



Data Article

Data of feed formulation for Indonesian short-fin eel, *Anguilla bicolor* McClelland, 1844 elver

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ABSTRACT

This article describes the data of raw material compositions for formulating the diet for Indonesian short-fin eel, *Anguilla bicolor* McClelland, 1844 elver. The data on growth performance, survival and feed utilization of eel elver from the formulated diet test results are also presented here. Four formulated diets and one commercial feed were tested for the eel elver. The formulated diet was formulated from animal and plant based protein sources such as; fish meal, cornmeal, soybean meal, fine bran, ebi-shrimp meal, golden snail meal, bloodmeal, and tapioca flour. Vitamins and minerals were added into the diet. In addition, probiotics and papain enzyme and its combination were also included into the experimental diets to boost the growth performance, survival and feed utilization of the fish. The tested treatments were; (A) commercial diet without probiotic and papain enzyme, (B) experimental diet without probiotic and papain enzyme, (C) experimental diet with probiotic 10 ml kg⁻¹ feed, (D) experimental diet with papain enzyme 10 g kg⁻¹ feed, (E) experimental diet with probiotic 10 ml kg⁻¹ + papain 10 g kg⁻¹ feed, (F) experimental diet with probiotic 5 ml kg⁻¹ + papain

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5 g kg⁻¹ feed. Each experimental fish group was fed on an experimental diet twice a day at 08.00 AM and 06.00 PM at feeding level of 10% body weight for 60 days. The results showed that the weight gain ranged between 4.60 g to 5.92 g, daily growth rate between 0.063 g day⁻¹ and 0.098 g per day⁻¹, the specific growth rate varies from 0.72% day⁻¹ to 1.35% day⁻¹, survival rate 50.00% to 73.33%, feed conversion ratio from 2.35 to 4.17, and feed efficiency between 41.82% to 58.98%. The best treatment was found in fish fed on the experimental diet with papain enzyme 10 g kg⁻¹ of feed

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Specifications table

Subject	Agricultural and Biological Sciences
Specific subject area	Aquatic Science
Type of data	Table, and Graph
How data were acquired	The data were acquired from laboratory experiment
Data format	Processed Data
Parameters for data collection	The data of growth performance was collected by measuring the body weight and total length of the fish, the data of survival rate was collected by calculating the total live fish at the end of the experiment, the feed utilization was calculated by comparing total feed taken during the experiment and total weight gain
Description of data collection	The weight gain data were measured at one week interval, the data of survival rate was calculated at the end of the experiment. The weight gain (g), daily growth rate (g day ⁻¹), specific growth rate (% day ⁻¹), survival rate (%), feed conversion ratio and feed efficiency (%) were calculated using a common formula based on De Silva & Anderson [1] and Muchlisin et al. [2]
Data source location	Universitas Syiah Kuala Banda Aceh Indonesia
Data accessibility	The raw data of growth and survival rates are available online at: https://figshare.com/s/3a019cd455de75276eef

Value of the data

- The researchers can develop and expand the study in this or other related fish species
- The farmers and fish feed industry can utilize this feed formulation for improved productivity
- The researchers can modify the experimental design to improve growth performance, high survival rate and feed utilization.
- The farmers can reduce the feeding costs and boost the growth performance of the eels in an aquaculture system

1. Data description

The Indonesian short-fin eel, *Anguilla bicolor* is one of the commercially important fish in Indonesia [3], this species has been culturing in this country. However, the larvae are still supplying from the wild, and therefore it is seasonal depending [4] Besides the difficulty in larvae supplying, the eel is also slow-growing and high larval mortality in the culture system. These are probably due to a discrepancy of the feed by the low quality of the feed, causing feed difficult to digest, especially at larvae and elver stages [5]. Therefore, it is necessary to explore the feed for-

Table 1

Crude protein content and composition of raw materials of the experimental diet with 30% crude protein.

Raw materials	Crude protein (%)	Proportion (g)
Fishmeal	65.8	290
Soybean meal	35.8	100
Ebi shrimp meal	59.4	50
Golden nail meal	51.8	100
Tapioca flour	15.3	30
Bloodmeal	85.2	100
Cornmeal	10	100
Finebran	13.3	160
Vitamins mix	0	10
Minerals mix	0	10
Fish oil	0	50
Total		1000

Table 2Weight gain, daily growth rate and specific growth rates of the eel elver on experimental feed containing probiotic and papain enzyme. Mean±SD in the same column with different superscripts are significantly different ($P<0.05$).

Treatments	Weight gain (g)	Daily growth rate (g day ⁻¹)	Specific growth rate (% day ⁻¹)
Commercial pelleted diet (control A)	4.86±0.086 ^{ab}	0.078±0.009 ^b	0.77±0.05 ^a
Experimental diet without Probiotic or papain Enzyme (control B)	4.60±0.16 ^a	0.063±0.009 ^a	0.72±0.09 ^a
Experimental diet + 10 ml kg ⁻¹ probiotic	5.18±0.63 ^{bc}	0.086±0.010 ^{bc}	0.92±0.12 ^b
Experimental diet with 10 g kg ⁻¹ papain enzyme	5.92±0.04 ^d	0.098±0.0007 ^d	1.35±0.05 ^d
Experimental diet + 10 g kg ⁻¹ papain + 10 ml kg ⁻¹ probiotic	5.33±0.15 ^c	0.088±0.002 ^c	1.15±0.05 ^c
Experimental diet + 5 g kg ⁻¹ papain + 5 ml kg ⁻¹ probiotic	5.25±0.12 ^{bc}	0.087±0.002 ^a	1.05±0.12 ^{bc}

mulation to boost the growth performance of the eels in the aquaculture system. The feed was formulated from animal and plant based protein sources, namely; fish meal, cornmeal, soybean meal, fine bran, ebi-shrimp meal, golden snail meal, bloodmeal, and tapioca flour. The diet was added with probiotic and papain enzyme to increase the digestibility of the feed (Table 1). The probiotic and papain enzyme are promising materials to enhance the digestibility of the feed and trigger the growth rate of the fish [6,7]. The eel elver was fed on formulated diet for 60 days.

