THE EFFECT OF MILK FERMENTED WITH PROBIOTIC BACTERIA SUPPLEMENTATION ON HAEMATOLOGIC CONDITION OF BROILER

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ABSTRACT

The effect of probiotic supplementation in fennerted milk on broiler hematologic condition, (the number of erythrocyte, hemoglobin and hematocryte value),used 100 broilers, and used Completely Randomized Design, with four treatments:R0=as control, R1= 0,5% probiotic, R2 = 1,25% probiotic, R3= 2,00% probiotic, which was five times repeated. The resultsshowed that theprobiotic supplementation up to 1,25 percent, had no significantcy($p>0.05$) on hematologic condition, but 2 percent probiotic supplementation has significantly increased the hematologic condition.

Key Words :Probiotic, Haematologic, Erythrocyte, Haemoglobine, Haematocrite Value

INTRODUCTION

Probiotic is classically defined as a microbial dietary supplement that beneficially affect the host through its effects in the intestinal tract . This definition however, was initially intended for use with animal feed. Probiotic microorganisms that have a favourable influence on physiological processes of the host by their effect on the intestinal flora may play a role in improving human health(Ericson and Nail, 2000). Erythrocytes contained hemoglobin that carries oxygen from the lungs and will be released into the tissue, and also binding carbon dioxide in tissue that will be brought to the organ secretions. Hemoglobine functions such as respiration and blood pigment as a buffer in the blood system, which is closely related to the ability of blood to carry oxygen. Non-pathogenic microbes such as Lactobacillus bulgaricusand Streptococcus thermophillus are capable of producing lactic acid and some amino acids and vitamins produced by microbes, and also as a precursor for the formation hemoglobin.

Microbes that classified as lactic acid bacteria (LAB) have a high microbial activity due to the resulting product will inhibit the growth of pathogenic bacteria that can damaged the cell membrane permiability and ended with the destruction of the cell wall, resulting in the release of hemoglobin from the cell. Fe has a large influence on the formation of blood hemoglobin. Fermented milk contains complete mineral,and will absorbed in the small intestine,and because has a low molecular weight, the compounds are soluble in water. Calcium and phosphorus we essential for the growth of bones and teeth, while iron in building muscle, skin and eggs of red blood cells, stimulates nerves, maintaining muscle elasticity and maintain osmotic pressure (Surono, 2004). Organic acids produced by lactic acid bacteria, mainly lactic acid and acetic acid to help stimulate activities of gastric the rate of passage become slower, and cause increased absorption of nutrients as a result of metabolic processes in the body and substance formation of red blood cells and hemoglobin will increase.

Oxidation reactions can occur in body cells and damage the body, especially the cell membrane. One of the important body of the cell membrane is the erythrocyte membrane. Oxidation reaction on erythrocyte membranes will result in damaging erythrocytes, will eventually lower the body resistance and response to disease. Erythrocyte damage would cause metabolic disorders at least will affect the productivity of livestock. The damage can be inhibited by the ability of lactic acid bacteria which can suppress the growth of various gram-positive bacteria and gram negative. Suppression process is influenced by the production of hydrogen peroxide inhibits the growth of pathogenic bacteria through the powerful influence of oxide on bacterial cell or through the destruction of the basic molecular structure of nucleic acids and proteins of cells and production of special proteins called bacteriocin.

Previous studies in rabbit which are given yoghurt containing Lactobacillus bulgaricus and Streptococcus thermophillus 2.00% of body weight, can increase the number of erythrocytes, hemoglobin, and hematocrit values significantly. Studies conducted on rats using of yoghurt containing Lactobacillus bulgaricus, Streptococcus thermophillus, Lactobacillus acidophilus, and

Bifidobacterium of 1.25% and 2.00% of body weight can increase the number of erythrocytes, hemoglobin and hematocrit values.

MATERIALS AND METHODS

Bacteria Strain: Two bacteria used in this research, are Lactobacillus bulgaricusand Streptococcus thermophilus as yoghurt culture starter.

Animal : one hundred broiler cp 707, day old chick, the treatment given from day old chicks until six weeks.

Experimental Design, broiler were randomly devided into 4t reams groups with 5 replications. The treatments consisted of probiotic yoghurt, RCcontrol , R1= control + 0,5% probiotic, R2 = control + 1,25% probiotic, R3= control + 2,00% probiotic

Data were analysed in a Completely Randomized Design (CRD). Further analysis for significantly was conducted using Duncan Test, the parameter observed were : the number of erythrocyte, hemoglobin, and hematocrit value.

RESULT AND DISCUSSIONS

Table 1, The results of the effect of treatment with addition of probiotic (Lactobacillus bulgaricus, Streptococcus thermophillus) on the number of erythrocyte, hemoglobin, and haematocrit.

Tabel 1. Effect of the treatment on total erythrocyte,haemoglobine, hematocryte value

	(x 10^6) ails/mm^3	g/ml	
R0	2,27	8,10	31,4
R1	2,32	8,38	31,6
R2	2,88	9,01	32,4
R3	3,04	9,22	35,5

Notes :

RO : control

R1 : control +0,5% from body weight

R2 : control +1,25% from body weight

R3 : control +2,00% from body weight

Based on Table 1, R3 treatment has total erythrocyte, significantly higher compared with the treatment RO and R1, while R2 and R3 has not significancy. The highest hemoglobin levels achieved in R3, that significantly higher than RO and R1, white: R2 and R3 showed no significancy. The highest hematocrit value achieved by the R3 treatment was significantly; compared with the treatment of RO, R1 and R2.

Lactobacillus produce metabolite on increased the size of new cells,and will influence the body weight gain, and also improved metabolismLactobacillus bulgaricus and Streptococcusthermophillus, Lactobacillus Acidophilusit can increase the elasticitythe cellular membranes thereby improving cell membranes, which in turn will improved the ability of erythrocytes to maintain the integrity of the membranes.

According, to 1997 Lovita, 2005,the organic acids produced by lactic acid bacteria such as lactic acid and acetic acid can protect the cell membranes and damaged other subcellular oxidation reaction by the peroxide bond.

Lactic acid bacteria which can increase the elasticity of cell membranes so that it will produce better cell membrane, which in turn will improve the ability in maintaining erythrocyte membrane integrity (Ganong, 1985). Other factors that affect their ability to both bacteria, will survives in the lower acid to base environment (Fuller, 1992). The addition of yoghurt are still within the criteria of normal erythrocytes. Acetic acid , some amino acids and vitamins produced by microbes, is a precursor to the formation of hemoglobin.

Acetic acid is inferred that changing in the cycle become keto glutarat kreb-alpha acid, and then binded the ketoglutarat two-alpha acid with one molecule of glycine to form pyrole compounds. The next four pyrole compounds to form compounds protoporfirin. One compound, known as n protoporfirin III, when binded with iron will form a molecule hem. Finally, four molecules bind one end of the globin molecule, the formation of hemoglobin, which in turn will increased the amount of hemoglobin (Guyton, 1985).

According to Swenson (1970), increasing in hemoglobin and erythrocyte number will be in line with the increase in hematocrit value because there is a positive relationship between the three components.The overall results indicated that administration of probiotic (Lactobacillus bulgaricus and Streptococcus thermophilus) on the dose up to 2% of body weight, will increase the amount of value erythrocyte, hemoglobin and hematocrit, still in the normal range.

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