

Selected questions and answers about barbecuing

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Apart from fine weather, a barbecue is all about a delicious selection of meats, fish, salads, sauces, dips and desserts. Consumers frequently ignore the health risks associated with barbecues, however. It is common knowledge that harmful substances which consumers ingest from meat and fish can form during grilling. The speed at which sensitive foods, such as barbecue sauces or egg-based desserts, can go bad at summer temperatures is also underestimated. Last but not least, liquid grill lighters and lamp oils in garden torches are a hazard, too. There have been repeated incidences of poisoning because children have sipped the dangerous liquids they contain. To ensure that nothing puts a damper on the fun of barbecuing, the BfR has compiled some frequently asked questions and answers on the correct handling of foods, liquid grill lighters and lamp oils.

How can harmful substances form during grilling?

When fat from meat or fish or oil from the marinade drip onto the glowing charcoal or onto the heating coil of an electric grill, polycyclic aromatic hydrocarbons (PAHs) can form. They are known to have a carcinogenic effect. Other harmful substances, such as heterocyclic aromatic amines (HAAs), are formed if meat and sausage products are grilled for too long at high temperatures.

How can harmful substances be avoided when grilling?

To prevent the formation of polycyclic aromatic hydrocarbons (PAHs), as little fat and oil as possible should be allowed to drip onto the glowing charcoal. A simple solution is to use trays which collect the liquids from the grilled food. Anyone who is thinking of buying a new barbecue could opt for a (somewhat rare) model in which the charcoal and food to be grilled are positioned vertically opposite each other. Other options are gas or electric grills, so long as these are models where fat and oil are unable to drip onto the heating coil.

As a general principle, meat and sausage products should not be exposed to great heat for too long (charring) to ensure that contaminants such as heterocyclic aromatic amines (HAAs) have no chance of forming. To ensure that the meat is cooked on the inside without charring on the outside, it should be cooked slowly over a low heat (not directly over glowing charcoal).

Can grill trays made of aluminium pose a health risk?

When grilling foods in aluminium trays, it is to be expected that aluminium ions transfer to the food. The intention of using aluminium trays for grilling is to prevent fat from dripping onto the glowing charcoal which may result in the formation of carcinogenic PAHs. When weighing up these risks, the occasional use of aluminium trays when grilling meat is regarded as acceptable, but salt and seasoning should only be applied at the end of the grilling process. Consumers who want to reduce the health risk posed by the intake of aluminium ions should use grill trays made from other materials, such as stainless steel.

You will find more information from the BfR on the topic of aluminium in foods and consumer products in our FAQs:

http://www.bfr.bund.de/en/faqs_about_aluminium_in_food_and_products_intended_for_consumers-191148.html

Should cured meat be barbecued?

Nitrite curing salt is used to produce cured meat and sausage products. In the case of packaged foods, this must be stated in the list of ingredients on the label. Nitrosamines can form during the grilling of cured meat and sausage products. As these are carcinogenic substances, it is better not to barbecue cured meat and sausage products at all.

For which foods are germs such as Salmonella a problem?

Pathogenic germs in foods can cause nausea, diarrhoea or vomiting. Particularly during the summer season, there is a higher risk of foodborne infections because germs can multiply quickly in foods which have not been refrigerated for a longer period.

When barbecuing, special attention should be paid when handling raw foods of animal origin, especially meat, fish and eggs. Pathogens can also spread to marinades, however, via raw meat or raw fish.

Although germs such as Salmonella are killed off when grilling if sufficiently high temperatures are reached, other foods can become contaminated with these germs through the migration of the germs to the hands, cooking utensils and kitchen surfaces. If these contaminated foods are not heated up again prior to consumption, they could damage health.

As Salmonella can multiply in foods at temperatures above 7°C, there is an elevated risk when eating foods which have been stored for longer periods without being refrigerated, such as salads, barbecue sauces, desserts and other foods that are eaten raw.

