

## Questions and answers on the effects of the use of antibiotics in livestock farming

Updated BfR FAQ of 03 August 2016

When animals become sick, it can be necessary to treat them with drugs. Antibiotics may only be administered to food producing animals specifically when prescribed by a veterinarian.

Foods may only be marketed if they do not contain any residues which could impair consumer health. If antibiotics are used for their intended purpose in livestock farming, there are no subsequent harmful residues in foods, provided that the prescribed waiting times have been complied with. Thanks to strict regulations and controls, the health risk of consumers through the consumption of food is low where antibiotic residues are concerned.

The use of antibiotics in livestock farming favours the development of resistance and spread of bacteria with resistance. Antimicrobial resistance means that the pathogens are insensitive to certain antibiotics. It has not been possible up to now, however, to estimate the extent to which the use of antibiotics in livestock farming contributes towards the resistance problem in human medicine.

In the food production process, resistant bacteria from livestock farming can be transferred to foods such as meat and milk. Resistant pathogens can also be transferred to consumers through food, as well as through direct contact with livestock, and can trigger infections in humans under certain circumstances. When treatment is necessary and the administered antibiotic has no effect, infections with resistant bacteria can last longer or be more severe.

To prevent the further increase of resistance, the BfR is of the opinion that the use of antibiotics in livestock farming should be restricted to the absolute minimum level required for therapy. The focus here should be on measures which keep animals healthy so that treatment with antibiotics does not become necessary in the first place. A concept to minimise the use of antibiotics in livestock farming was legally established with the 16<sup>th</sup> amendment to the German Medicinal Products Act (AMG).

### **What are antibiotics and what are they used for in livestock farming?**

Antibiotics are used to combat bacterial infections. The pathogens that cause infections of this kind can be introduced to herds/flocks of animals in different ways. When many animals live close together, pathogens can spread quickly throughout the herd/flock and cause considerable losses. Veterinarians administer antibiotics to agricultural livestock to cure the animals from infections of this kind and protect them from the consequences of the infection (disease, suffering, death). When animals are kept in groups, it is common to treat all of the animals in order to prevent the spread of the infection from sick animals to healthy ones within the same group.

The use of antibiotics as growth promoters in livestock farming has been banned in the EU since 2006. Prior to that, they were used to improve animal growth, for example.

### **Are the same antibiotics used in veterinary medicine as in human medicine?**

Many antibiotics are used in both branches of medicine. For this reason, a list of antibiotics which are of particular importance for the treatment of humans and animals was prepared on an international level: <ftp://ftp.fao.org/docrep/fao/010/i0204e/i0204e00.pdf>.

This list was extended by the WHO in 2011 with regard to the treatment of humans:  
[http://apps.who.int/iris/bitstream/10665/77376/1/9789241504485\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/77376/1/9789241504485_eng.pdf)

### **What quantities of antibiotics are used in livestock farming?**

The quantity of antibiotics supplied to veterinarians or veterinary pharmacies decreased from 1,706 tonnes (t) in 2011, the first year of the survey, to roughly 837 t in 2015.

It has to be assumed that the greatest quantities of these substances are used in livestock. The decrease relates to the vast majority of antibiotics groups. An increase over 2011 in the quantity sold was registered in 2015 for the substance groups fenicols, cephalosporins of the 3<sup>rd</sup> generation and fluoroquinolones. The use of fourth generation cephalosporins decrease only marginally. The development in the use of cephalosporins of the 3<sup>rd</sup> and 4<sup>th</sup> generations and fluoroquinolones should be assessed as critical due to the special significance of these substance groups for human medicine. The Federal Office of Consumer Protection and Food Safety (BVL) reports on the administered quantities:  
[www.bvl.bund.de/Abgabemengen2015](http://www.bvl.bund.de/Abgabemengen2015)

This development matches up with the results of the BfR research project VetCAB-Sentinel (Veterinary Consumption of Antibiotics) which is being conducted by the University of Veterinary Medicine Hanover in which the number of days on which fattening pigs were treated with any antibiotic sank from roughly five days per place per half year in 2011 to roughly one day per place per half year in 2014. These data show that a change has occurred in the behaviour of German veterinarians with regard to the prescription of antibiotics. The factors which have led to this change are to be examined in the coming years.

In each and every instance, the decision to use veterinary medicines lies with the veterinarian who regularly attends to the livestock or who has been commissioned by the farmer to treat sick animals. Updated "Guidelines for the careful use of veterinary medicines with an antibacterial effect" were last published by the Federal Chamber of Veterinarians in 2015:  
[http://www.bundestieraerztekammer.de/downloads/btk/leitlinien/Antibiotika-Leitlinien\\_01-2015.pdf](http://www.bundestieraerztekammer.de/downloads/btk/leitlinien/Antibiotika-Leitlinien_01-2015.pdf)

The veterinarian and the farmer must document the treatment of animals intended for food production and keep the documentation on file for several years.

### **What does antibiotic resistance mean?**

If bacteria are insensitive to certain antibiotics, this is called antibiotic resistance, which means that in the presence of substances which have previously inhibited or killed off bacteria of this kind, their growth is no longer influenced, or only to an insufficient degree. Bacteria have developed many different mechanisms to become insensitive (resistant) to antibiotics.

As infections caused by resistant bacteria are more difficult to treat, they can also last longer and be more severe.

### **Which foods can contain germs with antibiotic resistance?**

Generally speaking, resistant germs can occur in or on a variety of foods.

In the food production process, resistant germs from livestock farming can be transferred to the produced foods, e.g. meat or milk. The germs are killed through heat treatment (boiling, baking, frying, roasting or pasteurising).

