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HEALTH MANAGEMENT OF NILE TILAPIA (*Oreochromis niloticus*) IN GROW-OUT PONDS AT BALAI BENIH IKAN (BBI) BATU KUMBUNG LINGSAR, WEST LOMBOK

Manajemen Kesehatan Ikan Nile (*Oreochromis niloticus*) di Kolam Tumbuh di Balai Benih Ikan (BBI) Batu Kumbung Lingsar, Lombok Barat

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ABSTRACT

Nile tilapia (*Oreochromis niloticus*) is one of the most important freshwater aquaculture commodities in Indonesia due to its rapid growth, high adaptability, and stable market demand. The success of cultivation is strongly influenced by proper health management, including water quality control, feed management, and disease prevention. This field practice was carried out at the Batu Kumbung Fish Hatchery (BBI), Lingsar, West Lombok, aiming to observe and understand health management practices in tilapia grow-out ponds. Data were collected through observation, interviews, documentation, and active participation in pond preparation, stocking, feeding, health monitoring, and harvesting. The results showed that water quality parameters were within optimal ranges (temperature 26.3–27.3°C; dissolved oxygen 5–7 mg/L; pH 7.5–8), feed conversion ratio (FCR) was 1.1, survival rate (SR) reached 80%, and selection index (IS) was 0%, indicating no disease cases during cultivation. These findings confirm that the implementation of appropriate health management effectively maintains fish health, reduces mortality, improves feed efficiency, and supports sustainable tilapia aquaculture. Tilapia health management in the BBI Batu Kumbung rearing pond, Lingsar, West Lombok, is carried out through pond preparation, water quality control, regular feeding, and disease prevention by administering Lugol and soaking the fish in a salt solution or PK (Potassium Permanganate).

Keywords: Health Management, Nile Tilapia, Selection Indeks, Survival Rate, Water Quality

ABSTRAK

Ikan nila (*Oreochromis niloticus*) merupakan salah satu komoditas budidaya perairan tawar terpenting di Indonesia karena pertumbuhannya yang cepat, adaptabilitas yang tinggi, dan permintaan pasar yang stabil. Keberhasilan budidaya sangat dipengaruhi oleh pengelolaan kesehatan yang tepat, termasuk pengendalian kualitas air, pengelolaan pakan, dan pencegahan penyakit. Praktik lapangan ini dilakukan di Balai Tembakau Ikan Batu Kumbung (BBI), Lingsar, Lombok Barat, dengan tujuan untuk mengamati dan memahami praktik pengelolaan kesehatan di kolam pembesaran ikan nila. Data dikumpulkan melalui observasi, wawancara, dokumentasi, dan partisipasi aktif dalam persiapan kolam, penebaran, pemberian pakan, pemantauan kesehatan, dan panen. Hasil menunjukkan bahwa parameter kualitas air berada dalam kisaran optimal (suhu 26,3–27,3°C; oksigen terlarut 5–7 mg/L; pH 7,5–8), rasio konversi

pakan (FCR) adalah 1,1, tingkat kelangsungan hidup (SR) mencapai 80%, dan indeks seleksi (IS) adalah 0%, yang menunjukkan tidak ada kasus penyakit selama budidaya. Temuan ini menegaskan bahwa penerapan manajemen kesehatan yang tepat secara efektif menjaga kesehatan ikan, mengurangi angka kematian, meningkatkan efisiensi pakan, dan mendukung budidaya ikan nila yang berkelanjutan. Manajemen kesehatan ikan nila di kolam pemeliharaan BBI Batu Kumbung, Lingsar, Lombok Barat, dilakukan melalui persiapan kolam, pengendalian mutu air, pemberian pakan secara teratur, dan pencegahan penyakit dengan pemberian Lugol dan perendaman ikan dalam larutan garam atau PK (Kalium Permanganat).

Kata kunci: Manajemen Kesehatan, Ikan Nila, Indeks Seleksi, Tingkat Kelangsungan Hidup, Mutu Air

INTRODUCTION

The productivity of tilapia (Oreochromis niloticus) cultivation plays a significant role in supporting food security and the fisheries economy in Indonesia. As a popular freshwater fishery commodity, tilapia also boasts advantages such as faster growth, adaptability to diverse environments, and stable market demand. The development of tilapia cultivation in Indonesia is a strategic priority in the fisheries sector. Tilapia cultivation productivity is often influenced by various factors, including environmental, social, and economic factors (Mendrofa & Zebua, 2025).

