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Utilization Of Organic Wastes As Raw Material Of Fish Feed Production For *Catla Catla*

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***Abstract*:** Utilization of *Catla catla* (Rohu) organic waste as raw material for fish feed can save the cost of fish feed production. This study aimed to utilize organic waste as raw material for making fish feed. The study was conducted at the Polytechnic Indonesia Venezuela during four month (November 2020 – February 2021). This Research comprised 5 treatments with 3 replications, namely P_1 (Commercial Feeding), P_2 (Feeding with 5% Organic Waste Formulation), P_3 (Feeding with 25% Organic Waste Formulation), P_4 (Feeding with 50% Organic Waste Formulation) and P_5 (Feeding with 75% Organic Waste Formulation). Clarias Gariepenus was fish species used during the observation with size 2g/tail. Fish are cultivated in soil ponds (2x2 m^2) with density 500 fishes/ pond for 3 months. Parameters measured were growth and survival rate. The result shows that the best growth rate obtained at treatment P_2 (114.2g) and the highest survival percentage was on treatment P_1 and P_2 (> 60%) conclusion, the addition of the proportion of organic waste as much as 5% in making fish feed with protein 34.19% produces the best growth.

***Keywords*:** *Catla catla* organic waste, Fish feed formulation, Cost-effective aquaculture, Clarias gariepinus, Growth performance, Survival rate, Organic waste utilization, Protein content (34.19%), Aquaculture feed efficiency, Waste-based feed ingredients, Experimental treatments (P_1–P_5). Sone river.

1.0 Introduction: -

Some village is one of the located in the City of Dehari, which is visited by Tourists both local and nonlocal. There are many activities done by visitors in this city would be give not only positive impact but also negative impact. One of the negative impacts was increasing organic/ inorganic wastes from visitor's activities. Based on observations, the most organic wastes found were corn cobs (corn waste) and vegetable/food waste. The local village community has a program to utilize organic waste in order to reduce the environmental pollution. So for, utilization of organic waste has been carried only for making compost. However, it is expected that there will be a verity of products from the organic waste processing as raw material i.e. fish feed could be used by fish farmers in local village mo et al;

Mentioned that food waste is a suitable raw material for aquaculture feed. The use of organic waste as feed raw materials will save the production costs of fish feed and it can reduce the overcome organic waste for environmental management. Kusumanto and Hidayat. State the one of the weaknesses in the preparation of fish feed is un-optimized and potential of local ingredients. The saving of fish feed production costs can be done by providing the composition of organic waste as the main ingredient. The

maximum utilization of organic waste can provide significant results because the nutritional content and nutrient in organic waste are still very potential to be utilized. Furthermore, Martin et al; also said that the utilization of organic waste as raw material for feed formulation is an attractive alternative that deserves greater attention. In addition to reduce for feed formulations will maximize resource efficiency help feed production in providing more sustainable raw material and reduce dependence on current raw materials

2.0 Materials and methods: -

2.1 Time and Location – The study was conducted at the hurca nala nearby Dehri on Sone, Bihar State from November 2020 to February 2021.

2.2 Raw Material of Fish Feed – The fish sample in this study was *Catla – catla* which was stocked in a soil pond (2x2 m^2). Total 500 fishes/pond with a weight of 0.2 g/head. The raw materials used during the study for feed fish presented at Table 1.

\Table 1 Experimental feed Formulation using in through study.

No	Kind of raw material	Feed composition (1000 g)			
		5%	25%	50%	75%
1	Soy flour	180	90	100	30
2	Organic waste	50	250	500	75
3	Bran	50	50	50	20
4	Shrimp flour	260	210	80	50
5	Fermentation fish	10	210	80	50
6	Fish meal	270	20	20	2
7	Tapioca flour	20	50	50	20
8	Corn cob	50	50	50	20
9	*Leucaena* sp. flour	50	50	50	20
10	*Gliricidea seplum* flour	50	10	10	10
11	Premix	10	10	10	10
	Feed protein (%)	32.19	27.46	18.68	14.31

2.3 Experimental Design –

The research method used experimental methods.

