KOI FISH (*CYPRINUS CARPIO*) SEED FEED MANAGEMENT AT THE TECHNICAL IMPLEMENTATION ELEMENT OF THE CIPARAY FISH SEED CENTER (BBI), BANDUNG REGENCY, WEST JAVA.

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ABSTRACT

Koi carp (Cyprinus carpio) is one type of ornamental fish that is in great demand in Indonesia. there are many things to learn for the maintenance of koi carp, One of them is feeding. This article aims to study directly the feeding management techniques in koi carp hatcheries that are applied at BBI Ciparay, Bandung Regency, West Java - Indonesia. Field Work Practice was held at Fish Seed Center (BBI) of Ciparay, Bandung Regency, West Java on June 27 until July 27, 2022. The working method used in the Field Work Practice is a descriptive method by means of direct observation so that primary data and secondary data were obtained. Data were collected through observation, interview, and literature review. The technique of feeding koi fish hatcheries at BBI Ciparay is carried out in three stages. The first stage is when the larvae are 4 days old and are given boiled egg yolk. In the second stage, when the larvae are 5 to 9 days old, they are given artificial feed Feng-Li FL 0 crumble type with feed size <0.4 mm. The third stage is when the seeds aged 10 to 18 days are given Artificial sink feed Bintang 888-3 with feed sizes 2 mm and 3 mm. In addition to feeding, koi carp larvae are also given MAX C+ Vitamin C.

Keyword : *Feed Managemet, Artificial feed, Larvae, Protein, and Color.*

1. INTRODUCTION

Koi became a kind symbol of love and friendship in Japan. It is said to be a symbol of love because the word koi is another word for homophones which means affection or love. Koi carp is often considered a variant of the goldfish (*Cyprinus carpio*) when it is genetically different. Koi are kept as decoration for beauty and good luck inside the house and outside the house (koi pond or water garden) because koi fish are believed to bring good luck. People in general who have koi fish are people who have hobbies and really like koi fish. Besides being beautiful and beautiful, koi fish also have other advantages, such as being one of the ornamental fish that is widely tested for its beauty.

Feed as an important component in cultivation plays a role in supporting growth. Fish feed management is one of the factors that determine the success of a fish farming business. The scope of feed management includes how to start using efficiently in maintaining the type, quality, quantity, schedule, and method of feeding according to the needs and habits of fish. Feeding to raised fish must be carried out appropriately, both in quality, quantity, size, feed properties, techniques, and feeding so that later the resulting growth will be optimal (Nurulita et al. 2010). In order to support the sustainability of good feeding management, the availability of feed is certainly one of the successes of feed management. The availability of feed will affect the growth and survival of farmed fish. An obstacle that is

often found in fish farming businesses is the high price of the feed itself. Therefore, knowledge of good and efficient feed management is very much needed in the fish farming business so that the production costs incurred for the provision of fish are not wasted.

The Service Technical Implementation Unit (UPTD Fish Hatchery, Ciparay, Bandung Regency was established in 1963 under the name Fish Seed Center (BBI). BBI Ciparay is often used as a training ground for the people of Bandung Regency in hatchery and enlargement activities for koi fish. Koi fish seeds produced by BBI ciparay have been known by the public regarding the quality of the seeds they produce. Such success is greatly influenced by applied feeding management. This article aims to study directly the management techniques of feeding koi fish hatcheries applied at BBI Ciparay, Bandung Regency, West Java – Indonesia.

2. WORK PRACTICE METHODS

Field Work Practice was held at Fish Seed Center (BBI) of Ciparay, Bandung Regency, West Java on June 27 until July 27, 2022. Fish Seed Center (BBI) of Ciparay is located in Sagaracipta Ciparay Village, Cikoneng, Ciparay District, Bandung Regency, West Java.

Fig -1: Location of BBI Ciparay

The tools used in koi fish feeding management activities carried out at the Ciparay Fish Seed Center (BBI) are shown in Table 1.

Table -1: The tools used and their functions in providing Koi Fish Seed and Brood Feed

No.	Tools	Function
1.	Bucket	Feed carrier
2.	Dipper	To take feed
3.	Net	Fish breeding ground
4.	Hapa	Larvae and seed breeding grounds

The materials used in the activities of feeding Koi fish seeds at the Fish Seed Center (BBI) of Ciparay are shown in Table 2.

Table -2: The materials used and their functions in providing Koi Fish Seed and Brood Feed

No.	Material	Function
1.	Koi Fish Larvae	Larvae spawning after hatching eggs

2.	Koi Fish Seeds	Seeds starting from the exhaustion of the yolk to a size of 5 cm
3.	Koi fish broodstock	Fish to be spawned
4.	duck egg yolks stew	For feed koi larvae aged 3 days
5.	Feng-Li	For feed koi larvae that are already more than 3 days old
6.	Sinking feed	For larvae that are 5-7 cm in size

Field Work Practice are carried out by going directly to the field. The data taken are primary data and secondary data. Primary data was obtained from observation and interviews, while secondary data was obtained from literature study. Data analysis was carried out descriptively.