The growth of tilapia production in various regions must be supported by proper cultivation management, techniques, and innovation. One effort that can be made is by increasing stocking density. The higher the stocking density in a culture tank, the higher the production and the higher the profit (Hendriana et al., 2022). Low fish density results in good growth and survival rates but low production per area, while high density results in low growth and increased stress (Adi & Suryana, 2023).

A common problem faced by tilapia farmers is declining water quality due to pollution. This impacts fish health, leading to numerous disease and parasite problems. Parasites can attack or infect the skin and gills. Parasite infestation can cause fish to lose their appetite, leading to gradual weakness and even death (Atma et al., 2025).

Fish health management is used in tilapia farming to describe management methods to prevent emerging fish diseases. Sustainable tilapia (Oreochromis niloticus) farming requires optimal water quality management and proactive disease prevention, such as vaccination, biosecurity, and rapid response to emerging health issues. Tilapia farmers can also minimize the impact of disease outbreaks and maintain healthy fish populations (Adi et al., 2021).

METHODS

This research was conducted over 30 days at BBI Batu Kumbung Lingsar West Lombok. The tools used included a tub, hoe, DO meter, cell phone camera, sack, rearing pond, pH meter, ruler, sickle, sieve, net, thermometer, and scale. The materials used in this study included tilapia fry, PSP feed, fresh water, manure, and plastic bags.

This research method includes primary data and secondary data consisting of primary data collected directly from the main sources such as observation, interviews, documentation and active participation, while secondary data is obtained through references such as books, journals, articles, research reports and from internet sources and other online libraries. The observed data variables are: water quality parameters, Survival Rate (SR), Feed Conversion Ratio (FCR), Disease Calculation and Length and Weight Growth.

RESULTS

The results of this study include water quality, survival rate, feed conversion ratio (FCR), disease counts, and length and weight growth. Based on the results, the survival rate, feed conversion ratio (FCR), and disease counts or selection index (IS) were obtained.

Table 1. Water quality measurement results

Parameter	Measurement	Optimal Rage
Temperature (^{0}C)	26,3-27,3	25-30˚C (Amalia et al., 2024)
DO (mg/l)	5-7	5-7 mg/l (Mantayborbir et al., 2023)
pH	7,5-8	6-8,50 (Ningtiyas & Suwartiningsih, 2019)

