The Optimalization of Probiotic Based Liquid, Powder and Combination on Broiler Performance

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Abstract. Broiler are live microorganisms that are given in adequate amounts to provide health benefits to the body. Probiotics are live microorganisms that have a good effect on the health of the host (broiler). The use of probiotics for broilers has a function to increase growth and feed efficiency. Giving probiotics in drinking water has the potential to help the digestive system in broilers. The general objective of this research is to examine the use of probiotics as an alternative to AGP (Antibiotic Growth Promoter) in broiler feed and drink. The experimental design used was Completely Randomized Design with 4 treatments and 5 repetitions, namely T0 = Control (Without Probiotics), T1 = Basal Diet + Probiotic Powder (50 mg/Kg), T2 = Drinking Water + Probiotic Liquid (1 ml/L) , and T3= Combination (Basal Diet + Probiotic Powder 25 mg/kg) with (Drinking Water + Probiotic Liquid 0.5 ml/L). Data were analyzed using analysis of variance and further test using LSD (Least Significant Different). Observations made Average Day Gain (ADG), Body Weight (BW) and mortality in broilers related to the use of probiotics. In the observation of body weight at the age of 7, 14, and 21 days, the addition of probiotics was significant. Observation of body weight at the age of 14 days in treatment T2 and T3 was significantly different. In the observation of Average Day Gain (ADG) at the age of 7,14, 21 and 28 days are significant. After further testing, Least Significant Different (LSD) in the grower phase (14 days) was significantly different in T2 and T3 treatments. In monitoring overall mortality for 28 days, the addition of prebiotics significantly reduced mortality compared to controls. The conclusion is that the addition of probiotics is significant in observing the performance of body weight, adg, and mortality. Giving probiotics had a significant effect (T2 and T3) on the addition of ADG grower.

1. Introduction

One of the *SDGs* (Sustainable Development Goals) programs is ensuring food security and good nutrition for food security. Chicken farming is the fastest growing sector in the fulfillment of animal protein. Broiler chicken meat is an alternative provider of animal protein. The selling price of chicken meat in the market is cheaper than the price of beef, goat, and buffalo. The potential for developing chicken into healthy food has great potential to be developed, considering that the taste and acceptance of the community for chicken meat is very good. In early 2018, Indonesia began to ban the use of Antibiotic Growth Promoter (AGP) in feed. One alternative to AGP is the use of feed additives made from herbal, natural, and compounds that do not contain residues harmful to the human body. Research from Chicken performance can be improved through natural and animal source [1]. Probiotics are live microorganisms that are given in adequate amounts to provide health benefits to the body. Probiotic type LAB (*Lactic Acid Bacteria*) has the potential to be used as a supplement to feed or drink broiler chickens to improve performance as one of the AGP replacer technologies.

Probiotics are live bacteria that are capable of providing health effects on other organisms/hosts. The benefits of using probiotics for broilers include: support the digestive system in broilers, increase feed digestibility, maintain healthy intestinal microflora, prevent intestinal damage, and maintain broiler endurance. Bacillus-based probiotics are particularly suitable for use in broiler feeds. Probiotic spores are metabolically inactive and resistant to the environment. Bacillus-based probiotics are the

main mechanisms for preventing disease and maintaining chicken health, being able to produce biofilms in the upper villi of enterocyt, competing in exclusion, producing bacteriocin and modulating the immune system [2]. The results of the evaluation of the Ross male broiler on gut performance and quality with a diet with reduced energy metabolism in feed was able to increase the weight of the villi to the ratio of the jejunum and ileum, and was able to significantly reduce the weight of the liver [3]. Mortality is the number or number of deaths in broilers. The results of the evaluation of observations from [4] stated that probiotic threatment did not have much effect on broiler chicken performance, only at the age of 0-14 days in the observation that mortality in controls was higher than threatment. ADG in broilers is the average increase in body weight which is usually expressed in days, ADG is usually observed every seven days. According to [5], giving probiotics affects body weight gain in broiler chickens. Provision of probiotics in feed provides additional ADG and carcass weight and BW up to 12% [6]. Provision of probiotics has a significant effect on broiler chicken body weight [7]. According to[5], giving probiotics can increase chicken body weight, the higher the probiotics, the better body weight gain. Provision of probiotics as much as 50 mg/kg for 1-21 days and 22-42 days of broiler rearing resulted in higher body weight than control [8].

