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Prebiotic Applications From The Types Of Nuts In Feeding To The Flash Rate And Specific Growth Of The Milkfish (*Chanos chanos Forskal*, 1775)

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ABSTRACT

The purpose of this study was to analyze the survival and specific growth of milkfish after being given various prebiotics from the types of beans in the feed. Spread with a density of 15 birds/aquarium with a size of 50 x 45 x 45 cm filled with water with 15-20ppt salinity. Fish are kept for 60 days and fed 5% body weight/day. The study was designed in a completely randomized design with 5 prebiotic treatments from legumes, soybeans, peanuts, green beans, kidney beans, and controls. The results showed that various prebiotics in a feed from legumes was significantly ($p < 0.05$) on survival and specific growth (% / day). The highest synthesis was produced in red bean prebiotics (77.78 ± 3.85), but not different from peanut prebiotic types (73.33 ± 6.66), controls (66.67 ± 0.00), and peanuts green (60.00 ± 11.54), but significantly different from soybean prebiotics (.11 ± 13.87). The same results were shown at specific growth rates (% / day), the highest in red bean prebiotics (12.94 ± 3.19) and significantly different ($p < 0.05$) in the other treatments. So it can be concluded that the best type of prebiotic beans is red beans.

Keywords: legumes, prebiotics, probiotics, milkfish, survival, growth, milkfish

PRELIMINARY

One solution that can be offered to optimize the role of the digestive tract microflora as a producer of exogenous enzymes with prebiotic administration. Prebiotics act as a feed supplement which is in the feed or intentionally added to the feed can play a role in maintaining the balance of the microflora population and can be a growth promoter or activate several strains of beneficial bacteria found in the digestive tract of fish (Mazurkiewiecz et al. 2008).

In the digestive tract of milkfish, there is many microflorae where the microflora is a collection of microorganisms found in the digestive tract of organisms. In Aslamya study (2012) stated that there were microflora in the digestive tract of milkfish, namely 4 amylolytic microbial isolates (Moraxella sp., Aeromonas hydrophila, Citrobacter sp., And Carnobacterium sp.), 3 aerobic amylolytic microbes (Staphylococcus sp. Flavobacterium sp. , and Vibrio sp.), 5 types of aerobic proteolytic microbes (Streptococcus sp., Bacillus sp., Micrococcus sp., Pseudomonas sp., and Proteus sp.), 2 types of anaerobic proteolytic microbes (Vibrio alginolytic and types not identified), 2 types of aerobic lipolytic microbes (Planococcus sp., And Plesiomonas sp.) And 2 types of anaerobic lipolytic microbes (Kurthia sp. And erratia sp.). Microflora is able to utilize fibers in a feed that are not digested by the organism's intestine, so as to optimize the digestibility of feed in the digestive tract. Microflora in the form of probiotic bacteria that need nutrients in population development (Pelezar and Shan, 1988).

Microflora grows optimally supported by the availability of nutritional sources known as Prebiotics. Prebiotics are short chain sugar molecules, which contain fructose. Prebiotics are fibers that cannot be digested by the body and are food for probiotics. to optimize the bacterial population by providing prebiotics, according to Widowati and Misgiyarta (2003) that beans contain oligosaccharides not digested but beneficial for probiotic bacteria.

Types of beans that contain oligosaccharides are green beans, soybeans, and peanuts, so it is hoped that as a prebiotic can increase the bacterial population. Therefore, the synergy between probiotics and prebiotics will be more profitable, where the combined balance of probiotics and prebiotics will support the continuity and growth of beneficial bacteria in the digestive tract. The addition of prebiotics into the feed used by digestive bacteria causes an increase in enzyme activity in the digestive tract which

can increase digestibility (Murni, 2004). Good digestibility will optimize the utilization of feed consumed so that it is expected to improve the quality of feed so that it is expected to increase growth and survival in milkfish life.

