Developing of Catfish Cultivation at Lereng Merbabu (Cepogo) using an Independent Feed Aid Method the Central for Brackish Water Aquaculture, Jepara

Damang Suryanto[1*], Iwan Sumantri[1], and Sugeng Raharjo[1]

[1]BBPBAP Jepara, Indonesia

Abstract: Catfish cultivation is one of the improvements in the increasing affiliation of the Boyolali community. The main problem in catfish farming is the cost of feed. To fulfill the need for fish feed, most farmers rely on feed manufacturers where the price of factory feed continues to increase following the prices of feed raw materials. By increasing factory fish feed prices without being offset by increases in fish meat prices increases, farmers lose. The Center for Brackish Water Aquaculture (BBPBAP) Jepara through the Artificial Feed Laboratory tried to make catfish feed. This feed is assisted while being tested directly on catfish farmers in the Boyolali district of Central Java. The results obtained from the trial and assistance activities are Feed Concertion Ratio (FCR) 0.8-1 with 90-100 g Average Body Weight (ABW) with a maintenance period of 3 months. From the use of this independent feed, farmers get a profit margin of Rp. 550,000, - per 1,000 heads of catfish, is higher than the use of feed manufacturers with a profit margin of Rp. 300,000 per 1,000 catfish.

Keywords: catfish cultivation; cost; farmers

1 Introduction

Most of the people in Mliwis village, Subdistrict of Cepogo, Boyolali, Central Java are farmers and cattle breeders. To increase its income, the community tries to diversify its business. Catfish cultivation is one of the efforts in increasing the recording anchovy.

The main obstacle in catfish farming is the cost of feed. According to Mahyuddin (2008), more than 50% of production costs in catfish enlargement are costs for purchasing feed. To meet the needs of fish feed, most fish farmers rely on factory feed, where the price of factory feed continues to increase along with the increasing price of feed raw materials. With the increase in the price of factory

fish feed without an increase in the price of fish meat, farmers suffer losses.

Increased production in aquaculture can be achieved by optimizing environmental conditions, using stocked solids following the carrying capacity of the land, good seed quality, and provision of quality feed that is suitable for the needs of cultivated biota (Houlihan, 2001). According to Amalia et al. (2013), catfish can grow well by artificial feed containing ± 30% crude protein, crude fat ± 10%, BETN ± 30% and energy in feed at ± 270 kcal/gram. Chuapoehuk (1987) further states that catfish (*Clarias batrachus*) can grow to a maximum level of the feed protein content of 30%. Furthermore, Lovell & others (1989) adds that the optimum total protein intake for the Channel catfish seeds ranges from 25 - 36%. The results of Aryansyah et al. (2007) stated that juvenile catfish could grow well by artificial feed containing crude protein ± 30%, crude fat ± 5%, BETN

± 48%, chromium 2.6 mg/kg feed, and energy in the feed are ± 270 kcal/gram. Besides protein, the energy content of feed also needs to be considered. Energy for the maintenance of the body and other activities must be fulfilled before energy for growth. The use of carbohydrates by fish varies depending on the complexity of carbohydrates (Furuichi, 1988).

The Center for Brackish Water Aquaculture (BBPBAP) Jepara through the Artificial Feed Laboratory tried to make floating feed for catfish. The feed was tested directly on catfish farmers in the Boyolali district of Central Java.

2 Purpose

1. Feed production in the context of aid programs and catfish feed tests
2. Helping to increase the economy of the people in the Mliwis village, Subdistrict of Cepogo, Boyolali, Central Java with independent feed aid.

* Corresponding Author: damang.jpr@gmail.com

3 Tools And Materials

3.1 Tools

Table 1: Tools used Include

Type of equipment	Description
Scales	1 unit
Floating machine	1 unit
Mixer (feed mixer)	1 unit
Pellet printing machine (Extruder) Basin	1 unit 1 unit
Bucket	1 unit
Plastic dipper	1 unit
Cooler	1 unit
Inner plastic	1 unit
Hood of 30 kg 30 kg	1 unit

3.2 The Triple Bottom Lines

Table 2: The Materials used are

Feed ingredients Material	Composition (%)
Fish flour	20
Soybean meal flour	40
Tapioca flour	15
Pollard flour	25
Vegetable oil	1
Water	15.5

4 Conclusion

4.1 Made into Flour

To make the flour is using a flour machine to produce quality flour with very fine grains.

4.2 Weighing

The weighing process is carried out to determine the amount of raw material to be used appropriately.

4.3 Mixing

Mixing in a mixer is done in stages of 40 kilos according to the mixer's capacity. The addition of water to the raw material is done in two stages, namely at the beginning and middle of the stirring process. Mixing material is taken within 3-5 minutes

4.4 Mold

To mold, the feed of fish is using a pellet extruder printing machine. This machine produces floating feed directly half dry with granular shape according to the desired dies. The series of machines is one continuous, which is from stirring the material then inserted into the printer machine. The shape of the granules that come out is adjusted to the size of the dies. Then the pellet granules follow the speed of the engine running towards the dryer/oven. When exiting the pellet, it is in dry form with a moisture content of about 10%.

4.5 Coating oil

The coating on feed is carried out after the printing process and pellet cooling. The coating method is as follows: Pellet is poured into the coating machine and then sprayed with vegetable oil that has been heated to 60°C.

