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The Influence of River and Underground Waters On Production of Broiler

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Abstract: An experiment was conducted to determine the influence of River (A) and Underground water (B) on broiler at poultry Experiment Station (PES), Tandojam , each group contained 60 broilers. Broilers of both groups were housed under similar managemental conditions and offered same feed (iso-nitrogenous and iso-caloric) *ad libitum* during 11th June to 22nd July , 2002. A significant effect of different waters was recorded on Production of broilers. During the study, a significant intake of water was recorded in group A (227.12) and B (198.96)ml/b/d, but feed intake was non-significant for group B (87.29) and A (84.31) gm/b/d. Significant increase in the mean live bodyweight was recorded in group B(968.6) as compared to group A (943.8) gm/b/w and produced mean carcass weight in group B (1628) than A (1442) gm/b, respectively. The effect of river and underground water on all the visceral organs were statistically non- significant. It was concluded that water with different alkalinity, salinity chloride, total dissolved salts and electrical conductivity effect of overall water intake, live body weight dressed carcass recoveries of broiler.

Key words: River and underground water, live and carcass weight, feed and water intake and visceral organs

Introduction

Water is not commonly included in intake constituent list although it is an important constituent. However, it is required in large amount due to its physical properties and nature of use i.e. transport of food nutrients and blood and also maintained body temperature etc (Rodwell, 2000). Normally birds consume at least double water available against commercial feed intake but it may increase due to stress. Water intake of bird may be influenced by ambient temperature , compositions and intake of feed housing, genetic potential, age and weight, level of performance and environment. Furthermore, water main relates with intake of feed and performance of flock.

Water nitrates or nitrites are the most serious problem affecting water quality. Such contamination is usually an indiction of runoff from farm animal wastes or fertilizers leaking etc into the underground water system, which further depends upon the depth of availability of water (bore) at local level. The toxicity of nitrates to broiler had a negative effect on weight and its performance. Acidic drinking water can affect digestion corrode watering equipments and be in-compatible with medicines and vaccines. A large number of chemicals occurs naturally in underground water, they are usually present in amounts that intact with the metabolism or digestive functions of chicks. Although some times their level got out of balance or in combination with other chemicals affect of poultry performance such as excessive sodium (Na) level has a diuretic effect, too much chloride (CI) has detrimental effect on metabolism of bird. High sulfate (SO_4) level have a laxative effect, more magnesium (Mg) level cause loose droppings, other chemicals such as manganese (Mn) produce a flavour problem of water and copper (Cu) give a bitter taste and cause liver damage (Chohan, 1995). Keeping in view the importance of water, a study was designed with the objective to find the influence of river and underground waters on broiler production.

Materials and Methods

120 day old broiler purchased and randomly divided into 2 group i.e. A and B, 60 in each during 11th June to 22nd July , 2002 at PES, Tandojam. River and underground water was offered to group A and B at full choice, respectively. Dried wooden dust was used as litter and spread about 2 inches thick in diameter on house floor. Brooder's temperature was 90 to 95 ^{0}F during first week and reduced by 5 ^{0}F per week till 70 ^{0}F as house temperature. Humidity was maintained around 60 percent. Light was given 24 hours by using 60-

watt electric bulbs at the height of 7 feet. Pre-starter, starter and finisher rations were provided *ad libitum.* Fresh water was samples of both waters were collected into well washed bottles in each week and brought for the determination of pH, chlorides, salinity, alkalinity, Total dissolved salts (TDS) and electric conductivity (E.C) at M.A. Qazi Institute of Chemistry and Institute of Biochemistry, University of Sindh, Jamshoro (Hussain and Jabbar, 1985 and Merck, 1974). Vaccination schedule was followed against ND, IB, IBD and Hydropericardium disease. Broilers were individually weighted at the beginning and later at the end of each week in their respective groups. 10 broilers from each group were randomly selected, weighted, slaughtered, de-skinned and weighted for their carcass weighted and its percent followed by their weighted of liver, heart, proventriculus, gizzard, lungs, kidney, thymus, bursa and spleen. The collected data was tabulated and analyzed by using Minitab Microcomputer Software in General Linear Model (M. T. B., 1992).

Results

Water: Samples of river and underground waters collected from PES, S.A.U., Tandojam were analyzed. The reports showed that the temperature and pH were almost similar but level of E.C., Salinity, TDS, Chlorides and Aikalinity were comparatively higher in underground than river water (Table 1). This indicates more heaviness of underground water.

