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Blood Protein Profile of Sentul Chicken with Lactic Acid as an Acidifier in Rations Containing Probiotics

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Abstract.

The study aimed to evaluate the use of lactic acid as an acidifier in ration containing probiotics on blood protein profile of Sentul chicken. Sixty female Sentul chickens aged 6 months were reared for two months in a 20-unit battery cage and subjected to a completely randomized design (CRD) with four treatments and five replicates, with 3 females each for each unit. The treatments were R₀: Basal ration (BS); R₁: BS + 0.5% lactic acid; R₂: BS + 1.0% lactic acid; and R₃: BS + 1.5% lactic acid. Data were analyzed by Analysis of Variance (ANOVA) using an IBM SPSS Statistics ver. 22. The result showed that lactic acid as an acidifier in rations containing probiotics on blood protein profile of Sentul chicken did not significantly ($P>0,05$) affected the blood protein profile (uric acid, creatinine and blood urea nitrogen) of Sentul chicken. The average of uric acid as 5.6 ± 1.86 mg/dl; creatinine 1.07 ± 0.40 mg/dl and blood urea nitrogen 4.31 ± 1.08 mg/dl. The conclusion was that the use of up to 1.5% lactic acid as an acidifier in feed created similar results in uric acid, creatinine and blood urea nitrogen.

Keywords: Sentul chicken, blood protein, acidifier

1. Introduction

Sentul chicken is a local chicken originating from Ciamis Regency, West Java Province. According to [1] stated that Sentul Chicken is a type of livestock that is being developed by the West Java Government as a local potential that can meet the protein needs of the community. [2] stated that the genetic potential of Sentul chickens as a producer of high native chicken eggs needs to be supported by high quality feed nutrient content. Quality feed nutrients besides containing balanced protein and energy are also provided with the addition of supplementary feed / feed additives. Therefore, it is necessary to increase production by providing quality feed and supplementary feed in the form of probiotics and acidifiers.

Probiotics contain lactic acid bacteria (LAB) which will increase the number of beneficial microbial populations and inhibit the development of microbes that harm the digestive tract. The growth of lactic acid bacteria can be optimized by adding an

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acidifier. Lactic acid can be used as a feed additive source. Acidifier is a feed additive that functions to control microflora in the digestive tract. Acidifier as an organic acid added to feed or drinking water can be used for the purpose of improving livestock digestibility ([3]). According to [4] stated that these organic acids can penetrate bacterial cell walls and interfere with the physiology of several types of pathogenic bacteria, besides suppressing the pH of the digestive tract so that it is expected to increase the development of lactic acid bacteria which affect the process of lipogenesis or fat formation because lactic acid bacteria will inhibit enzyme secretion. lipase from the intestinal mucosa of chickens. The content of lactic acid in chicken feed can increase the productivity and health of chickens.

Chicken health can be measured from the blood protein profile. Blood protein is a component of blood that is closely related to body functions. The blood protein profile can be determined by the levels of blood urea nitrogen, creatinine and uric acid. Albumin is a blood protein produced by the liver and plays a role in maintaining normal blood volume. Creatinine can describe the body's protein mass, an increase in serum creatinine levels indicates a decrease in the glomerular filtration rate, namely the rate of creatinine excretion through the kidneys and excreted in the urine. High uric acid levels indicate that chickens are less able (less efficient) to use protein to build body tissues, which means deamination of amino acids occurs so that a lot of ammonia is produced which will be converted into uric acid. In contrast, low uric acid levels indicate good efficiency in using amino acids ([5]). Based on the above discussion, it is necessary to conduct research on the use of acidifiers on blood protein profiles in Sentul chickens.

2. Materials and Methods

The research was conducted at Experimental Farm and Animal Nutrition and Food Science Laboratory, Faculty of Animal Husbandry, Jenderal Soedirman University, Purwokerto. The study used 60 Sentul abu chickens with a female gender, 6 months old. Livestock are kept for 2 months. Ingredients for corn, bran, probiotic bran, fish meal, soybean meal, palm oil, CaCO₃, premix, L-Lysin HCl, and methionine and lactic acid as acidifier. Ransum is prepared with iso calories and iso protein. The ration protein content was 18.39% and metabolic energy was 2,853.60 kcal / kg.

The research design used was a completely randomized design. There were 4 treatments and 5 replications in order to obtain 20 experimental units, namely:

R0: Basal Ration (BS)

R1: BS + Probiotic with Acidifier / eubiotic Lactate acid 0.5%

R2: BS + Probiotic with *Acidifier* / *eubiotic* Lactate acid 1.0%

R3: BS + Probiotic with *Acidifier* / *eubiotic* Lactate acid 1.5%

The research includes: Cage preparation, propagation of probiotic isolates, Making Probiotic Bran, Making Ration Formulations, raising Sentul Chickens, sampling, analyzing samples.

Blood sampling: Performed at the end of the treatment by taking ± 2 ml of blood, from the brachial vein which is located under the wing using a 3 ml syringe, the blood is collected in the EDTA tube.

Measurement of uric acid levels ([6]): Blood and serum are separated by centrifuge for 15 minutes using a centrifuge at a speed of 2500 rpm. The first tube contains PVP solution, the second tube contains standard uric acid, and the third tube contains the test serum, each tube is added with 1 TBHBA reagent and then incubated at room temperature (20-250 C) for 5 minutes. Then added 2 TBHBA reagent, incubated at room temperature for 30 minutes. Examination of uric acid levels used a Vitalab Micro spectrophotometer at a wavelength of 505 nm.

