The Influence of Lactic Acid Bacteria *Lactobasillus Casei* For performance of Broiler

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**Abstract.** This research aims to determine the influence of addition of probiotic lactic acid bacteria *Lactobasillus casei* which derived from Yakult toward the performance of broiler chicken. This research used complete randomized design with four treatments and two replications. This research used 60 DOC CP 707 from Charoen Pokhpand Indonesia, Yakult as the source of bacteria *Lactobasillus casei*, commercial feed 511 and 311, and drinking water. If the F count treatment is higher than F table of 5 % meal, so it would continued with Duncan test. This research was carried out with direct observation and weighing in the experimental field. Based on the result of the research it can be seen that the addition of lactic acid bacteria *Lactobasillus casei* had a very significant effect (P <0.01) on body weight gain and feed conversion and had no significant effect (P> 0.05) on the consumption of broiler chicken feed. Based on the results of the research it can be concluded that the addition of lactic acid bacteria *Lactobasillus casei* has an effect on body weight gain and feed conversion. Where the *lactobasillus casei* lactic acid bacteria doses 1.5 ml helps digestion and absorption of fed so it can increase the body weight gain with the best feed conversion.

1. **Introduction**

Broiler chicken has an essential role as source of animal protein from poultry. Chicken meat which spread in Indonesia is mostly from broiler chicken [1]. Feed is an important factor in livestock business to achieve the optimum productivity [2]. Feed is consist many of ingredients which contain of particles that can be digested and absorbed by poultry. Feed additive in the form of antibiotic is often used in ration to optimize the production of poultry [3]. The use of antibiotics in the livestock industry, beside being utilized for medicinal purposes, is also utilized as feed additives so that it can accelerate the growth of livestock [4].

That the use of antibiotics in cattle increase extremely, including broiler chicken to accelerate the growth rate of body weight [2] . Antibiotic Growth Promotor (AGP) which widely utilized to accelerate the production begin to be banned due to the possibility of its negative impact on consumers [5]. The effort in finding the replacement is focused on natural material such as microbes and their metabolites in the form of organic acids [6].

There are many studies focused on alternative growth booster products that can be used, like the use of probiotic in poultry can be utilized to reduce or prevent the occurrence of disease-causing microbial contamination of poultry products, so that the products remain hygienic. The giving of probiotic in broilers is also reported to improve growth, conversion rates and increase the availability of vitamins and other feed substances. Thus the giving of probiotic in poultry is expected to be able to improve the performance of production both in quantity, like the number of livestock, meat or eggs produced more, as well as the quality in the form of healthy products which are safe to be consumed [7].
Probiotics are able to produce useful substances, reduce the population of pathogenic microbes in the digestive tract, improve the health and strength of livestock immunity. To maintain the efficiency of broiler production and provide livestock products which are safe for consumption, an alternative way to use antibiotics or drugs in the livestock industry should be done by providing probiotics such as lactic acid bacteria. Lactic acid bacteria besides producing bacteriocin also provide physiological effects on health, namely as a supplement (in food and drink), drugs (such as natural antibiotics), therapeutic effects (such as hypcholesterol and antihypertension, prevention of diarrhea). Lactobacillus microbes contained in this probiotic can survive up to the intestine and have the ability to produce lactic acid and acetic acid which can suppress the growth of pathogenic bacteria. Microbes found in the digestive tract consist of two types, some are beneficial while others are harmful. Probiotic lactobacilli bacteria works anaerobically to produce lactic acid resulting the decrease of pH of digestive tract which hamper the development and growth of pathogenic bacteria. It is in line with the opinion [8] that there are some benefits of utilizing probiotic in livestock like accelerating the growth and improve feed conversion which in line with the theories of Ref. [9] and Ref. [10], that giving probiotic in broiler is reported to improve the growth and feed conversion and giving probiotic in broiler should be carried out during three weeks of maintenance. Based on the previous study who use 0.25% of Starbio probiotics in feed can increase broiler body weight until the age of six weeks and improve the use of crude fibre in feed up to 6% [11].

The purpose of the study is to determine the effect of the addition of lactic acid bacteria Lactobacillus casei to body weight gain, feed consumption and feed conversion in broiler chicken.

2. Materials and Method

2.1. Materials and tools
The ingredients used in this study were: broiler chickens from PT Charoen Pokhpand Indonesia approximately 60 chickens, feed 3.11 was given at the 1-3 days and feed 5.11 was given at the age of 3-28 days with nutrient content of feed max moisture content: 13.0% crude protein min 21.0%, crude fat max 7.0% crude fiber max 6.0% and max ash 8.0%, Yakult which contain more than 6.5 billion bacteria Lactobacillus Casei Shirota strains, drinking water (given continuously).

