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POTENTIAL OF LOOSE PALM OIL AS AN ALTERNATIVE FEED TO INCREASE THE GROWTH OF CATFISH (Clarias batrachus)

Potensi Brondolan Kelapa Sawit Sebagai Pakan Alternatif Dalam Meningkatkan Pertumbuhan Ikan Lele (Clarias batrachus)

Ricko Reynalta[1*], Noorsheha[2], Putri Anugerah[3]

[1]Aquaculture Study Program, Faculty of Fisheries and Marine Sciences, Mulawarman University, [2]Fisheries Resource Management Study Program, Faculty of Fisheries and Marine Sciences, Mulawarman University, [3]Aquaculture Study Program, Faculty of Fisheries and Marine Sciences, Mulawarman University

Gunung Tabur Street, Gunung Kelua Campus, Samarinda, Indonesia

*Coresponding author: ricko.reynalta@fpik.unmul.ac.id

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ABSTRACT

Aquaculture activities generally use commercial feed to fullfill the nutritional needs of fish. The use of commercial feed can increase production costs, because they still use imported raw materials. To reduce production costs, can use alternative feed by utilizing local materials. Palm oil is one of the abundant local raw materials in Indonesia and produce underutilized waste such as loose palm oil. This study aims to determine the effect of using loose palm oil as an alternative feed on catfish. This study consisted of three treatments (control, soft loose palm oil, and wormy loose palm oil) of three repeats each. Feeding catfish with ad satiation for 28 days. Parameters observed include survival rate, absolute weight growth, absolute length growth, and spesific growth rate. The results showed that the best treatment was the use of wormy loose palm oil feed with a survival rate of 100%, absolute weight growth of 44,23 g, absolute length growth of 6,20 cm, and spesific growth rate of 10,22%.

Keywords: alternative feed, catfish, growth, loose palm oil

ABSTRAK

Kegiatan budidaya umumnya menggunakan pakan komersial untuk memenuhi kebutuhan nutrisi ikan. Penggunaan pakan komersial dapat meningkatkan biaya produksi, karena masih menggunakan bahan baku impor. Untuk menekan biaya produksi, dapat menggunakan pakan alternatif dengan memanfaatkan bahan lokal. Kelapa sawit merupakan salah satu bahan lokal yang jumlahnya melimpah di Indonesia dan menghasilkan limbah yang kurang termanfaatkan seperti brondolan kelapa sawit. Penelitian ini bertujuan untuk mengetahui pengaruh pemanfaatan brondolan kelapa sawit sebagai pakan alternatif pada ikan lele. Penelitian terdiri dari tiga perlakuan (kontrol, brondolan kelapa sawit lunak, dan brondolan kelapa sawit berulat) yang masing-masing tiga ulangan. Pakan diberikan secara *ad satiation* selama 28 hari. Parameter yang diamati meliputi tingkat kelangsungan hidup, pertumbuhan bobot mutlak, pertumbuhan panjang mutlak, dan laju pertumbuhan spesifik. Hasil menunjukkan perlakuan terbaik adalah penggunaan pakan brondolan kelapa sawit berulat dengan tingkat kelangsungan

hidup 100%, pertumbuhan bobot mutlak 44,23 g, pertumbuhan panjang mutlak 6,20 cm, dan laju pertumbuhan spesifik 10,22 %.

Kata kunci: brondolan kelapa sawit, ikan lele, pakan alternatif, pertumbuhan

INTRODUCTION

Catfish is a commodity that is widely cultivated by Indonesian people. The advantages of catfish are that they grow quickly and have a high ability to adapt to poor water quality (Sitio et al., 2017), so that production increases every year. Catfish are also omnivores who eat various types of food and make it easy to maintain. Catfish production in Indonesia in 2022 will increase by 32.39% from the previous year (KKP, 2022). Increased production can be influenced by the use of quality feed that meets nutritional needs.

The use of quality feed can increase fish survival rates and growth (Anis & Hariani, 2019). Quality feed is obtained from commercial feed supplies that use imported raw materials, thereby increasing total production costs (Nikhlani, 2022). To overcome this, you can use alternative feed. The alternative feed used comes from local ingredients and is quite abundant. A local material that has potential as an alternative feed is palm oil.

