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Research Article

EFFECT OF GIVING PROBIOTICS *PEDIOCOCCUS PENTOSACEUS* ORIGIN IN WEST SUMATRA ON THE PERFORMANCE OF DUCK BAYANG (*ANAS* SPP)

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ABSTRACT

Evaluation of *Pediococcus pentosaceus* application to duck feed was conducted. The research divided into 2 factors, i.e. probiotic doses (A1; 1 ml, A2: 2 ml, A3: 3ml) and probiotic provision (B1: 0 time, B2: 1 time, B3: 2 times, B4: 3 times, B5: 4 times, B6: 5 times). Feed consumption, body weight gain, feed conversion, and carcass percentage of treated ducks were determined. From this research, duck treated with 1 ml probiotic dose for 5 times considered as the best treatment applied with 1307.10 g/week consumption, 369.74 g/week weigh gain, 3.58 feed conversion, and 64.07% carcass percentage. In summary, Pediococcus pentosaceus was potential probiotic to improve duck performance.

Keywords: probiotics, dose, frequency, duck *Bayang*, performance

INTRODUCTION

Probiotics are an alternative antibiotic that can act as a growth booster. Probiotics are generally defined as single or mixed cultures beneficial for human and animal health. Bacteria can simply be grouped into "good and bad" bacteria. Lactic acid bacteria are good bacteria because they only kill/ inhibit the growth of bad bacteria instead of good bacteria. Therefore, lactic acid bacteria are called as probiotics. Pathogenic bacteria are bacteria that cause many diseases such as diarrhea, typhus, tetanus, tuberculosis, even anthrax. If the pathogenic bacteria are more dominant in the environment, then disease[1].

Probiotics are live bacteria given as food supplementation. Probiotics can have a beneficial effect on health where probiotics produce inhibitor compounds such as lactic and acetic acids, which cause the intestinal atmosphere to become acidic and H_2O_2 and bacteriocin which provides antagonistic effects on the growth of pathogenic bacteria, thereby reducing the growth and pathogenicity of these bacteria and improving the balance of intestinal microflora. Microflora which are classified as probiotics, are especially from the Lactobacillus and Bifidobacterium groups[2].

Lactic Acid Bacteria (LAB) in the digestive tract can reduce cholesterol levels, because LAB produces the enzyme Bile Salt Hydrolase (BSH). BSH enzyme is an enzyme that is able to conjugate bile acids to produce free or deconjugated bile salts, then be secreted through feces, so as to reduce cholesterol levels in the blood or in meat. LAB can help with atopic dermatitis in children. LAB helps to absorb nutrients, reduces high blood pressure, and helps lactose digestion for people with lactose intolerance[3,4,5].

Probiotics are living a pathogenic microbes, whose mechanism of action urges non-indigenous microbes to come out of the digestive tract ecosystem and replace the location of pathogenic microbes in the digestive tract. Non-indigenous pathogenic microbes are foreign objects, therefore they are pushed out of the digestive tract. The mechanism of this probiotic in the intestine is to maintain balance, eliminate unwanted microbes, or pathogenic bacteria from the host. The main mechanism of probiotics in maintaining the balance of intestinal microflora, that is, the a pathogen microflora competes with exclusion with pathogenic microflora in attachment and removal of nutrients in the small intestine. Probiotics are also able to stimulate the immune system and reduce the pH of the small intestine so that the presence of pathogenic microflora will be disrupted. On the other hand, the work of probiotics also improves enzyme production, binds mycotoxin and is able to reduce ammonia levels in feces[5].

Probiotic microbes inhibit pathogenic microorganisms by competing to obtain a number of food substrates to be fermented. Substrate food ingredients are needed so that probiotic microbes can develop well and also with the addition of probiotics the composition of intestinal microflora is likely to change so that the number of beneficial microbes increases[6].

Formation of microflora that is balanced and solid in the digestive tract of chicken, has a positive and very beneficial effect on the host and ensures the achievement of excellent chicken health. Increasing the height and width of villi is associated with a wider surface of villi for the absorption of nutrients (nutrients) into the bloodstream[6].