MATERIALS AND METHODS

This research was carried out in the Mini Hatchery Unit of the Department of Fisheries, Faculty of Marine and Fisheries, Hasanuddin University, Makassar, using 15 glass aquariums measuring 50 x 45 x 45 cm filled with brackish water with 15-20 ppt and test fish with stocking densities of 15 tails/container. As a treatment, prebiotics is given from the type of beans in the feed with compositions such as Table 1, which is prebiotic feed from legumes including soybeans, peanuts, green beans, kidney beans and without nuts (controls).

Table 1. Feed formulations used during the study

raw material	Percentage of treatment				
	Soybeans	Peanuts	Green beans	Red beans	Control
Fish flour	35	32	43	42	45
Soybean flour	30	0	0	0	0
Peanut flour	0	30	0	0	0
Green bean flour	0	0	30	0	0
Red bean flour	0	0	0	30	0
Coconut meal flour	20	23	12	13	40
Wheat flour	10	10	10	10	10
Fish oil	3	3	3	3	3
Vitamins & Minerals *	2	2	2	2	2
total	**100**	**100**	**100**	**100**	**100**

Description: *) Composition of vitamins & mineral mix. Every 10 kg contains Vitamin A 12,000,000 IU; Vitamin D 2,000,000 IU; Vitamin E 8,000 IU; Vitamin K 2,000 mg; Vitamin B1 2,000 mg; Vitamin B2 5,000; Vitamin B6 500 mg; Vitamin B12 12,000 µg; 25,000 mg ascorbic acid; Calcium-D-Phantothenate 6,000 mg; Niacin 40,000 mg; Cholin Chloride 10,000 mg; Metheonine 30,000 mg; Lysine 30,000 mg; Manganese 120,000 mg; Iron 20,000 mg; Iodine 200 mg; 100,000 mg Zinc; Cobalt 200,000 mg; Copper 4,000 mg; Santoquin (antioxidant) 10,000 mg; Zinc bacitracin 21,000 mg.

Each treatment consisted of three replications and was designed in the complete random form (Gasperz, 1991). Prebiotic administration by mixing evenly with raw materials, then printed using a feed printing machine, then dried until ready to be given to test animals. Feeding is done three times a day at 7:00 a.m., 12:00 p.m., and 17:00 p.m. with the percentage of feeding 5% of the body weight of the test fish per day.

The variables observed, the specific growth rates with the formula Hardjamulia et al (1986), are compatible with Widyanti (2009). In addition, observations were also made on water quality variables including temperature, salinity, dissolved oxygen, and pH, to determine the feasibility of habitat for the life of the test fish. A sampling of growth is carried out every 10 days using a Camry scale accuracy of 0.01 g is survival calculated at the end of the study. The data obtained were analyzed for variance and followed by the W-Tukey test.

RESULTS AND DISCUSSION

Growth

The results of the variance analysis showed that the treatment of various types of beans in feed significantly ($p < 0.05$) on the growth of milkfish. W-Tuckey's further test of the treatment of various types of beans in feed on the growth of milkfish showed in Table 2 that the growth of milkfish in the administration of prebiotic feed from Red bean species gave the best growth results of 12.937 ± .3.19%.

Table 2. Average growth of milkfish during maintenance.

Various Prebiotics in Feed	Parameter ± Std
	Growth
Soybeans	9,830±.2,69ab
Peanuts	5,743±.1,78a
Green beans	6,960±.3,07ab
Red beans	12,937±.3,19b

Control	6,273±.2,37ab

Description: Different superscript letters in the same column show significantly different results (P <0.05).

The results showed that the highest growth rate was obtained from the feed treatment containing red beans. The high growth rate of milkfish in the treatment of feeding containing red beans is thought to be due to the high crude fiber contained in red beans. Given that crude fiber is not digested in the intestine, it is not concerned with the formation of energy. However, fiber is metabolized by bacteria that are and through the digestive tract.