Table 1: Detailed water analysis report

Tests	Group A	Group B
Temperature (^{0}C)	32.0	32.2
PH	7.47	7.42
Electrical Conductivity (µs/cm)	200	1190
Salinity (gm/litre)	0.1	0.6
Total Dissolved Salts TDS(mg/litre)	128.0	761.6
Chlorides (mg/litre)	58.85	117.70
Alkalinity (mg/litre)	154	462

Average daily water intake of broilers (Table 2) showed that river water was consumed significantly more in quantity by broilers of group A (227.12) than group B broilers (198.96) ml/b/d P<0.05). Although, intake of both the waters over 42 days shows continuous significant (P<0.05) increase of water consumption by the broilers (Fig. 1).

Feed: The average feed intake (Table 3) of broilers offered river (A) and underground (B) waters (84.31vs 87.29)gm/b/d was not statistically significant (P>0.05). Interaction between both groups offered various waters and weeks (Fig. 2) shows that broilers feed intake was continuously increased with the progress of their age upto the completion of trial (P<0.05).

Table 2: Average water intake of broilers offered river and underground waters(ml/b/d)

Groups A	Groups B	Probability
227.12±4.391	198.96±4.391	0.001

Table 3: Average feed intake of broilers offered river and underground waters(gm/b/d)

Groups A	Groups B	Probability
84.31±1.430	87.29±1.430	0.145

Bodyweight: Average live bodyweight (Table 4) of underground water offered to group B (968.6) was significantly heavier (P<0.05) than river water consuming broilers A (943.8) gm/b. Furthermore interaction between groups offered various waters and time periods show that live bodyweight of broilers was significantly increased throughout experimental period in both groups (Fig. 3)

Table 4: Average live bodyweight of broilers offered river and underground waters(gm/b/week).

Groups A	Groups B	Probability
943.8±7.625	968.6±7.625	0.022

Carcass: Pre-slaughter bodyweight (Table 5) was significantly higher in group B broilers than group A and similar trend was observed for their carcass weight and percentage (2556, 1628 gm/b, 63.7% and 2295, 1442 gm/b, 62.8%), respectively.

Visceral Organs: Average weight of liver, heart proventriculus, gizzard, lungs, thymus, kidney, bursa and spleen and their sizes of thymus, kidney, bursa and spleen obtained from 10 slaughtered broilers of each group on various waters were not different statistically (P>0.05)

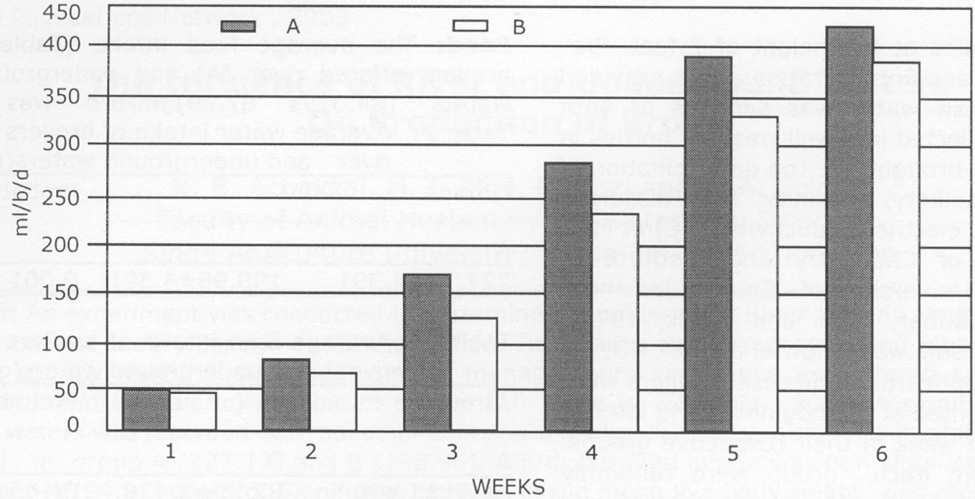

Fig. 1: Interaction between groups and weeks for water intake of broiler offered river and underground waters

