

Questions and answers on the effects of the use of antimicrobials in animal production

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When animals get sick, it may be necessary to treat them with pharmaceutical products. In animals used for the production of food, antimicrobials must only be used, when prescribed by a veterinarian.

Food must only be marketed, if it does not contain any residues which may have negative effects on the health of consumers. If antimicrobials are used in animal production correctly and withdrawal periods are respected, no residues from these antimicrobials posing any health risks are found in the food products. Due to the strict regulations and controls, the health risks to consumers resulting from food are low with regard to residues from antimicrobials.

The use of antimicrobials in animal production promotes the development of resistance and the spread of resistant bacteria. Resistance to antimicrobials means that the pathogens are insensitive to certain antimicrobials. However, no data is currently available on the extent to which the use of antimicrobials in animal production contributes to the problem of resistance in human medicine.

During food harvest, i.e. slaughter or milking, resistant bacteria can be transmitted from animals to foods such as meat or milk. Via food, but also through direct contact with animals, consumers can come into contact with resistant pathogens which occasionally lead to infections in humans. If treatment is required but the used antibiotic does not work, the infection caused by the resistant bacteria can be more serious and take longer to clear up.

In the opinion of the BfR, the use of antimicrobials should be restricted to what is medically absolutely necessary in order to avoid a further increase in resistance. To this end, efforts should focus on keeping animals healthy, so that no treatment is necessary in the first place.

What are antimicrobials? What are they used for in animal production?

Antimicrobials are used to treat bacterial infections. A given animal population can contract the pathogens of such infections through various paths. Because of the close proximity of large numbers of animals in such populations, infectious agents can, once introduced, quickly spread through the population and lead to significant losses. Veterinarians use antimicrobials in domestic food animals, in order to cure such infections and to protect the animals from the consequences of the infection (illness, suffering, death). Where animals are kept in groups, often all animals are treated in order to prevent a spread of the infection from the sick to the still unaffected animals within the group.

The use of antimicrobials as a way to increase performance has been banned in the EU since 2006. Prior to that change in regulations, antimicrobials were used to enhance animal performance, for example to promote growth.

Does veterinary medicine use the same antimicrobials as human medicine?

A number of antimicrobials are used both in veterinary and in human medicine. At the international level, a list of antimicrobials has therefore been drawn up which are especially important for human and veterinary medicine.

<ftp://ftp.fao.org/docrep/fao/010/i0204e/i0204e00.pdf>

What quantities of antimicrobials are used in animal production?

No comprehensive and current data on the extent of the use of pharmaceutical products in animal production are available for Germany. Data on the use of antimicrobials in poultry farming have just been published by North Rhine-Westphalia and Lower Saxony which show that antimicrobials in animal products are frequently used under certain circumstances (available in German only):

http://www.umwelt.nrw.de/verbraucherschutz/pdf/antibiotika_masthaehnchen_studie.pdf
http://www.ml.niedersachsen.de/portal/live.php?navigation_id=1312&psmand=7

The decision about the use of veterinary medicinal products must in each individual case be taken by the veterinarian who is in charge of the animal population or who has been called by the farmer to treat sick animals. The Federal Chamber of Veterinarians recently published an update of "Guidelines on the Prudent Use of Antimicrobial Veterinary Medicinal Products" in 2010 (in German only):

http://www.bundestieraerztekammer.de/datei.htm?filename=ab-leitlinie-2010.pdf&themen_id=4868

Both the veterinarian and the farmer must document the treatment of animals used for food production and preserve those records for several years.

What does antimicrobial resistance mean?

Bacteria can be resistant to certain antimicrobials, a phenomenon referred to as antimicrobial resistance. This means that such bacteria are no longer or only insufficiently influenced in their growth by substances which previously inhibited the growth of bacteria or killed them altogether. Bacteria have developed a wide range of mechanisms that make them resistant to antimicrobials.

