

INFLUENCE OF VARYING LEVELS OF WATER SUPPLY AND DIETARY PROTEIN ON PERFORMANCE AND CARCASS CHARACTERISTICS OF BROILER CHICKENS

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Abstract

This study assessed the effects of 3 different levels of dietary protein (DP), water supply level (WL) and their interactions on the performance and carcass characteristics of broiler chickens. A total of 270 four weeks old broilers (St. Nicholas) were randomly arranged in 3x3 factorial of a complete randomized design based on % protein levels of 18, 20 and 22 and the water supply levels of 50, 75 and 100%. The Total Feed Intake (TFI), Average Feed Intake (AFI), Mortality %, Water Intake (WI) and protein intake (PI) were significantly ($P < 0.001$) influenced by the DP. With exception of FCR all the performance indices measured were significantly ($P < 0.001$) influenced by the WL. The carcass "fast food" cuts were in most cases significantly ($P < 0.01$; 0.001) influenced by the treatments. Conclusively, the performance and/or carcass traits of broiler chickens could be affected by varying levels of water supply and dietary protein.

Keyword : Dietary protein, Water levels, Performance, Carcass traits, Broiler chickens

Introduction

Water is not always considered as a nutrient in animal nutrition but is about the most important nutrient for poultry as survival time is limited with its absence (Atteh and Leeson, 1983). Birds can survive for longer periods without any other nutrient than they can survive without water. Effort to determine the extent to which broilers can withstand water scarcity through knowledge of water supply and restriction especially when they are fed varying dietary protein levels is very important to farmers. This therefore forms the focus of this study.

Materials And Methods

A total of 270 four weeks old broilers (St. Nicholas) were randomly arranged in 3x3 factorial of a complete randomized design based on % protein levels of 18, 20 and 22 and the water supply levels of 50, 75 and 100%. The Gross composition of experimental broiler finisher is as shown in Table 1. There were 9 treatments containing 3 replicates of 10 birds each. They were fed their respective diets *ad libitum* for 28 days and the response criteria were the performance and carcass traits.

Results And Discussion

Table 2 shows that water levels were significant ($P < 0.001$) for Final Body Weight (FBW), Total Weight Gain (TWG), TFI, AFI, WI and total PI while it was significant ($P < 0.01$) for mortality. Also DP levels were significant ($P < 0.001$) for

Table 1: Gross composition of Experimental Broiler finisher Diets (%)

Ingredients	Diet 1	Diet 2	Diet 3
Maize	54.5	54.5	55.2
Maize offal	13.2	7.0	2.2
Soyabean	15.0	17.0	16.0
Groundnut cake	8.0	12.0	17.0
Fish meal	2.0	2.0	2.0
Soya oil	2.8	3.0	3.1
*Others	4.5	4.5	4.5
Calculated			
Crude Protein (%)	18.1	20.3	21.9
ME (MJ/Kg)	13.02	13.02	13.03

*Bone meal = 2.5%, Oyster shell = 1.0%, Premix = 0.5%, L-lys-Hcl = 0.1%, DL. Met = 0.1%, Salt = 0.3%.

TFI, AFI, WI and total PI. These findings were consistent with the report of Boyle (2003). However, interactions between WL and DP were not significant for all the parameters measured. Table 3 shows that DP was significant ($P < 0.01$; 0.001) for relative weights of breast, shank, head and back while WL was significant ($P < 0.01$; 0.001) for neck, breast, drumstick, shank, head and back relative weights, suggesting that DP and WL have varying effects on the relative organs of broiler chickens.

References

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Table 2: Performance of water and protein intake of broiler finisher fed varying levels of protein and water supply

water supply	DIETS												
	18				20				22				
Dietary Protein (%)	100	75	50	100	75	50	100	75	50	±SEM	Dietary Protein (CP)	Water Level (WL)	DP×W. L
Water level (%)	100	75	50	100	75	50	100	75	50				
Initial Bdy wt (g/bird)	525.90	483.33	438.87	585.33	525.00	441.67	594.43	525.83	431.25	39.41	NS	***	NS
Final Bdy wt (kg/bird)	2.5	2.1	1.9	1.8	2.2	1.9	2.5	2.4	2.0	182.93	NS	***	NS
Total wt gain (kg/bird)	2.0	1.6	1.5	2.2	1.7	1.5	1.8	1.8	1.6	189.62	NS	***	NS
Avg wt gain (g/bird)	70.02	57.74	54.87	81.55	62.38	54.95	66.90	67.53	58.35	6.77	NS	***	NS
Total feed int (kg/day/bird)	3.8	3.2	2.8	3.8	3.3	2.8	3.8	3.8	2.9	149.85	***	***	NS
Avg Feed int (g/day/bird)	159.83	134.66	121.86	162.49	139.32	118.09	163.44	159.85	118.54	6.24	***	***	NS
FCR	2.29	2.36	2.24	2.01	2.25	2.18	2.44	2.37	2.04	0.27	NS	NS	NS
Mortality (%)	0.00	3.33	10.00	0.00	3.33	6.67	3.33	3.33	7.00	2.00	NS	**	NS
Water intake (lt/wk/bird)	12.61	11.25	7.50	13.75	11.82	7.88	14.53	12.38	8.45	143.60	***	***	NS
Total protein int (g/wk/bird)	172.34	145.43	131.61	194.99	167.95	141.71	214.42	211.11	158.18	7.24	***	***	NS

Table 3: Carcass traits of broiler chicken fed varying level of dietary protein and water supply

Dietary Protein (%)	DIETS											
	18				20				22			
	100	75	50	100	75	50	100	50	100	75	50	±SEM
Water level (%)												
Dress wt (%)	87.86	82.34	85.22	87.23	86.50	82.85	86.31	84.46	84.64	1.11	NS	NS
Evisc wt (%)	81.16	76.97	79.53	77.56	82.22	76.76	78.69	78.94	79.70	1.65	NS	NS
Neck	59.20	42.11	41.75	57.11	48.65	41.18	25.50	56.19	44.84	7.37	NS	NS
(g/kg/bdwt)												
Breast	199.69	126.17	132.17	198.43	172.79	135.89	222.67	165.71	179.99	30.41	*	NS
(g/kg/bdwt)												
Thigh	15.63	14.90	15.47	14.90	15.20	13.95	15.97	14.33	14.74	1.42	NS	NS
(g/kg/bdwt)												
Drumstick	55.16	41.30	36.73	50.91	47.60	39.08	55.10	51.06	46.30	6.19	NS	NS
(g/kg/bdwt)												
Shank	23.43	18.25	14.38	22.57	16.34	16.69	24.93	21.13	16.04	1.85	*	NS
(g/kg/bdwt)												
Head	26.33	20.46	18.80	27.41	19.41	20.33	27.94	23.53	20.89	1.69	*	NS
(g/kg/bdwt)												
Back	170.18	113.47	119.27	182.20	134.66	116.89	176.24	143.68	135.05	11.54	**	NS
(g/kg/bdwt)												
Belly fat	21.89	15.66	18.21	25.99	24.30	15.28	20.50	16.53	20.03	7.02	NS	NS
(g/kg/bdwt)												