). Use a digital food thermometer inserted sideways into burger patties to test for doneness.
- Some marinades have been shown to reduce HCA's. Use acidic marinades such as those made with citrus juices, wine or vinegar.
- Use leaner cuts and trim visible fat from meat before grilling to avoid flare-ups and prevent charring.
- Spritz-out any flare-ups on the grill with water.
- Trim away portions of charred meat before serving.
- Enjoy moist heat cooking such as braising, stewing or slow-cooking, more often.

## Are we exposed to HCAs in other ways?

The majority of exposure to HCAs is believed to occur through food; however, HCAs have also been found in beer, wine, cigarette smoke, diesel emissions, emissions from garbage-burning plants, and river water in varying amounts. Most of the HCA's in these sources are at such small amounts, they aren't considered significant by scientists.