Experimental tests have shown that high germ counts can pass over to kitchen utensils during the processing of meat. If kitchen hygiene is poor, the introduction of resistant germs via raw meat in private households can have the result that consumers ingest resistant bacteria if, for example, the germs are transferred from raw meat to lettuce by using the same dishes or through contact with the same utensils.

### **What share does the use of antibiotics in livestock farming have on the spread of resistant bacteria?**

It has to be assumed that the use of antibiotics in livestock farming contributes towards the development of resistance and in particular to the spread of resistant bacteria.

Study results show that pathogens detected in sheds and stalls can be transferred along the entire food chain and find their way into private households via contaminated meat. There are not sufficient analyses, however, that allow to estimate the extent to which the use of antibiotics in livestock farming influences the spread of resistance in humans.

To prevent a further increase in resistance, the use of antibiotics should be restricted to the level that is absolutely necessary for treatment, in the opinion of the BfR. Efforts to keep animals healthy so that they do not require any treatment should stand at the forefront here.

### **Are the measures to reduce antibiotic resistance in livestock farming taking effect? As**

a result of the minimisation measures, many farmers and veterinarians have made efforts to reduce usage within their area of responsibility, which has in turn contributed to a significant reduction in the supply of antimicrobial substances to veterinarians.

Because of the changes to the medicinal products act (16<sup>th</sup> amendment AMG), since April 2014 farmers who keep livestock for food production have to report details of the use of antibiotics in their herds/flocks once they have reached a certain size. Businesses that use considerably more antibiotics than comparable businesses must take measures to reduce usage. The goal of this legally established minimisation concept is a permanent reduction of antibiotics use in livestock farming.

### **How can consumers protect themselves from resistant germs in food?**

In principle, the measures consumers can take to protect against resistant germs on foods are not different from those to be taken to prevent other bacteria, such as Salmonella and Campylobacter pathogens. Hygiene measures during the transport, storage and preparation of foods also offer protection against bacteria that are resistant to antibiotics. Accordingly, raw meat should be heated to a minimum of 70 degrees Celsius for at least two minutes prior to consumption. When handling raw meat, care should be taken to ensure that germs are not passed on to other foods via the hands or cooking utensils, such as knives and chopping boards.

The BfR has published the leaflet "Consumer tips: Protection against food infections in private households" in which the most important hygiene rules for the handling of food are summarised. The information provided in this leaflet applies in equal measure to resistant as well as sensitive bacteria:

[http://www.bfr.bund.de/cm/350/verbrauchertipps\\_schutz\\_vor\\_lebensmittelinfektionen\\_im\\_privathaushalt.pdf](http://www.bfr.bund.de/cm/350/verbrauchertipps_schutz_vor_lebensmittelinfektionen_im_privathaushalt.pdf)

The BfR has also produced a video clip on kitchen hygiene entitled "What to do with the chicken?":

[http://www.bfr.bund.de/de/was\\_tun\\_mit\\_dem\\_huhn\\_-191706.html?current\\_page=1](http://www.bfr.bund.de/de/was_tun_mit_dem_huhn_-191706.html?current_page=1)

### **Which foods can contain antibiotic residues and how do they get into the food?**

Residues of antibiotics can be contained in all foods produced from animals, such as meat, eggs, milk etc if the animals were treated with antibiotics. If an animal has been given antibiotics, no foods produced from this animal may be put onto the market within a predetermined waiting period. If medicinal products are used properly and as intended in livestock production, no residue quantities of any concern for health are contained in the food once this waiting period has expired.

### **Do antibiotic residues in food pose a health risk to consumers?**

The health risk to consumers from the consumption of foods with residues of medicinal products is low. The establishment of maximum residue limits in foods is one of the prerequisites for the approval of a drug for use with animals that produce food. The maximum residue limits for drugs in foods are established within the course of the approval process.

The Federal Office of Consumer Protection and Food Safety provides an annual overview of the results of the residue examinations of the monitoring authorities in line with the National Residue Control Plan (NRCP):

[http://www.bvl.bund.de/SharedDocs/Downloads/01\\_Lebensmittel/08\\_nrkp\\_erkp/nrkp2013\\_bericht.pdf?\\_\\_blob=publicationFile&v=11](http://www.bvl.bund.de/SharedDocs/Downloads/01_Lebensmittel/08_nrkp_erkp/nrkp2013_bericht.pdf?__blob=publicationFile&v=11)

The BfR regularly assesses these results and makes them accessible by the general public:

<http://www.bfr.bund.de/cm/343/ergebnisse-des-nationalen-rueckstandskontrollplanes-und-des-einfuhrueberwachungsplanes-von-2013-belegen-hohes-mass-an-sicherheit-bei-lebensmitteln-tierischer-herkunft.pdf>

### **What are maximum residue levels?**

A maximum residue level is the quantity of a substance which may be contained in a food. This quantity may not pose a health risk to consumers.

In Germany, the food monitoring authorities in each federal state check for compliance with maximum residue levels. If they are exceeded, the food may not be sold.

### **Can organic foods also contain residues of antibiotics?**

In principle, livestock reared on organic farms may also be treated with antibiotics, but further-reaching regulations apply here as defined by an EU Regulation, as well as several regulations issued by the various organic agriculture associations. There are currently no reliable statistics on the use of antibiotics in organic livestock farming.

### **Are antibiotic residues in foods reduced once the foods have been heated?**

In general, foods for consumption may not contain any residues which could impair consumer health. Heating would not necessarily inactivate the substances used or their degradation products. The degree of inactivation depends on the type of substance.