3. RESULTS AND DISCUSSION

There are three types of feeding techniques carried out on koi fish seeds from the larvae stage until the koi fish seeds are ready to be marketed, there are three types of feed, namely giving duck egg yolks stew, "Feng-Li" artificial feed and sinking artificial feed. The feeding process for each is as follows:

3.1 Duck Egg Yolk Stew

When the koi fish eggs hatch, the koi fish larvae are not immediately transferred to the nursery pond, they are kept in the hatchery pond until the larvae are two weeks old. The average temperature of the water in the hatchery pond at the Ciparay Seed Center during hatching and rearing of the larvae is around 26^{o}C. After the age of 3 days, the larvae are not given additional feed because there is still remaining egg yolk in their body which can be used as food extract and used as a source of energy for growth and development.

After the remaining yolk is used up, which is around the age of 4 days, the koi fish larvae are fed with boiled duck egg yolk. Duck egg yolks have a fairly high protein content. Some of the advantages of duck egg yolks are easy to obtain and low prices. Duck egg yolk also has a complete nutritional content and high protein, which contains 17.0 grams of protein, 0.8 grams of carbohydrates, 35.0 grams of fat, 47.0% water, 150 mg calcium, 399 Kcal energy, vitamin A 2870 IU, Vitamin B1 0.6 mg, and phosphate 400 mg per 100 grams of duck egg yolk compared to other egg yolks, (Directorate of Nutrition, Ministry of Health RI 2004). According to Heny (2002) duck eggs also contain 10 kinds of essential amino acids that are useful in the growth process, namely histidine, arginine, threonine, valine, methionine, isoleucine, leucine, phenylalanine, lycin, and tryptophan. Furthermore, the National Research Council (1997) added that fish need essential amino acids consisting of Arginine, Histidine, Isoleucine, Leucine, Lycin, Methionine, Phenylalanine, Threonine, Tryptophan, and Valine. Fish need 10 types of essential amino acids for growth and survival. If one of the 10 types of essential amino acids is not contained in the feed, the growth and survival of fish will not be good.

According to research by Sihombing et al (2020) shows that giving a decoction of duck egg yolk can increase the growth of the absolute weight of koi carp larvae. According to Subandiyono and Hastuti (2016) the color, smell, and taste of egg yolk stew are quickly indicated by fish larvae so that the larvae quickly find the location of the feed (egg yolk stew). The high fat content in the yolk stew can increase the consumption and appetite of fish towards feed

At the Ciparay Fish Seed Center, fish in the larvae stage which are 4 days old, are given duck egg yolk which is added with vitamin C as much as 1 – 3 grams, given 1 time a day, namely in the morning. The feed from duck egg yolks that is used first is made by adding water so that the duck egg yolks dissolve. This is done so that the feed matches the mouth openings of the koi fish larvae. After that, the feed is given to the koi fish larvae pond by giving it to each side of the koi fish larvae rearing pond.

Feeding the koi fish larvae that are only 4 days old, does not use daphnia or flour which is commonly used for larvae, but uses duck egg yolks stew, due to limited feed, high feed prices, the absence of daphnia cultivation at the Ciparay Seed Center causes the need to provide other alternatives such as artificial feed boiled duck egg yolk. In

addition, duck egg yolks also contain sufficient protein for the growth of koi fish larvae at the Ciparay Fish Seed Center.

At the Ciparay Seed Center, boiled duck egg yolk was given at the age of 4 days of larvae, and only 1 day, because it was to stimulate the introduction of feed to koi fish larvae at the Ciparay Seed Center. In addition, feeding boiled duck egg yolks can also be replaced with boiled chicken egg yolks, because they both have high protein.

3.2 Artificial Feed (Feng Li)

Fig -2: Artificial Feed (Feng Li)

Artificial feed is feed that made by humans from various kinds of raw materials that have nutritional content according to the growth phase of the fish. In the manufacture of fish feed what needs to be considered is the protein content of the fish feed, so it is necessary to do the right calculations in dispensing fish feed. Fish growth is closely related to the availability of protein in the feed. Protein is a source of energy for koi larvae, and protein is a nutrient that is needed for growth. According to Arofah, (2016), fish growth can occur if the amount of food exceeds the need for maintenance of the body. Feng Li is a type of artificial feed that is intended for all types of freshwater fish, shrimp, and lobster. Formulated with premium raw materials and contains essential amino acids, resulting in optimal growth of fish, shrimp, and lobster with a high survival rate.

