AMR reduction in practice

PD Dr. habil. Andreas Palzer

Antimicrobial resistance is, at the moment, worldwide seen as a major challenge for mankind (1). Also, within the veterinary profession, it is a top priority. Under the perspective of “One-Health”, it has become in Europe not only a scientific challenge but also a politically loaded one. While the political discussion is mainly around the human AMR burden, nevertheless the use of antibiotics to animals has been discussed at length. Although science show us that transfer of AMR from animals or animal products is only responsible for a small percentage of resistance problems in humans, the impact of the use of antibiotics in animals cannot be ignored. The European Medicines Agency (EMA), the European Food Safety Authority (EFSA) and the European Centre for Disease Prevention and Control (ECDC) have analysed the potential relationship between the consumption of antimicrobials by humans and animals and the occurrence of antimicrobial resistance in their findings in the joint inter-agency antimicrobial consumption and resistance analysis (JIACRA) reports (2). The use of antibiotics is between the different countries is compared by the European Medicine Agency in their annual reports on European Surveillance of Veterinary Antimicrobial Consumption (3).

The role of the veterinarian is of great importance. Veterinarians can act as ‘gatekeeper’ to ensure correct use of antibiotics (3) and advise their clients on how to prevent diseases, thereby limiting the need to treat animals with antibiotics. Veterinarians also can help educate and raise awareness among their clients to ensure correct and responsible use of antibiotics in animals. Raising further awareness and changing mentality is important, as we can see that within Europe the amounts of antibiotics used in animals and the methods and databases how the use of antibiotics is measured differs greatly between countries. The first country in Europe which implemented a controlling system was Denmark. In the last years, other countries like the Netherlands, Germany and France have followed. In the eight ESVAC report from 2018, which compares the sales of veterinary antimicrobial agents in 30 European countries in 2016, trends about the usage of different antibiotics are described (2). This is done by calculating a figure in mg of active ingredient per PCU (population correction unit) out of the sales of veterinary antimicrobial agents marketed mainly for food-producing animals in tonnes. The report also takes a closer look on the different classes of antibiotics used in the different countries.

One question for us as veterinarians is the question why the usage of different classes of antibiotics differs so much between countries. Especially if we look at classes like cephalosporines or fluoroquinolones, both critical important antibiotics for human medicine, significant differences can be seen between countries. Another point is that some countries have reduced to use of antibiotics in animals significantly while other countries do not yet show such a trend. Positive is that the reduction in usage of antibiotics in some countries also led to a reduce of resistance in certain bacteria, however, we can also see that the AMR situation of some specific bacteria is not changing. This topic need further scientific investigations to understand the effects. What is certain is that AMR is a global problem. People, animals and goods are traveling all over the world, and resistant bacteria travel with them. Europe alone cannot solve the problem.

As practitioners, we first have to ask ourselves how we can reduce the selection pressure by the usage of antibiotics on certain bacteria. A big problem is the influence of antibiotic treatments on commensals which are not directly targeted by the treatment. Therefore, the first and important step was to ban all antibiotic growth promoters in Europe in the year 2006. The next step is now to reduce the number of indications who need an antibiotic treatment in animals. In the pig sector, this can be done by changing the management system (e.g. not mixing animals from different farms),

optimizing the conditions for animals on the farms (feeding, water, climate) or other strategies like vaccinating against diseases. Vaccination has already helped a lot in reducing disease outbreaks in farms but there is still a lot of possibilities to work with different types of vaccines. We need to be aware that some changes which we are doing in the housing system due to higher animal welfare are causing problems for the health in animals while others are of benefit. Beside this we need to investigate much more other treatment schemes without antibiotics. In some cases, alternative treatments such as feed additives can be used to treat sick pigs. A lot of research is done at the moment in this topic. The research in genetics and breeding of pigs for more robust animals and e.g. resistance against different infections like *E. coli* and *Actinobacillus pleuropneumonia* is of great interest for the future. And finally, veterinarians need to choose the right antibiotic substance to do the treatment. This demands much more diagnostic testing and investigations to do precise treatments in animals.

A great challenge for associations and universities is the education of students and veterinarians in the field of AMR and correct use of antibiotics in the field. This is very important as we need to ensure that all treatments are done according with the principles of responsible and judicious use. Above all, the welfare of the animals needs to be ensured, sick animals will need to be treated.

Local veterinary organisations have guidelines about the use of antibiotics in animals and on EU level e.g. the Federation of Veterinarians in Europe (FVE) has written guidelines about the responsible use of antibiotics (4). The European commission has just adopted the new legislation on veterinary medicines. It will be applicable in all EU countries from 28 January 2022 (5). This new Regulation will have a significant influence on the legal situation in every country and on the daily work of veterinary practitioners in Europe.

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