Oil palm plants are found in large quantities in several plantation areas. Oil palm is a plant that has fibrous roots and easily experiences drought (Idris et al., 2020). The use of oil palm has been carried out by Pratama et al. (2023), using palm kernel meal with an additional dose of 10% in the feed can increase the growth rate and feed conversion of kelabau fish (*Osteochilus melanopleurus*). Nikhlani (2022), used palm oil meal as an alternative raw material for feed for sangkuriang catfish (*Clarias gariepinus*) to increase the growth in weight and body length of the fish. In line with the large number of oil palm plantation areas, more and more waste is produced and it has not been utilized optimally. One of the palm oil waste produced is brondolan.

Palm oil fruit comes from oil palm fruit that is too ripe and separated from the bunch (Jufri & Chairudin, 2023). This brondolan is often found as a waste product in oil palm plantations. Palm oil brondolan is usually used to increase the selling value of palm oil by soaking it in oil, which reaches 22% -24% (Jufri & Chairudin, 2023). Palm oil brochures have not been utilized as fish feed in cultivation activities, so research was carried out on the use of palm oil brochures as feed to see its potential for catfish (*Clarias batrachus*).

METHODS

Place and Time

The research was carried out from February to April 2023 located in catfish cultivation ponds, Aceh Singkil Regency, Aceh Province. Test ingredients include catfish and palm oil fruit. The catfish used weighed 2.7-2.9 g with a length of 6.1-6.5 cm. Brondolan is taken from oil palm plantations in the Mount Lagan Region, Aceh Singkil Regency, Aceh Province.

Research Design

The research used the concept of a Completely Randomized Design (CRD) with three treatments and three replications. The treatments used included A (control) using commercial feed, B (soft palm fruit fruit), and C (wormy oil palm tree fruit).

Alternative Feed Preparation

The alternative feed used comes from palm oil pulp. For the treatment of soft oil palm brondolan (B), the brondolan is soaked in a medium containing water for several days until the brondolan becomes soft. The treatment of caterpillar oil palm shoots (C) also involves soaking the shoots in water for a longer period of time until the shoots become caterpillars.

Test Fish Maintenance

Catfish were reared for 28 days at a density of 30 fish per replication. Feed is given according to treatment in the morning and evening on an ad satiation basis. Data on the number of individuals, weight, length are collected during rearing.

Research Parameters

This research covers several parameters including:

1. Survival Rate

The survival rate of catfish is calculated using the formula Efffendie (2002):

$$TKH = N_t/N_0 \times 100$$

Information :
TKH = Survival rate (%)
Nt = Number of live fish at the end of the study (tails)
N0 = Number of fish at the start of the study (tails)

2. Absolute Weight Growth

The absolute weight growth of catfish during the study was calculated using the formula Efffendie (2002):

$$W_m = W_t - W_0$$

Information :
Wm = Absolute weight growth (g)
Wt = Fish weight at the end of the study (g)
W0 = Fish weight at the start of the study (g)

3. Absolute Length Growth

The absolute length growth of catfish during the study was calculated using the formula Efffendie (2002):

$$P_m = L_t - L_0$$

Information :
Pm = Absolute length growth (cm)
Lt = Fish length at the end of the study (cm)
L0 = Fish length at the start of the study (cm)

4. Specific Growth Rate

The specific growth rate of catfish per day is calculated using the formula Hopiuns (1992):

$$LPS = (Ln W_t - Ln\ W_0)/t \times 100\%$$

Information :
LPS = Specific growth rate (%)
Wt = Fish weight at the end of the study (g)
W0 = Fish weight at the start of the study (g)
t = Duration of research (days)

Data analysis

Data processing was carried out using Microsoft Excel 2019 and ANOVA analysis using IBM SPSS Statistics 26.0. The data results were significantly different, followed by Duncan's further test.

RESULT

Survival Rate

The survival rate of catfish in all treatments reached 100%, which means no deaths occurred. The survival rate results are presented in Figure 1.

