LIPID PROFILE OF FUNAAB -ALPHA CHICKENS FED DIETS CONTAINING HOT RED PEPPER

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Abstract
This study was designed to determine the lipid profile of FUNAAB-Alpha chickens fed diets containing Hot Red Pepper at varying inclusion level. A total of 128 day-old FUNAAB-Alpha broiler chicks were used for the study that lasted for 56 days. The birds was weighed and randomly divided into four treatment groups, each consisting of four replicates with 8 birds per replicate. The data collected were subjected to analysis of variance using a completely randomized design. Four experimental diets were formulated to include the 0 % HRP, 0.25 %HRP, 0.50 % HRP, 0.75 % HRP. At starter phase, Cholesterol, Triglyceride, High Density Lipoprotein, Low Density Lipoprotein were significantly influenced ($p<0.05$) by the diets. At finisher phase , the results obtained shows Cholesterol, Triglycerides, High Density Lipoprotein, Low Density Lipoprotein and Very Low Density Lipoprotein were significantly different ($p<0.05$). In conclusion, addition of 0.75% HRP reduced cholesterol at both starter and finisher phase, as well as increased levels of high-density lipoprotein cholesterol.

Keywords: Phytobiotics, hot red pepper, cholesterol, high density lipoprotein, low density lipoprotein

Introduction

The hazard of the continuous emergence of new antibiotic resistance mechanisms in different microorganisms caused the European Com-mission to ban antibiotics as growth enhancers in animal feed (European Union, 2005). Herbs and plant extracts used in animal feed are referred to as phytogenics feed additives. Phytobiotics or botanicals are defined as compounds of plant origin added into animal feed to enhance livestock productivity through the improvement of digestibility, nutrient absorption and elimination of pathogens residents in the animal gut (Athanasiadou *et al.* 2007). capsicum is a tropical and an important agricultural crop and one of the popular vegetables, not only because of its economic value, but also for the combination of colour, taste and nutritional values of its fruit (Kouassi and Koffi, 2012; Nadeem *et al*., 2011). The interest in the consumption of capsicum is to a large extent due to its content of bioactive compounds and their importance as dietary antioxidants.

Materials and Methods

The study was carried out at the Directorate of University Farms (DUFARMS) of the Federal University of Agriculture, Abeokuta. A total of 128 day–old FUNAAB-Alpha birds were weighed and randomly divided into four groups, each consisting of four replicates with 8 birds per replicate. The data collected were subjected to analysis of variance using a completely randomized design. The birds were housed under same experimental conditions of temperature and humidity. Samples of Hot Red Pepper was obtained from the local market, air-dried and milled to pass through 1mm sieve using electric blender. The entire test ingredient was stored in an air tight container at room temperature until when needed. At the end of the 28th and 56th week, eight birds were randomly chosen from each treatment and bled via wing vein puncture to obtain blood samples. Blood samples were centrifuged and serum was collected for later analysis. Blood HDL and LDL levels were determined spectrophotometrically by using commercial kits.

Table 1: Composition (%) of Experimental Diets (Starter and Finisher Phase)

	Starter Phase				Finisher Phase			
Ingredients	T1	T2	T3	T4	T1	T2	T3	T4
Maize	47.00	47.00	47.00	47.00	53.50	53.50	53.50	53.50
Fish meal (72% CP)	2.00	2.00	2.00	2.00	0.40	0.40	0.40	0.40
Soyabean meal	18.50	18.50	18.50	18.50	16.50	16.50	16.50	16.50
Groundnut cake	17.50	17.50	17.50	17.50	13.80	13.80	13.80	13.80
Wheat offal	10.00	9.75	9.50	9.25	10.80	10.55	10.30	10.05
Bone meal	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Oyster shell	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lysine	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Vit-Min Premix	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Salt(NaCl)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
HRP	0.00	0.25	0.50	0.75	0.00	0.25	0.50	0.75
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
CalculatedNutritional Values (%)								
ME(Kcal/kg)	2825	2825	2825	2825	2900	2900	2900	2900
Crude Protein	23	23	23	23	20.10	20.10	20.10	20.10
Crude Fibre	3.61	3.61	3.61	3.61	3.51	3.51	3.51	3.51
Fat	4.16	4.16	4.16	4.16	3.96	3.96	3.96	3.96
Calcium	1.17	1.17	1.17	1.17	1.24	1.24	1.24	1.24
Phosphorus	0.70	0.70	0.70	0.70	0.71	0.71	0.71	0.71
Lysine	1.15	1.15	1.15	1.15	0.95	0.95	0.95	0.95
Methionine	0.78	0.78	0.78	0.78	0.34	0.34	0.34	0.34

1 kg premix contains Vit. A: 10,000,000 IU, Vit. D3: 2,500,000 IU, Vit. E: 20,000 mg, Vit. K3: 3000 mg, Vit. B: 30,000 mg, Vit. B3: 3000 mg, Vit. B2: 7000 mg, Vit. B6: 5000 mg, Vit. B12: 25 mg, Pantothenic acid: 10,000 mg, Folic acid: 800 mg, Biotin: 50 mg, Manganese: 80,000 mg, Iron: 40,000 mg, Zinc: 60,000 mCopper: 8000 mg, Cobalt: 250 mg, Iodine: 1000 mg, Selenium (1%), 150 mg, Choline: 200,000 mg and Antioxidant: 100,000 mg.