2. Methods

The ingredients used were 400 broilers of Ross strain, the feed given was 10 sacks of Galaxy Series brand commercial feed from CJ, 2 kg of liquid probiotics and BAL powder, husks for the base, lime for disinfectant. The equipment used is a broiler chicken coop, scales, knives, trays, feed containers, drinking containers, temperature and lamps (heaters). The study design used Completely Randomized Design, 4 treatments x 5 replications, T0 = control (without probiotics), T1 = basal diet + probiotic powder (50 mg/Kg), T2 = drinking water + probiotic liquid (50 ml/l), and T3 = combination (Basal Diet + Probiotic Powder 50 mg/kg) with (Drinking Water + Probiotic Liquid 50 ml/L). The data is processed using analysis of variance and for futher test using LSD. Parameters observed included body weight (BW), average daily body weight gain (ADG), and number of mortality.

3. Results and Discussion

The observed performance includes mortality, Average Day Gain (ADG), Body Weight (BW) and mortality. Observed parameter Probiotic on broiler performance can be seen in **Table.1.** In the observation of body weight at the age of 7, 14, and 21 days, the addition of probiotics was significant. Observation of Body Weight (BW) at the age of 14 days in treatment T2 and T3 was significantly different. Provision of probiotics has a significant effect on broiler chicken body weight folow [7]. In the observation of Average Day Gain (ADG) at the age of 7,14, 21 and 28 days are significant. After further testing, Least Significant Different (LSD) in the grower phase (14 days) was significantly different in T2 and T3 treatments. According to [5] giving probiotics affects body weight gain in broiler chickens. Provision of probiotics in feed provides additional ADG follow [6]. In monitoring overall mortality for 28 days, the addition of prebiotics significantly reduced mortality compared to controls, not according the evaluation of observations from [4] stated that probiotic threatment did not have much effect on broiler chicken performance.

Table. 1 Observation BW, ADG, and Mortality

No	Parameters	T0 (Control)	T1	T2	T3
1	Body Weight(kg/b) (7d)	0.17 ± 0.005^{a}	0.18 ± 0.016^{a}	0.19±0.083a	0.19±0.027a
	Body Weight(kg/b) (14d)	0.45 ± 0.068^{a}	0.49 ± 0.025^{a}	0.57±0.035b	0.51±0.040ab
	Body Weight(kg/b) (21d)	0.86 ± 0.023^{a}	0.91 ± 0.020^{a}	0.93±0.041a	0.89±0.037a
	Body Weight(kg/b) (28d)	1.28 ± 0.040^{ns}	1.36 ± 0.051^{ns}	1.55 ± 0.054^{ns}	0.41 ± 0.040^{ns}
2	Average Day Gain (ADG) kg/b/d (7d)	0.045 ± 0.060^{a}	0.045 ± 0.063^{a}	0.048 ± 0.067^{a}	0.048 ± 0.066^{a}
	Average Day Gain (ADG) kg/b/d (14d)	0.041 ± 0.009^{a}	0.045 ± 0.004^{a}	0.048 ± 0.005^{b}	0.047 ± 0.007^{ab}
	Average Day Gain (ADG) kg/b/d (21d)	0.057 ± 0.008^{a}	0.059 ± 0.004^{a}	0.057 ± 0.007^{a}	$0.054\pm0.010_{a}$
	Average Day Gain (ADG) kg/b/d (28d)	0.059 ± 0.005^{a}	0.064 ± 0.008^{a}	0.088 ± 0.007^{a}	0.074 ± 0.009^{a}
3	Number of Mortality (b)	0.16 ± 0.408^{a}	0.16 ± 0.408^{a}	0.33 ± 0.516^{a}	0.33 ± 0.516^{a}

Description : a,b = values followed by unequal letters in a row indicating significant significantly different ($P<0.05$).

4. Conclusions

The conclusion is that the addition of probiotics is significant in observing the performance of body weight, adg, and mortality. Giving probiotics had a significant effect (T2 and T3) on the addition of ADG grower.

5. References

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