The tools used in the study were: battery cages sized 40 x 40 x 60 cm, lights, knife, scale, box for drink and feed, syringes 0.5 ml, 1 ml, 1.5 ml and 2 ml, cleaning equipment: broom, napkin, and bucket.

2.2. Research method
The design used in this study was a complete randomized design with five treatments and four replications: P0 = without the addition of BAL; P1 = Probiotics BAL Lactobacillus Casei 0.5 ml; P2 = Probiotics BAL Lactobacillus Casei 1 ml; P3 = Probiotics BAL Lactobacillus Casei 1.5 ml; P4 = Probiotics BAL Lactobacillus Casei 2 ml. In each experiment, there were three broiler chicken.

2.3. Research Stage
The cage used in this study was made with a battery system equipped with a feeder, waterer and lamp. On the side of enclosure covered with a terpaulin during the starter period. It was intended that the cage was kept warm. Two weeks before the study begin, cage was cleaned, doused with lime water and curtain sprayed using disinfectant. Likewise, the research equipments used were available in a clean condition one day before the chicken arrives. Then, cage was sprayed with disinfectant from inside to the outside. The chick were weighed at the beginning of the experiment when chicks in. Then the chickens were put in the battery system cage where each cage consisted of three chickens. Chicken were feed from 7.00 am and 3.00 pm. Water were supplied ad libitum to the broiler throughout the experimental period. Yakult (as the source of Lactobacillus casei probiotic) was given based on the treatment dose given at 10.00 am by drenching. Weighing the remaining feed was done every day in the morning before the next feed was given. Body weigh was scaled every week.

3. Result and Discussion
From Table 1, shown the addition of probiotic lactic acid bacteria *Lactobacillus casei* are not significantly different (P>0.05) at treatment P0, P1, P2, P4 and significantly different (P<0.01) at treatment P4 of body weight gain. The highest body weight throughout all of the week was observed in P4, this is because probiotic lactic acid *Lactobacillus casei* in accelerating growth and feed conversion. This result supported by Ref. [8] that mention the advantages of probiotic for animal is to improve growth and feed conversion. And also Ref. [10], mention that probiotic would increase body weight gain and improve feed conversion to broiler. *Lactobacillus casei* would increase nutrition adsorption in the intestine, that would cause optimum digestibility performance. This observation agree with Ref. [12], mention that lactic acid *Lactobacillus casei* would increase intestine vili-vili and improving the nutrition adsorption, increasing digestibility, maintaining broiler health and providing enzyme that capable to digest fibre, fat and protein. The low weight gain of treatment P4 (54.75) can be caused by the doses that given , has interfered the microbe balance at digestive system. Based on [13] [14] [15] stated that probiotic also has some disadvantages and negative impact if it is given with inappropriate doses. From the table above, shown that the addition lactic acid probiotic *Lactobacillus casei* was non-significantly different (P>0.05) on feed consumption.

### Tabel 1. Average performances of broiler during experiment

| Treatment | Weight gain (g/h) | Feed consumption | FCR  |
|-----------|-------------------|------------------|------|
| P0        | 60.81a            | 94.78a           | 1.56a|
| P1        | 59.88a            | 89.63a           | 1.50b|
| P2        | 60.27a            | 91.20a           | 1.51b|
| P3        | 61.45a            | 89.05a           | 1.47b|
| P4        | 53.75b            | 87.97a           | 1.61a|
| SE        | 1.22              | 1.73             | 1.73 |

a’b: value bearing different superscripts in a row differ significantly (P<0.01).

This is caused by the feed that used in this experiment were similar, both the composition and the nutrition especially the content of metabolizable energy and crude protein in the feed. In line with the opinion from [15] stated that, the total of feed consumption is determined by the energy content in the feed. Feed consumption would decrease if content of the energy are low. Furthermore, broiler would stop eating if theirs metabolize energy have been fulfilled. Stated that, probiotic would improve intestine track and increasing digestibility by pushing pathogen bacteria at intestine track so by that it would support good bacteria to adsorb the nutrition in the feed [5].

