THE 2nd INTERNATIONAL CONFERENCE OF ADVANCED VETERINARY SCIENCE AND TECHNOLOGIES FOR SUSTAINABLE DEVELOPMENT (2nd ICAVESS), 17-18 September 2022, Day 2, AAVS-WOAH-UGM Session on AMR and Food Safety: One Health education and the role of VEEs in Asia

Panel Discussion

Q: What are your thoughts and feelings with collaborating with other sectors?

- Dr Siti Subandiyah
    - Dr Siti notes there is generally a lot of use of pesticides by farmers in horticulture, up to 10 or more times over the course of a couple of months. This can end up in foods such as salads- via research conducted with Australian Centre for International Agricultural Research. As pesticides are a type of antimicrobial agent, and hence fertiliser management should be improved upon.
    - Via the use of antimicrobials in animals, animal manure such as chicken manure has signs of antimicrobial resistance AMR, made worse when applied as a crop fertiliser.
    - Currently there is collaborative work with the Department of Microbiology, Faculty of Agriculture and Forestry, at Helsinki University, in hopes for more collaboration post-covid to prevent the spread of AMR.
- Dr Yuri Fujimoto
    - Dr Fujimoto notes that there is currently a push for more monitoring systems for AMR use in Japan, and especially for the aquaculture sector, as this is the 2nd sector that uses the most antibiotics in Japan. Therefore, more monitoring is needed to decipher the true use of antimicrobial use in this field.
- Dr Masaru Usui
    - Dr Usui agrees with Yuri, as other sectors' use of antimicrobials and AMR has been studied extensively, but not yet explored in aquaculture. As in humans and livestock, it is much easier to isolate bacteria, but not so much in aquaculture.
    - Due to this fact, the comparison of antibiotic resistance gene (ARG) and the different bacterial resistance is much more difficult.
    - Collaboration can be had for ARG comparison with other sectors for resistance.
- Dr Channarong Rodkhum
    - Dr Rodkum does a lot of studies into AMR in aquaculture in Thailand, and resistance analysis of pathogens isolated from aquatic animals. There is collaboration current both inside and outside the university.
    - Inside the university, he notes of the centre under WHO collaboration called "Antimicrobial Resistance Monitoring Centre of Food Borne Pathogens"
    - Outside of the university, there is collaboration with the Thai Department of Fisheries, and also with another university that is conducting similar research.

    - To add, Dr Rodkum addresses the need to standardise the point at which each bacteria is susceptible to the antimicrobial, and also bacterial identification.
    - Most pathogens found in aquaculture most often require special media, and are always almost different to those found from other sectors. Therefore, there still can be further collaboration for the standardisation of testing in aquatic animals.

Q: Bacteriophage has been a treatment used in cats and dogs- can this be transferred over to aquaculture?

- Dr Masaru Usui
    - Dr Usui notes that bacteriophage can be one of the tools to control AMR in the future, but the key right now is to reduce antimicrobial use in tackling resistance. Data is also needed to be gathered about the safety and efficacy of bacterial phage going forward.
- Dr Channarong Rodkum
    - Dr Rodkum thinks further collaboration is required for this, and alternative methods to antibiotics such as immunostimulants, vaccines and bacteriophages should be looked into.
    - In Dr Rodkum's laboratory, he has started research relating to bacteriophage infection in aquaculture. It has shown success in a laboratory setting but notes that further research into upscaling this for commercial use is required.
    - Methods to use pour-in water bacteriophage therapy to treat pathogens affecting the fish on the outside of the body (notably flavobacterium) will need to be developed for the successful reduction of antimicrobial usage.