Table 2. FCR, SR, IS Results

Data	Results
SR	80 %
FCR	1,1
IS	0%

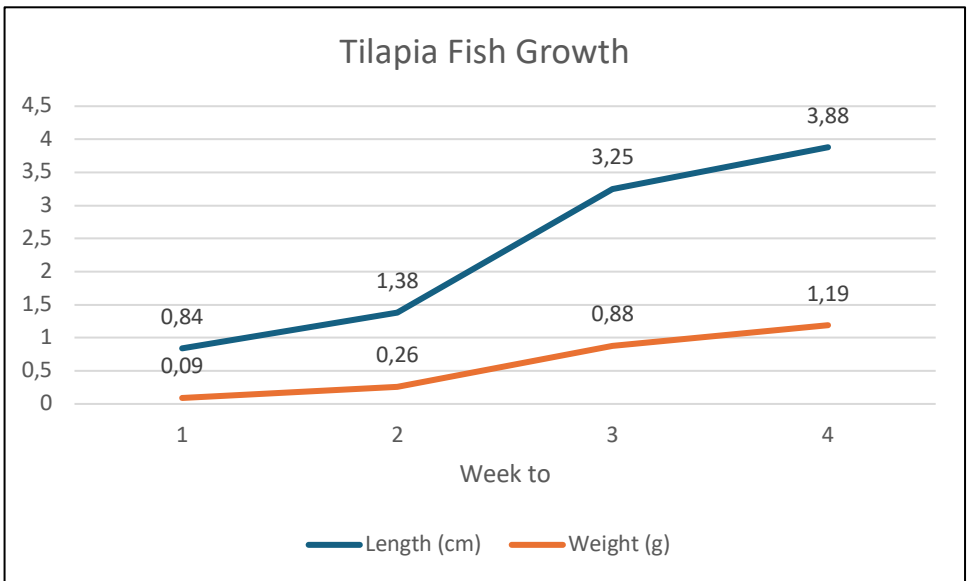

Figure 1. Tilapia Fish Growth

DISCUSSION

Fish health management at the Lingsar Fish Seed Center (BBI) begins with pond preparation. Pond preparation is the first step in tilapia health management, aiming to create an optimal environment for the growth and development of tilapia. This pond preparation stage includes pond cleaning, soil turning, fertilization, and filling with water. This preparation is carried out to ensure the pond is free from pests, diseases, and undesirable conditions. This is in line with the opinion of Sholika et al. (2024), who stated that the pond preparation process is very important for optimal cultivation activities.

According to Anjani et al., (2022), who also stated that good pond preparation will ensure the pond is free from pests and diseases. The fish health management technique

implemented in this study is by checking the health of the fish every day in the rearing pond. Checking the health of tilapia in the rearing pond is done through behavioral observations, physical examinations, recording mortality, and routine water quality measurements. The results of observations show that fish in healthy condition have active movements, are responsive to feed, and at the end of maintenance there are physical abnormalities. The low mortality rate indicates the success of health management. According to Handayani & Siswanto (2022), it states that checking the health of tilapia through physical examinations, behavioral observations and water quality.

Research has identified pests such as snails, lizards, and monitor lizards as threats to farmed fish. Monitor lizards often prey on fish swimming near the surface, leading to a decline in fish populations and potentially detrimental to fish farmers at BBI Batu Research has identified pests such as snails, lizards, and monitor lizards as threats to farmed fish. Monitor lizards often prey on fish swimming near the surface, leading to a decline in fish populations and potentially detrimental to fish farmers at BBI Batu Kumbung, West Lombok. This is supported by Apriyanto et al. (2015), who stated that lizards live in areas with abundant food. For example, lizards eat fish, insects, and other things, so their habitat is along riverbanks, swamps, and other water sources. Selfrida (2016) stated that snail pests do not harm tilapia fry, and snails also compete with tilapia for oxygen. The way to deal with this is by regularly cleaning the eggs and snail broodstock.

The research results did not find any diseased tilapia. Therefore, based on interviews during fieldwork, it can be seen that diseases in tilapia are generally caused by fungi such as Saprolegnia sp. Saprolegnia sp. is a water fungus that causes saprolegniasis in tilapia. Symptoms include white, cotton-like threads on the skin, fins, or gills, usually affecting weak or injured fish. This disease is detrimental because it reduces appetite and growth, and can lead to death. Prevention involves maintaining water quality and fish density, while treatment can include salt, formalin, or herbal remedies. According to Fradina et al. (2023), Saprolegnia sp. is a water fungus that attacks the skin, fins, and gills of fish, characterized by white, cotton-like threads. Microscopically, this fungus has branching hyphae and produces spores through zoospores, thus spreading rapidly. Colonies are typically white to gray in color and are easily recognized in infected fish.

Based on the calculation, the IS (Selection Index) value for tilapia cultivation in ponds was 0%, indicating that no fish were detected to have symptoms of disease during observation, so it can be interpreted that the fish are in a healthy condition. This is in line with the statement of Soto-Rordriguez et al., (2024) who stated that an IS value of 0% in tilapia indicates that during observation no fish were found to be infected or showing disease. However, if there is a tilapia infected with the disease, the first action taken is to move the infected fish to the quarantine pond. The results of this observation are carried out to prevent the spread of disease to other fish in the main pond. One of the control methods carried out is to soak the fish in a salt solution or PK (Potassium Permanganate) for 10-30 minutes while being aerated, after which the fish are kept in the quarantine tank until they recover. This was confirmed by Adriansyah (2018), who stated that this substance can help kill parasites and bacteria in fish. Care must be taken, including the correct dosage, to prevent further damage to the fish. The salt dosage used is 50 g/L. Furthermore, pond cleanliness must be maintained to prevent the emergence of pests and diseases.

