ESBL-forming bacteria in foods and their potential transfer to humans

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ESBL-forming bacteria can destroy penicillins and cephalosporins through enzymes and are insensitive to these active substances. ESBL stands for **e**xtended-**s**pectrum **b**eta-**l**actamases, which means that these enzymes can not only destroy penicillins but also modern cephalosporins of the 3rd and 4th generation. They are resistant to numerous antibiotics used to treat infections. As the genes which carry this property are located on mobile genetic elements, they can easily be exchanged between different bacteria types.

ESBL-forming bacteria have not only been detected in hospitals but also in animals. They can be mainly harmless intestinal bacteria (so-called commensal bacteria) as well as pathogenic (disease-causing) bacteria, such as Salmonella and verotoxin-forming *Escherichia coli* (VTEC). The Federal Institute for Risk Assessment (BfR) has examined whether ESBL-forming bacteria from livestock herds can transfered to foodstuffs and whether human infections can occur via this route. At the same time, an initial assessment was made as to whether humans can be infected directly with ESBL-carrying pathogens through domestic animals or household pets.

The BfR concludes that ESBL-forming bacteria have been detected in livestock herds (poultry, pigs, cattle) and that their occurrence is on the increase. The bacteria involved are zoonotic pathogens, such as Salmonella, as well as commensal *E.coli*. It was also possible to isolate ESBL-forming Salmonella and *E.coli* strains from food samples (pork, poultry meat and raw milk). In the opinion of the BfR, this means that the infection of humans with ESBL-forming pathogens through foodstuffs is possible. How high the risk of infection is cannot currently be estimated, however. Furthermore, the BfR thinks that livestock as well as household pets can be a source of infection for bacteria of this kind.

The extend ot the contribution of the infections via food, domestic animals and household pets, as well as livestock herds in agriculture, to the ESBL problem linked in humans cannot be estimated from the data available to date. It can be derived from the available molecular biological findings, however, that ESBL-forming bacteria from livestock husbandry pose a risk to human health.

Although their percentage of the examined isolates still appears to be low, the BfR proposes that in light of the increase in ESBL-forming bacteria in livestock herds, measures should be taken to curtail this development.

The full version of this BfR Information is available in German on
http://vm-webextern7r-master.bfr.bund.de/cm/343/esbl-bildende-bakterien-in-lebensmitteln-und-deren-uebertragbarkeit-auf-den-menschen.pdf