The experimental design used was completely randomized design (CRD) non factorial with 5 treatments and 3 replications, namely

P1 Commercial feeding

P2 Feeding with organic waste formulation 5%

P3 Feeding with organic waste formulation 25%

P4 Feeding with organic waste formulation 50%

P5 Feeding with organic waste formulation 75%

2.4 Data analysis –

2.4.1 Growth rate – The absolute growth was calculated according Effendi E4:

W = Wt - Wo

Where

W = Growth (gram)

Wt = weight biomass at the end of the study (gram)

Wo weight biomass at the start of the study (gram)

2.4.2 Survival Rate – Survival rate of fish was calculated based on Muchlisin et al; [5]

SR = (No –Nt/No) x 100

Where

SR = Survival rate (%)

Nt = No of fish death during at study

No = No of fish at the start of study

3.0 Results and Discussion –

3.1 Fish Growth – Fish growth is the result of the differences between intake energy and energy out and the intake energy is obtained from the food consumed. The amount of energy consumed by fish is influenced by the availability of energy in the feed, The Physical condition of the fish and the condition of the water (Temperature and dissolved oxygen). Fish growth is very dependent on the energy available in the feed and energy expenditure. Energy requirements for maintenance must be fulfilled first and if excess, the excess will be used for growth. This means that if the energy in feed is limited, the energy is only used for metabolism and not for growth. According to Anggreani and Rahmiati, that the high and low optimum protein content in feed is influenced by adequate fat and carbohydrates. Without carbohydrate and fats that are enough fish depend on energy mostly from feed. Protein which will be used a source of energy to digest food and metabolic process.

Fish growth rate is one of the important factors to know the Success in aquaculture activities. The growth of *Catla catla* feed with organic waste formulations of 5, 25, 50 and 75% for twelve weeks can be seen in figure 1.

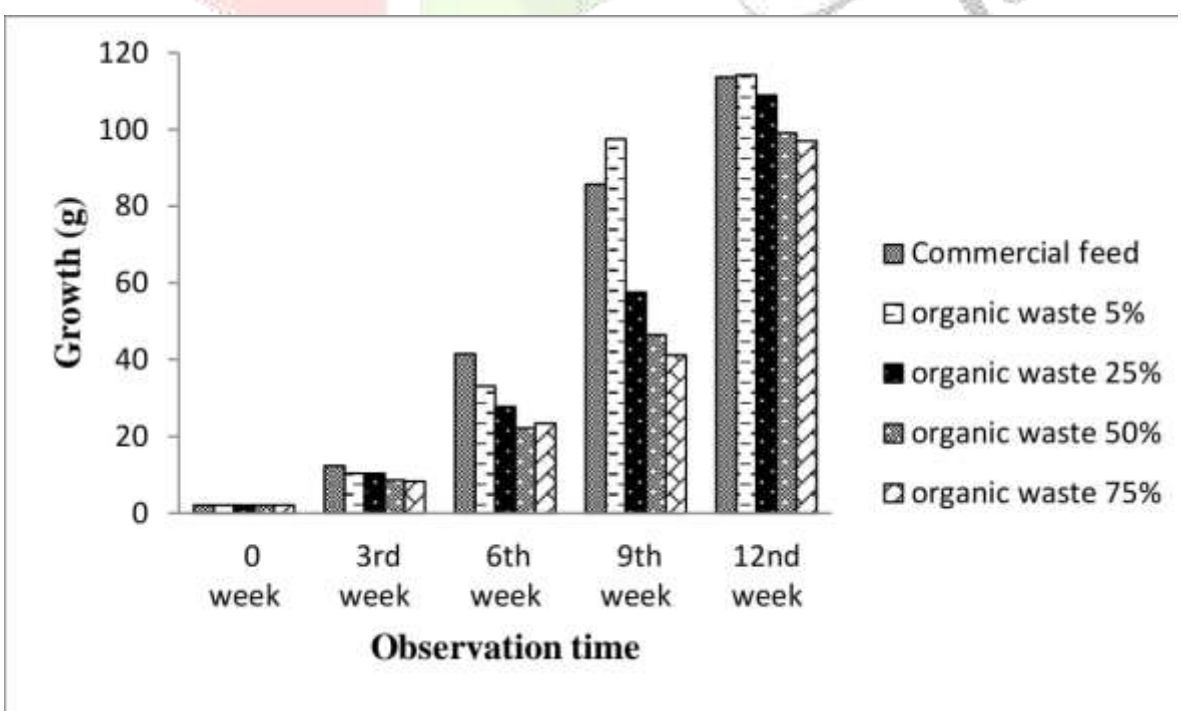

Fig 1: Growth chart of *Catla catla* fish fed by different type of feed.

