Selected FAQs on poultry meat

Updated FAQ from 19 March 2015

Poultry meat consumption has increased significantly in Germany in recent decades. In 1952, per-capita consumption was roughly 1.2 kg. By 1978, it had gone up to over 10 kg, whereas in 2013, each person consumed about 19.4 kg of poultry meat.

Apart from the cheap price, the main reason behind this increase is that poultry meat caters to consumer demand for low-calorie and easy-to-digest food. Chicken most frequently appears on the menu, although turkey has also become much more popular. Duck, goose and other types of poultry are chosen much less often. In addition to slaughter poultry, poultry parts, offal and a large number of poultry meat products are available on the market.

At the same time, poultry meat and poultry meat products are perishable foods which, if not handled correctly, can be a source of food-borne infection. This means that special care must be taken when preparing such foods: the principles of kitchen and food hygiene should be strictly observed in order to avoid infection through pathogens such as campylobacter or salmonella.

Below, the BfR has compiled selected FAQs on poultry meat and correct handling of these sensitive foods.

In what form is poultry meat offered on the market?
Poultry meat is offered in different forms, namely as

- slaughter poultry (chicken, duck, goose, turkey), fresh, deep-frozen or frozen,
- poultry parts (poultry halves, breasts, whole legs, thighs, lower legs), fresh, deep-frozen or frozen,
- giblets (liver, gizzard, hearts),
- poultry meat products (sausages and pies, aspic products, pickled or smoked duck breast, ready-to-cook and ready-to-eat meals etc.).

What are “poultry meat products”?
A poultry meat preparation consists of poultry meat to which salt, mustard, spices and their aromatic extracts, kitchen herbs and their aromatic extracts or additives have been added. The preparations have been treated in such a way that the cell structure of the meat is not fundamentally changed. This means that meat preparations are fresh meat that has been combined with the components listed above (such as seasoned or marinated chicken or turkey meat).

Poultry meat products include

- **Raw sausages.** These notably include fresh Mettwurst and Teewurst/spreading sausage made with raw minced poultry meat.
- **Frankfurter type sausages** such as ham sausage, Mortadella, Jagdwurst, pies and roulade containing poultry meat.
- **Cooked sausages** made of poultry meat or containing some poultry meat. The selection here is smaller and essentially limited to poultry liver sausage, coarse or fine.
- **Aspic products**, to which wine, mushrooms, mixed pickles and other vegetables may be added.
- **Cans** containing poultry meat.
- **Additional products** such as smoked goose breast or cured, hot smoked chicken.

What information appears on the label of poultry meat?
All data on the packaging of poultry meat is provided for the purpose of informing consumers and are, in the case of health risks or violation of legislation, important for the traceability of the product.

For pre-packed poultry meat of Commercial Classes A and B, the following information should be labelled:

- the Commercial Category,
- for fresh poultry meat: ”consumed until” date,
- for (deep) frozen poultry meat: the best-before date,
- the condition of the product offered for sale (i.e. fresh, frozen, deep-frozen) and the recommended storage temperature (max. +4° C),
- the approval number of the slaughter and / or processing plant and
- for poultry meat not imported from EU country, the country of origin.

The **information on the type of husbandry** are limited to the following terms:
- Fed with … % …,
- Extensive indoor (‘Barn-reared’),
- Free range,
- Traditional free range,
- Free range - total freedom.

This information can be supplemented with additional statements on the special features of the various forms of husbandry.

What is the difference between spoilage organisms and pathogens?
While multiplying, spoilage organisms produce enzymes in the food on the basis of which they can break down lipids, sugars, starch and proteins. In the process, metabolites form which change the smell, taste, texture and appearance of the food. The spoiled food should no longer be eaten, even if doing so does not necessarily lead to illness.

Pathogens in food include bacteria such as campylobacter and salmonella. It is usually not possible to tell that foods are contaminated with pathogens, because the foods are unchanged in terms of appearance, smell and taste.

