

# Changing antimicrobial use in animal production

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**Overuse and improper use of antimicrobials in animal production are contributing to the emergence and spread of antimicrobial resistance, causing a significant threat to global public health and food security. Changes in decisions and actions in antimicrobial use are needed; however, the solution is not one-size-fits-all. In this article, based on a scientific literature review by CIRAD and ICROFS for the H2020 ROADMAP project, steps and interventions are proposed that can lead to a prudent use of antimicrobials in animal production.**

Changing the use of antimicrobials can be a difficult process. To increase your chances of success, proceeding by steps is recommended. The first step is to set a motivation for changing antimicrobial use and to define the expected outcomes. With a clear motivation in mind, hurdles such as fear of negative impacts on productivity, economy or animal health are easier to take.

It is crucial to involve all levels of stakeholders from direct (i.e., veterinarians, farmworkers, feed advisors, researchers) to indirect (drug and food industry, government bodies) at all stages of the intervention. This allows all stakeholders to analyse the changes they wish to see and assess how these interventions can be implemented.

The next step would be to start defining and implementing an intervention strategy. Different categories of interventions exist and can be combined to set up the strategy best adapted to your goals. Focal points could be knowledge improvement, animal health and herd management or technological innovations. Which interventions to use, depends on the set goal and desired outcomes. An intervention strategy should thus be specific and personal.

After implementation of the personal intervention strategy, the final step is to monitor and evaluate the results. Different intervention results exist, including outputs (i.e., knowledge, training), outcomes (i.e., changes in behaviour) or impacts (i.e., longterm effects). Different indicators can be used to evaluate the intervention strategy such as on-farm antimicrobial use (i.e., incidence of critical antimicrobial use, number of treatments), technical performance indicators (i.e., mortality, reproductive parameters) or economic indicators. For instance, results can be monitored by questionnaires and interviews, on-farm observations, on-farm databases, and reports (i.e., economic- or annual).

To achieve a successful change, it is important to plan a complete intervention process carefully. The intervention strategy should be attainable, with clear objectives. Next to that, participatory approaches are more likely to yield results. It is therefore important that stakeholders of all levels are involved. Together, we can work towards a balanced use of antimicrobials in animal production.



## Figures and tables

Table 1 Intervention categories and examples of possible interventions

<b>Knowledge improvement</b>
Training Communication Individual support Feedback reports Awareness campaigns
<b>Antimicrobial stewardship</b>
Involving farmers and veterinarians in the decision-making and design of health plans and policies Diagnostic support programs Antibiograms
<b>Animal health and herd management</b>
Prevention practices Promoting good sanitation and hygiene Alternative measures related to feeding or watering Vaccination Internal or external biosecurity Disease control plan Reducing risky practices
<b>Technological innovations</b>
Tape measures and dosage charts to estimate dosage based on livestock body size Thermometers to enable milk pasteurization
<b>Monitoring support</b>
Surveillance systems and monitoring of antimicrobial use and/or antimicrobial resistance Regulations, norms and standards Restrictions or bans of use of critical antimicrobial Restrictions or bans of use of antimicrobial as growth promoters in food animals Regulation of drug sales and distribution Guidelines for veterinary prescription and therapeutic AMU Penalties for high AMU



Figure 1 Example intervention strategy