The use of probiotics bio l on the production performance and quality of KUB chicken’s eggs

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Abstract. The superior of native chicken from Agricultural Research and Development Center (KUB) is a chicken selected by 6 generations. The purpose of this study was to examine the effect of Probiotic Bio L on production performance and quality of chicken eggs in the R & D Kampung Superior. The research method used was experimental using a completely randomized design (CRD). Treatment using 60 KUB chickens aged 22 weeks (Layer phase) Divided into 3 P0: feed according to the farmer; P1: concentrate (25%), corn (40%) and bran (35%); P2: P1 + Bio B 2 cc / 1 litre of water; the number of administration is 80-90 g / head / day. The results showed that the growth rate and egg production of P2 treatment were statistically significantly higher (P <0.05) when compared to treatments P1 and P0. Therefore, in terms of consuming P2 ration, it was the most efficient way of absorbing the feed given, with conversion of rations 3.44 was significantly lower (P <0.05) than other treatments. Likewise, with the chemical quality of eggs can increase egg yolk protein by 7.6% and reduce yolk fat content by 16.15%.

1. Introduction
KUB chickens are local chickens that have been selected to produce superior seeds which are expected to produce good performance in order to obtain egg yields. The superior chicken Balitbangtan (KUB) as the result of the selection of chickens is able to produce higher eggs compared to ordinary native chickens. Therefore, the spawning performance is influenced by the ration treatment given during the growth period, so the laying performance is 22-42 weeks old [1].

Eggs as a food product originating from poultry are one of the foods that have high nutritional value, but in the process of their maintenance, especially to increase production, it cannot be separated from the use of vaccines, drugs, vitamins, and antibiotics as feed additives. The continuous use of antibiotics as prophylactic and growth promoters results in residues in livestock products that affect food safety, especially their physiological functions. Efforts that need to be made to overcome this can be done by providing probiotics which are to increase growth, productivity, health and the livestock products that are produced provide benefits to human health [2]. In intensive chicken farming, feed is the largest cost, which can reach 70% of production costs. Therefore, the price of feed raw materials will determine the production costs. To meet the needs of this raw material, most farmers (especially plasma) get it from buying at the nearest production input shop, commonly given feed in the form of factory feed, corn flour and rice bran which are sometimes very high in price so sometimes they
cannot be bought. While local raw materials are mostly by-products of agro-industry, they are generally of low quality and low in protein and digestibility.

Probiotics are microorganisms that live in food which have beneficial effects in the body by increasing the balance of microorganisms in the digestive tract [3]. Further [4] explained that probiotics are live microbes or their spores that can live or develop in the intestine and can benefit their host either directly or indirectly from the results of the metabolism of the substrate that can change the intestinal micro ecology in such a way that beneficial microbes can reproduce properly. The way probiotics work, especially through modification of the intestinal bacterial population and its effectiveness depends on the microbial status in one livestock group and in individual livestock [5]. Bio L probiotics are probiotics that are directed for monogastric beef cattle. This probiotic is in liquid form, which contains several types of microbes isolated from the intestines, including Lactobacillus which can aid digestion of food [6]. Starting from this, a study was conducted regarding: the effect of using Bio L probiotics mixed into drinking water on production performance and egg quality in KUB chickens.

2. Materials and methods
The number of chickens in this phase were 60 KUB chickens, divided into 3 ration treatments, each consisting of 20 chickens (with 5 replications each 4 chicken). The amount of feed / ration given is 80-90 grams / head / day. The research was conducted at the field level for 5 months, using a randomized block design (RBD) experimental design with the following treatments:
P0 : feed according to farmers' method (30% concentrate; 45% corn and 25% bran)
P1 : concentrate, corn and bran with a ratio of 25%: 40%: 35% as much as 90 grams / head / day referring to the study of native Balinese chickens in 2009. While drinking water is given ad-libitum.
P2 : such as P1 + Bio L 2 cc / 1 litter of water

Crude protein content of each treatment 19% (P0), 17% (P1 and P2)

The variables observed were: 1) feed consumption (g / head/day) was measured by reducing the amount of feed given with the remaining ration. Ration consumption is measured once a week. 2) Egg production (grain), calculated based on the number of eggs produced at a certain time, 3) the average egg weight (g / grain) is obtained by dividing the total egg weight then divided by the number of eggs during the study, 4) Score ration usage efficiency (FCR, g ration / g eggs) obtained by using the formula: total consumption age 22-42 weeks divided by mass production egg. The egg mass production value (g / day) was obtained by multiplying the average egg weight by the total egg production. Physical Egg Quality (Egg Weight, Shell Weight, Egg White Weight, Egg Yolk Weight, Egg Yolk Colour Score); Chemical Quality of Eggs (Egg Yolk Protein Content and Egg Yolk Fat Content). The research data were analysed for variance and continued with the 5% LSD test [7].

