Probiotic Lactobacillus Acidophilus La-14 as Feed Additive Substitute for Antibiotic Therapy in Broilers

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Abstract. The intake of quality nutrition is key, one of which is the consumption of protein which is important for health. In pandemic conditions, the quality of life determines whether people can avoid COVID-19. To meet the high demand for broiler chickens in feed, feed additives and Growth Promoter Anti-Biotics (AGP) in the form of antibiotics to accelerate growth and endurance. Unwise use of antibiotics will cause antibiotic residues and resistance or Antimicrobial Resistance (AMR), namely the ability of microorganisms to withstand antimicrobial treatment (antibiotics). In the treatment of COVID-19, which was rampant, it should be avoided the presence of infections due to AMR because of the difficulty of treatment and increased mortality. Purpose: This study aimed to replace antibiotic therapy with probiotic Lactobacillus acidophilus La-14 in broilers to avoid the occurrence of AMR in the community. How it works: This type of study is an experimental study using chicks aged six days treated using Lactobacillus acidophilus La-14 bacteria, given therapy, and negative control without any treatment. Data analysis was taken qualitatively and quantifiably. Qualitative data analysis refers to data, information, and research that has previously been carried out. In contrast, quantitative data analysis was carried out by referring to the results of this study, namely the research using chicks on the growth, health of chickens, and weight gain. Weight measurement using a digital balance sheet is expected to be read until the increase in the number 1 behind the comma.

Keywords: AMR · Resistant · Broiler · Lactobacillus acidophilus La-14 · Therapy

1 Introduction

The use of antibiotics as additives has been banned in Indonesia since January 2018, in accordance with the Regulation of the Minister of Agriculture No.14/PERMENTAN/PK.350/5/2017 concerning the classification of veterinary drugs [1]. The use of antibiotics in spurring livestock growth is feared to cause antibiotic residues that can cause bacterial resistance. It harms livestock and adversely affects the health of the humans who consume them because the antibiotics used are semi-synthetic

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products [2]. As a substitute for antibiotics in maintaining the immune system of livestock and to increase livestock productivity, other alternative ingredients can be used as a substitute for AGP, which contains natural growth promoters, one of which is probiotics [3].

2 Methods

This is experimental research using 6-day-old chicks treated with Lactobacillus acidophilus La-14 bacteria, given therapy and negative control without any treatment. Analysis of the data was taken by referring to the research results carried out, namely the measurement of body weight, which was carried out every week for four weeks using a digital balance. A data source was obtained based on literature studies, case studies, and research to be carried out. The provision of probiotic Lactobacillus acidophilus L-14 was used as a substitute for feed additive as a substitute for antibiotic growth promoters. The first treatment was that the chicks were fed Lactobacillus acidophilus L-14 for six days, while the second treatment was that the chicks were given therapy. The method used to test the ability of Lactobacillus acidophilus L-14 on the growth and development of broilers is weighing and measuring the body circumference of the broilers.

3 Result

The results were not much different between the antibiotic therapy treatment with Lactobacillus acidophilus La-14 probiotics, while the negative control results were far below the treatment given. The following Table 1. Gives a summary of all heading levels.

The results of weight observations showed the average that Lactobacillus acidophilus L-14 substitute feeds additive antibiotic replacement therapy in broilers. The results of data analysis using SPSS for Windows version 21 showed normally distributed data with a value of $P = 0.200 > \alpha = 0.05$. While the data of the homogeneity test using LEvene's test was presented in Table 2 (Table 3 and Fig. 1).

Giving probiotic Lactobacillus acidophilus La-14 as a feed additive makes chick-ens gain weight significantly. Chickens also look healthier compared to the use of antibiotic therapy, so it can be concluded that Lactobacillus acidophilus La-14 probiotics can replace feed-additive substitute antibiotics for broiler chickens [4]. Residues of antibiotics in food can threaten public health. The threat is in the form of negative impacts that result in the community, including bacterial resistance, allergies, food, and poisoning [5]. In the world of feed, it is important to remember that there are two types of feed additives, namely, feed additives and feed supplements [6]. Feed additives are feed ingredients added to feed but are not a source of nutrition, so they cannot replace feed nutrients. Examples are enzymes (mannose, protease, and others), antibiotics, antioxidants, probiotics, and flavoring agents [7].

