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INNOVATIVE APPROACHES AND DISEASE PREVENTION STRATEGIES IN THE DEVELOPMENT OF THE FISHERIES SECTOR

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Abstract: The article analyzes the importance of innovative technologies, genetics and ecological approaches in the development of fish farming industry. Also, important aspects of increasing the efficiency and productivity of fisheries through disease prevention strategies and modern methods were emphasized.

Key words: Fisheries, innovative technologies, disease prevention, artificial intelligence, genetic selection, environmental technologies, automated monitoring, efficient management, feeding system, economic efficiency.

INTRODUCTION

In every field, innovative approaches and effective management practices are considered key factors in ensuring economic growth and sustainable development. In particular, the fishery sector plays an important role in ensuring food security, supplying the population with high-quality protein products, and increasing export potential. However, various diseases encountered in this sector — including infectious, parasitic, and non-infectious diseases — negatively affect the quality of fish products, productivity levels, and the economic stability of fish farms.

Therefore, the development of scientifically grounded measures for the early detection, effective treatment, and prevention of diseases in fish farms is one of the most pressing issues. To prevent and combat diseases, it is necessary to implement modern diagnostic methods, utilize innovative veterinary tools, apply ecologically sustainable methods, and establish a system to monitor the quality of feed and water environments.

In addition, increasing awareness among fish breeders regarding disease prevention, promoting best practices, and strengthening state support mechanisms will help improve the efficiency of the fishery industry and reduce economic losses. For this reason, the Presidential Decree of the Republic of Uzbekistan No. PQ-83 dated January 13, 2022, "On Additional Measures for Further Development of the Fishery Sector" emphasizes that the development of the fishery sector is of great importance in ensuring Uzbekistan's economic stability and strengthening food security. This decree is aimed at implementing new intensive technologies in the fishery industry, increasing export capacity, and ensuring the well-being of the population.

MAIN BODY

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In recent years, the introduction of innovative technologies, application of modern diagnostic and preventive methods, and efforts to ensure ecological balance have become increasingly important in the development of fish farming.

To improve the efficiency and sustainable development of fish farms, the following innovative approaches are of significant importance. Recirculating Aquaculture Systems (RAS) enable efficient use of water resources in aquaculture. In these systems, water is continuously filtered and purified to create optimal conditions for fish. This method offers advantages such as reduced water consumption, disease prevention, and year-round production.

Genetic selection plays a crucial role in increasing fish productivity, enhancing disease resistance, and promoting faster growth. Biotechnology makes it possible to breed fish with high natural immunity, develop enzyme-based technologies to improve nutrition, and create effective vaccines against infectious diseases. In Uzbekistan, the Fishery Research Institute conducts extensive scientific studies on developing high-yield fish breeds and improving breeding and selection processes.

Modern sensor systems and artificial intelligence algorithms are making significant contributions to improving efficiency and resource management in fish farms. These technologies allow for monitoring fish movements and health, as well as continuously measuring water temperature, oxygen levels, and pH balance. In addition, automating the feeding process helps reduce feed waste and ensures optimal growth conditions for the fish.

The spread of bacterial, viral, and fungal diseases among fish can have serious negative effects on their development. Common infectious diseases include Aeromonosis (which affects internal organs), Pseudomonosis (an infection that damages the skin and internal organs of fish), and Viral Hemorrhagic Septicemia (VHS), a dangerous viral disease that affects the circulatory system of fish.

Fish affected by parasites may experience stunted growth or even die. One of the most common parasitic diseases is Ligulosis, where tapeworms (cestodes) inhabit the abdominal cavity of the fish. Additionally, Ichthyophthiriosis (commonly known as white spot disease) is caused by protozoan infections that lead to small white spots on the fish’s body. Dactylogyrosis and Gyrodactylosis are parasitic diseases that affect the gills and skin of fish.

Some fish diseases may be caused by environmental factors or improper feeding. For instance, hypoxia — a lack of oxygen in the water — can lead to fish mortality. A deficiency in micronutrients such as vitamins and minerals negatively affects bone structure and growth. Poisoning may occur due to the consumption of polluted water or low-quality feed, causing serious damage to the fish's overall health.

Disease prevention strategies involve preventive measures and modern diagnostic methods. Preventive measures include compliance with hygiene and sanitation regulations, implementing quarantine procedures, and conducting vaccinations to boost fish immunity. Modern diagnostic techniques enable early detection and effective disease control. Molecular diagnostics help identify diseases at early stages through DNA and RNA analysis, while immunological tests assess immune levels and diagnose infectious diseases early. Moreover, automated monitoring systems using artificial intelligence and sensor technologies allow for continuous health tracking and timely intervention. These strategies serve to prevent diseases in fish farms, improve product quality, and enhance economic efficiency.

CONCLUSION

In conclusion, to ensure the efficiency and sustainable development of the fishery sector, it is essential to implement innovative technologies, apply modern disease prevention methods, and establish effective management systems. This not only increases the quality and productivity of fish products but also helps prevent economic losses. In the future, the fishery industry is expected to further develop with the help of artificial intelligence, ecological technologies, and genetic innovations. Therefore, expanding scientific research and applying advanced technologies in practice will remain a fundamental factor in the sustainable development of the sector.

REFERENCES

1. Daminov A., Nasimov Sh., Gerasimchik V., Eshburiyev S., Qurbonov F. “Baliq kasalliklari” o‘quv qo‘llanma. Samarqand-2020.
2. Haqberdiev P.S., Davlatov R.B. “Baliqlarni saqlash, oziqlantirish, ularning
3. kasalliklarini davolash va oldini olish “, o‘quv qo‘llanma.Samarqand-2012.
4. Abdullayev A., Tursunov A. “Baliqchilik asoslari” – Toshkent: Fan, 2019.
5. https://uzfishery.uz/uz/index.html
6. https://agro-olam.uz/category/baliqchilik/