TOTAL BACTERIA AND THE GRAM-POSITIVE AND NEGATIVE BACTERIA OF SMALL INTESTINES BROILERS IN STARTER PERIOD WITH DIFFERENT METHODS OF GIVING PROBIOTICS

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Abstract. The objective of the study was to evaluated total bacteria and the existence of positive and negative gram bacteria of small intestines broilers in starter period with different methods of giving probiotics Lactobacillus Sp. The completely randomized design with 4 treatments and 5 replications was used in the research. The treatments were T0 = Control without probiotics, T1 = Force feeding method, T2 = Giving Lactobacillus Sp. On Feed, T3 = Giving Lactobacillus Sp. on drinking Water. Data of bacteria population were evaluated by descriptive analysis. The Result showed that the total bacteria of small intestines broilers in starter period with given probiotics Lactobacillus Sp. (T1, T2 dan T3) were lower compared to control treatment. Most of the microbes of small intestines broilers in starter period with given probiotics Lactobacillus Sp. (T1, T2 dan T3) were Gram-positive rods, followed by Gram-positive cocci and Gram-positive duplococci, the gram-negative rods bacteria were founded at small intestines broilers in starter period with control treatments. The conclusion was the total bacteria at small intestines broilers in starter period with given probiotics Lactobacillus Sp. was decreased and there were positive gram bacteria, and suppress negative bacteria.

1. Introduction
In commercial broiler production, feeds represents the major portion of production cost. The diets stimulate certain bacteria (e.g., Lactobacillus) that can increase digestive enzyme activity while suppressing some bacteria (e.g., Escherichia coli) as known probiotics [1]. Probiotics are live microbial feed supplement used by poultry producers to protect animals from enteric pathogen infection and improve animal health [2].

Compare with antibiotic growth promoters (AGP) in poultry production, probiotics are not leave residues in animal product. There are some methods for giving probiotics that are force feeding, giving in the feed and drinking water. The objective of the study was to evaluated total bacteria and the existence of positive and negative gram bacteria of small intestines broilers in starter period with different methods of giving probiotics Lactobacillus Sp. The novelty of this research was probiotics Lactobacillus Sp. isolated from indigenous chicken. The objective of the study was to evaluated total bacteria and the existence of positive and negative gram bacteria of small intestines broilers in starter period with different methods of giving probiotics Lactobacillus Sp.

2. Materials and Methods
2.1. Materials
Research was done on Laboratory Feed Technology, Faculty of Animal and Agricultural Sciences, Diponegoro University. Materials research were 200 days old chick (DOC) strain Cobb unsex, isolate
Lactobacillus Sp. and complete feed. The complete feed contained metabolism energy 3000 MJ/Kg and crude protein 20 % non antibiotic growth promoters (AGP).

2.2. Maintenance of Broilers
Two hundred broilers divided into 4 group with 4 treatments, 5 replications and 10 units. Maintenance of broilers started with cleaning cage space then conducted disinfection and fumigation. For one days, DOC was given sugar water. In group T1, Lactobacillus Sp was given by force feeding each day with 1 ml concentrations of 10⁹ cfu/ml. One groups of DOC (T2) were given by 2 % Lactobacillus Sp on feed and T3 Groups were given by 2 % Lactobacillus Sp on drinking water. Maintenance was performed for 15 days.

2.3. Statistical Analysis
The Completely Randomized Design (CRD) consisted of 4 treatments and 5 replications with 10 experimental units. The treatments were P0 = Control, P1 = Salmonella pullorum, P2 = Probiotics Lactobacillus salivarius, P3 = Salmonella pullorum + probiotics Lactobacillus salivarius. The parameters were total bacteria and the existence of positive and negative gram bacteria. The data were obtained by descriptive analysis.

3. Results and Discussion
The total bacteria and the existence of positive and negative gram bacteria of small intestines broilers in starter period with different methods of giving probiotics Lactobacillus Sp of shows in Table 1 and Table 2.

Table 1. Average of Total Bacteria at Small Intestines of Broilers in starter period with different methods of giving probiotics Lactobacillus Sp.

| Treatments                  | Total Bacteria (cfu/g) |
|-----------------------------|------------------------|
| Control                     | 6.8 x 10⁸±0.1          |
| Force feeding               | 4.8 x 10⁷±0.1          |
| Probiotics in feed          | 5.9 x 10⁷±0.1          |
| Probiotics in drinking water| 4.2 x 10⁷±0.1          |

Table 1. showed that the total bacteria of small intestines broilers in starter period with given probiotics Lactobacillus Sp. (T1, T2 dan T3) were lower compared to control treatment. The small intestines of chicken harbors a complex microbiome, which is composed of bacteria. Between 20 – 60% of the total small intestines bacteria could be cultivated depending on chicken age [3]. There are an exist extensive interactions of this intestinal microbiome with poultry host and diet, and also interactions among individual gut microbes, which have profound effects on poultry nutrition and health, and importance to poultry production [4].

Table 2. The existence of positive and negative gram bacteria of small intestines broilers in starter period with different methods of giving probiotics Lactobacillus Sp.

| Treatments                  | Total Bacteria (cfu/g) |
|-----------------------------|------------------------|
| Control                     | Gram-positive rods, Gram-positive cocci and Gram-positive duplococci, gram-negative rods |
| Force feeding               | Gram-positive rods, Gram-positive cocci and Gram-positive duplococci |
| Probiotics in feed          | Gram-positive rods, Gram-positive cocci and Gram-positive duplococci |
| Probiotics in drinking water| Gram-positive rods, Gram-positive cocci and Gram-positive duplococci |

Table 2 showed that the existence of positive and negative gram bacteria of small intestines broilers in starter period with different methods of giving probiotics Lactobacillus Sp were dominated with gram-
positive bacteria. The first cultivation-based study on the intestinal microbiome of domesticated turkeys was reported in 1983 [5], most (77%) of the microbes were Gram-positive rods, followed by Gram-negative rods (14%), and Gram-positive cocci (9%). The cecum of chickens composed of Lactobacilli bacteria (>10^4/g colony forming units, CFUs) and clostridia (10^2–10^4/g CFUs) in the small intestines and high abundance (10^{10}–10^{11}/g microscope counts) of anaerobic bacteria in the cecum of chickens [6]. Colonization with microorganisms in the poultry gut occurs immediately after hatch and microbial succession follows until eventual establishment of a complex and dynamic microbiome. It was recommendation that probiotics *Lactobacillus* Sp. can be used to control intestinal health of broilers.

4. Conclusion
The conclusion was the total bacteria at small intestines broilers in starter period with given probiotics *Lactobacillus* Sp. was decreased and there were positive gram bacteria, and suppress negative bacteria.

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