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Opinion Article

Biosecurity Measures Used in Aquaculture

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DESCRIPTION

Biosecurity refers to any management activity designed to prevent disease-causing pathogens from entering an aquaculture plant. Farm-level biosecurity measures entail the implementation of a set of operations that includes rigorous quarantine, equipment sanitation, egg disinfection, traffic control, water treatment, clean feed, and proper disposal of the deceased. These procedures should be followed for the introduction of new stock, as well as for lowering infections and preventing pathogen transmission from one stock to another. The majority of aquaculture infections may be avoided with careful biosecurity precautions. One of the most significant methods for controlling fish infections in aquaculture is to reduce stocking density. When ecto-parasite infections initially appear, decreased stocking densities, along with increased water flow, provide a more effective impact on the parasites. Aquatic species brought in from the outside and whose health condition is unclear are quarantined before being released into the herd. During this period, animals must be closely monitored and proper diagnostic tests must be used. The quarantine can last anything from fifteen days to three months. Treatment with effective medications should be administered for the appropriate duration of time after a correct diagnosis of the condition in issue. Antibiotic resistance develops as a result of incorrect antibiotic usage, which can be prevented using prophylactic therapy. Disinfection is the process of removing bacteria from inanimate items using physical or chemical means.

Disinfectants in aquaculture might also comprise substances that kill bacteria on the surface of fish eggs. These compounds are used to restrict the spread of aquatic animal infections in aquaculture operations as part of biosecurity practices. Drying and cleaning ponds properly may be quite effective in managing many fish infections in aquaculture. A pond with high-quality, well-aerated water is essential for breeding healthy fish, especially those species that are native to oligotrophic environments, such as salmonids. Disinfectants used in aquaculture include formaldehyde, isopropyl alcohol, hydrogen peroxide, chlorine, iodine, glucoprotamine, and iodophors. Quaternary ammonium compounds are excellent in killing life in inanimate objects, in addition to being harmful to fish. Chlorine can also be used; however, it must be neutralized properly to prevent fish death.

Because iodine-containing chemicals can be harmful, equipment disinfected with them must be washed before use. Without high-quality health data, no aquatic animal health strategy or policy can be developed. By conducting aquatic animal surveillance, this data may be used for disease management, quarantine, and health certification. Surveillance to prevent disease introduction is an important aspect of any biosecurity plan because it helps to identify potential disease introduction routes and notice the onset of a new illness early enough to deploy control techniques before the pathogen spreads. Surveillance should be conducted frequently to limit the danger of disease transmission. All government aquatic animal health programs should include disease surveillance as an essential component. Data acquired for various purposes can be used to determine the health condition of aquatic animals and to devise disease-prevention strategies. Laboratories, field trips, research initiatives, farmers, and aquaculturists can all provide data. Passive surveillance can help spot developing diseases early on. Its limitations include the inability to estimate disease incidence and prevalence and the inability to show disease freedom. Active surveillance is conducting surveys to determine the state of a certain disease. Active surveillance results may be affected if not designed and assessed properly. Appropriate analysis can yield accurate figures of disease incidence and prevalence in a given area. Its benefits include higher-quality data, as well as faster and less expensive data collection than passive monitoring.

CONCLUSION

Because fish cannot be observed close enough like terrestrial animals, the environment can facilitate disease transmission quickly, fish are not easily cached without stress, they often gather in groups, and disease is often difficult to detect and control, infectious disease control in aquaculture is more complicated than terrestrial animal disease control. The identification of disease in fish is another significant difficulty; in terrestrial animal disease diagnostics, the individual animal is the unit of interest. A disease may spread fast, and the entire tank might be a source of infection for healthy stock. In this situation the entire tank must be studied and diagnosed. Samples should be taken not only from fish but also from water to determine essential properties such as pH, soil bottom conditions, and turbidity, making aquatic animal diagnosis difficult and time-consuming.

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