Based on the Duncan's Test, The treatment of 5% organic waste feed was not significantly different with the treatment of 25% organic waste feed, but it was significantly different with those 50% and 75% organic waste feed treatments. The growth rate of fish feed commercial feed at the beginning was better than feeding formulated by utilize 5% of organic waste, where the Second protein content of this feed is > 30%. In the early days, the maintenance of fish fed commercial food was better to utilize the feed given optimally because the feed size given was appropriate with the opening of fish's mouth. Than the growth of fish feed fish by utilizing 5% organic waste able to rival the growth of fish fed commercial feed and even experienced a significant increase in the week of 9^{th} – 12^{th} week. The present study showed that fish are better able to used commercial feed at the beginning of maintenance, which is 0 to 6^{th} week. At the 1^{st} week to the 6^{th} week the feed utilizing organic waste was not printed in the form of pellets because there was no small size feed printing machine that can be adjusted to the size of the fish mouth opening. Therefore it is dealt with by making feed in the form of lumps to fit the opening of the fish's mouth. The weakness of feed in the lump from when was given to fish in water, it will be easily broken (dissolved in water). So that sometimes before being eaten by fish. The nutrient content of the feed has been dissolved in water. According to nutrition is very important to avoid signs of deficiency, maintain adequate animal performance and maintain animal health. Feed with important nutrient (protein, amino acids, essential fatty acid, vitamins and minerals) is not adequate will be cause malnutrition and susceptibility to disease.

However, after the six week maintenance, in this size fish feeding using organic waste can already be optimally utilized by fish because it has been printed in the form of pellets so that it is not easily dissolved in water.

Utilization of organic waste with a large porocity in the utilization of vegetable waste as animal feed also has several weaknesses that can limits its feasibility. Fish feed formulations with 5, 25, 50, 75% of organic waste had protein content formulation of 25, 50 and 75% were low compared to fish fed with 5% organic waste formulation. This is probably because fish are less able to use digest sources of nutrients that are not proteins and protein requirements in large feeds. *Catla catla* is omnivorous fish tend to be carnivores so that it is easier to use the source of nutrition in the form of protein from animal to use the source of nutrition in the form of protein from animal to use the source of nutrition in the form of protein from animal sources. Organic waste can be processed and it is good to be used for animal feed such as fishes, where in the first place fish pellets. Allameh et al; in addition to fish size, different type of feed provide different digested energy values. Furthermore, Anggraeni; Dewi et al; maintained that plant based feed ingredients generally contain high coarse fiber which is difficult to digest and has a strong cell wall that is difficult to solve so that food derived from vegetable ingredients is usually less digested than animal ingredients. NRC (1983) in Dewi et al; stated that the digestibility of fish to a food is influenced by several factors, i.e. chemical properties of water, water temperature, type of feed, size and age of fish, nutrient content of feed, frequency of feeding and the number and type of digestive enzymes in the digestive tract feed. The water quality parameters measured in this study where PH, temperature and dissolved oxygen. The value of those parameters were obtains 7, 28 – 30^0C and 5.3 mg/l, respectively.

3.2 Survival Rate – the result showed that the highest survival rate was fish given commercial food (64.1%), followed by fish feed with 5%, 25%, 50% and 75% of organic waste formulations which had value 61.1%, 60.1%, 56.7%, 54.4%, respectively (Figure 2). The highest of survival of fish is obtained from the treatment of fish given commercial feed because at this treatment the level cannibalism was low. Fish cannibalism is low because it uses floating feed types and sufficient nutrient content (high protein). Commercial fish feed used during the study was floating type feed and it will be easily eaten by fish before the feed reaches the pond bottom. The nutrient content of feed protein was > 30% also supports the nutritional adequacy needed by this omnivorous fish.

Furthermore, high survival rate in feed with 5% organic waste formulation, after that 25, 50 and 75%. During observation, the survival rate of fish feed with low organic waste formulation lower than fish given commercial feed was due to the type of food that could be categorized as drowning food, so that when it was spread into the water it reached the bottom immediately. Actually, during the study it was anticipated through the provision of lift nets as a place to put food so that it did not fall directly to the bottom and mix with the soil. However, fish that will eat food in the net, the fish must swim into the net first and compact with other fish to get the food. Fish that move active will eat a lot of food and if the food provided is not evenly distributed, than the fish in the pond is not nutritionally sufficient, causing the fish growth was not homogeneous. Fish growth is not homogeneous due to uneven distribution of feed. So fish that are well fed will grow faster. According to Trisnawati et al; mentioned that fish growth is influenced by energy from the food they consumed. Digested feed will produce a supply of energy that can be used for the body's metabolism and the rest will be used for growth. Growth occurs when there is excess free energy after the available energy is used for body maintenance, based metabolism and activity. Aric stated that the survival rate of fish can be influenced by biotic factors i.e. water quality, feed, competition, human handling and stocking density while abiotic factors are physical and chemical properties in waters.

