

EFSA evaluates the public health risk of bacterial strains resistant to certain antimicrobials in food and food-producing animals

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The European Food Safety Authority (EFSA) has published an assessment on the potential contribution of food and food-producing animals to the public health risks posed by bacteria that produce enzymes that makes them resistant to treatments with broad spectrum beta-lactams[1]. EFSA's Panel on Biological Hazards (BIOHAZ Panel) concludes that the use of antimicrobials in food-producing animals is a risk factor for the spread of these bacterial strains. The experts recommend that decreasing the overall use of antimicrobials in food-producing animals in the European Union (EU) should be a priority in terms of limiting the risk to public health arising from resistance in the food chain and that an effective option would be to restrict or stop the use of cephalosporins in the treatment of food-producing animals.

Antimicrobials are used in human and veterinary medicine to treat infections caused by bacteria. Resistance to antimicrobials occurs when bacteria develop mechanisms that reduce their effectiveness or render their use ineffective. Resistant bacteria can spread through many routes. When antimicrobial resistance occurs in zoonotic bacteria[2] present in animals and food, it can also compromise the effective treatment of certain infectious diseases in humans.

In its assessment, the BIOHAZ Panel evaluated the risks to public health of bacterial strains producing two types of enzymes; extended-spectrum beta-lactamases (ESBL) and AmpC beta-lactamases (AmpC). These enzymes inactivate the effects of antimicrobials such as penicillins and cephalosporins which are defined as critically important antimicrobials for both human and veterinary medicine[3].

EFSA's Panel experts conclude that different bacteria are able to produce these enzymes, most often *Escherichia coli* (*E. coli*) and *Salmonella*[4]. Since 2000, ESBL/AmpC-producing *Salmonella* and *E. coli* in animals and foods have been increasingly reported both in Europe and globally. These resistant bacterial strains have been found in all major food-producing animals, most frequently in live chickens and chicken meat, eggs and other poultry products. In addition to identifying the relevant bacterial strains, the opinion also looked at epidemiology of resistance caused by ESBL/AmpC enzymes and the methods for detection of this type of resistance.

The BIOHAZ Panel analysed the risk factors contributing to the occurrence, emergence and spread of ESBL/AmpC-producing bacteria and concluded that

the use of antimicrobials in general (and not only that related to cephalosporins) is a risk factor for the spread of these types of resistant bacterial strains. The experts concluded that decreasing the overall use of antimicrobials in food-producing animals should be of high priority in the EU as these bacterial strains are often resistant to many other commonly used veterinary drugs. It was also concluded that an additional risk factor is the extensive trade of animals in EU Member States.

When evaluating possible control options, EFSA's scientists state amongst other recommendations that a highly effective control option to reduce ESBL/AmpC-producing bacteria in food-producing animals at the EU-level would be to restrict or stop the use of cephalosporins in the treatment of food-producing animals.

The Panel also recommended improvements for the ongoing EU surveillance and monitoring programmes on antimicrobial resistance caused by ESBL/AmpC enzymes.

- [Scientific Opinion on the public health risks of bacterial strains producing extended-spectrum \$\beta\$ -lactamases and/or AmpC \$\beta\$ -lactamases in food and food-producing animals](#)

Notes to editors

Zoonoses are infections and diseases that are transmissible between animals and humans; of these the most reported are *Salmonella* and *Campylobacter* (see EFSA and ECDC annual report on zoonoses[5]). The zoonotic bacteria that are resistant to antimicrobials are of special concern since they might compromise the effective treatment of infections in humans and also in animals.

ESBL/AmpC-enzymes are most commonly produced by *Klebsiella* and *Escherichia coli* but may also occur in other Gram-negative bacteria, including *Enterobacter*, *Salmonella*, *Proteus*, *Citrobacter*, *Morganella morganii*, *Serratia marcescens*, *Shigella dysenteriae*, *Pseudomonas aeruginosa*, *Burkholderia cepacia*, and *Capnocytophaga ochracea*.

The scope of the current mandate considered the impact on human health of resistance arising from the food chain as a result of the use of antimicrobials in food producing animals. In line with this mandate, the impact of the proposed measures on animal health was outside the remit of the request from the European Commission.

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