UNDERSTANDING THE USE AND IMPACT OF ANTIBIOTICS IN AQUACULTURE

White Paper Summary (June 2022)

Aquaculture is critical to feeding the growing global population. However, emerging science is raising concerns that the use of antibiotics to treat bacterial diseases in aquaculture may have detrimental impacts on both the marine ecosystem and human health. Currently, there are no good alternatives to antibiotics for producers to treat bacterial diseases and the rapid expansion of the industry coupled with climate change, limited global governance structures, and increases in disease outbreaks are all accelerating the need for global solutions and recommendations.

To explore issues around antibiotic use in aquaculture, Monterey Bay Aquarium Seafood Watch teamed up with the World Bank to launch the Antimicrobial Assessment on Global Aquaculture Production Initiative (AGAP), conducting an extensive literature review and hosting workshops with over 50 experts from over 15 countries. The work is grounded in the World Health Organization's One Health approach, which promotes solutions that balance the health of people, animals, and ecosystems.

Some of the key findings from the AGAP work include:

- Emerging science is showing connections between antibiotic use and challenges such as water pollution, the contamination of non-target organisms, and the global health threat posed by antibiotic resistant bacteria. However, there are critical gaps in the data needed to assess and monitor the impacts of antibiotic use in aquaculture on humans, animals, and the environment.

- Improving the collection and dissemination of data about antibiotic use at both the farm and regional level is key to assessing and monitoring its impacts. More data is needed on many fronts, including records that track the use and efficacy of antibiotics at the farm level and assessments of antibiotic residue in water, farm sediment, wild fish, and humans.

- The socio-economic drivers of antibiotic use in aquaculture are complex and there is a clear need for more research to find ways to manage these drivers. An approach based on improving communications, trust, and support between the public sector and producers, instead of a ban on antibiotic use, is more likely to result in a clearer understanding of the use and impacts of antibiotics as well as better disease management practices.

- Many countries do not have regulatory frameworks or offer training around antibiotic use in aquaculture and do not require labeling on products that contain antibiotics. For small-scale producers, there are few – if any – other cost-effective alternatives to antibiotics for managing these diseases. In many regions, small producers do not have access to veterinarians for assistance in developing disease management plans. All of these factors can lead to overuse and misuse of antibiotics.

- There are a number of methodological, technical, and regulatory challenges that must be addressed in order to better understand and manage potential risks of antibiotic use in aquaculture. These challenges include the lack of a standardized methodology for measuring and assessing the impacts of antibiotic use in the field, the lack of a standard framework for establishing impact thresholds, and the lack of internationally agreed upon environmental quality standards.

RECOMMENDATIONS

There is an urgent need to better understand the impacts of antibiotic use in aquaculture in order to develop strategies for managing their use in ways that ensure the health of animals, humans, and the environment. Seafood Watch, the World Bank, and the experts who contributed to the AGAP Initiative are calling for a new global action plan that includes the public and private sector as well as academic institutions and is built around the **T.I.M.E.R** pillars: **Train, Invest, Monitor, Evaluate, and Restrict.**

TRAIN

Stakeholders throughout the seafood supply chain need better training on the efficient and responsible use of antibiotics. For example, producers need to know the proper techniques for dosing and disposing of antibiotics as well as strategies for early disease detection.

INVEST

Public and private investment is needed on many fronts to better understand and manage antibiotic impacts in aquaculture. Critical areas of investment include science to establish doses, withdrawal periods, and specific maximum residue limit (MRL) for different species; the creation of alternative solutions to disease management, such as vaccination and genetics; and technology to connect remote farms with resources, such as veterinary services, training, and technical assistance.

MONITOR

Improving the collection and dissemination of data is critical to understanding and monitoring the impacts of antibiotic use in aquaculture on animals, humans, and the environment. For example, baseline data and indicators of risk are necessary to develop monitoring plans designed to track both the cumulative impacts of antibiotic use and improvement over time.

EVALUATE

To create better policies for managing antibiotic use in aquaculture, we need to do a better job evaluating its impacts. For example, scientists should collaborate with the public sector and producers to design and implement standard methodologies for evaluating the impacts, including the creation of field measurement data repositories and common definitions for potential risks to animals, humans, and the environment.

RESTRICT

Strategies for curbing the use of antibiotics in aquaculture include more robust regulatory frameworks and better scientific guidance. For example, the public sector should put regulations in place so antibiotics can only be purchased from authorized suppliers and require labeling for medicine with information about proper use, precautions, and disposal. More science is needed to validate species-specific doses and set acceptable limits to ensure animal, human, and ecosystem health.

To learn more about this issue, visit www.seafoodwatch.org/our-projects/antibiotics-in-aquaculture or contact argi@mbayaq.org.