

THE IMPACTS OF PREBIOTIC AND FEED RESTRICTION ON LIPID METABOLITES OF BROILERS

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INTRODUCTION

In recent years, increasing heart problems as a result of high fat consumption has caused the usage of low fat meat to be paid more attention, and poultry meat to be used more. Feed restriction is one way of decreasing broiler's abdominal and carcass fat. Also it seems that prebiotics are indirectly advantageous to lipid metabolites in blood such as cholesterol and triglyceride by changing intestine's micro-flora. This study was done to investigate the effects of feed restriction and prebiotic supplementation on broiler chickens' fat metabolites in blood.

MATERIALS AND METHODS:

240 one-day-old broiler chickens (Ross 308) were divided into 4 treatment groups with 6 replicates in randomized complete block design. Treatments included 1) control, 2) feed restricted, 3) control plus prebiotic, 4) feed restricted plus prebiotic. From day 7 to day 14, 80% of the ad libitum feed was given to restricted groups. At days 21 and 42, 3 ml of blood was collected from wing vein of 1 bird in each replicate, centrifuged at 2000 rpm for 10 min and the serum was separated, then stored at -20°C until assayed to measuring lipid metabolites including cholesterol, triglycerides (TG) and HDL.

Statistical analyses were conducted with the general linear model procedure of SAS for Windows version 9.1.

RESULTS AND DISCUSSION:

At day 21, Serum TG was significantly higher in the restricted groups ($p < 0.05$), but there were not any significant differences in serum cholesterol and HDL among all groups ($p > 0.05$). At day 42, serum TG was not significantly different ($p > 0.05$), but serum cholesterol in feed restricted plus prebiotic group was significantly lower than control and feed restricted groups ($p < 0.05$), and serum HDL in feed restricted group was significantly lower than other groups ($p < 0.05$).

More feed intake causes less lipolysis which leads to decrease of blood TG, therefore feed restriction can increase blood TG. Also, the stress caused by limitation in feed access can lead to increase in corticosterone hormone secretion. Corticosterone increases lipolysis in tissues therefore TG level rises in blood. Onbasilar *et al.* (2009) reported that feed restriction in broilers increases TG level. Velasco *et al.* (2010) stated that prebiotics may cause simultaneous reduction of hepatic expression and activity of lipogenic enzymes and consequently reduction of fatty acids' synthesis. Our findings are also in agreement with Kanan *et al.* (2005) who expressed that the prebiotic extracted from yeast and copra meal reduces the serum cholesterol concentration.

The results of this study showed that prebiotics can be effective on decreasing blood lipid metabolites such as cholesterol. This can probably cause a decrease in fat deposition in carcass of broilers.

Keywords: prebiotic, feed restricted, lipid metabolites, serum

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