

Advice 01-2018 on the monitoring of antimicrobial resistance in indicator bacteria, pathogens and zoonotic bacteria

Background & Terms of reference

Transfer of (multi) antibiotic resistance genes from animal commensal and pathogenic bacteria to human commensal and pathogenic bacteria, and vice versa, is not only an important risk factor for food safety but also for human and animal health.

Currently, a substantial number of analyses are being carried out in the food chain to monitor the presence of antimicrobial resistance (AMR) in indicator bacteria and zoonotic bacteria. The aim of the current monitoring program is to have an optimal balance between the number of analyses and the information that can be derived from them, and this either for a single bacterial species or sector or for all bacterial species and sectors. Results of this monitoring are used for prevalence determination, trend analysis, evaluation of the effect of usage of antibiotics on the prevalence of AMR in the food chain, evaluation of policy measures, and detection of new resistance(mechanisms).

The Scientific Committee has been asked to evaluate the current monitoring program for AMR and to formulate recommendations to optimize it.

Methodology

This opinion is based on data from scientific literature, on the results of current monitoring programs for AMR in Belgium, and on expert opinion.

Conclusion

The Scientific Committee is of the opinion that current monitoring for AMR in the food chain in Belgium is of high quality and provides very useful information concerning the trend of AMR in primary production and in the food chain in general. Nevertheless, the Committee has identified some topics which might be improved.

To obtain a good idea of the current state and evolution of AMR in primary production (both in animal and in vegetable production) the Committee recommends intensifying existing AMR monitoring in animal indicator bacteria and reducing AMR monitoring in zoonotic bacteria (*Salmonella* and *Campylobacter*) of animals, as far as legally permissible.

AMR monitoring in zoonotic bacteria of foodstuffs has to be continued because it provides direct information on the transfer risk of AMR pathogens to consumers. In order to calculate sample size it is recommended to take into account the consumption of the different foodstuffs, and also the risk of contamination by resistant bacteria. It would also be useful to intensify monitoring of the prevalence of AMR in imported foodstuffs of animal origin to better assess their contribution to overall risk.

Furthermore, it is recommended to resume the AMR monitoring of Gram positive bacteria (*in casu Enterococcus faecalis* and *Enterococcus faecium*) within the framework of AMR monitoring of commensal bacteria of animals.

For predominantly practical and logistical reasons, phenotypical testing within the framework of AMR monitoring cannot be abandoned at present. However, it is also recommended to perform genetical testing, in addition to phenotypical testing, for the determination of resistance profiles. For that purpose, it seems appropriate to use modern molecular genetic techniques e.g. Next-Generation sequencing (NGS). Besides the fact that these techniques have several disadvantages, the benefits within the framework of AMR monitoring are substantial. It is recommended to sequence all isolated bacteria within the framework of AMR monitoring. However, if this is budgetary not feasible, it is recommended to sequence a random sample of bacteria isolated within the AMR monitoring program of commensal bacteria and in addition strains showing exceptional or emerging resistance and strains showing resistance to a combination of critically important antibiotics.

Moreover, the Committee has noted that there is too little feedback to stakeholders regarding the results of AMR monitoring. Therefore, it is strongly recommended to write one general report on AMR on an annual basis. This report should ideally contain trends regarding the use of antibiotics in animal production as well as trends regarding the prevalence of AMR in animals, feed and foodstuffs. To be sufficiently policy-relevant, this report should be published timely. Finally, within the framework of the “One Health” concept, it is highly advisable to combine this report with a report on the results of antibiotic usage and resistance in human medicine.

The full text is available on this website in dutch and in french.