Global Scientific JOURNALS

GSJ: Volume 7, Issue 11, November 2019, Online: ISSN 2320-9186
www.globalscientificjournal.com

Evaluation Domestic Food Waste Utilization As Alternative Feed In Catfish Culture (*Clarias gariepinus*)

Yuli Andriani*, Irfan Zidni*, Achmad Rizal*, and Muhammad Fatah Wiyatna**
* Faculty of Fisheries and Marine Sciences, Padjadjaran University, Indonesia.
**Faculty of Animal Husbandry, Padjadjaran University, Indonesia
Jl. Raya Bandung-Sumedang Km. 21 Jatinangor 45363 Tlp. (022) 87701519 Fax. (022) 87701518
Email : yuli.andriani@unpad.ac.id

Abstract

Domestic food waste is one of the wastes that can be utilized as catfish feed. This research was conducted to determine the performance of catfish fed with domestic food waste. The treatment consists of two, namely feeding using domestic food waste (A) and commercial feed (B) as a control, each treatment repeated 7 times. The study was conducted for 36 days consisting of 6 times sampling. The parameters observed include absolute growth, daily growth rate, survival and feed conversion (FCR). Data were analyzed using Least Significant Different Test. The result showed that the use of domestic food waste has an insignificant least different from a commercial feed. Domestic food waste has the same potential both with commercial feed to be used as catfish feed. The feeding-based utilization of domestic food waste provides an absolute growth value of 20.80 g, the daily growth rate of 1.48%, the survival rate of 98% and the conversion ratio of 2.3.

Keywords: domestic food waste, alternative feed, catfish, daily growth rate

Introduction

Increasing the number of population which in turn will have an impact on increasing the volume of domestic waste, one of which is domestic food waste. Until now, the management of waste originating from domestic acitivity is still using conventional methods, namely by collecting and stacking it in landfills. Conventional waste management will threaten the occurrence of environmental pollution, due to the imbalance between the waste generated and the processing that can be carried out by the waste management site

On the other, the waste of food from domestic food waste has the opportunity to be used as fish feed, one of them as catfish feed (*Clarias gariepinus*). Feed is an important component in fishery activities but often faced with a higher price. Utilization of food waste from domestic food waste has good prospects considering the value of nutrients owned by domestic food waste is good and high availability (Cahya *et al*., 2019). Protein content in domestic food waste meal ranges between 10,89-26,55%, crude fat 1.16-9.7%, and crude fiber 9.13% (Yulianias 2002; Zainuddin and Nazar 1999). Feed is one of the conditions that must be met

in aquaculture activities, about 60-70% of the total cost of cultivation production is spent for feed (Andriani *et al*. 2016). Accordingly, it is necessary to develop independent feed using alternative feed materials that are easy to find and have a large availability.

The use of domestic food waste as catfish feed has not been known to influence, so it is necessary research to know the potential utilization of domestic food waste to catfish performance. This research aims to determine the effect of the use of domestic food waste to catfish performance (*Clarias gariepinus*)

Methods

Feed Preparation

Domestic food waste is collected from Awisurat, Tanjungsari. Then organic waste is chopped up into pieces-small pieces, then in the press using a tool pressing to make excess fluid in the garbage out. After that, inserted into the oven for the drying process (water content 10%-14%) and was passed.

The test feed is formulated using a Pearson-square method with 30% protein content. Samples of feed material of domestic food waste and feed test and commercial pellet further tested its nutritional content using proximate analysis in Livestock Nutrition Laboratory of the Faculty of Animal Husbandry Universitas Padjadjaran (Table 1).

Table 1. Proximate Analysis Results of Domestic Food Waste, Test Feed and Control Feed

Sample Name	Protein (%)	Fibre (%)	Fat (%)	BETN (%)	Energy (kkal/kg)
Domestic food waste	24,18	3,48	11,87	51,23	4241
Test feed	30.98	5.16	8.45	33.28	3661
Commercial pellet (control)	30.76	3.35	4.56	12.98	3133

Source: Ruminant Animal and Food Chemistry Nutrition Laboratory Livestock, Faculty of Animal Husbandry, Padjadjaran University

Experimental Design

The research method is a experimental design consisting of 2 treatments and 7 times repeated. The treatments tested are as follows:
Treatment A: Feeding provided by domestic food waste
Treatment B: Commercial pellet feeding

Implementation of Research

A total of 100 catfish each are kept in two fiber containers. The treatment given is feeding with additional domestic food waste (A) and commercial feed (B). Catfish every day are given food as much as 3% of the weight of biomass twice a day. At the beginning of rearing, catfish weighed and measured body length. Catfish are kept for 36 days, according to the nursery period. Every 6 days a sampling of 10 catfish is carried out by weighing, measuring the length and counting the number of dead fish. The amount of feed will be adjusted for each sampling period. During the study, water quality measurements included temperature, pH and DO three times, at the beginning, middle and end of the study. The parameters observed were

absolute growth, daily growth rate (Effendi, 2002), feed ratio conversion (Djarijah 1995). The data obtained were analyzed using the Least Significant Different Test (Gasperz, 1991).