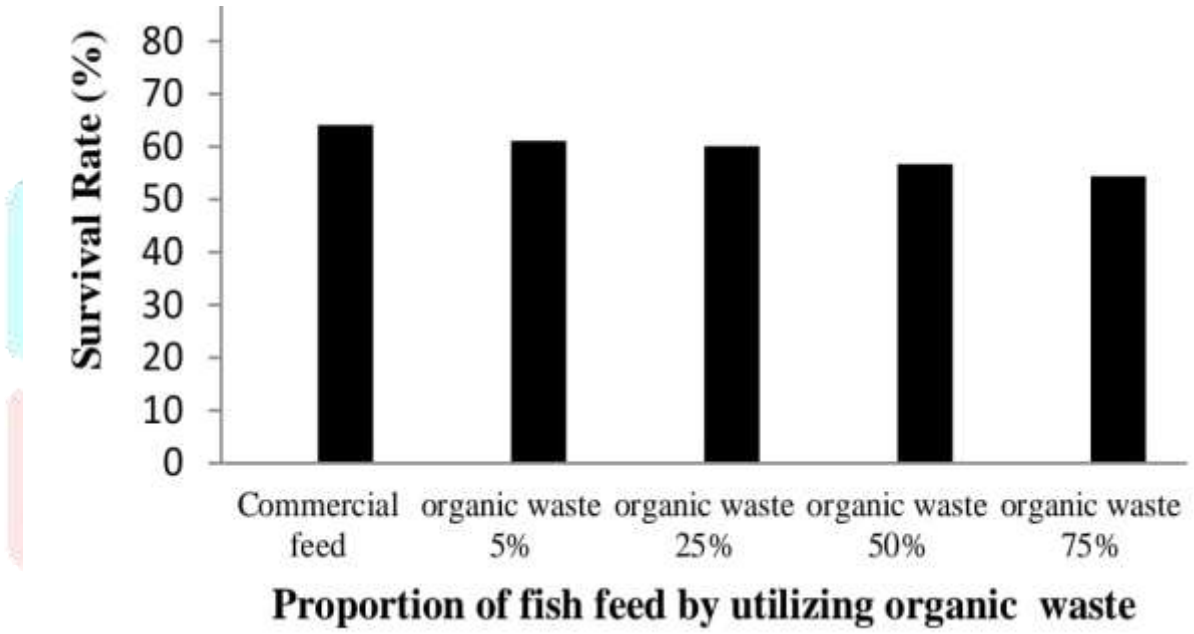

Figure 2 : Survival rate of *Catla catla* during the observation.

4.0 Conclusion – The organic waste can be used as one of the raw material of the artificial feed. But, as high organic composition in the formulation, as low the protein content of feed.

References:

1) Mo YM, Man YB, et al; 2017 Journal Science of the total Environment.
2) Kusumanto I Dan and Hidayat MI 2018, Analisis Tekno Ekonomi Pembuatan Petel Ikan Dari Sampah Ogranic di LotaPekan Baru J Sceins Teknology dan Industries.
3) Martin D.S. and Ramoss, Zubia J 2015, Food Chemestry.
4) Muchlisin ZA et al; 2016 Archives of Polish Fisheries.
5) Effendi MI 1997, Metodelogi Biologi Perikanan Yayasan Devi Bogor.
6) Anggreani DN and Rahmiati 2016, Journal Ilmiah Biologi Biogenesis.
7) Yengkokpam and Debnath D 2016, Nutrition and food Technology for producing healthy fish through aquaculture in book: Workshop Compendium on fish feed formulation prepration and its importance in Northeast India Publisher: National Fisheries Development Board Hyderabad.
8) Allameh SK, et al; 2007, Pakistan Journal of Biological Science.

9) Anggraeni S 2011, Penggunaan wheat bran Sebagai bahan baku alternatif Pengganti Jagung Pada Pakan ikan nila Skripsi Fakultas Perikanan dan IImu Kelautan Institut Pertanian Bogor Bogor.
10) Dewi C D, et al; 2013.