THE EFFECTS OF *Lactobacillus bulgaricus* and *Streptococcus thermophilus* AS RATION SUPPLEMENT ON BROILER CARCASS WEIGHT, CARCASS FAT CONTENT AND THE SERUM CHOLESTEROL CARCASS CONTENT.

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ABSTRACT

Hundred final stock Arbor Acres were used in this experiments, using Completely Randomized Design (CRD) with four treatments : R-0 - as control (0.0% *Lactobacillus bulgaricus* and *Streptococcus thermophilus*), R-1 (1.0% *Lactobacillus bulgaricus* and *Streptococcus thermophilus)*, R-2 (1.5% *Lactobacillus bulgaricus* and *Streptococcus thermophilus*), and R-3 (2.0% *Lactobacillus bulgaricus* and *Streptococcus thermophilus*); which was five times repeated. Results indicated that R-3 (ration that has supplemented with 2.0% *Lactobacillus bulgaricus* and *Streptococcus thermophilus*), has the highest carcass weight but the carcass fat content and the serum cholesterol carcass content was the lowest.

Keywords : *Lactobacillus bulgaricus* and *Streptococcus thermophilus*, broiler carcass, carcass fat content and serum cholesterol carcass content.

INTRODUCTION

Using probiotic, will significantly improved the body weight of the broilers. Carcass quality and blood contituents were determined and the administration of probiotic affected positively the body weight, feed intake and feed conversion rate by 7.7 and 8.1%, respectively (P> 0.05) compared to the control group. Lower concentration of serum cholesterol and triglycerides were observed in the treatment group. The probiotic addition reduced the fat content of the chicken meat (Ignatova, et al, 2009). The effect of probiotic started at two weeks of age. The differences in the body weight became greater towards the end of the trial periods. The birds fed on probiotic level 1 g/kg exhibited higher body weights among groups at all times of the trial. Lengkey, et al (2009) was isolated heterofermentative *Lactobacillus* species from raw poultry meat. Khaksefidi and Ghoorchi, 2006 report that probiotic supplemented to the birds improve the body weight and daily weight gain of broiler. Mohan et al (1996) reported that the beneficial effect of probiotic on chicken occurred only after the 4th week of growth. Edens (2003), reported that the inclusion of desirable microorganisms (probiotics) in the diet allows rapid development of beneficial bacteria in the digestive tract of the host, improving its performance. According to

Arun et al (2006), the probiotic supplementation of *Lactobacillus sporogenes* at 100 mg/kg diet will reduced the serum total cholesterol and the triglycerides were reduced significantly. The significant reduction in serum cholesterol of broiler chickens fed probiotic supplemented diet could be attributed to reduced absorption and/or synthesis of cholesterol in the gastro-intestinal tract by probiotic supplementation (Mohan, et al, 1996) Chickens fed with various level of probiotic showed a significant decrease in cholesterol concentrations when compared to the control group. Ignatova et al (2009) reported that the probiotic supplementation reduced the serum cholesterol and triglyceride significantly. Mohan et al (1996) mentioned that chickens that received 75, 100, and 125 mg probiotic/kg diets had lower serum cholesterol content (93.3 mg/100 ml) compared to the control birds (132.2 mg/100 ml). According to Abdulrahim et al, 1996; *Lactobacillus acidophilus* reduces the cholesterol in the blood by deconjugating bile salts in the intestine, thereby preventing them from acting as precursors in cholesterol synthesis.

MATERIAL AND METHODE

The Chickens are Broiler Arbo Acres 707 doc, but for these experiments, after 4 weeks old. The broiler carcass weight, fat content in the carcass, serum cholesterol carcass content was detect at 4 weeks old, using Completely Randomized Design (CRD).

RESULTS AND DISCUSSIONS

Probiotic effects on Broiler Carcass Weight

In Table 1, there is the results of probiotic supplementation on broiler carcass weight.

