

# THE EFFECT OF PROBIOTIC SUPPLEMENTED RATION ON BROILER ABDOMINAL FATTY CONTENT AND FINAL WEIGHT

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## Abstract

In this research we were studying the effect of ration supplemented with *Lactobacillus bulgaricus* and *Streptococcus thermophilus* on broiler abdominal fatty content and final weight using Completely Randomized Design (CRD) with four treatments: R0 – 0% *Lactobacillus bulgaricus* and *Streptococcus thermophilus* as control, R1 – 0.5% *Lactobacillus bulgaricus* and *Streptococcus thermophilus*, R2 – 1.25% *Lactobacillus bulgaricus* and *Streptococcus thermophilus*, R3 – 2.0% *Lactobacillus bulgaricus* and *Streptococcus thermophilus*; which was five times repeated. Result indicated that ration supplemented with 1.25% *Lactobacillus bulgaricus* and *Streptococcus thermophilus* has highest final weight and supplemented with 2% has the lowest abdominal fat content.

**Key words:** probiotic, *Lactobacillus bulgaricus*, *Streptococcus thermophilus*, abdominal fat, final weight

## INTRODUCTION

Probiotic have been utilized to improve animal performance by maintaining normal microflora of host animals. Several modes of action of probiotics involving the changes of intestinal microflora have been examined (1 and 2). The metabolic capacity of microflora is extremely diverse and can produce positive and negative effect on gut physiology (3). Upon consumption probiotic, many lactic acid delivered into the gastrointestinal tract. These microorganism have been reputed to modify the intestinal mileu and to deliver many enzymes into the intestines (4). *Lactobacillus bulgaricus* and *Streptococcus thermophilus* as probiotic has been found to improve performance in poultry. Several of our study have consistently shown that the growth performances of broilers, supplemented with a probiotic containing *Lactobacillus* cultures are significantly improved. The present study was conducted to determine the effects of *Lactobacillus bulgaricus*, *Streptococcus thermophilus* as probiotic on fat content in broiler carcass and the growth of broiler.

## MATERIALS AND METHODS

One hundred day old chicks broiler which placed randomly on 20 plot experiment cages, each cages for 5 chick,

Probiotic contains *Lactobacillus bulgaricus*, *Streptococcus thermophilus* in Yoghurt used in this research. The dietary treatments consisted of :

- R<sub>0</sub> = Based ration without probiotic
- R<sub>1</sub> = Based ration + 0.5% probiotic
- R<sub>2</sub> = Based ration + 1.25% probiotic
- R<sub>3</sub> = Based ration + 2 % probiotic

The composition of based ration are in the Table 1. The nutrient and metabolism energy content of four treatments are in Table 2.

Table 1. Composition of Based Rations

Ingredients	Treatment			
	R0	R1	R2	R3
Concentrated (%)	42	42	42	42
Yellow corn (%)	52	52	52	52
Rice bran (%)	6	6	6	6
<i>L. bulgaricus</i> + <i>S. thermophilus</i> l (%)	0	0.5	1.25	2.0
				0

Table 2. The Nutrient and Metabolism Energy Content in Rations

Nutrition component	Treatment			
	R0	R1	R2	R3
Crude protein (%)	22.11	22.14	22.17	22.20
Crude fat (%)	6.56	6.60	6.64	6.68
Crude fiber (%)	4.17	4.17	4.17	4.17
Ca (%)	0.97	1.53	1.54	1.56
P (%)	0.75	0.79	0.79	0.79
Energy metabolism (kcal/kg)	3019.9	3020.8	3021.7	3022.6

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The experiment used Completely Randomized Design (CRD), with four treatments and each treatment was five times repeated. The data was analyzed with Duncan, Multiple Range Test, the treatment were abdominal fat content and final body weight.

**RESULTS AND DISCUSSION**  
**The Effect of Treatment on Abdominal Fat content in Broiler**

The Average levels of Abdominal Fat content of the treatments, in Table 3.