Rough fiber is a part of plants that cannot be absorbed by the body and does not have nutrients, but fiber has a function that is not replaced by other substances in triggering physiological and metabolic events that can protect the health of the digestive tract. In the context of fiber, Fructose oligosaccharide (FOS), Galakto-Oligo-Sakarida (GOS), or Inulin can simultaneously increase the population of positive bacteria. Fructose oligosaccharide (FOS) is one of the dietary fiber that can be obtained from food derived from legumes which is a substance that not only improves intestinal microflora through bacterial growth but also has a positive impact on the element of host health (Kusharto, 2006).

According to Anggraeni and Nurlita (2013) that fish growth is closely related to the availability of protein in feed because protein is an energy source for milkfish and protein is also a nutrient that is very needed by milkfish for growth, that the amount of protein will greatly affect the growth of milkfish. In Sumpeno's (2010) study, referenced by Yeni et al. (2014), explaining fish growth is influenced by two factors, namely internal factors which include genetic traits and physiological conditions of fish and external factors related to food and the environment. According to Sudarman (1988) the speed of growth depends on the amount of feed consumed, water quality and other factors such as heredity, age, endurance and the ability of the fish to utilize feed, Furthermore Boyd and Koppler, (1990) added that the amount of feed given is very important because if too little will result in slow fish growth and competition for feed will occur which results in variations in the size of the fish produced. Conversely, if too much feed will cause environmental pollution and inefficient.

Synthesis

The results of the variance analysis showed that the treatment of various types of beans in the feed had a significant effect (p <0.05) on the survival of milkfish. The W-Tuckey test shows in Table 3 that survival values in feed containing red beans differ from those containing soybeans but are similar to feed containing peanuts, green beans, and controls.

Table 3. The average survival of milkfish during maintenance.

Various Prebiotics in Feed	Parameter ± Std
	Synthesis
Soybeans	51,113±.13,87a
Peanuts	73,333±.6,66ab
Green beans	60,003±.11,54ab
Red beans	77,777±.3,85b
Control	66,670±.0,00ab

Description: Different superscript letters in the same column show significantly different results (P <0.05).

The survival rate of milkfish produced in this study ranged from 51.11 to 77.78%. This shows that the percentage of the survival rate of milkfish in all treatments during the study experienced mortality or death, but the provision of feed with the content of red beans in the feed gave the highest survival rate of 77.78%. The high yield on feed containing red beans in this study is thought to be due to the nutrient content in the feed given in the form of protein, carbohydrates, and energy according to the needs of milkfish. Thus, the need for energy can be fulfilled so that fish can maintain their survival rate.

In addition to the availability of artificial food and the fulfillment of nutrients for fish, the addition of feedstock types of beans into artificial feed is thought to cause the survival of milkfish to be high besides the survival of milkfish between treatments shows a significant effect, because the feed percentage is 5% from biomass/day is the ideal size so that fish do not experience shortages of feed or excess feed, even by feeding four times a day allowing milkfish not scrambling for food so as not to cause cannibalism which can reduce the value of fish survival.

According to Yurisman and Heltonika (2010), in Yeni et al., (2014), factors that can influence the high and low life velocity of an organism are biotic and abiotic factors. Biotic factors include competitors, population density, age and ability of organisms with the environment while abiotic factors such as temperature, dissolved oxygen, pH. According to Reksono et al., (2012), that water quality also influences the survival and growth rates of cultivated aquatic organisms, and is supported by the statement of Serdiati et al., (2011), that fish survival is caused by many factors, one of which is a solid fish stock that is too high.

CONCLUSIONS

The administration of prebiotics from the type of legumes into feed in treatment D gave the best growth results, namely 12.94 ± .3.19%. The results showed that the highest growth rate was obtained from the feed treatment containing red beans. while at survival shows that survival values in feed containing red beans are different from feed containing soybeans but the same as feed containing peanuts, green beans, and controls. the percentage of milkfish survival rate in all treatments during the study experienced mortality, but the feeding of red bean in feed gave the highest survival results. So that it can be concluded that the use of prebiotics from the recommended type of red beans is applied to milkfish feed formulations.

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