MATERIAL AND METHOD

The research method was carried out with a complete random factorial pattern, the first factor (A) was the dose of probiotic (BAL) administration, which is the treatment of:
A1: Dosage of 1 ml probiotics (12.7 x 10^8 CFU / g)
A2: Dosage of 2 ml probiotics (25.4 x 10^8 CFU / g)
A3: Dosage of 3 ml probiotics (38.1 x 10^8 CFU / g)

The second factor (B) is the frequency of administration during the study as follows:
B1: Provision of probiotics of 0 times
B2: Provision of probiotics for once
B3: Provision of probiotics for twice
B4: Provision of probiotics for 3 times
B5: Provision of probiotics for 4 times
B6: Provision of probiotics for 5 times
B7: Provision of probiotics for 6 times
Measurements of the observed variables are as follows:

1. Consumption (gram/head), calculated based on the amount of ration given each week minus the amount of residual ration each week
2. Body weight gain (gram/head), obtained by calculating the difference between body weight for 1 week and body weight of the previous week.
3. Conversion, calculated by the ratio between the rations consumed with the previous weight gain.
4. Percentage of carcass, calculated by the weight of the carcass divided by the weight of life multiplied by 100%.

The results of the research data were processed by ANOVA test. Influential data is carried out in further testing with statistical processing. 8. Tukey HSD Test.

RESULTS AND DISCUSSION

Feed Consumption

Table 1: Average Consumption of Research Duck Bayang (gram/week)

Frequency	Dose			Average
	1 ml	2 ml	3 ml	
0	997.90	997.90	995.80	997.20
1	1032.40	1032.10	1074.50	1046.33
2	1143.20	1194.40	1211.80	1183.13
3	1279.50	1296.50	1206.20	1260.73
4	1324.00	1231.50	1320.50	1292.00
5	1307.10	1329.10	1340.70	1325.60
6	1331.00	1283.40	1327.10	1313.83
Average	1202.14	1194.99	1210.94	

From Table 1 above, the results showed that the dose of lactic acid bacteria given to shadow ducks had no significant effect (P≥0. 05) on direct consumption of shadow ducks. Meanwhile, the frequency had a very significant effect (P <0.05). There was an interaction between the dose and frequency of lactic acid bacteria administration (P <0.05) on the consumption of shadow rations. The optimal average consumption of rations, namely the administration of probiotics with a dose of 1 ml and frequency of 5 times (1307.10 gram/week). This is in line with the increase of body weight and feed conversion and the weight of the final carcass. The frequency of giving 5 times is a maximum gift and has reached the saturation point so that the additional provision once again becomes 6 times causing a decrease in consumption.

The presence of probiotics in feed can increase enzymatic activity and increase the digestive activity. As a result, nutrients such as fat, protein and carbohydrates, which are usually wasted in the feces will be reduced. Probiotics (starbio) used in feed supplementation are natural bacterial colonies. The use of starbio in feed causes bacteria that are in starbio to help break the tissue structure that is difficult to decompose so that more nutrients can be absorbed and transformed into livestock products[7].

Additional Weight

Table 2: Average Weight gain of research duck Bayang (grams / week)

Frequency	Dose			Average
	1 ml	2 ml	3 ml	
0	170.61	198.81	130.02	166.48
1	182.24	204.69	137.79	174.91
2	260.64	189.01	274.29	241.31
3	333.04	200.09	193.41	242.18
4	265.96	153.26	132.62	183.95
5	369.74	312.55	244.01	308.77
6	187.13	246.65	161.39	198.39
Average	252.77	215.01	181.93	

In Table 2, the effect of doses was very significant (P <0.01) on the weight gain of the duck, as well as on the effect of frequency (P <0.01). There was a very significant interaction (P <0.01) between the dose and frequency of giving LAB to duck weight gain. This means that the single dose or frequency factor or its interaction has a very significant effect on increasing the duck weight. Furthermore, the Tukey HSD test was carried out to find out the treatment that showed a significant effect. The table in the appendix shows that the administration of LAB with a dose of 1 ml and the frequency of 5 times gives high weight gain (369.74 grams).

LAB is able to produce lactic acid as the final product of carbohydrate, hydrogen peroxide and bacteriocin overhaul. The average weight gain of Broiler ducks at the age of 10 weeks with 18% feed protein was 1,545.74 grams[8].

The use of starbio at the level of 0.25% and the level of crude fiber of 6% ration in free-range chicken rations cause an increase in ration consumption and weight gain. Supplementation of probiotics in rations can increase body weight gain, utilization of nutrients and digestibility of nitrogen and phosphorus. Supplementation of probiotics in real rations increased duck body weight gain[9].

