

Questions and Answers on Chemical Decontamination of Poultry Meat

BfR FAQ of 21 March 2017

Compared to other foods, poultry meat is relatively often contaminated with pathogens such as *Campylobacter* or *Salmonella* which can cause gastrointestinal illnesses in humans. The pathogens frequently colonise the animals while they are still living or are transferred to the meat by cross-contamination during slaughtering, deboning or treatment of the carcasses.

In order to avoid infections that can be transmitted by contaminated foods, a holistic hygiene concept should be followed from the breeding of the animals, through the slaughtering process, all the way to sale. Where these prevention strategies are not enough on their own, they could be supported by the use of decontamination measures.

Below, the Federal Institute for Risk Assessment (BfR) has compiled questions and answers on this topic.

In Germany, how significant are infections caused by pathogens in poultry meat?

The presence of pathogens such as *Salmonella* or *Campylobacter* spp. poses a risk to the health of consumers. In recent years, for example, the Robert Koch Institute (RKI) has recorded an increasing number of campylobacter illnesses in Germany. In 2013, over 63,500 cases of campylobacteriosis were reported to the RKI; in 2014, it was over 71,000, and the figure in 2015 was approximately 70,000 (https://www.rki.de/DE/Content/Infekt/EpidBull/Archiv/2016/Ausgaben/03_16.pdf).

In many cases, the illnesses can be attributed to the consumption of contaminated poultry meat. Based on the data from past investigations, the European Food Safety Authority (EFSA) calculated for 2010 that around 20 to 30 % of cases of human campylobacteriosis could be attributed to the consumption of poultry meat, and that about 50 to 80 % of all cases of illness were connected to poultry.

Which legal regulations has the EU Commission introduced to date in order to reduce the occurrence of pathogens in poultry meat?

The specifications of Regulation (EC) No. 2073/2005 on microbiological criteria for food also apply to poultry. This regulation contains a food safety criterion for *Salmonella* Enteritidis and Typhimurium specifying that these two *Salmonella* serovars cannot be detected in a sample size of n=5 in 25 g of the analysed meat.

In addition, discussions are currently ongoing EU-wide regarding the introduction of a process hygiene criterion for *Campylobacter* spp. to reduce the high number of cases of illness caused by these bacteria. The aim of this would be to prevent poultry meat with high numbers of *Campylobacter* per gram from being sold. If high levels of *Campylobacter* are nevertheless detected, the food business operator is obliged to improve hygiene.

What possibilities do food business operators have to improve poultry meat hygiene?

Alongside the specifications of Regulation (EC) No. 2073/2005 and the introduction of a process hygiene criterion for *Campylobacter* spp., discussions have been ongoing for many years on additional effective measures in poultry meat hygiene, whereby food business operators are already obliged to conduct the slaughtering process under the best possible hygiene conditions.

To date, several strategies have been used against pathogenic microorganisms in and on poultry meat. These include:

- Great care in breeding and fattening poultry
- Hygienic conditions during transport, stunning, scalding, plucking, evisceration and further slaughtering steps
- Fast and effective cooling
- Targeted cleaning and disinfection of slaughtering machines and slaughtering equipment with which the product comes into contact

Within the scope of the joint research project EsRAM, in which the BfR is also involved, investigation is currently taking place into which measures of a holistic hygiene concept can result in a significant reduction in bacterial contamination.

Why are decontamination processes for poultry meat being discussed in the EU?

This is due to the fact that the hygiene measures to date have not been enough to reduce the presence of *Campylobacter* spp., in particular, on poultry meat. Consumers expect food to be safe and not to endanger health. However, microbial contamination of food cannot always be ruled out. It appears that kitchen hygiene measures for protection against foodborne infections are not given adequate consideration; this is shown by statistics from the European Food Safety Authority (EFSA) and the European Centre for Disease Prevention and Control (ECDC). According to these statistics, almost 230,000 human campylobacteriosis cases were reported in the EU in 2015, for example. 31 % of reported cases required inpatient hospital treatment, while the illnesses were mostly contracted within private households.

EFSA (European Food Safety Authority) and ECDC (European Centre for Disease Prevention and Control), 2016. The European Union summary report on trends and sources of zoonoses, zoonotic agents and foodborne outbreaks in 2015. EFSA Journal 2016;14(12): 4634
<http://ecdc.europa.eu/en/publications/publications/zoonoses-trends-sources-eu-summary-report-2014.pdf>

What is meant by the term “chemical decontamination” of poultry meat?

The term “chemical decontamination” of foods refers to the use of antimicrobial substances such as chlorine dioxide or peroxyacetic acid, which can be used to reduce the levels of *Salmonella* or *Campylobacter* bacteria.

Is the decontamination of poultry meat currently permitted in the EU?

At this time, only the use of drinking water is permitted to remove surface contamination on poultry meat. Decontamination substances are currently not allowed for poultry meat.