Table 1. Results obtained were not much different between the antibiotic therapy treatment with probiotics Lactobacillus acidophilus La-14, while the negative control results were far below the treatment given

TREATMENT	Test	CALCULATION OF WEIGHT (gr) FOR 4 WEEKS				AVERAGE AMOUNT
		1	2	3	4	
THERAPY	1	12.2	15.5	16.7	17.2	15.4
	2	10.6	16.6	17.2	19.3	15.9
	3	9.1	12.2	14.6	16.3	13.5
	4	10.3	13.8	15.3	17.5	14.1
	5	10.5	14.1	15.7	17.3	14.4
Lactobacillus acidophilus L-14	1	12.1	14.2	16.6	20.2	15.7
	2	10.3	15.3	17.5	19.7	15.7
	3	9.8	13.5	16.8	18.7	14.7
	4	10.7	13.9	15.2	16.8	14.1
	5	10.2	15	18.3	19.2	15.7
No Treatment	1	12.7	13.6	14.6	15.4	14.1
	2	9.6	12.7	13.6	16.2	13.0
	3	11.1	12.4	14.3	15.6	13.3
	4	11.3	13.6	14.6	16.3	13.9
	5	10.3	14.6	16.3	17.2	14.6

P = Repetition of treatment; M = Week of weighing time and examination of chickens

Table 2. Test of Homogeneity of Variances

	Levene's test	df1	df2	Sig.
M1	.131	2	12	.878
M2	2.002	2	12	.178
M3	.139	2	12	.871
M4	.496	2	12	.621

Table 3. Analyze the significance of the between group and within group

		Sum of Squares	df	Mean Square	F	Sig.
M1	Between Groups	.604	2	.302	.269	.769
	Within Groups	13.480	12	1.123		
	Total	14.084	14			
M2	Between Groups	3.545	2	1.773	1.281	.313
	Within Groups	16.608	12	1.384		
	Total	20.153	14			
M3	Between Groups	12.148	2	6.074	5.330	.022
	Within Groups	13.676	12	1.140		
	Total	25.824	14			
M4	Between Groups	19.321	2	9.661	8.482	.005
	Within Groups	13.668	12	1.139		
	Total	32.989	14			

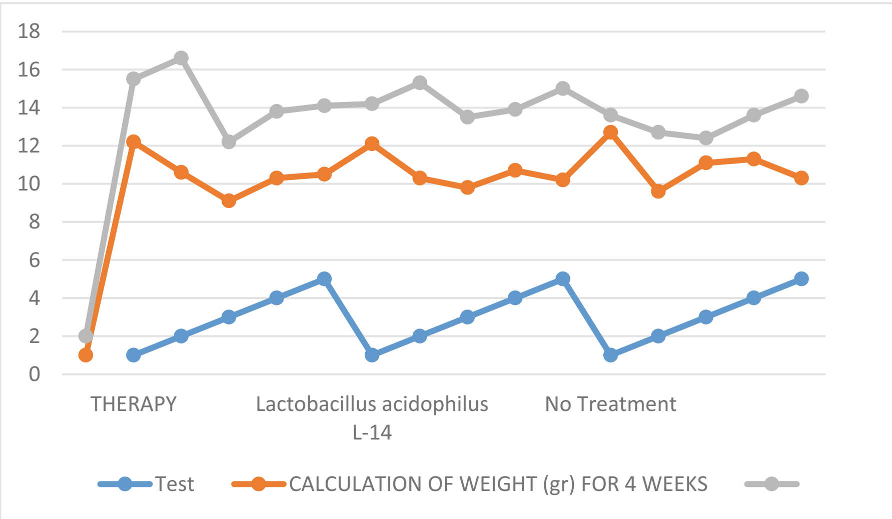

Fig. 1. Diagram of the results of probiotic administration of Lactobacillus acidophilus and control of negative-positive with treatment control. For reference citations, the researchers preferred using square brackets and consecutive numbers. Citations using labels or the author/year convention are also acceptable.

4 Conclusion

As a substitute for antibiotics in maintaining the livestock immune system and increasing livestock productivity, other alternative materials can be used as a substitute for the Antibiotic Growth Promoter (AGP), which contains natural growth promoters, one of which is probiotics [5]. Lactobacillus acidophilus has long been known as a normal flora that functions as a probiotic agent that can inhibit the growth of the infection, causing bacteria, and can produce lactic acid as the main product of sugar fermentation [8]. Lactobacillus acidophilus can function for immunity because these bacteria can stimulate the formation of antibodies that prevent excess growth of harmful bacteria, prevent urinary tract infections, and increase protection against pathogens, viruses, bad-band bacteria, and chemotherapy [9]. Increased immunity by Lactobacillus acidophilus is associated with IgA levels. Systemically, it raises the role of T regulators that will inhibit excessive Th2 activity, as well as excessive Th1 activity [10]. Probiotics also activate non-specific (innate) and specific (adapted) immune responses. Lactobacillus acidophilus bacteria also stimulate the production of cytokines in the blood and increase macrophage e activity [11].

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