Measurement of creatinine levels ([7]): First, the blood sample is centrifuged to take the serum. Centrifuge is carried out for 15 minutes, then 0.5 ml of serum is taken into the volumetric flask. 10 ml of picric acid solution was added, then 0.75 ml of 10% NaOH and 50 ml of H₂O were added into the volumetric flask and then homogenized. The color formed will be stable for 30 minutes, the absorption is read within 30 minutes and observed on a spectrometer with a wavelength of 520 nm.

Measurement of urea levels ([8]): Analysis of urea levels was carried out using the Diasys KIT with a register number (AKL20101804026). A total of 0.1 mL of standard and blood samples were inserted into each test tube. Adding 1 mL of reagent (buffer and urease mixture, 100: 1) into the sample tube, standard and blank. Shaken and incubated at room temperature (20-25oC) for 5 minutes, then added 1 mL of reagent. Shake and incubated at room temperature (20-25oC) for 10 minutes. The sample and standard concentrations against the blank were read using a photometer.

3. Results and Discussion

The rest of the protein metabolism products that must be removed from the body of the livestock are uric acid, creatinine and urea. The average levels of uric acid, creatinine and urea in Sentul chicken blood are presented in Table 1.

⁷
TABLE 1: Average levels of uric acid, creatinine and ureum in Sentul chicken blood.

¹⁴ Treatment	Uric acid (mg/dL)	Creatinine (mg/dL)	Ureum (mg/dL)
Basal Ration	5.20±1.54	1.70±0.31	4.35±1.16
BR + lactic acid 0.5%	5.72±2.74	2.50±0.64	4.21±1.05
BR + lactic acid 1%	5.20±1.67	2.52±0.71	5.00±1.38
BR + lactic acid 1.5%	6.28±1.51	2.50±0.81	3.68±0.72

3.1. Uric acid level

The uric acid levels in Sentul chicken blood ranged from 5.20-6.38 mg / dL. The R3 treatment feed with the addition of lactic acid by 1.5% showed the highest uric acid level, namely 6.38 mg / dL. This is in line with research from [9] stated that the uric acid levels in chickens fed with herbal ingredients and mangrove shellfish extract were 3.95-6.70 mg / dL. Meanwhile, reported by [10] the range of uric acid in chickens is around 4.87-6.57 mg / dL and is still included in the normal category.

The results of the analysis of variance obtained showed that the treatment ¹² had no significant effect ($P > 0.05$) on the blood uric acid levels of Sentul chickens. This means that the addition of an acidifier to a level of 1.5% is still insufficient to influence the process of protein metabolism. Acidifier is more useful to improve the nutrient absorption system in the digestive tract because of its low pH. This is in accordance with the opinion of [11] which states that lactic acid is used as an acidifier to maintain the condition of the digestive tract to maximize the absorption of food substances that enter ⁶ the digestive tract and increase the number of beneficial microbes and reduce pathogenic microbes in the digestive tract.

Uric acid itself is not toxic or dangerous in the body of chickens, but if it forms uric crystals it will damage the body's tissues, this happens because it is not immediately excreted out of the body due to kidney problems ([12]). [10] stated that low levels of uric acid mean that the amino acids consumed are more used to compose tissues and do not experience much deamination which results in uric acid end products.

3.2. Creatinine level

Blood creatinine levels in Sentul chickens ranged from 1.70-2.52 mg / dL. R2 treatment with the addition of 1% lactic acid showed the greatest results in creatinine levels, namely 2.52 mg / dL. This is different from the opinion of [13] which states that the creatinine levels in Sentul chickens that are given noni fruit extract range from 0.10 to 0.22 mg

/ dL. [14] states the same thing that chicken blood creatinine levels are normal in the range 0.10-0.40 mg / dL.

The results of the analysis of variance showed that the treatment ⁵ had no significant effect ($P > 0.05$) on creatinine levels in Sentul chicken blood. The creatinine levels of this study were quite high. This may be due to impaired kidney function in livestock. According to [15] serum creatinine levels reflect the rate of renal elimination. An increase in serum creatinine level indicates a decrease in the glomerular filtration rate. If the serum creatinine level increases, there will be impaired kidney function.

High or low levels of creatinine in the blood can also be used to describe the severity of kidney function disorders. The amount of creatinine produced can also describe the skeletal muscle mass the body has. There is a lot of creatinine in the tendon to supply energy. This compound is present a little in the plasma of adult animals, while in the plasma of animals that are growing there is more ([16]). Adding the opinion of [17] stated that creatinine levels in the blood are more sensitive in detecting renal organ damage than BUN levels, because creatinine does not undergo reabsorption and is excreted through the kidney tubules.

3.3. Blood urea nitrogen level

Blood urea levels in Sentul chickens ranged from 3.68-5.00 mg / dL. R2 treatment with the addition of 1% lactic acid showed the highest yield at urea levels, namely 5.00 mg / dL. In line with [18] opinion, it was stated that the normal range of urea levels in chickens ranged from 3.3 to 7.2 mg / dL. From the above, it shows that the urea levels in the treatment at the time of the study had normal results. According to [19] states that if urea levels increase above the normal range, it indicates a chronic kidney disease experienced by livestock.

The results of the analysis of variance showed that the treatment ⁵ had no significant effect ($P > 0.05$) on urea levels in Sentul chicken blood. This could be due to kidney damage causing the kidneys to be unable to excrete useless metabolic products, especially urea. The level of urea mainly reflects the balance between the formation of urea and protein catabolism and excretion of urea by the kidneys ([20]). According to [21], high levels of urea are not always a sign of kidney damage, dehydration or shock results in the amount of urea released decreasing so that urea levels in the circulation increase.

4. Conclusions

Based on the results of the study, it can be concluded that the levels of uric acid and urea in Sentul chicken blood are still in the normal range. This means that the use of lactic acid acidifier up to a level of 1.5% can be used as additional feed for Sentul chickens.

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