What proposal has the EU Commission submitted on the decontamination of poultry carcasses and meat?

To improve poultry meat hygiene, the EU Commission has proposed allowing the use of peroxyacetic acid for the decontamination of poultry carcasses and meat as an additional measure under specific conditions.

To prevent the development of resistance and the formation of residues, the EU proposal also specifies corresponding concentrations and application times for the use of peroxyacetic acid and prescribes control parameters that oblige the food business operator to monitor the respective hygiene measures and decontamination measures taken within the scope of the HACCP process.

Even in its recitals, the EU proposal emphasises the significance of “conventional” hygiene measures during the production of poultry meat. It explains that these hygiene measures in the sense of a hurdle concept continue to be of paramount importance and that they cannot be replaced by decontamination measures. Instead, conventional hygiene requirements and possibilities throughout the entire farming, fattening, transport and slaughtering process should be combined with an additional decontamination procedure.

Does the use of chemical decontamination substances on poultry carcasses pose a risk to the health of consumers?

The European Food Safety Authority (EFSA) dealt with the decontamination of poultry carcasses in 2014. It assessed the safety and efficacy of peroxyacetic acid as a decontamination substance and came to the conclusion that the process represents a suitable additional possibility for reducing pathogens. When peroxyacetic acid is used to reduce the level of bacteria on poultry carcasses and poultry meat, no health risks for consumers are to be expected from a toxicological perspective.

<http://www.efsa.europa.eu/en/press/news/140326>.

How are decontamination substances on food assessed in terms of health?

In principle, the procedure for toxicological assessment of decontamination substances for meat is similar to that for processing aids, food additives or biocides, which also include the disinfection and decontamination substances.

However, in detail, different testing requirements and assessment criteria apply to these substances. No specific testing requirements currently exist for processing aids, while the European Food Safety Authority (EFSA) has published a guideline with assessment criteria for decontamination substances.

http://www.efsa.europa.eu/sites/default/files/scientific_output/files/main_documents/1544.pdf

What legal regulations apply to the use of decontamination substances?

Article 3 Paragraph 2 of Regulation (EC) No. 853/2004 with specific provisions on foods of animal origin stipulates that, aside from drinking water, only substances whose use has been approved by the EU Commission can be used to remove surface contamination. Decontamination substances for application on other types of meat and foods are already permitted in the EU, e.g. the use of lactic acid on half cattle carcasses.

What requirements do decontamination substances need to fulfil in order to be used on poultry meat?

The basic rule that applies is that the ideal decontamination substance should have a broad range of effect or a high selective effect against bacteria.

The ideal decontamination substance should demonstrate a fast and irreversible effect in its working dilution and have a low loss of efficiency due to environmental influences (e.g. protein, PH value or temperature). Furthermore, the substance should be harmless to humans and animals. It should not have a negative effect on the surface of the food and should have good application properties.

Could the use of chemical decontamination substances lead to the development of resistance?

In general, possible development of resistance of bacteria to the active substances used during the decontamination process is seen in a critical light in the same way as the development of resistance of bacteria to active substances that are used during disinfection. Not only the development of resistance to the substance in question need to be considered, but

there is also a danger that the pathogenic bacteria could become resistant to certain antibiotics (cross-resistance).

To prevent the development of resistance of bacteria to peroxyacetic acid, the EU proposal stipulates the required concentrations and application times for the use of this substance for decontamination and stipulates parameters in the context of the internal company inspection system that oblige the food business operator to perform monitoring.

EFSA published an opinion on this topic in 2014:
<http://www.efsa.europa.eu/en/press/news/140326>.

Does the use of chemical decontamination substances have an effect on the quality of meat?

Depending on the substance in question, the use of decontamination processes can result in various deviations in sensory quality, such as changes in colour, flavour and texture, in addition to the desired hygienic effects. Whether such deviations can be accepted depends on the purpose of the treated meat. The colour changes described during decontamination measures are determined by the procedure itself and the matrix (muscle, fat, tendons etc.). For example, muscle tissues can become grey or pale or take on brown colour deviations following treatment. The flavour can also change due to the effects of decontamination substances. The reduced (spoiling) germ flora can lead to an increased shelf life because bacterial spoiling sets in later but, on the other hand, the fat can go rancid quicker through oxidation processes.

At this point in time, however, the BfR is not aware of any analysis results on sensory changes in poultry meat following treatment with peroxyacetic acid.

How does the BfR assess the use of chemical decontamination substances on poultry?

From the BfR's perspective, the application of chemical substances alone to achieve a "low-bacteria" food is not adequate to improve food safety. At best, chemical decontamination is a further component in a series of necessary measures, beginning with good hygiene in poultry flocks and in the abattoir with the aim of ensuring the lowest possible contamination with pathogens.

The most important requirement for the use of decontamination substances is that they are guaranteed not to pose a risk to health. The BfR is conducting research on this and evaluating possible health risks.

This text version is a translation of the original German text which is the only legally binding version.