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FOOD SAFETY ISSUES RELATED TO ANTIBIOTIC RESIDUES IN AQUACULTURE

Dragana Ljubojević Pelić[1*], Miloš Pelić[1], Nikola Puvača[2],

Jasna Kureljušić[3], Sandra Jakšić[1], Ana Gavrilović[4],

Milica Živkov Baloš[1]

[1]Scientific Veterinary Institute "Novi Sad", Novi Sad, Serbia

[2]Department of Engineering Management in Biotechnology, Faculty of Economics and Engineering Management in Novi Sad, University Business Academy in Novi Sad, Novi Sad, Serbia

[3]Scientific Institute of Veterinary Medicine of Serbia, Belgrade, Serbia

[4]University of Zagreb, Faculty of Agriculture, Zagreb, Croatia

*dragana@niv.ns.ac.rs

Aquaculture is a rapidly expanding food industry sector and one of the most sustainable sources of animal protein. Similar to agriculture, aquaculture is believed to use a lot of antimicrobials, which are among the most well-known and frequent chemical contaminants that find their way into the environment and consequently the food chain. The present work aims to provide an overview on the application, residues, regulations, possible health

risks to humans associated with antibiotics used in aquacultureand some recommendations.

Treatments of fish are usually regarded as metaphylactic and antibiotics are added to feed or, less frequently, directly to the water. Although their primary function is to inhibit the growth of microbes, these compounds have also long been exploited as growth promoters in fish production. There are a number of reasons why residues can be found in edible tissues, such as usage of medications against recommended dosages or instructions, disregard recommended withdrawal times, administer too many antibiotics, use contaminated equipment, or neglect to properly clean equipment used to mix or administer medications or inadvertently consuming medicated feeds. It is extremely difficult to collect trustworthy statistics on antibiotic consumption in majority of countries worldwide, which makes determining the exact extent of the risk of antibiotic residue in aquaculture extremely challenging. On the other side, in the majority of European countries, the use of antimicrobials is closely limited by law.

Antimicrobial residues have significant negative effects on public health, including the emergence of drug resistance to antimicrobials, cancer, teratogenicity, mutagenicity, changesin standard intestinal flora, hypersensitivity reactions and others. In order to protect the consumer's health it is necessary that antibiotic residues in products delivered from aquaculture be controlled. The usage of antimicrobials should be reduced in order to decrease the concentration of residue in edible tissues and also to slow down the development of antimicrobial resistance. Also, the quality of water bodies introduced in aquaculture should be regularly controlled and proper preventions strategies should be developed. National and international regulatory frameworks on the sales, usage, and quality of antimicrobial agents are necessary for better management and control over the use of antimicrobial agents in aquaculture as well as for effective prevention. Food safety and consumer protection depend on the availability of straightforward and trustworthy screening methods for identifying antimicrobial residues in aquatic animal tissue.Alternative approaches have concentrated on boosting fish immunity and

preserving a pond's and fish's health microbiome. Fish can currently be treated with a variety of immune stimulants, such as vaccination, immune stimulants, probiotics, prebiotics, herbal medicines, essential oils, bacteriophages, albeit there is still relatively little information on how effective they are. Proper handling and distribution by dealers, veterinary supervision of farmers' administration of antibiotics with observance of withdrawal periods prior to slaughter, and clear instructions from medication makers are all necessary for the responsible use of antibiotics.

Key words: Aquaculture Health Management, Antimicrobials, Food Safety, Veterinary drug residue

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