Table 3. Average levels of Abdominal Fat on Each Treatment

Replication	Treatment			
	R0	R1	R2	R3
	.....gram.....			
1	42.67	37.52	18.00	16.00
2	43.93	23.73	21.10	20.00
3	31.57	30.32	28.20	21.02
4	20.84	35.60	14.80	17.42
5	44.27	39.00	22.23	20.60
Total	193.28	166.17	104.33	95.04
Average	38.66	33.23	20.87	19.01

The average abdominal fat showed at Table 3. The abdominal fat percentage levels were variation, from the lowest (19.01gr, 2% probiotic) until the highest (38.66 gr, without probiotic). The data were followed with statistic analysis. The results indicated that

all treatments have significantcy on the abdominal fat. Adding until 2% probiotic (mixed *Lactobacillus bulgaricus* and *Streptococcus thermophilus*) in the ration broiler has advantages, because the bioactive substances as bacteriocin would improved the metabolism of carbohydrates and fat in the body. At five weeks of age, broiler fed diet with probiotic had significantly less abdominal fat than those fed without the probiotic, The decrease in abdominal fat suggest that greater metabolizable energy was consumed through elevation of heat production by supplementation of lactic acid bacteria, with hardly any energy stored as body fat. Probiotic supplementation appears to induce greater muscle weight, higher protein and lower lipid content in muscles. Supplementation of *Lactobacillus culture* to broilers, significantly reduced the fat contents of the liver, muscle and carcass (5), also found that supplementation of *Lactobacillus bulgaricus* in broiler diets significantly (P < 0.05) reduced s fat deposit in carcass, and suggested that *Lactobacillus bulgaricus* could significantly decrease the activity of acetyl-Co A carboxylase which catalyses the rate-limiting step in fatty acid biosynthesis

**The Effect of Treatment on Final Weight**

Table 4. Average Levels of Broiler Final Weight

Replication	Treatment			
	R0	R1	R2	R3
	.....gram.....			
1	1543.33	1584.00	1488.33	1200.00
2	1573.33	1451.25	1622.50	1353.33
3	1395.00	1525.00	1948.33	1405.00
4	1141.67	1527.00	1530.00	1296.67
5	1570.00	1620.50	1637.50	1381.67
Total	7223.33	7699.75	8226.66	6636.67
Average	1444.67	1539.95	1645.33	1327.33

The average final weight showed at Table 4. The final weight were variation, from the lowest (1327,33 gr, 2% probiotic) until the highest (1645 gr, 1.25% probiotic). The data were followed with statistic analysis. The results indicated that adding until 1,25% probiotic (mixed *Lactobacillus bulgaricus* and *Streptococcus thermophilus*) in the ration broiler has advantages, because the bacteria community inhabiting the ilea of broiler is likely to effect the efficiency of utilization of food constituens. Lipid absorption occurs maximally in the distal jejunum and proximal ileum of broiler, also deconjugation of conyugated bile salts in the ileum by *lactobacillus* could thus effect the efficiency of food conversion because these substances have critical roles in the emulcification and absorption of dietary lipids.

#### CONCLUSIONS

- By adding *Lactobacillus bulgaricus*, *Streptococcus thermophilus* until 2.00% from body weight in the ration have significant effect on abdominal fat content
- By adding *Lactobacillus bulgaricus* and *Streptococcus thermophilus* until 2.00% from body weight in the ration have significant effects on final body weight, but the highest on adding 1.25%.

#### REFERENCES

- [1]. Fuller, R., 1989. Probiotics in man and animals. J. Appl. Bacteriol., 66: 365-378.
- [2]. Jin, L. Z., Y. W. Ho, N. Abdullah, and S. Jalaludin, 1997. Probiotics in poultry: Modes of action. World's Poult. Sci. J. 53:351-368.
- [3]. Macfarlane, G. T., and J. H. Cummings, 1991. The colonic flora, fermentation and large bowel digestive function. Pages 51- 92 in: The Large Intestine: Physiology, Pathophysiology and Disease. S. F. Phillips, J. H. Pemberton, and R. G. Shorter, ed. Raven Press, New York, 3.
- [4]. Marteau, P., and J. C. Rambaud, 1993. Potential of using lactic acid bacteria for therapy and immunomodulation in man. FEMS Microbiol. Rev. 12:207-220.
- [5]. Santoso, O. U., K. Tanake., S. Ohtani and M. Sakaida, 2001. Effect of fermented product from *Bacillus subtilis* on feed conversion efficiency, lipid accumulation and ammonia production in broiler chicks. Asian-Aust. J. Anim. Sci., 14: 333-33
- [6]. Lovita A. (2005) Consorsium probiotic on reduce pathogen bacteria in the intestine of mice