The data shows that the weight gain ranges between 4.60 g to 5.92 g, daily growth rate 0.063 g day⁻¹ to 0.098 g day⁻¹, specific growth rate ranges between 0.72% day⁻¹ to 1.35% day⁻¹ (Table 2), survival rate ranges between 50% to 73.33%, feed conversion ratio was 2.35 - 4.17, and feed efficiency was 41.82 - 58.98% (Table 3). The Duncan multiple range tests showed that the highest weight gain, daily growth rate, and specific growth rate were recorded at fish fed on an experimental diet with 10 g kg⁻¹ papain enzyme. These values were significantly different from other treatments. In addition, the higher feed conversion and feed efficiency were also recorded in fish fed on the experimental diet with 10 g kg⁻¹ papain enzyme. Moreover, higher survival rate was also found at 10 g kg⁻¹ papain enzyme, but this value was not significantly different from other treatments except with control B (experimental diet with probiotic or papain enzyme).

Table 3

Survival rate, feed conversion ratio and feed efficiency of the eel elver on experimental feed containing probiotic and papain enzyme. Mean±SD in the same column with different superscripts are significantly different ($P<0.05$).

Treatments	Survival rate (%)	Feed conversion ratio	Feed efficiency (%)
Commercial pelleted diet (control A)	63.33±6.66 ^b	3.82±0.09 ^c	46.48±0.82 ^b
Experimental diet without Probiotic or papain Enzyme (control B)	50.0 ± 8.60 ^a	4.17±0.09 ^c	41.82±1.20 ^a
Experimental diet + 10 ml kg ⁻¹ probiotic	65.0 ± 6.38 ^b	3.22±0.68 ^b	49.04±0.46 ^c
Experimental diet with 10 g kg ⁻¹ papain enzyme	73.3 ± 5.44 ^b	2.35±0.25 ^a	58.98±0.85 ^f
Experimental diet + 10 g kg ⁻¹ papain + 10 ml kg ⁻¹ probiotic	73.3 ± 5.44 ^b	2.90±0.14 ^b	57.07±0.61 ^e
Experimental diet + 5 g kg ⁻¹ papain + 5 ml kg ⁻¹ probiotic	66.6 ± 5.44 ^b	3.25±0.12 ^b	52.99±0.43 ^d

2. Experimental design, materials, and methods

The diet was formulated using plant and animal based protein sources with at least 30% crude protein and 15 crude lipid. The tested treatment is the application of probiotic and papain enzyme and its combinations into the formulated diet. The completely randomized design with three levels of treatments was used in this study. The treatment was done with three replications. The tested treatments are as follows:

- Treatment A= Commercial feed without probiotic and papain enzyme
- Treatment B= Experimental diet without probiotic and papain enzyme
- Treatment C= Experimental diet with probiotic 10 ml kg⁻¹ of feed
- Treatment D= Experimental diet with papain enzyme 10 g kg⁻¹ of feed
- Treatment E= Experimental diet with probiotic 10 ml kg⁻¹ of feed + papain enzyme 10 g kg⁻¹ of feed
- Treatment F= Experimental diet with probiotic 5 ml kg⁻¹ of feed + papain enzyme 5 g kg⁻¹ of feed.

The raw materials were purchased from the local market in Banda Aceh City, Indonesia. The raw materials used are fishmeal, ebi shrimp meal, golden snail meal, blood meal, soybean meal, cornmeal, tapioca flour, and fine bran. The raw materials were analyzed for proximate composition prior to use in the formulation (Table 1). The materials were mixed homogenously then extruded as a pellet, and then sun dried for 24 h. The dried feed was storage at 4 °C prior to use in the experiment.

The commercial probiotic Raja Lele[®] containing *Lactobacillus* bacteria and commercial papain enzyme flour was used in this study. These materials were purchased from the local market in Banda Aceh City. The probiotic or papain enzyme was mixed with 5% egg yolk in the 100 ml distilled water then sprayed homogenously onto the experimental diet, left for 30 min at room temperature prior to use for feeding. The papain enzymewas mixed with other raw materials in the formulation.

A total of 360 eel larvae with average body weight 4.3156 ± .029 g and total length of 14.3159 ± .02 mm were purchased from Karawang West Java and acclimatized for one week in the fiber tank. The fish were fed on a commercial diet two times a day at 08.00 AM and 06.00 PM until satiation. The fish was distributed randomly into 18 plastic containers (vol. 25 L) which have been equipped with aeration at a stocking density of 15 fish per container. The fish was individually measured for initial body weight and total length. The fish was fed on an experimental diet at feeding level of 10% body weight two times a day at 08.00 AM and 06.00 PM for 60 days. The feces and unconsumed feed were siphoned two hours after feeding and the water was refilled to compensate for the siphoning procedure. A total volume of 50% of the water was discharged one-week interval. The data of every replication was calculated for average

value then subjected to one-way Analysis of Variance (ANOVA) followed by Duncan's multiple range test. The analysis was performed using the SPSS software ver. 22.0.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.dib.2020.105581](https://doi.org/10.1016/j.dib.2020.105581).

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