What is a food-borne infection?
“Food-borne infection” or “food poisoning” denotes a disease caused by pathogens living in or on the food. The most common type found in Germany are bacterial food-borne infections caused by campylobacter or salmonella.

Why does poultry meat spoil quickly?
Poultry meat is generally susceptible to spoilage, and this also applies to chilled poultry products. The reason is that some of the bacteria can tolerate cold temperature and have protein-decomposing properties. At a temperature of +4° C, the number of these bacteria can double every 7 to 8 hours, whereas at 2° C this takes 13 to 14 hours, and at 0° C they can increase twofold within 24 hours. The bacteria can include pathogens such as Salmonella, Campylobacter, *Listeria monocytogenes* or *Yersinia enterocolitica*. For this reason, interruptions in the cold chain are especially risky: at room temperature, as a result of the multiplication of bacteria, putrefaction on the surface begins after as little as 4 to 6 hours. Because bacteria may be present in the deeper layers of the muscle as well, germ

multiplication on the surface is typically accompanied by an increase in the number of germs in the deeper muscle tissue. At the same time, more and more bacteria enter the deeper layers from the surface.

What happens when poultry meat "spoils"?
Regular maturation of poultry meat begins immediately after slaughtering: the pH value which is slightly alkaline in the live muscle starts to drop. The reason for this is the disintegration of organic phosphoric acid esters, and notably acid formation from the carbohydrates in the muscle tissue, especially glycogen.

In contrast, **anaerobic maturation** denotes quick, enzymatic glycogen decomposition, which usually occurs, without the involvement of bacteria, in meat that has not been chilled sufficiently. As part of the process, the poultry skin assumes a greasy, dull and occasionally grey colour. It gives off an offensive sour odour. Connective tissues and muscles too have an acidy and mouldy smell; the colour of the muscle can become copper red and its consistency is brittle and soft. The first changes occur in the moistest parts, for example underneath the wings, between the abdominal wall and the thighs and in the visceral cavity.

In contrast to anaerobic maturation, microorganisms are always involved in **putrefaction**. Already while the bird is still alive, bacteria populate the outer skin, especially in the area of the quills, and they are also found in the muscles. During slaughtering and associated processing, they can enter the visceral cavity. Depending on whether the bacteria present prefer cold or warm temperatures and depending on the ambient temperature, signs of putrefaction appear after as little as one day of storage (e.g. in high temperatures). Incomplete bleeding or improper disembowelling of the poultry carcass can facilitate the development of putrefaction.

The first signs of putrefaction are the greasy appearance of the meat combined with grey-green and dull discoloration and a rotten and later clearly ammoniacal odour.

What does "damp stains" mean?
In poultry that is stored frozen, changes caused by microbes are rare. In case of improper storage of poultry meat, black, grey, green and even brown or white dots or stains appear which can go as deep as the hypodermis. Referred to as "damp stains", these areas are colonies of cold-adapted mould. Poultry meat showing such stains is spoiled and should no longer be eaten.

What is freezer burn or frost burn?
Freezer burn or frost burn are among the flaws most often observed in deep-frozen and frozen poultry. This is a special type of drying of the meat. Initially only affecting the upper tissue layers, they assume a sponge and straw-like structure. The typical meat aroma is also lost. Such changes are irreversible, i.e. they remain after thawing. In frozen condition, they manifest as pale grey areas of different sizes, usually with sharp edges. The size of these areas increases with further storage.

For packed poultry, such freezer burn spots are predominantly found in areas where the packaging material either does not touch the meat or is broken. These changes too constitute "spoilage", meaning that the meat must no longer be offered for sale. Since the sensory value of poultry meat showing freezer or frost burn is reduced, meat changed in such a way should not be consumed in private households either.

How long can poultry meat be stored?
At a storage temperature of +4° C, the surface of poultry meat already shows high bacteria levels indicating beginning spoilage (putrefaction) after 7 to 8 days. For this reason, chilled poultry meat should be eaten within 5 to 6 days. For poultry parts without the outer skin, storage life is extended by 1 to 2 days, because the surface is usually not contaminated as much.