Results and Discussions

The result of this study is presented on Table 3. The results indicated that there were significant ($p<0.05$) effect of Hot Red Pepper on Cholesterol ,Triglyceride, High Density Lipoprotein ,Very Low Density Lipoprotein at starter and finisher phase. At finisher phase the highest concentration of cholesterol, Triglyceride, Very Low Density Lipoprotein was observed in the control group and birds fed diet with the inclusion level of 0.25%. This result is in agreement with (Puvaca., *et al* 2015a; Rengpipat, *et al* 2008). Tshe reduction in cholesterol at finisher phase is in agreement with the report of (Alkassie *et a*l., 2012; Alaa, 2010) who reported addition of HRP to the broiler diet in different amounts from 0.25 to 1% had influence on decreased concentration of blood cholesterol and other blood biochemical parameters. This results showed that hot red pepper are effective in regulation of lipid metabolism in a favourable manner.

Table 3: Lipid profile of FUNAAB-Alpha chickens fed diets containing Hot Red Pepper at varying inclusion levels.

Levels of inclusion of HRP						
Parameters	*0%HRP*	*0.25%HRP*	*0.50%HRP*	*0.75%HRP*	*SEM*	*p-value*
0-28 days						
Cholesterol	*95.00^{a}*	*88.00^{ab}*	*100.67^{a}*	*74.00^{b}*	*3.36*	*0.004*
Triglyceride	*97.67^{a}*	*78.00^{b}*	*85.67^{ab}*	*93.00^{ab}*	*2.73*	*0.023*
HDL(mg/dl)	*52.00^{a}*	*54.00^{a}*	*55.33^{a}*	*31.00^{b}*	*3.16*	*0.000*
LDL(mg/dl)	*23.67^{ab}*	*18.07^{b}*	*27.40^{a}*	*25.20^{ab}*	*1.32*	*0.040*
VLDL (mg/dl)	*19.67^{a}*	*15.57^{b}*	*17.10^{ab}*	*18.17^{ab}*	*0.56*	*0.033*
29-56 days						
Cholesterol	103.67^{a}	90.33^{a}	68.67^{b}	70.00^{b}	4.65	*0.000*
Triglyceride	103.00^{a}	97.67^{a}	82.33^{b}	83.00^{b}	2.85	*0.000*
HDL(mg/dl)	45.67^{ab}	42.67^{b}	34.00^{c}	48.33^{a}	1.69	*0.000*
LDL(mg/dl)	28.67	28.40	17.50	17.00	2.24	*0.062*
VLDL (mg/dl)	21.00^{a}	19.45^{a}	16.33^{b}	14.17^{b}	0.89	*0.000*

^{ab} Means on the same row having different superscript were significantly different ($P<0.05$)

HDL = High density lipoprotein, LDL = Low density lipoprotein, VLDL = Very low-density lipoprotein

Conclusion and Recommendation

In conclusion, addition of 0.75% HRP reduced cholesterol at both starter and finisher phase and increased HDL at finisher phase. Further research should be carried out on inclusion of HRP on other domesticated birds to further ascertain its effectiveness in maintaining good health.

References

Alaa, A.A.(2010). The effect of the Capsicum annuum in the diet of broilers on the isolation and shedding rate of Salmonella paratyphoid. *Kufa Journal for Veterinary Medical Sciences 1(1), 28-38.*

Al-Kassie, G.A , Butris, G.Y, Ajeena, S.J (2012). The potency of feed supplemented mixture of hot red pepper and black pepper on the performance and some hematological blood traits in sbroiler diet. *Int. J. Adv. Res. Biol. Sci., 2 (2012), pp. 53-57*

Athanasiadou, S.J. Githiori and Kyriazakis, I. 2007. Medicinal plants for helminth parasite control: Facts and fiction. Animal, 1: 1392-1400.

European Union. 2005. Ban on antibiotics as growth promoters in animal feed enters into effect. EuropeanCommission.AccessedNov.2021. https://ec.europa.eu/commission/presscorner/detail/en/I

Kouassi K.C and Koffi N.R. (2012). Evaluation de la connaissance et utilisation des varietes de piment (Capsicum) cultivees en Cote d'Ivoire. *International Journal of Biological and Chemical Sciences, 6 (1), 75-85.*

Nadeem M, Anjum F.M, Khan M.R, Saeed M and Riaz M. 2011.Antioxidant potential of bell pepper (Capsicum annuum L.)-A review. *Pakistan Journal of Food Science* 21(1-4), 2011, 45-51.

Puvača, N., Kostadinović, L.J., Ljubojević, D., Lukač, D., Lević, J., Popović, S.,Novakov, N., Vidović, B. and Đuragić, O. (2015)..Effect of garlic, black pepper and hot red pepper on productive performances and blood lipid profile of broiler chickens. *European Poultry Science 79:1-13, DOI: 10.1399/eps.2015.73*

Rengpipat, S., Niumsakul, A., & Tumwasorn, S. (2008). The effect of hot red pepper on the growth performance, carcass characteristics, and bloo`d lipid profile of broiler chickens. *World's Poultry Science Journal, 64(2), 167-173.*