Effectiveness of the use fish herbs in feed for growth of catfish (Clarias gariepinus)

Hasna Nabila Shobihah, Yuli Andriani, Rosidah, Kiki Haetami and Dedi Supriadi

Abstract
This research aims to find out the results of the proximate catfish meat that is cultivated by dosing different herbs in and determine the effective dose of the addition of herbs for the growth of catfish. The trial fish used was catfish with a size of 5-7 cm obtained from farmers in Selasari village, Pangandaran. The fingerlings were kept for 50 days by stocking 1 fish/Liter in an aquarium containing 20 liters of water and fed three times a day at a dose of 3% of catfish biomass. The method used in this study was an experimental method with a Completely Random Design (CRD) consisting of five treatments and three replications. The treatment given consists of treatment A (control, commercial feed without the addition of herbs), B (feed with 50 ml of herbal additions), C (feed with 100 ml of herbal additions), D (feed with 150 ml of herbal additions) and E (feed with 200 ml of herbal additions). Analysis of absolute growth used analysis of variance (ANOVA) with a confidence level of 95%, while the nutritional content of catfish meat and water quality were analyzed descriptively. Catfish meat treatment E has water content (78%) and ash content (9.17%) compared to other treatment samples, while the treatment C has the highest protein content of 20.27% while having the lowest fat content of 10.01%. The results showed the additions of herbs in 200 ml of feed produced in the highest absolute growth of 29.2 gram.

Keywords: Catfish, fish herbs, nutritional value of fish meat, absolute growth

1. Introduction
Catfish (Clarias gariepinus) is a freshwater fishery commodity that is widely cultivated in Indonesia because demand continues to increase annually. Catfish Production at quarterly I-III in 2017-2018 from $41.75 thousand tons to 1.81 million tonnes (114.82%) (Ministry of Maritime and Fisheries, 2018) [10]. The price of catfish among West Java farmers currently ranges from Rp. 10,000.00 – Rp. 13,000.00/kg. In order to increase catfish production and meet market demand, it is necessary to increase the pace of the growth through the utilization of nutrients in the feed effectively and efficiently. Feed is one component that reaches 60-70% of the total cost of production (Andriani et al., 2016) [2]. Feed becomes one of the determinants of the success of cultivation business, so it needs effective and efficient management (Haetami et al., 2008) [8]. Effective and efficient feed utilization can be improved among others by utilizing herbal supplements.

The herbal supplements used are made of turmeric, ginger, curcuma, greater galangal, noni, catappa leaf, betel leaf, molasses and yeast that are formulated into fish herbs. The use of yeast (Saccharomyces cerevisiae) in fish herbs has a good impact on fish growth, because the cell wall extract of Saccharomyces cerevisiae (glucan, mannoprotein and chitin) is a natural immunostimulant and also acts as a growth promoter (Esteban et al., 2004) [3]. In addition, the curcumin content in fish herbs is able to increase the digestion of fats, proteins and carbohydrates by stimulating the bile to secrete bile into the small intestine so that the absorption activity of food substances increases (Darwis et al., 1992) [6]. Some other benefits from herbal supplements include increasing body resistance to disease attacks, launching the digestive system, saving in the use of feed, improving fish appetite and can increase the rate of daily fish growth (Puspitasari, 2017) [9]. Based on the background it is necessary to do research on the effectiveness of the use fish herbs in feed against the growth of catfish.

2. Materials and Methods
This research was conducted from December 2019 to February 2020. Research conducted in...
the Laboratory of Fisheries, Faculty of Fisheries and Marine sciences, Padjadjaran University. Materials used during research in the laboratory is the fingerlings of catfish used 20 catfish/replication with a size of 5-7 cm and weights ± 3 grams/fish, fish herb s++ production of UD. Mina Jala and commercial pellets. The research used was a Completely Random Design (CRD) consisting of five treatments and three replications. The addition of fish herbs on each treatment is as follows:

Treatments and Discussion

3.1 Nutritional Value of Catfish Meat

Catfish is a type of cultivated commodity that contains vitamins, proteins, minerals as well as the fat content of unsaturated fats and carbohydrates. The results of the proximate catfish meat test are shown in table 1.