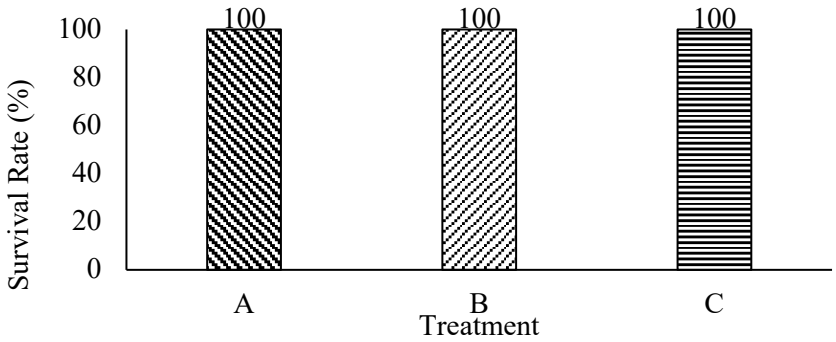

Figure 1. Survival rate of catfish during the study

Absolute Weight Growth

Absolute weight growth showed that the silky oil palm sprout treatment had the highest value (44.23 g) compared to the soft oil palm sprout treatment (40.20 g) and the control (40.13 g). The results of the growth in absolute weight of catfish are presented in Figure 2.

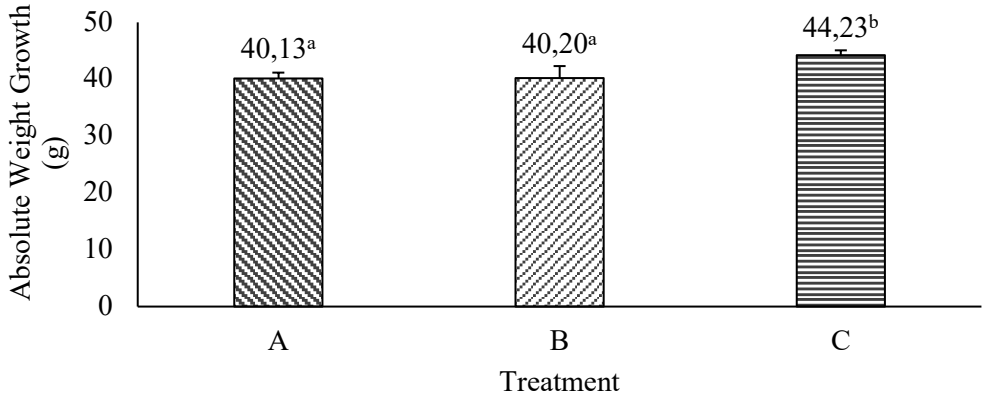

Figure 2. Absolute weight growth of catfish during the study. [Different superscript letters indicate significantly different results (P<0.05)]

Duncan's further test in Figure 2 shows that the silky oil palm sprout treatment gave significantly different results to the soft oil palm sprout treatment and the control. Meanwhile, the soft oil palm brondolan treatment was not significantly different from the control treatment.

Absolute Length Growth

Absolute length growth showed the highest results in the caterpillar oil palm sprout treatment (6.20 cm) compared to the control treatment (5.23) and soft oil palm sprouts (4.07). The results of the absolute length growth of catfish are presented in Figure 3.

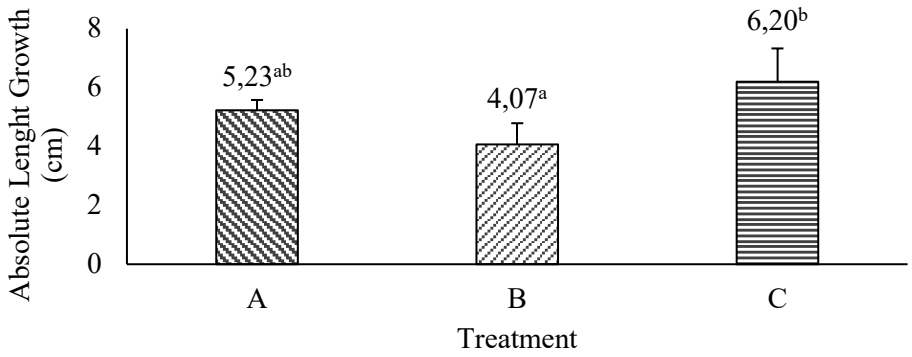

Figure 3. Absolute length growth of catfish during the study. [Different superscript letters indicate significantly different results (P<0.05)]

Duncan's follow-up test in Figure 3 shows that the silky oil palm sprout treatment was not significantly different compared to the control treatment, but was significantly different from the soft oil palm sprout treatment. Different results were shown in the control treatment which was not significantly different from the treatment of wormy oil palm sprouts and soft oil palm sprouts.

