



## G20 Workshop on Antimicrobial Resistance (AMR) September 1<sup>st</sup>, 2021

### Concept Paper

Antimicrobial resistance (AMR) is a rising pandemic. According to WHO, an estimated 700,000 people die each year due to drug-resistant infections. If no action is taken, drug-resistant infections could cause 10 million deaths each year by 2050, and AMR could force up to 24 million people into extreme poverty by 2030,

In the coming decades, the use of antimicrobials in animal production and health will likely rise as a result of economic expansion, a growing global population, and higher demand for animal-sourced foods.

The misuse and overuse of antimicrobials in agriculture and aquaculture without appropriate waste management, contaminate the environment and, increasing the selective pressure, contribute to the rise of the emergence and spread of resistant microorganisms. This poses a threat not only to human health, but also to animal health and welfare, and sustainable livestock production, and has implications for food security and people's livelihoods.

The scale of the problem requires an important leap in international awareness and a concerted global effort.

In line with One Health principles, countries all over the world have been developing approaches to tackle AMR taking into consideration:

- animal health and welfare during all phases of the food system production;
- good hygiene, vaccination, biosecurity measures, and general conditions on farms rules to reduce the need for any medicines in the first place;
- professional advices for disease diagnosis and application of rigorous disease control measures by veterinary services;
- use of locally adapted animal breeds which are more resistant to diseases and stress or animals bred for disease resistance;
- the efficiency of feeds to substitute antimicrobials as growth promoters using appropriate alternatives.

Scientific research based on robust methodologies focusing on a better understanding of the dynamics and epidemiology of AMR, can contribute to find actions to tackle antimicrobial resistance, and address the growing threat of AMR.



This workshop aims at presenting recent approaches developed to cope with the challenges posed by the AMR, exploring the most current understanding, sharing knowledge and brainstorming research needs in the field.

Delegates are invited to share their experiences, to identify research gaps and future directions, and discuss recent research findings such as:

- new effective vaccines against animal pathogens;
- novel, rapid, reliable and low-cost diagnostics to give the appropriate treatment tailored to the nature of the infectious pathogen and its resistance;
- promising antimicrobial alternatives to control bacterial virulence through quorum-sensing disruption, the use of synthetic polymers and nanoparticles, the exploitation of recombinant enzymes/proteins and the use of phytochemicals;
- use of integrated genomic, meta-genomic, transcriptomic and proteomic to monitor the emergence and spread of AMR in agriculture and aquaculture, and to better understand the modes of action of many phytochemical compounds and possibly lead to the development of feasible additives/treatments that can be used as alternatives to antibiotics in animal feeds;
- understanding the bacterial growth-inhibition mechanisms of many novel synthetic polymers and nanoparticles to provide a safe, effective, and inexpensive way to control the prevalence of antibiotic resistance in the animal production chain.