3. Results and discussion
3.1. Effect of treatment on production performance
The average results of the research on the use of Bio L probiotics on KUB chicken production performance are presented in full in Table 1. The results of the analysis of variance in Table 1 show that giving Bio L of 2 cc / 1 litter of drinking water (P2) has a significant effect (P< 0.05) on ration consumption, egg production and ration conversion. Efficiency of feed use or FCR is most commonly reported as the impact of using enzymes or probiotics in poultry rations. The effect of treatment on the level of ration consumption showed that the lowest level of consumption was achieved by chickens in the P2 group (17.5%), namely 85.42 g / head / day, and the highest consumption of rations was in the P0 group (19%) which was 102.48 g / head / day (Table 1). The treatment resulted in varying levels of ration consumption, this was possible due to variations in the body weight of the chickens, although this result was still in line with the results of research on the medium type of layer chicken commodity. It is said that ration protein levels during the growth period did not result in a different
consumption of rations during the production period in medium type laying hens [8]. Decrease in ration protein levels at 12-22 weeks of age gave results that were not significantly different from the percentage of hen day for KUB chickens aged 22-42 weeks. The treatment effect on the percent of hen day also had no significant effect (P> 0.05). The results of this study support what concludes by [9] that the level of ration protein during the growth period had no significant effect on egg production (percentage of production).

This occurs because FCR is the combined result of the effect of enzymes or probiotics on ration consumption and production (body weight or egg production). A slight (although not real) decrease in ration consumption followed by a slight increase in production could have a more significant effect on FCR. The results of previous research indicated that supplementing the use of the BS4 enzyme in the ration of laying hens improved the efficiency of feed use (FCR) around 5.8-8.3% [10].

This is due to the addition of probiotics as supplementary feed because probiotics have the ability to live (grow and develop) in the digestive tract of chickens so that they can increase production, improve feed efficiency, and improve egg quality [11,4] and livestock health by inhibiting the growth of pathogenic bacteria so that chicken performance increases [12,4] explains that probiotics are live microbes or their spores that can live or develop in the intestine and can benefit their host, either directly or indirectly, from the metabolic results of the substrate that can change the intestinal micro ecology in such a way that beneficial microbes can reproduce well.

This is supported by research from the research of [13,14] who stated that the use of probiotics as supplemental feed will provide good production performance because the chickens are healthy.

| Variable                        | P0    | P1    | P2    |
|---------------------------------|-------|-------|-------|
| Feed consumption (g / head/day) | 102.48a | 87.42a | 85.42b |
| Egg production (%)              | 42.00a | 42.70b | 48.00b |
| Average Egg Weight (g / grain)  | 34.26a | 33.72a | 35.4a  |
| Feed conversion Ratio (g / g)   | 7.98a  | 6.68a  | 5.54b  |

Notes: different superscripts on the same line indicate significantly different (P <0.05). P0 = ration using 30% concentrate, 45% corn, 25% rice bran, P1 = ration using 25% concentrate, 40% corn, 35% rice bran, P2 = rations such as P1 + Bio L 2cc / 1 l drinking water.

3.2. Effect of treatment on physical egg quality

Eggs when in the hen's reproductive tract for more than 24 hours and undergo many processes that affect their quality. Factors that influence egg quality before ovipositional include genetic factors, age and weight of brood stock, dietary nutrition, disease, and environmental temperature. Egg production and quality is the phenotypic appearance of the hen as an accumulation of genetic and environmental influences from the hen itself. Genetic factors are factors that greatly influence egg quality which include egg size and weight, shell colour and thickness, the presence of blood stains, and the number of thick egg whites that differ between classes, strains, families and individual chickens [15].

The structure of eggs is generally divided into three parts, namely, shells, egg whites and yolks, and the respective levels are 11%, 57%, and 32%. The nutritional content or chemical composition of a whole egg is 65% water, 11.8% protein, 11% fat, 0.1% carbohydrates, and 11.6% minerals. Meanwhile, the chemical composition of eggs without shells is 73% water, 12.7% protein, 13.3% fat, and 1% carbohydrate.