Results and Discussion

The results showed that the use of domestic food waste as a feed affects the performance of catfish, including absolute growth, growth rate, survival rate and feed conversion (Table 2)

Table 2. Catfish performance fed by household waste and commercial feed

Parameter	Feed Test	
	A	B
Absolute growth (g)	20.80± 7.55a a	22.00a± 6.66a
Growth rate (%/day)	1.47± 0.12a	1.52± 0,06a
Survival rate (%)	98± 8.66a	99± 5.77a
Food Conversion Ratio (FCR)	2.3± 0.07a	2.0± 0.02a

Note: The value followed by the same letter does not differ based on the Least Significant Different Test of 95%

The feeding of domestic food waste (A) is responded well by the catfish, it is indicated by the value of absolute growth and the rate of daily growth which does not differ from the treatment of B (commercial feed; control) (Fig. 1).

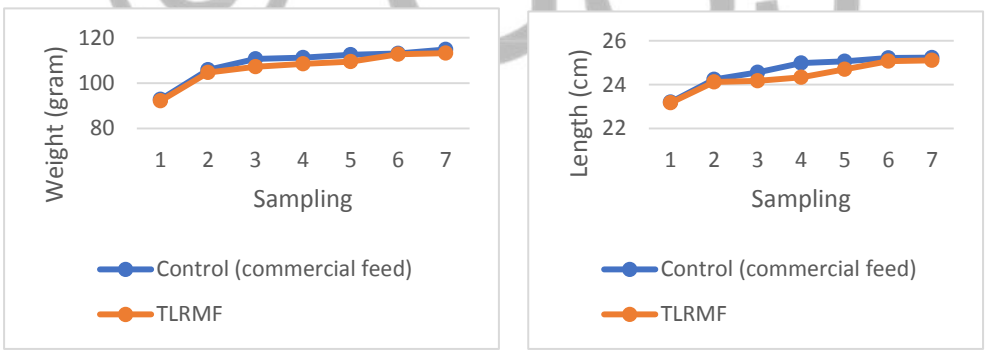

Figure 1. Catfish weight and length increased during the study

Fish growth is determined by the quality of feed provided, mainly related to the availability of protein and energy in feed. As a feed ingredient, domestic food waste has good nutritional value. This can be seen from the proximate test results of domestic food waste meal which has crude protein content reaching 24.18% and low crude fiber (3.48%). Similarly, after formulation, the crude protein content of the test feed reached 30.98% and crude fiber 5.16%. The component of domestic food waste affects the quality and nutritional content of the waste. Based on observations, the average component of restaurant waste consists of 3 sources, namely carbohydrate (rice), animal (bone and meat) and vegetable. Cahya (2019) states that domestic food waste generally consists of carbohydrate (rice) sources by 36%, the

average animal source derived from meat and bone leftovers by 31% and the average vegetable source by 33%.

The feed conversion based domestic food waste gives a distinct, non-tangible effect with commercial feed (B; control). This indicates domestic food waste has a good enough quality to be used as an alternative feed. Domestic food waste is generally the leftover food that has been cooked or process before. This causes the domestic food waste component to be the physically processed feed material and has an impact on its increasingly simple and easily absorbed particles. Several studies illustrated that the structure of feed, i.e., the particle size, particle-size distribution, and the physical form of the diet, affects the avian gastrointestinal function and health leading to changes in productive performance (Röhe *et al*., 2014).

In turn, survival is the impact of providing a feed that meets the needs of fish. The survival of fish fed by domestic food waste has a value that is not different from the fish that is fed with commercial feed. It is suspected because the energy owned by both types of feed meets the needs of fish (Table 1). Maghsoudloo et al (2012) showed that most of growth parameters in juvenile Pacific white shrimp (*Litopenaeus vannamei*) depended with the availability of digestible energy levels. Also, the high survival in this research is supported by the quality of water that is qualified for catfish cultivations.

Conclusion

Domestic food waste has the same potential both with commercial feed to be used as catfish feed. The feeding-based utilization of domestic food waste provides an absolute growth value of 20.80 g, the daily growth rate of 1.48%, survival rate of 98% and conversion ratio of 2.3.

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