Infections caused by resistant bacteria are more difficult to treat. As a result, such infections can be more serious and take longer to clear up.

What foods can contain bacteria that are resistant to antimicrobials?

As a general rule, resistant bacteria may be present in or on a number of different foods.

During slaughter and milking, resistant bacteria can be transmitted from animals to the resulting foods such as meat or milk. Through heat treatment (cooking, baking, frying or pasteurising) the bacteria are killed.

The contamination of plant-based foods with resistant bacteria is currently the subject of research projects. A common source of the contamination of plant-based food is a lack of hygiene in the preparation of meals in the kitchen. For example, bacteria can be spread from raw meat to lettuce via hands or cutting boards.

What part does the use of antimicrobials in animal production play in the spread of resistant bacteria?

It is to be assumed that the use of antimicrobials in animal production contributes to the development of resistance and notably to the spread of resistant bacteria. No data is

currently available on the extent to which this application area of antimicrobials contributes to the spread of resistant bacteria in humans.

In the opinion of the BfR, the use of antimicrobials should be restricted to what is medically absolutely necessary in order to avoid a further increase in resistance. Efforts should focus on keeping animals healthy, so that no treatment is necessary in the first place.

How can consumers protect themselves from resistant bacteria in food?

Hygiene measures during transport, storage and preparation of food offer protection against bacteria that are resistant to antimicrobials. For example, raw meat should be heated to 70 degrees Celsius for at least two minutes before it is eaten. When handling raw meat, it should be ensured that the bacteria are not spread to other food via hands or kitchen utensils (e.g. knives or cutting boards).

The BfR has published the leaflet "Consumer Tips: Protection against Food-borne Infections in Private Households" (in German only) which summarises the most important hygiene rules for handling food. The explanations in this leaflet equally apply to resistant and non-resistant bacteria:

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

What foods can contain antimicrobial residues? How do they get into the food?

Residues from antimicrobials can be found in all animal-based foods such as meat, eggs and milk etc, if the animals were treated with antimicrobials. If an animal has received pharmaceutical products, food produced from this animal must not be harvested and marketed within a defined withdrawal period. If pharmaceutical products are used in animal production in accordance with the regulations, quantities of residue posing any health risks are not found in the food products, after the end of the required withdrawal periods.

Do residues from antimicrobials in food pose any health risk to consumers?

The health risk for consumers from eating food is low with regard to residues from pharmaceutical products. The definition of a maximum residue level in food is a legal requirement for the approval of pharmaceuticals for use in food animals. The maximum residues for pharmaceuticals in food are determined in the course of the approval procedure.

The Federal Office of Consumer Protection and Food Safety annually publishes an overview of the results of the residue analyses of the supervisory authorities in accordance with the national residue control plan (in German only).

http://www.bvl.bund.de/DE/01_Lebensmittel/01_Aufgaben/02_AmtlicheLebensmittelueberwachung/07_NRKP/01_berichte_nrkp/05_NRKP_ErgaenzendeDokumente_2009/lm_nrkp_bericht_2009_basepage.html?nn=1622520#doc1401960bodyText3

What are Maximum Residue Levels?

A maximum residue level is the quantity of a substance which may be contained in food. This quantity must not pose any health risk for the consumer.

In Germany, the food control authorities in the federal states (Länder) are responsible for monitoring compliance with the maximum residue levels. If those maximum residue levels are exceeded, the particular food product must not be sold.

Can organic foods also contain residues from antimicrobials?

In general, animals raised and kept on organic farms may also be treated with antimicrobials.

However, limitations exceeding those for conventional farming are laid down in an EU regulation and guidelines of the various organic farming associations. No detailed figures on the use of antimicrobials in organic animal production are currently available.

Are antimicrobial residues reduced, if the food is heat treated?

In general, no residue must be contained in food sold to consumers which may pose a health risk for consumers. Heating does not necessarily inactivate the substances or their degradation products. The degree of inactivation to a large extent depends on the type of substance.