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

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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 841.75 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 galangale, 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) [5]. 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) [12]. 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 \pm 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:

Treatment A (Control) = feed without the addition of a fish herb.

Treatment B = 50 ml/kg of feed

Treatment C = 100 ml/kg of feed

Treatment D = 150 ml/kg of feed

Treatment E = 200 ml/kg of feed

The observed parameters are:

Nutritional Value of Catfish Meat

Observations conducted by conducting proximate test on catfish meat fed with the addition of fish herbs with the aim to see changes in the nutritional value of catfish meat which includes protein levels, fat content, moisture content and ash content.

Absolute Growth

Calculation of the absolute weight growth is done using the

formula:

$$G = W_t - W_o$$

Explanation

G = total weight growth.

W_t = average weight of fish at the end of research (g).

W_o = Weighted average at the beginning of research (g).

Water Quality

The water quality parameter of the maintenance media is determined by measuring the physical and chemical parameters of water quality during the pre-determined research of pH, DO and temperature. This Data is used to determine the feasibility of water quality for media maintenance during research. Measurement of temperature, DO and pH done 10 days once using a thermometer, DO meter and pH meter using a sampling method.

3. Results 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

Treatments	Parameters			
	Moisture (%)	Ash (%)	Proteins (%)	Fats (%)
A (Control)	79,52	11,64	18,94	11,21
B (50 ml/kg of feed)	79,22	10,48	19,37	12,25
C (100 ml/kg of feed)	79,21	10,32	20,27	10,01
D (150 ml/kg of feed)	79,18	10,39	19,80	10,62
E (200 ml/kg of feed)	78,00	9,17	20,13	11,05

Sources: Nutrition Laboratory of Ruminants and Food Chemistry, Faculty of Animal Husbandry, University Padjadjaran (2020)

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) ^[4]. 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) ^[9]. 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) ^[13], 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) ^[15].

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.

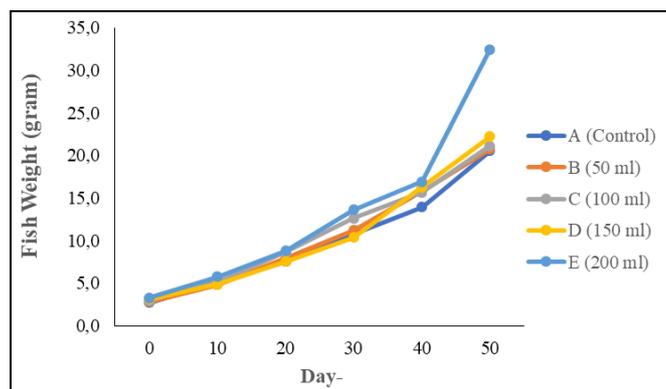


Fig 1: Increased weight average of catfish

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.

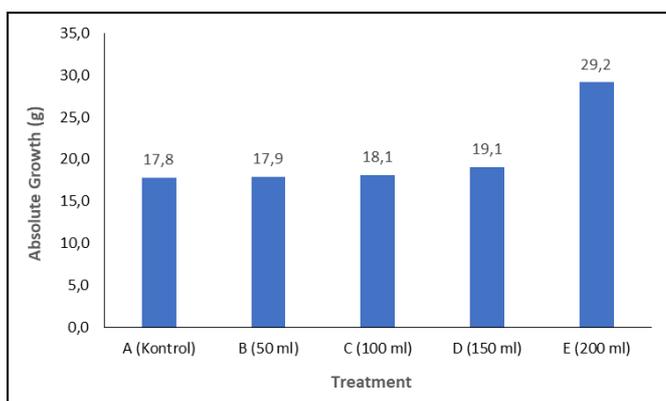


Fig 2: Average absolute growth

The treatment of E at a dose of 200 mL, shows the best results for the growth of catfish, when compared to other dosages. This indicates that the dose of fish herbs according to the needs of fish because of the various active substances present in fish herbs is able to improve the quality and digestibility of feed. Essential oils and curcumin in herbal medicine affect the performance of the pancreas in secreting enzymes amylase, lipase and protease that are able to improve the digestion of carbohydrates, fats and proteins as well as increase appetite because it can accelerate gastric discharge, thereby will arise hunger and stimulate appetite and improve the feed palatability (Wijayakusuma, 2003) [16]. The results of

research obtained in accordance with the results of the study of herbal supplements consisting of turmeric, curcuma, greater galangale and bacteria content of *Lactobacillus* with a dose of 200 ml/kg of feed produce the best weight growth for catfish (Puspitasari, 2017) [12]. Turmeric contains essential amino acids, as well as non-essential amino acids (Sharma *et al.*, 2013) [14]. The more protein is absorbed, the more protein will affect the growth of fish with increased weight (Munisa *et al.*, 2015) [11].