Table -3: Feng-Li Nutrient Content

Code	Packaging (bag)	Feed size (mm)	Protein (min)	Fat (min)	Fiber (max)	Ash (max)	Water content (max)
FL – 0	10 kg	Crumbel <0.4	40 %	7 %	3 %	13 %	10 %
FL – 1	10 kg	Crumbel 0.4 - 0.7	40 %	7 %	3 %	13 %	10 %
FL – 2	10 kg	Crumbel 0.7 - 1.0	40 %	7 %	3 %	13 %	10 %
FL – MP	25 kg	Pellet 1.0 X 1.0 - 2.0	40 %	7 %	3 %	13 %	10 %
FL – 3S	25 kg	Pellet 1.2 X 1.5 - 2.5	38 %	7 %	3 %	13 %	10 %
FL – 3M	25 kg	Pellet 1.5 X 1.5 - 2.5	38 %	7 %	3 %	13 %	10 %

At the Ciparay Fish Seed Center, artificial feed used for koi fish larvae is Feng Li with type FL – 0 which contains 40% protein, 7% fat, 3% fiber, 13% ash, and 10% water content. Fish at the larval stage aged 5 to 9 days were given fengli with added vitamin C 2 times a day in the morning and evening. This feed is given according to the mouth opening of the koi fish. Feng Li's artificial feed has several advantages, including:

- The innovative formula provides good yields in freshwater fish, shrimp, and lobster cultures.
- Easily digestible protein to improve the digestive health of freshwater fish, shrimp, and lobster.
- Contains essential amino acids so that shrimp growth is more optimal.
- Accelerate the growth and health of freshwater fish, shrimp, and lobster with a higher survival rate.
- Support the management of less water exchange by maintaining the stability of good water conditions.

Fengli feed used at the Ciparay Fish Seed Center was FL 0 of crumble type with feed size <0.4 mm. The shape of Fengli's artificial feed is like grains of sand but smaller in size.

Fig -3: Artificial Feed (Feng Li) size < 0.4 mm

In addition to giving fengli to koi fish larvae, vitamin C is also given. The following Vitamin C is used at the Ciparay Seed Center during feeding koi fish larvae:

Fig -4: Vitamin Max-C+

MAX C+ High dose Vitamin C. Vit C content 50%.
Indication:

- Reduce stress
- Increases endurance
- Increase the immune system
- Helps growth
- Helps recovery from illness

3.1 Sinking Artificial Feed

Fish pellets are fish feed that is printed in the form of granules the size of pills. This fish pellet is made from a mixture consisting of various ingredients such as animal and vegetable which function as energy for fish and most importantly as a supplement in the process of their growth becoming large. Giving fish pellets has a purpose besides

the growth process as well as the nutritional intake for fish which will produce a productive harvest for fish cultivators. The submerged artificial feed has its advantages, namely, it is cheaper and the fish will weigh more than fish that are fed floating feed. The sinking pellets will sink when they are spread in ponds or fish farming ponds.

At the Ciparay Fish Seed Center, the type of artificial sinking feed used is Feed Bintang 888-3. Bintang 888-3 CPP is a sinking feed with a balanced nutritional content. This fish feed is suitable for optimizing the growth of cultivated koi fish larvae. The ingredients contained in Bintang 888-3 sinking feed are 28% protein, 6% lipid, 6% crude fiber, 13% ash content, and 12% moisture content. In addition, Bintang 888-3 feed contains a complete nutritional composition and high-quality protein (essential and essential amino acids), fat, crude fiber, and minerals suitable for optimal fish growth.

Fig -5: Sinking Artificial Feed (Bintang 888-3)

At the Ciparay Fish Seed Center, fish from the larvae stage to the seed are fed with this Bintang 888-3 Sinking artificial feed as much as 580gr and increasing by 50gr every day. This feed is given 2 times a day, namely in the morning and evening. The sizes of the feed are 2 mm and 3 mm, the physical form of this feed is like sinking feed in general, in the form of small tubes measuring 2 mm and 3mm. The feeding method is the same as the fengli feeding method, namely, take Bintang 888-3 sinking feed using a scoop, then put the feed into the bucket. After that give enough water, and wait for about 15 minutes. After the sinking feed is mixed with water, the artificial feed is given to the koi fish larvae pond by giving it on each side of the pond so that the koi fish larvae are not difficult to find the feed. This feed is mixed with water because it adjusts the mouth opening of the koi fish larvae.

This submerged feed was given from the 10th to the 18th day. The reason Ciparay Seed Center used sinking feed with the Bintang 888-3 brand was that the content in the Bintang 888-3 feed already fulfilled the protein content of the koi fish larvae. This feed is easy to find at Ciparay Seed Center. Feeding at the Ciparay Seed Center is given 2 times a day, in the morning at 8 o'clock and in the afternoon at 2 o'clock. This provision is done so that the fish grow fast, and the afternoon gift is withdrawn into the afternoon, for fear of rain at the Ciparay Seed Center.

4. CONCLUSIONS

The technique of feeding the koi fish hatchery at BBI Ciparay was carried out in three stages. The first stage is when the 4-day-old larvae are given boiled egg yolk. In the second stage, when the larvae are 5 to 9 days old, they are given artificial feed Feng-Li. The third stage is when the seeds aged 10 to 18 days are given artificial feed that sinks.

5. REFERENCES

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