How can microbial risks be avoided?

Foodborne infections can be avoided by complying with the proper hygiene rules when handling food:

- Raw foods of animal origin and other foods (e.g. salads or desserts) should be stored and prepared separate from one another.
- Frozen meat should be allowed to thaw in the fridge.
- Packaging materials, thaw water and any marinade left over should be carefully disposed of.
- Any devices and surfaces that have come into contact with raw foods of animal origin, thaw water or marinades should be cleaned thoroughly with warm water and washing-up liquid before using them again.
- Hands should be washed thoroughly with warm water and soap between the individual preparation stages.
- Meat should always be cooked through. In the case of poultry, it should be ensured that the colour of the meat on the bone is also somewhere between white and grey.
- To prevent germs migrating from the raw meat or marinade to the cooked food, different barbecue tongs and forks should be used.
- During warm weather it is better not to use raw eggs for self-prepared fresh mayonnaise and desserts (e.g. zabaglione or tiramisu).
- It should also be ensured that sauces, mayonnaise and other sensitive foods (e.g. desserts) which do not contain any raw eggs are always refrigerated properly and are only removed for serving immediately prior to consumption!

Is it advisable to grill in enclosed spaces?

Grilling with charcoal in indoor areas – including garages – can be fatal. The glowing charcoal releases considerable quantities of carbon monoxide (CO). Even if the windows and

doors are wide open, potentially lethal CO concentrations can accumulate in the air in the room.

What happens when you grill indoors?

When charcoal burns, the odourless gas carbon monoxide is formed in addition to combustion gases. As the grill does not have a chimney, the gases cannot be extracted from interior areas and remain in the air in the room. Any persons present in the room then automatically breathe in the carbon monoxide. By doing so, the shortage of oxygen in their tissue can lead to severe brain damage or death within a short space of time.

Are “indoor grills” or “hot pots” that use charcoal suitable for grilling indoors?

Devices that are alleged to be special “indoor barbecues”, although they use glowing charcoal as the heat source, and charcoal-fired pots known as “hot pots” are potentially lethal if used in indoor areas such as living rooms or restaurants. Devices of this kind can produce dangerous concentrations of carbon monoxide, even after a relatively short space of time.

What risks are associated with liquid grill lighters and lamp oils?

The BfR receives repeated reports of poisoning incidents involving small children who, when left unattended for a few minutes, have sipped paraffin-containing lamp oils or grill lighters. These lamp oils can easily reach the lungs. Even the smallest amounts can cause “chemical pneumonia” and in the worst case may even prove fatal.

How can children be protected from poisoning by liquid grill lighters and lamp oils?

As soon as they are no longer needed, liquid grill lighters should be taken to a safe place. To be on the safe side, solid grill lighters should be used instead of liquid ones as there is almost no risk of the harmful oils reaching the lungs if swallowed.

It is not sufficient to store the containers safely to avoid lamp oil poisoning. Poisoning incidents have also happened because small children sucked the wick of a garden torch or oil lamp. No garden torches or oil lamps should be used at all if there are children at the barbecue.

What action should be taken in the event of a poisoning incident involving liquid grill lighters or lamp oils?

The following rules should be observed if children have managed to get hold of liquid grill lighters or lamp oil despite all the precautionary measures and child-resistant closures:

- Do not induce vomiting!
The vomit containing oil could penetrate the lungs.
- Consult a physician immediately!
Even if only mild symptoms occur, such as direct, persistent coughing, the child must see a doctor or be admitted to hospital for observation. If possible, the product involved should be presented to the attending physician in its original packaging so that he/she can provide the Poison Information Centre with specific information. The more information that is available, the more specifically can help be given.
- Doctor’s duty to report poisoning incidents!
In order to identify any dangers and take precautionary measures as soon as possible, physicians must report all instances of poisoning involving chemical products to the BfR. The attending physician should be made aware that he/she is legally obliged to provide this information!