The results of the analysis of variance in Table 2 show that the use of Bio L probiotics has a significant effect (P< 0.05) on the physical quality of eggs, namely egg weight and yolk weight. This is because giving Bio L as supplemental feed can produce digestive enzymes such as amylase, protease and lipase which can increase the concentration of digestive enzymes in the digestive tract of the host so as to increase nutrient overhaul [5]. This research is also supported by the results of research by [8].
which state that egg production and egg weight are influenced by linoleic fatty acids and the amino acid metheonin. Linoleic fatty acids can control proteins and lipids needed for follicular development that directly control egg production including egg weight [16].

### Table 2. Physical quality of eggs.

| Variable                  | Treatment | P0      | P1      | P2      |
|---------------------------|-----------|---------|---------|---------|
| Egg Weight (g)            |           | 34.26<sup>a</sup> | 33.72<sup>a</sup> | 35.40<sup>b</sup> |
| Egg yolk Weight (g)       |           | 10.82<sup>a</sup>  | 11.04<sup>a</sup> | 12.17<sup>b</sup> |
| Egg white weight (g)      |           | 18.88<sup>a</sup>  | 18.40<sup>a</sup> | 18.47<sup>a</sup> |
| Score egg yolk            |           | 8.40<sup>a</sup>   | 8.40<sup>a</sup>  | 8.48<sup>a</sup>  |
| Shell weights (g)         |           | 4.56<sup>a</sup>   | 4.28<sup>a</sup>  | 4.76<sup>a</sup>  |

Notes: different superscripts on the same line indicate significantly different (P <0.05). P0 = ration using 35% concentrate, 45% corn, 25% rice bran, P1 = ration using 25% concentrate, 40% corn, 35% rice bran, P2 = rations such as P1 + Bio L 2cc / 1 l drinking water.

3.3. Effect of chemical treatment on egg quality

The average results of the study using Bio L probiotics on the chemical quality of KUB chicken eggs are presented in full in Table 3. The results of the analysis of variance in Table 3 show that the use of Bio L probiotics in drinking water has a significant effect (P <0.05) on egg quality. chemically (egg yolk protein content and egg yolk fat). The structure of eggs is generally divided into three parts, namely, shells, egg whites and yolks, and the respective levels are 11%, 57%, and 32%. The nutritional content or chemical composition of a whole egg is 65% water, 11.8% protein, 11% fat, 0.1% carbohydrates, and 11.6% minerals. While the chemical composition of eggs without shells is 73% water, 12.7% protein, 13.3% fat, and 1% carbohydrates [15]. While the fat content in egg yolk is 26% -30%.

### Table 3. Chemical quality of eggs.

| Variable                  | Treatment | P0      | P1      | P2      |
|---------------------------|-----------|---------|---------|---------|
| Egg Yolk Protein (%)      |           | 13.40<sup>a</sup> | 13.37<sup>a</sup> | 14.50<sup>b</sup> |
| Egg Yolk Fat (%)          |           | 31.39<sup>a</sup>  | 30.75<sup>a</sup> | 26.32<sup>b</sup> |

Notes: different superscripts on the same line indicate significantly different (P <0.05). P0 = ration using 35% concentrate, 45% corn, 25% rice bran, P1 = ration using 25% concentrate, 40% corn, 35% rice bran, P2 = rations such as P1 + Bio L 2cc / 1 l drinking water.

The addition of Bio L probiotics to drinking water had a significant effect (P <0.05) on egg yolk protein content because Bio L probiotics have the ability to hydrolyze feed protein components better, Bio L probiotic bacteria are able to change macro protein molecules from rice bran into micro molecules so that easily digested by poultry in addition to probiotics Bio L produces proteolytic enzymes that help degrade feed protein from other feed ingredients into easy digestibility. Evidenced by the protein content of egg yolk P2 which is higher, namely 14.50 percent compared to P0 of 13.40 percent, and P1 of 13.37 percent, this shows that the role of probiotics is able to increase the
biosynthesis of feed protein for the better, so that with the presence of probiotics The efficiency of feed digestion increases due to the presence of several enzymes such as proteolytic and cello lytic enzymes produced by probiotics which can increase the availability of feed nutrients. The results of this study are in accordance with [17] that the use of probiotics not only maintains the balance of the microflora in the intestine but provides enzymes that are able to digest crude fiber, protein and fat so that feed becomes more available for use by chickens or in other words probiotics can increase feed bioavailability so that probiotics categorized as functional feed as [14,18,19].

4. Conclusions
The addition of 2 cc of Bio L into 1 liter of drinking water in KUB chickens was able to reduce the conversion of feed consumption by 17.31%, increase egg weight by 3.22%, increase protein content by 7.6% and reduce fat content by 16.15 %.

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