Table 1: Results proximate of catfish meat samples

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Parameters</th>
<th>Moisture (%)</th>
<th>Ash (%)</th>
<th>Proteins (%)</th>
<th>Fats (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (Control)</td>
<td></td>
<td>79.52</td>
<td>11.64</td>
<td>18.94</td>
<td>11.21</td>
</tr>
<tr>
<td>B (50 ml/kg of feed)</td>
<td></td>
<td>79.22</td>
<td>10.48</td>
<td>19.37</td>
<td>12.25</td>
</tr>
<tr>
<td>C (100 ml/kg of feed)</td>
<td></td>
<td>79.21</td>
<td>10.32</td>
<td>20.27</td>
<td>10.01</td>
</tr>
<tr>
<td>D (150 ml/kg of feed)</td>
<td></td>
<td>79.18</td>
<td>10.39</td>
<td>19.80</td>
<td>10.62</td>
</tr>
<tr>
<td>E (200 ml/kg of feed)</td>
<td></td>
<td>78.00</td>
<td>9.17</td>
<td>20.13</td>
<td>11.05</td>
</tr>
</tbody>
</table>

Based on table 1, the highest moisture in treatment A of 79.52%, while the treatment E is the best moisture content because it has the lowest moisture content compared with other treatment of 78.00%. The moisture content of fish fillet shows water stability in the fish's environment (Adewumi et al., 2014) [1]. The moisture content in the catfish meat in general has a value of 74-85% (Cruz et al. 2013) [2]. Based on the data, the moisture content test results in this study are still within the normal range.

The lowest ash content shown in treatment E is 9.17% and the highest rate of treatment A is 11.64%. Treatment B, C and D have a consecutive ash content of 10.48%, 10.32% and 10.39%. The minerals contained in the fish meat that have been given herbs on the feed have a lower value compared to the treatment A (control). It is suspected because of the yeast content in fish herbs that serves as a probiotic and contains microbes that can affect the mineral content that can be absorbed by fish because the use of probiotics can decrease the amount of mineral in water maintenance so that only a few are able to be absorbed by fish (Bimantara, 2018) [3].

Protein content test results show the highest number of 20.27% in treatment C and the lowest number of 18.94% in treatment A. Protein content in treatments B, D and E respectively is 19.37%, 19.80% and 20.13%. This indicates that there is an increase in protein levels in fish meat which is given the addition of fish herbs in feed compared to treatment A (control). The use of feed supplements derived from plants may also affect the high levels of protein in fish meat. Fish herbs that are added in the feed contain turmeric that is suspected to increase protein levels in the meat. The addition of turmeric supplements in feed can indicate an increase in nutritional digestibility and the antioxidant activity of turmeric which excitatory protein synthesis by the enzymatic system (Estriyani, 2013) [7]. Addition of turmeric supplements in tilapia feed as much as 0.50% increase the crude protein levels of fish meat is 16.78%, the value is higher compared to the protein content of fish meat without the addition of turmeric powder in feed i.e. 15.71% (Mahmod et al. 2014) [8]. The highest fat content in treatment B is 12.25% and the lowest on treatment C is 10.01%, low in fish meat that has been given the addition of fish herbs into feed caused by the content of curcumin contained in turmeric, and noni containing various active substances that are very useful for health, one of them is saponin. Saponin may affect the decrease in meat cholesterol and fat levels (Salleh et al., 2002) [9], whereas curcumin has the efficacy of it can stimulate the wall of the gallbladder to secrete bile fluid so that it can smooth digestion of fats. In cells, curcumin increases the catabolism of fat, thereby lowering the body's detreatment and also lowering cholesterol (Wijaya et al., 2014) [10].

3.2 Absolute Growth

The results of varying average weights show that the addition of fish herbs to the feed with different doses gives different influences on the growth of catfish. Giving fish herbs on feed...
gives a good response to the growth of catfish, it is seen from the increase in the average weight of individual catfish every sampling (10 days once). The fish's average weight increase rate can be seen in Figure 1.

In Figure 1 of day 0 until day 50 shows a pattern of increased growth for each treatment at every observation. The average initial weight in catfish is 2.7 g - 3.3 g and at the last observation of the catfish weight reaches 20.5 g - 32.5 g. The increase in the highest growth average value is in the treatment E with an average final weight of 32.5 g.

At the end of the research day of the 50, the absolute growth of catfish that is fed by the addition of fish herbs with different doses is a distinct real ($P$ < 0.05). The highest absolute growth value is obtained at the addition of fish herbs at a dose of 200 ml with an average of 29.2 grams, while the lowest value is obtained at a control treatment with an average of 17.8 grams, using ANOVA test obtained results that the real difference occurs in the treatment E (the addition of fish herbs at a dose of 200 ml) to treatment A, B, C and D. Graph of the absolute weight growth can be seen in Figure 2.

Measuring water quality during research is conducted using sampling methods. The results of measuring water quality in fish maintenance media have the optimum range for the life of catfish because the value produced in accordance with Indonesian national standard. The temperature in the maintenance media ranges from 25, 0 - 28, 1 °C, dissolved oxygen content or dissolved oxygen (DO) ranged from 3.0 to 3.6 mg/L, degree of acidity or potential hydrogen (pH) is worth 8.

4. Conclusions
Based on the results of the study can be concluded that the addition of the optimal fish herbs on the feed is 200 ml kg-1 feed and give effect to the growth of catfish.

5. References
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