Feed Conversion

Table 3: Average Conversion Ration of Research Duck Bayang

Frequency	Dose			Average
	1 ml	2 ml	3 ml	
0	5.85	8.04	10.17	8.02
1	5.67	5.04	7.80	6.17
2	4.39	6.32	8.22	6.31
3	3.84	6.48	6.24	5.52
4	3.61	5.02	5.50	4.71
5	3.58	4.25	4.42	4.08
6	6.23	5.20	7.51	6.31
Average	4.74	5.76	7.12	

One indicator of livestock productivity is conversion which is the ratio between the rations consumed and the resulting body weight gain. The smaller the conversion value means the more efficient the animal is in utilizing the rations obtained to increase body weight per unit weight. The conversion rate of research results varies from 3.58 + 0.11 - 10.17 + 0.53. The lowest conversion is in the combination of treatment dose of 1 ml with a frequency of

5 times (3.58 + 0.11) and the highest in the control (administration of 3 ml with a frequency of 0 times). Feed conversion is also influenced by nutrient composition of rations such as protein and crude fiber. Crude fiber in poultry has the benefit of helping intestinal peristalsis, preventing clumping of feed on the wounds, accelerating the rate of digestion and spurring the development of digestive organs.

High crude fiber causes birds feel full, which can reduce consumption because crude fiber is voluminous. Increased levels of fiber in rations tend to prolong the intestine. The higher the level of crude fiber in the ration, the slower the rate of digestion and absorption of nutrients. Coarse fiber in the ration has a positive function which is stimulating the growth of digestive organs, preventing clotting of rations in the stomach and intestines and aiding intestinal peristalsis[9].

The reduction of ammonia excreta gas levels affects the condition of litter and housing and makes ducks more comfortable, so as to increase ration consumption and support the production process. Ducks given rations with different levels of crude fiber plus probiotics resulted in higher feed consumption than the control ration. Duck fermentation with starbio increases body weight gain, carcass and decreases abdominal fat in Bali ducks aged 2-8 weeks. Probiotics that are used are thought to have an effect on the physiological conditions of the digestive tract, which is to increase the thickness of digestion so that it affects the rate of digestion[10].

Percentage of Carcass

Table 4: Average Percentage of Carcass Research Duck Bayang (%)

Frequency	Dose			Average
	1 ml	2 ml	3 ml	
0	47.08	48,56	48.35	48.00
1	57.16	57.57	57.61	57.45
2	56.76	58.48	57.55	57.60
3	56.89	57.08	63.35	59.11
4	59.19	66.55	66.79	64.18
5	64.07	67.44	72.63	68.05
6	63.60	67.41	66.86	65.96
Average	57.82	60.44	61.88	

The lowest percentage of the carcasses of the research results in table 4 is in the control and the percentage of carcass is required of high quality feed and contains balanced nutrients. The administration of LAB with a dose of 1 ml with a frequency of 5 times during the 8-week study could increase the percentage of Carang duck carcasses by an average of 64.07% which corresponded to feed consumption and body weight gain and feed conversion.

This is caused by an increase in enzymatic activity produced by LAB in digesting proteins, fats and carbohydrates so that their absorption becomes better which in turn can increase the percentage of carcasses. The presence of probiotics in feed can increase enzymatic activity and increase digestive activity. As a result, nutrients such as fat, protein and carbohydrates, which are usually wasted in the feces will be reduced[11].

Probiotics (starbio) used in feed supplementation are natural bacterial colonies. The use of starbio in feed causes bacteria that are in starbio to help break the tissue structure that is difficult to decompose so that more nutrients can be absorbed and transformed into livestock products[12]. The addition of microorganisms (probiotics) into feed will also help digestion, thus affecting feed growth and consumption. Probiotics in the poultry digestive tract produce bacteriocin which suppresses pathogenic bacteria, so that the normal digestive tract, especially the intestinal mucosa and intestinal villi, functions to absorb feed nutrients. When nutrients are absorbed perfectly, the feed consumption increases and growth are also getting better[13].

CONCLUSION

From the results of the research that has been done, it can be concluded that the results of the study of Biological testing of LAB *Pediococcus pentosaceus* (probiotics) given to ducks namely food consumption (1307.10 g) with the frequency of Probiotic for 5 times and a dose of 1 ml. The highest average weight gain (369.74 g) was obtained by giving LAB at 1 ml dose and with the frequency of 5 times. The lowest ration conversion was in a combination of 1 ml dose treatment with a frequency of 5 times (3.58). Percentage of carcass with a dose of 1 ml and frequency of 5 times (64.07%).

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