From the table above, shown that the addition probiotic lactic acid *Lactobacillus casei* did not differ significantly (P>0.05) on feed conversion to treatment P1,P2,P3 and different significantly (P<0.01) to treatment P0 and P4. It caused by the giving of right doses of probiotic lactic acid would affect feed conversion. The smaller the feed conversion ration shows the better efficiency of the feed consumption. If the comparison rate is small, it means the body weight gain is satisfying or broiler did not have to eat much to increase the body weight [16]. Ref. [6] mention that, the probiotic would expand adsorption area because it affects intestine anatomy, that make vili intestine would become longer and increasing density. This observation in line with [17] stated that, the existence of probiotic would increase the enzyme activity and improve digestibility. As a result, nutrition such as fat, protein and carbohydrate which are usually wasted in faeces will be reduced. Furthermore, the addition of probiotic would improve growth, health and feed conversion [18]. Probiotic microorganism would improve the adsorption of the nutrient by producing metabolism that would create new tissues, so it would improve feed conversion.

### 4. Conclusions

Based in the result of the research which has been done, it can be concluded that the addition of probiotic lactic acid *Lactobacillus casei* has an effect on body weight and feed conversion. As long as, the probiotic lactic acid of *Lactobacillus casei* doses 1.5 ml help digestible process and adsorption nutrient that increase the body weight gain with the best feed conversion rate.
References

[1] Resnawati H. 2005. Preferensi Konsumen terhadap Daging Dada Ayam Pedaging yang Diberi Ransum Menggunakan Tepung Cacing Tanah (Lumbricusrubellus).
[2] Anastasia Y. 2011. Teknik Analisis Residu Golongan Tetrasiklin dalam Daging Ayam secara Kromatografi Cair Kinerja Tinggi. Buletin Teknik Pertanian.
[3] Wahyurinaningsih S. 2001. Persentase Berat Karkas, Organ Dalam dan Lemak Abdominal Ayam Broiler yang Diberi Antibiotik Zinc bacitracin, Probiotik Bacillus sp. dan Saccharomyces cerevisiae dalam Ransumnnya. Bogor (ID): Institut Pertanian Bogor.
[4] Yuningsih, S. 2005. Keberadaan Residu Antibiotika dalam Produk Peternakan (Susu dan Daging). Lokakarya Nasional Keamanan Pangan Produk Peternakan. 48-5.
[5] Kompiang IP. 2002. Pengaruh Ragi: Saccharomyces Cerevisiae dan Ragi Laut sebagai Pakan Imbuhkan Probiotik terhadap Kinerja Unggas.
[6] Kompiang, IP. 2009. Pemanfaatan Mikroorganisme Sebagai Probiotik untuk Meningkatkan Ternak Unggas di Indonesia. Pusat Penelitian dan Pengembangan Peternakan. Bogor.
[7] Agus. 2004. Pemanfaatan Probiotik Dalam Meningkatkan Penampilan Produksi Ternak Unggas. Prog Pascasarjana Institut Pertanian Bogor.
[8] Havenaar, R., & Huis, I. 1992. Probiotic: A General View, In Wood, B.J.B. (Ed.). The Lactic Acid Bacteria in Health and Disease, pp.
[9] Barrow, P.A. 1992. Probiotic for Chicken. In Fuller, R. (Ed.) Probiotic.
[10] Yeo, J., & Kim, K. 1997. Effect of Feeding Diets Containing an Antibiotic, A Probiotik, or Yucca Extract on Growth and Intestinal Urease Activity in Broiler Chicks.
[11] GunawandanSundari. 2003. Pengaruh Penggunaan Probiotik Dalam Ransum Terhadap Produktivitas Ayam. Institut Pertanian Bogor.
[12] Wahuudy, A. dan L.Hendraningsih. 2007. Probiotik, Konsep dan Penerapan pada Ternak rumiansia. UMM Press. Malang
[13] Petterson, J. A., and K. M. Burkholder, 2003. Application of prebiotic and probiotic in poultry production. Poultry science 82: 627-631
[14] Cavazzoni, V., A.Adami and C. Castrovilli, 1998. Performance of broiler chickens suplemented with Bacillus coagulans as probiotic. Brit. Poult. Sci. 39:526-529.
[15] Jull MA. 1979. Poultry Husbandry. Ed ke-3. New York: Tatu McGraw Hill.
[16] Sidadolog, J.H.P. 2011. Manajemen Ternak Unggas. Fakultas Peternakan Universitas Gadjah Mada. Yogyakarta.
[17] Jin, L. Z., Y. W. Ho, N. Abdullah and S. Jalaludin., 1997. Probiotic in Poultry: Modes of Action. Worlds Poultry Science Journal.
[18] Tortureo, A., A. Brenes and J. Rioperez. 1975. The influence of intestinal (caeca) flora on serum and egg yolk cholesterol level in laying hens. Poultry Science.
[19] Daud, M. 2005. Performan dan Kualitas Karkas Ayam Pedaging yang diberi Probiotik dan Prebiotik dalam Ransum. Tesis. Institut Pertanian Bogor. Bogor.