Specific Growth Rate

The highest value of specific growth rate was shown in the treatment of caterpillar oil palm leaflets (10.22%) compared to the control (10.16%) and soft oil palm leaflets (9.71%). The results of the specific growth rate of catfish are presented in Figure 4.

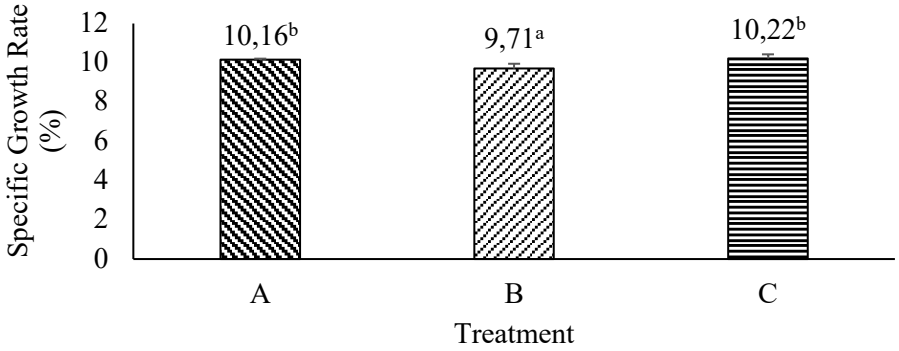

Figure 4. Specific growth rate of catfish during the study. [Different superscript letters indicate significantly different results (P<0.05)]

Duncan's follow-up test in Figure 4 shows that the treatment of silky palm kernels was not different from the control treatment, but was significantly different from the treatment of soft palm kernels. Different results were shown by the soft oil palm sprout treatment which was significantly different from the control and worm palm oil palm leaf treatment.

DISCUSSION

No deaths occurred in all treatments, because the feeding was sufficient for the survival and growth of catfish. Fish survival is influenced by the availability of feed in the cultivation environment which will later be used as an energy source (Elrifadah et al., 2021). If energy intake is inadequate, fish become lazy to move, get stressed, their metabolism is disturbed, their growth is hampered, and it can even cause death of the fish. Adaptability also influences fish survival rates (Mokoginta et al., 2022). Catfish have high adaptability, so they are able to survive in unfavorable environmental conditions.

Absolute weight growth in the treatment of caterpillar oil palm sprouts gave the best results. It is suspected that it is easier for catfish to digest oil palm fruit fruit that has worms. Growth is faster if the food is easily digested by the fish. The ability of fish to digest and absorb feed well can increase growth. Similar research was conducted by Fachruuddin et al. (2022), used Hong Kong caterpillars on fingerling fish (*Channa marulioides*) which were able to accelerate growth in the fish. In addition, caterpillar food is preferred by fish. Live and moving food can trigger the fish's hunting instinct, so it is preferred. The type of feed your fish prefers can influence the amount of fish consumed and result in better growth.

Absolute length growth in the oil palm leafworm treatment gave the highest yield. It is suspected that the nutritional content of caterpillar palm fruit is more in line with the nutritional needs of catfish. Fish can grow well if the feed consumed matches their needs (Noorsheha et al., 2024). According to Gunadi et al. (2021), that the increase in fish body weight is in line with the increase in body length.

The caterpillar oil palm fruit fruit treatment showed the highest specific growth rate. It is suspected that the energy obtained by fish in the oil palm leafworm treatment is higher than in the control treatment using commercial feed. Nutrients obtained through feed are stored in the body which will later be converted into energy (Ririhena & Palinussa, 2021). The incoming energy is used first for body activities and cell maintenance (Balqis et al., 2021). The excess energy used will be used for fish body growth (Ratulangi et al., 2022). Karimah et al. (2018), explained that the amount of feed consumed with different nutrient contents can provide different growth in weight and length. Furthermore, Puteri et al. (2020), explains that energy from feed is also used for the development of sexual organs.

Fish feeding is closely related to fish growth. Optimal feeding must be adjusted to the fish's eating habits. Good feeding management by paying attention to the dose, frequency and time of feeding (Cahyani & Hafiludin, 2022). By implementing good feeding management, overfeeding can be minimized and feed cost efficiency increased (Alal, 2018).

CONCLUSION

The caterpillar palm brondolan has the potential as an alternative feed for catfish (*C. batrachus*) as seen from the survival rate parameters reaching 100%, absolute weight growth of 44.23 g, absolute length growth of 6.20 cm, and specific growth rate of 10. 22%.

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