3.3 Water Quality

Measurement of water quality is done for 10 days with the following results (table 2):

Table 2: Results of water quality measurements

Treatment	Parameters		
	Temperature (°C)	DO (mg L ⁻¹)	pH
A	25,0-28,0	3,1-3,6	8
B	25,0-27,9	3,0-3,6	8
C	25,0-27,9	3,0-3,5	8
D	25,2-28,0	3,1-3,5	8
E	25,0-28,1	3,0-3,5	8
Optimum Value*	25,0-30,0	≥ 3,0	6,5-8

Sources: *Indonesian National Standard (2014)

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

- Adewumi AA, Adewole HA, Olaleye VF. Proximate and Elemental Composition of the Fillets of Some Fish in Osinmo Reservoir, Nigeria. *The Agriculture and Biology Journal of North America*. 2014; 5(3):109-117.
- Andriani Y, Rostika R, Subhan dan KU. Haetami. *Nutrition fish*. Bandung: Unpad Press, 2016, 264.
- Bimantara A. Test of meat of catfish that cultivated with the difference of water quality management and feed. *Journal of Fisheries and Marine Science*. 2018; 10(1):55-62.
- Cruz NE, Cruz PE, Suarez H. Characterization of the Nutritional Quality of the Meat in Some Species of Catfish: A Review. *The Revista Facultad Nacional De Agronoma Medellin*. 2013; 65(2):67-99.
- Darwis. Potential betel (*Piper betle* Linn.) as a medicinal plant. *Inside News Indonesian Medicine*. 1992; 1(1):9-11.
- Esteban MA, Rodriguez A, Mesguer J. Glucan receptor but not mannose receptor is involved in the phagocytosis of *Saccharomyces cerevisiae* by seabream (*Sparus auratus* L.) blood leucocytes. *Fish Shellfish Immunology*. 2004; 16:447-51.
- Estriyani A. Effect od adding turmeric solution (*Curcuma longa*) on feed againts the growth of catfish. IKIP PGRI,

- Semarang, 2013.
8. Haetami K, Abun dan Y, Mulyani. BAS-renewal Study of probiotic (*Bacillus licheniformis*, *Aspergillus niger* dan *Saccharomyces cerevisiae*) as Feed Supplement as well as its implications on red tilapia growth. Report of research result, Faculty of Fisheries and Marine Science, Padjadjaran University, Jatinangor, 2008.
 9. Mahmud MMA, El-Lamie MMM, Dessouki AA,. Yusuf MS. Effect of Turmeric (*Curcuma longa*) Supplementation on Growth Performance, Feed Utilization and Resistance of Nile Tilapia (*Oreochromis niloticus*) to *Pseudomonas fluorescens* Challenge. *Global Research Journal of Fishery Science and Aquaculture*. 2014; 1(12):26-33.
 10. Ministry of Maritime and Fisheries. Reflection 2018 and Outlook 2019 Ministry of Maritime and Fisheries, Jakarta, 2018.
 11. Munisa Q, Subandiyono dan Pinandiyono. The influence of fat and energy content is different in feed to the utilization of feed and growth of patin (*Pangasius pangasius*). *Journal of Aquaculture and Technology*. 2015; 4(3):12-21.
 12. Puspitasari D. Effectiveness of Herbal Supplement on growth and livelihoods of catfish (*Clarias sp.*). *Management Science Journal*. 2017, 53-59.
 13. Salleh MN, Runnie I, Roach PD. Inhibitor of low density lipoprotein oxidation and up regulation of low density lipoprotein receptor in help G2 cell by tropical plant extract. *Journal of Agricultural and Food Chemistry*. 2002; 19(50):3693.
 14. Sharma DK, Maheshwari dan A, Gupta PM. Nutritional analysis of *Curcuma longa* L. in Different Cities of West Uttar Pradesh (INDIA). *International Journal of Chemistry and Pharmaceutical Science*. 2013; 4(4):7-14,.
 15. Wijaya O, Rahardja dan Prayogo BS. A solid influence of catfish against the pace of growth and survival rate of the aquaponic system. *Journal of Fisheries and Marine Science*. 2014; 6(1):55-58.
 16. Wijayakusuma H. Healing with medical plants. Jakarta: Elex Media komputido, 2003.