

Effect of Yeast on Cholesterol content in broiler chicken

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Abstract

The high cost of meat and egg in Nigeria has been attributed to livestock production costs which ultimately increase the price of the finished products. The interaction between production costs and meat output culminates in the production of insufficient quantity of meat and egg. This in turn accentuates the shortage of animal protein to the populace. With the widening protein deficiency gap due to high population and high cost of livestock production, there is the need to reduce production cost through feed cost savings. This is to allow the products go round the population at affordable prices. The benefits of feed savings, feed conversion rates, lean meat and a more uniform growth are worth serious consideration. This can be done by finding ways of reducing feed cost. The proposed study was to measure the effect of Yeast on cholesterol content in broiler chicken.

Keywords: Yeast; Cholesterol; Broiler-chicken; Protein deficiency; Livestock production.

Introduction

Cholesterol is a steroid; a fatty monoatomic alcohol derived primarily from bile (Webster's Comprehensive Dictionary, 1995). It is mainly found in the spinal cord and makes up to 10 percent of the dry matter of the brain and about 140g of the human body (Conn *et al.*, 1987). Cholesterol is probably the best known steroid because of its association with atherosclerosis and heart disease, but biochemically, is of significance as a precursor of a number of equally important steroids that include the bile acid, adrenocorticosteroid hormones, sex hormones, D vitamins, cardiac glycosides, sitosterols of the plant kingdom and some alkaloids (Kathleen, 2003). It plays a vital role in digestion and absorption (Tianshi, n.d).

Cholesterol serves as an intermediate in the biosynthesis of all steroids and thus is essential to life (Solomons, 1998). Cholesterol is widely distributed in all cells particularly in the nervous tissue. It is a major component of plasma membrane and of plasma lipoproteins. Cholesterol is an essential structural component of membranes and outer layer plasma lipoprotein (Kathleen, 2003).

The body synthesizes about 1500-2000mg of new cholesterol each day, while dietary cholesterol intake in chicken ranges from 28-116 mg/dl.

(Collins, n.d) against the desirable cholesterol level of 200mg (<130 LDL, >40 HDL and <135mg/dl triglyceride). Cholesterol in the bile can crystallize to form gallstones that may block the bile duct, and in the development of atherosclerosis (fatty deposits that form inside the blood vessels) leading to heart attack. However, the major culprit seems to be LDL (Low Density Lipoprotein) that are in excess of the body need (Ultranet, 2006). Presence of chlorine elevates blood pressure by converting antidiuretic hormone to angiotensin. Increase in blood pressure may eventually result to heart attack or stroke (Web Project, 2000). This study is designed to investigate the effect of yeast on cholesterol content in broiler chicken.

Materials and methods

A total of 150 Hubbard Broiler chicks were used in this study. The experiment was laid out in a Completely Randomized Design with 5 yeast application levels of 0g, 0.5g, 1.0g 1.5g and 2.0g. The treatment was yeast in feed and in water. The birds were brooded using the conventional deep litter system in their respective replicate pens after 1 week of adaptation in the brooder house. They were fed *ad libitum* during the adaptation stage but only by day afterwards until the end of the 4th week.

Daily records on feed intake and weight gains were taken. At the end of the trial three chickens were

randomly selected from each group. One chicken per replicate for abdominal fat and cholesterol content. Blood cholesterol was determined using the method outlined by Jain (1986).

All data generated were subjected to One-way analysis of variance (Minitab, 1996), and means separated using Duncan's Multiple Range (Duncan, 1955).

Result and discussion

Table 1: Effect of yeast on feed intake, live weight, abdominal fat and cholesterol.

Feed intake (g)	812	831.1	866.1	849	849.4
Live weight (g)	1635.4	1728.24	1755.4	1726.9	1725.9
Abdominal Fat (g)	9.23	10.58	7.55	6.46	7.13
Cholesterol (g)	54.4 ^c	56 ^c	72 ^a	75 ^a	64 ^b

Means with different superscripts are significantly ($P < 0.05$) different. Means without superscripts are not significantly ($P > 0.05$).

From the above table 1, feed intake, live weight and abdominal fat are not significantly ($P > 0.05$) different. This implies that yeast inclusion in water and in feed has no significant statistical difference at the probability level studied. However, there are numerical differences, which have all values higher than the control for the parameters studied. This indicates an interaction in the route of administration. This positive numeric differences could be statistically different ($P < 0.05$) when fed in water or in feed only. Secondly, the 4weeks duration of the trail could also contribute to the non-significant ($P > 0.05$) in feed intake, live weight and abdominal fat. However, there is a significant ($P < 0.05$) difference in the blood cholesterol content. This could be attributed to increased cholesterol metabolism in treatments that received yeast inclusion levels. Yeast must have contributed this in its digestion of saturated fatty acids in the feed. The cholesterol levels however, are within the levels recommended by Collins (n.d) and Ultrnet (2006).

The implication of this result is that fatty acids in feed can be better utilized by broiler chicken by converting fats to cholesterol. There is a need to

investigate the type of cholesterol (HDL or LDL) that is being produced.

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