Table 1. The effect of *Lactobacillus bulgaricus* and *Streptococcus thermophilus* on Broiler Carcass Weight (g)

		Treatment	(%)		Total
Repetition	R-0	R-1	R-2	R-3	
1	909.55	997.64	999.98	1058.92	
2	915.45	993.70	1000.77	1062.28	
3	909.45	999.06	1001.05	1060.90	
4	910.15	992.24	1001.05	1081.40	
5	911.15	995.66	1001.00	1041.00	
Total	4555.75	4978.30	5003.85	5304.50	19842.40
Average	911.15	995.66	1000.77	1060.90	

From Table 1, it can be noticed that the probiotic treatments (R-1; R-2 and R-3), showed more broiler carcass weight than control group (R-0). These results showed that the probiotic supplemented groups improved the body weight and get more carcass weight than the control groups, that feed no probiotic in the diet. It means that the beneficial effect of probiotic on chicken ration. The improvement in the body weight in this study may be due to the increased efficiency of digestion and nutrient absorbtion processed due to precence of the probiotic bacteria. As a consequence, there is an improvement in the intestinal environment, increasing the efficiency of digestion and nutrient absorption processes.

According to Ignatova et. al (2009), the administration of probiotic affected positively body weight ($p<0.001$), feed intake and feed conversion rate by 7.7 and 8.1%, respectively ($p>0.05$) compared to the control group.

Effects of Probiotics on Fat Content in the Carcass.

Table 2, shows that the fat content in the carcass of the chickens that have fed with probiotic diet, get less fat content than the carcass from the control diet. The probiotic supplementation showed less fat content in the carcass, in proportion to the content of probiotic in the diet. The carcass from the chickens that fed with no probiotic in the ration have the highest fat content in the carcass. And the group with more probiotic in the diet, have the less fat content in the carcass, because the lactic acid in the probiotic will lower the pH in digestive tracts and inhibit the growing of other bacteria, especially the harmful bacteria. And also the energy from the carbohidrat was convert into lactic acid, so the fat formation in the carcass will decreased. The triglycerides were reduced by dietary supplementation of probiotic in the ration. Similar results were reported by Arum et al (2006) who found that triglyceride were reduced significantly by dietary supplementation of probiotic containing *Lactobacillus sporogenus* at 100 mg per kg diet. Table 2. Fat content in the carcass that fed on rations containing different concentration of probiotic (g/kg feed)

		Treatment	(%)		Total
Repetition	R-0	R-1	R-2	R-3	
1	4.92	4.32	4.67	2.21	
2	5.87	3.68	3.76	2.25	
3	5.91	3.80	2.82	2.66	
4	4.74	3.78	4.09	4.05	
5	3.61	4.90	3.08	3.13	
Total	25.05	20.40	18.45	14.30	78.20
Average	5.01	4.08	3.69	2.86	

Effect of probiotic in the serum cholesterol carcass content.

Table 3, shows the serum cholesterol carcass content of the chickens that have fed with probiotic diet. Table 3. Serum cholesterol carcass content of the chickens that fed on rations containing different concentration of probiotic (mg/g carcass)

		Treatment	(%)		
Repetition	R-0	R-1	R-2	R-3	Total
1	117	112	114	109	
2	123	108	100	113	
3	113	114	108	103	
4	130	134	103	100	
5	127	102	115	105	
Total	610	570	540	530	2250
Averages	122	114	108	106	

Table 3 clearly demonstrated that the probiotic in the diet will reduced the serum cholesterol carcass content. Chickens that received probiotic had lower serum cholesterol, (106, 108 and 114 mg/100 g carcass) compared to 122 mg/100 g carcass, from the control birds. Chickens that received probiotic *Lactobacillus* has found to have a high bile salt hydrolytic activity, which is responsible for deconjugation of bile salt. Similar results were reported by Arun et al (2006), who found that serum total cholesterol and triglycerides were reduced significantly by dietary supplementation of probiotic containing *Lactobacillus sporogenes* at 100 mg per kg diet. Mohan et al (1996) mentioned that chickens that received 75, 100, and 125 mg probiotic/kg diets had lower serum cholesterol content (93.3 mg/100 ml) compared to the control birds(132.2 mg/100 ml). The significant reduction in serum cholesterol of broiler chickens that fed probiotic supplemented diet could be attributed to reduced absorption and/or synthesis of cholesterol in the gastro-intestinal tract by probiotic supplementation (Mohan et al, 1995). According to Ignatova et al (2009), the probiotic supplementation reduced the serum cholesterol and triglyceride significantly.

CONCLUSIONS

The probiotic supplementation in the diet, incearsed the body weight, because it was increased feed intake and improved feed utilization. The probiotic supplementation also reduced the serum cholesterol and triglyceride significantly.

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