If poultry meat is consistently stored at temperatures around 0° C, their storage life can be extended by a few days, because the putrefaction processes are delayed. Through the use of protective gas with a high $C0_2$ content in the packaging of poultry meat, storage life can almost be doubled.

For the storage life of (deep) frozen poultry such as chicken, turkeys, ducks or geese, the following guidelines apply (Ristic, 1975; Fehlhaber, 2001):

	Storage temperature (° C)	Storage life (months)
Chicken	-18 -21 -28	4 - 6 12 - 15 over 18
Water fowl	-18	6
Turkey	-18 -21 -28	7 8 12

What is the correct way of storing poultry meat?
Fresh poultry meat must be stored at a temperature of -2° C to +4° C. In addition, it must have a use-by date (“consumed until”). It must only be labelled “fresh”, if the meat was not treated in any way other than chilling or freezing. The storage life of chilled poultry meat depends on a number of parameters. These notably include storage temperature, initial bacteria count when storage starts, the degree of drying of the inner and outer surfaces of the animal carcass and type of packaging. The storage periods are determined by the poultry producer, as part of their duty of care, on the basis of their own storage research.

What are the things to watch out for when thawing frozen poultry meat?
Deep freezing does not kill microorganisms such as bacteria and viruses. Spoilage and pathogenic bacteria already on the meat before it is frozen can survive freezing, storage and thawing. This means that thawing of frozen poultry meat poses a health risk. In addition, microbial enzymes such as proteases and lipases may have formed before the meat was frozen, and they remain active during freezing storage.

When thawing poultry meat the meat juice (mixed with draining-off foreign water absorbed during the slaughtering process) is released and moisture on the meat surface increases. In order to prevent multiplication of germs, the food should be prepared or processed immediately. Since the thawing water often contains pathogenic bacteria, it must be removed in order to prevent cross contamination.

The quality loss of meat is lowest if poultry meat is thawed under in refrigeration conditions, for example in the fridge. In this type of slow defrosting, part of the meat juice is reabsorbed. In addition, the surface of the meat is not exposed to higher temperatures at which the bacteria can multiply rapidly. At +4° C the thawing time for chicken is about 12 hours, for

ducks about 22 hours and for geese up to 38 hours. At room temperature (ca. 20° C) these thawing times are cut in half. The quickest way to defrost poultry meat is by microwaving it (approximately 30 minutes for chicken). Due to the short thawing time, there is no microbial multiplication. However, more thawing water forms than in refrigeration temperatures.

What rules of hygiene are particularly important when handling poultry meat?
When preparing poultry meat, it is especially important to avoid so-called “cross-contamination”, i.e. transferring germs from the raw poultry product to other foods. The following universal rules of hygiene help achieve this:

- Store and prepare raw poultry meat and other foods separately, especially if the latter are not to be heated again before consumption.
- For the preparation and storage of poultry products, use different containers and equipment.
- Wash your hands thoroughly with water and soap between the individual preparation steps.
- Do not put cooked poultry meat in unclean containers that have already been used for storing raw products.
- Equipment and surfaces (e.g. kitchen table, sink) that have come into contact with raw poultry products must be thoroughly washed with warm water and washing-up liquid.
- Packaging materials, thawing water etc. must be disposed of immediately.

In addition, the following applies to the preparation of poultry meat and eggs:

- Poultry meat must be cooked thoroughly in order to deactivate any potentially present pathogens. The core of poultry meat must reach at least 70° C for two minutes, i.e. all parts must be cooked through. Egg white and yolk are cooked through when they are hard.
- Do not use raw or soft boiled eggs in dishes that are not to be heated again before consumption.

The BfR has summarised further information on food hygiene in the brochure “Protection against food-borne infection in private households” (in German only):

http://www.bfr.bund.de/cm/350/verbrauchertipps_schutz_vor_lebensmittelinfektionen_im_privathaushalt.pdf