The survival rate (SR) value for tilapia cultivation in ponds was 80%. This indicates that 8,000 fish managed to survive until the final day, a value that is very good for successful cultivation. This is in line with Hapsari et al., (2020), who stated that the optimal SR for 3-4 cm tilapia fry is 70%. Mortality in this study was not caused by disease, but is suspected to be due to cannibalism.

Growth in this study showed a significant increase (Figure 1) in the weight and length of the fish over a period of 4 weeks. The initial average fish weight was 0.09 grams per fish with a length of 0.84 cm per fish. Fish weight increased to 0.26 grams per fish in the second week, while the length increased to 1.38 cm per fish. Then, in the third week following, the weight of the fish increased to 0.88 grams per fish, while the length increased to 3.25 cm per fish. At the end of the maintenance period, the weight of the fish reached 1.19 grams per fish and the length reached 3.88 cm per fish. This indicates that the rate of growth in length was faster than the growth in weight during the maintenance period and the growth in length and weight were within the optimal range.

The reason for the difference in growth rate between weight and length is thought to be due to the fact that the length growth of tilapia larvae is generally faster than the weight growth because in the early phase of development, metabolic energy is directed more towards the formation and elongation of basic body structures, such as bones, muscles, and vital organs, before tissue thickening and body mass accumulation occur. This is in line with Amalia (2018) that in the larval stage, the fish digestive system is not yet fully developed so that the efficiency of nutrient utilization for meat tissue deposition is still low, while the increase in body length is prioritized first as an adaptation to improve swimming and foraging abilities. Tilapia are fed regularly 2-3 times a day (morning and evening) at a rate of approximately 10% of the total fish biomass per day. The feed generally consists of Hi-Pro-Vite PSP pellets with a 37% protein content to support optimal growth. Feed should be given little by little until the fish appear full to prevent wasted feed that could contaminate the water. According to Wahidan & Mulyani (2024), Hi-Pro-Vite PSP contains 37% protein, 3% fat, 3% crude fiber, 12% ash, and vitamins and minerals. Feed is given twice daily according to the dosage. Feed quality is very important, especially protein content because it is the main component of fish growth. Artificial pellets are chosen because they are practical, durable, and meet the nutritional needs of farmed fish. The FCR value obtained in tilapia cultivation is 1.1. Based on the results obtained under optimal conditions, the lower the FCR value, indicating that all the feed provided is consumed by the fish. According to Elrifadah et al. (2019), a low feed conversion value indicates better feed efficiency. However, a high feed conversion value indicates that most feed is wasted.

Water quality measurement is one form of fish health monitoring at the Fish Seed Center. Water quality management is carried out to anticipate pests and diseases in the pond. Measurements are carried out once a week in the morning at 08:00 WITA. The water temperature in the cultivation pond at BBI Lingsar is found to be between 26.3 - 27.3˚C, which indicates that the water temperature in the tilapia rearing pond is still within the optimal range for fish growth and survival. According to Amalia et al., (2024), optimal temperatures will help maintain fish health, temperatures that are too low will reduce the metabolism and endurance of fish, and temperatures that are too high can cause stress, the emergence of According to Mantayborbir et al., (2023) that the dissolved oxygen requirement required by fish is 4 mg/l. The optimal DO in tilapia cultivation is between 5-7 mg/l. The results of the pH measurements carried out obtained the pH value before the stocking of the pH obtained around 7.5, after the stocking of the DO obtained around 7.8, and at the end of the cultivation the pH obtained around 8.0. This shows that the pH of the waters is good for cultivation activities, especially for the enlargement of tilapia. According to Ningtiyas & Suwartiningsih, (2019) who stated that tilapia can live in the pH range of 6-8.50. Suboptimal acidity levels will cause fish to be susceptible to disease, stress, and low growth.

CONCLUSION

Tilapia health management in the BBI Batu Kumbung rearing pond, Lingsar, West Lombok, is carried out through pond preparation, water quality control, regular feeding, and

disease prevention by administering Lugol and soaking the fish in a salt solution or PK (Potassium Permanganate).

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