4.6 Packing

Packing is done in a dry and clean place and tightly closed, with the aim that the feed is not easily contaminated, which will cause damage to the feed. In the packing process, the *Pellet* is weighed with a capacity of 30 kg/sack with inner plastic coated inside the sack and then sewn.

4.7 Storage

After cooking, the food is stored in a cool, dry place not exposed to direct sunlight with a water content of less than 10%.

5 Result

Fish feed that has been produced and distributed as much as 6,000 kg. The feed is buoyant with a protein content of 31.65%, Fat 3.08%, Ash 11.7%, Fiber 1.5%, and BETN 45.76% (Table 3). The protein content of 31.65% is good enough to supply the nutritional needs of catfish. This is consistent with the opinion of Lovell (1989), adding that the optimum total protein intake for the Channel catfish seeds ranges from 25 - 36%. The results of Aryansyah et al. (2007) stated that juvenile catfish could grow well by artificial feed containing crude protein ± 30%, crude fat ± 5%, BETN ± 48%, chromium 2.6 mg/kg feed and energy in the feed are ± 270 kcal/gram.

Table 3: Nutrient Content of Catfish Pellets

Materials	Protein	fat	Ash	Fiber	BETN
Catfish Pellet	31,65	3,08	11,7	1,5	45,76

The life span of catfish tested ranged from 90.77 %%. The figure was high. The high survival value of cultivated catfish indicates that the feed given has a positive effect on fish.

The final growth of catfish in testing this feed reaches 83-100 gr. Internal factors and external factors influence the growth of fish. Internal factors that influence fish growth are hereditary, age, and physiological abilities of fish, while external factors that influence fish growth are fish feed and water media. Handajani (2012) states that foods that have good nutrition and are following the nutritional needs of fish can accelerate the growth rate.

In testing, this feed FCR data is obtained around 0.8-1. The low value of the food conversion ratio in aquaculture shows that the feed given can be utilized and absorbed by the body well for growth. A high feed conversion value is caused because the nutrients contained in the given feed cannot be optimally utilized by the body and are wasted in the form of feces. Handajani (2010) stated that the value of the feed conversion ratio in aquaculture was influenced by factors of quality and quantity of feed. According to the NRC (1993), the size of feed confers influenced by several factors, including quality and quantity of feed, species, size, and quality of water. Low feed configuration values indicate better utilization of feed and body absorbed feed is used to increase growth while high feed conversion values are caused due to high nutrient in a feed that is not utilized optimally by the body or wasted due to lack of appetite for fish.

In addition to having an impact on growth, the independent feed is given also affects the texture of the meat produced. According to the recognition of some farmers that catfish are given meat, independent food is denser when compared with catfish, which are fed from manufacturers. This indirectly affects the selling price of cultivated catfish. This catfish from Cepogo is in great demand by buyers because the quality of post-harvest catfish meat to consumers does not experience shrinkage weight. The profit margin obtained from the use of self-feed per stock of 1,000 catfish is Rp. 550,000, higher than feed consumption originating from the manufacturer, which is Rp. 300,000. Another positive impact felt by farmers is the addition of cultivated land, which was originally only 20 catfish ponds to 37 catfish ponds.

6 Conclusions

The conclusions that can be drawn from this activity are:

1. Catfish feed can be produced in Jepara BBPBAP and can have a positive effect on growth of 83-100gr and FCR 0.8-1 with a 3 month maintenance period and denser meat texture
2. The use of independent feed provides a profit margin of Rp.550,000 per 1,000 heads.
3. Increased cultivation area from 17 plots to 37 plots since the introduction of independent Jepara BBPBAP production feed

7. Suggestions

Further assistance programs are needed in the form of formulated feed raw materials so that farmers are motivated to make feed independently.

References

Amalia, R., Arini, E., & others. (2013). Pengaruh penggunaan papain terhadap tingkat pemanfaatan protein pakan dan pertumbuhan lele dumbo (Clarias gariepinus). *Journal of Aquaculture Management and Technology*, *2*(1), 136–143.

Aryansyah, H., Mokoginta, I., & Jusadi, D. (2007). Kinerja pertumbuhan juvenil ikan lele dumbo (Clarias sp.) yang Diberi Pakan dengan Kandungan Kromium Berbeda. *Jurnal Akuakultur Indonesia*, *6*(2), 171–176.

Chuapoehuk, W. (1987). Protein requirements of walking catfish, Calrias batrachus (Linnaeus), fry. *Aquaculture*, *63*(1–4), 215–219.

Furuichi, M. (1988). Fish nutrition. *Fish Nutrition and Mariculture, JICA Textbook, The General Aquaculture Course. Kanagawa International Fisheries Training Center, Tokyo*.

Handajani, H. (2012). Optimalisasi substitusi tepung Azolla terfermentasi pada pakan ikan untuk meningkatkan produktivitas ikan nila gift. *Jurnal Teknik Industri*, *12*(2), 177–181.

Handajani, H. dan W. W. (2010). *Nutrisi ikan*. Malang.

Houlihan, D. (2001). Food intake in fish. *Aquatic Living Resources*, *15*(2), 145. https://doi.org/10.1016/s0990-7440(02)01151-8

Lovell, T., & others. (1989). *Nutrition and feeding of fish* (Vol. 260). Springer.

Mahyuddin, K. (2008). *Agribisnis lele*. Jakarta: Penebar Swadaya.

NRC. (1993). *Nutrient requirement of fish*. Washington D.C: National Academy Press.