

Recent news reports have prompted questions about grilling safety and about consuming meat and poultry products that are charred. This fact sheet aims to answer questions commonly asked by consumers.

## Is grilling healthy?

Absolutely. Grilling is a delicious and nutritious way to cook meat and poultry. Grilling imparts a distinct flavor that consumers enjoy. And, when meat and poultry cuts are grilled, fat drips away from the product, which reduces fat without reducing flavor.

## What are 'heterocyclic amines'?

Heterocyclic amines (HCAs) are chemicals formed during high temperature combustion. Because grilling uses high heat, HCAs can form when amino acids (the building blocks of proteins) and creatine (a chemical found in muscles) react.

## Do HCAs pose a risk?

In studies where animals were fed levels of heterocyclic amines that were thousands of times higher than normal human exposure, cancer has been induced. But epidemiologists studying human populations have seen much less consistent and conclusive results. However, the National Institutes of Health says on its web site that because researchers are still investigating this issue, no limits have been set for HCA consumption.

## Do other forms of cooking cause HCAs to form?

Frying and broiling at high temperatures has been shown to increase HCA formation. When lower temperatures – like those used for baking -- are used to prepare meat and poultry products, studies show that HCA formation is greatly reduced.

## Is there way to prevent HCAs from forming?

Yes. By trimming away excess fat before grilling, it is possible to reduce flare-ups that can char meat and poultry. Using lower temperatures when grilling, using indirect heat in which meat and poultry are not placed directly on the flame and turning meat and poultry frequently can reduce HCA formation. If meat and poultry become charred, trimming

the charred portion is advised.

In addition, if appropriate for the cut of meat or poultry being prepared, marinades have been shown to reduce HCA formation.

## But I've been told to cook meat thoroughly. What do I do now?

Cooking meat to the proper temperature is essential. While there is some evidence to show that overcooking and charring meat and poultry can increase HCAs, there is still much more research to be done in this area. However, the risks of undercooking meat and poultry are well established. It is essential to cook meat to recommended temperatures using an instant read thermometer to ensure proper doneness.

## How much HCA consumption is too much?

According to the National Institutes of Health, studies are being conducted to assess the amount of HCAs in the average American diet. At the present time, the maximum daily intake of HCAs in food has not been established.

Given the preliminary state of the science on this issue, the wisest course of action is to consume a balanced diet consistent with U.S. Dietary Guidelines.

## Helpful Web Sites

[www.fsis.usda.gov](http://www.fsis.usda.gov)

[www.meatsafety.org](http://www.meatsafety.org)