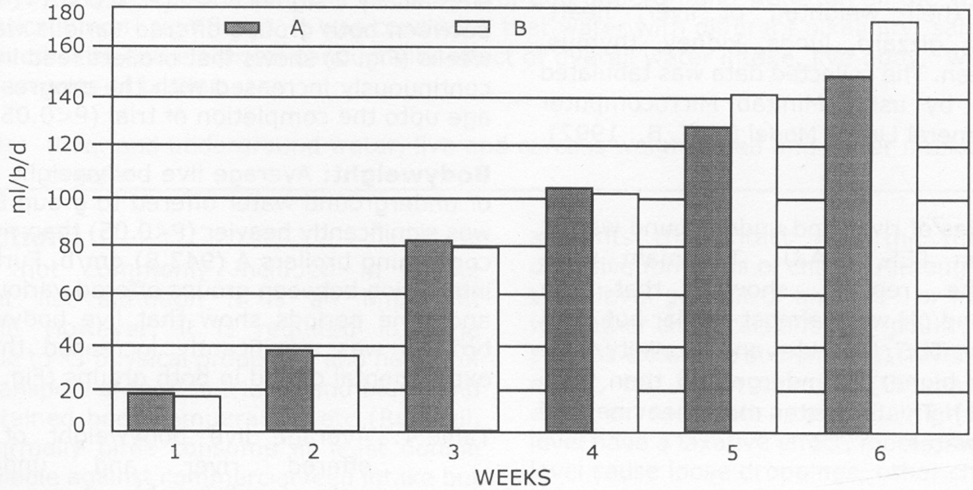

Fig. 2: Interaction between groups and weeks for feed intake of broiler offered river and underground waters

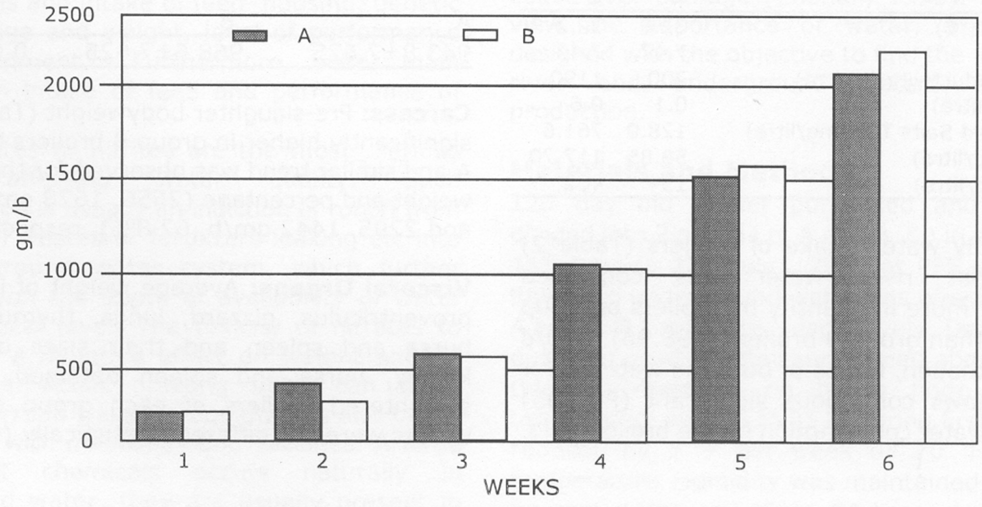

Fig. 3: Interaction between groups and weeks for live body weight of broiler offered river and underground waters

(Table 6 and 7).

Table 5: Average carcass weight and percentage of broilers offered river and underground waters.

Particular	Groups A	Groups B	Standard	Probability
Carcass weight (gm/b)	1442	1628	±0.05	30.022
Carcass%	62.83	63.69		

Table 6: Average weight of visceral organs of broilers offered river and underground waters (gm/b).

Weight	Groups A	Groups B	Standard	Probability
Liver	49.50	47.50	±3.403	0.683
Heart	8.30	7.10	±1.062	0.435
Proventriculus,	4.40	6.00	±0.838	0.194
Gizzard	36.00	43.00	±2.887	0.104
Lungs	9.70	9.70	±0.761	1.000
Thymus	11.40	10.50	±1.137	0.583
Kidney	10.70	12.10	±0.537	0.101
Bursa	1.73	1.93	±0.366	0.704
Spleen	1.98	2.15	±0.387	0.760

Table 7: Average size of Thymus, kidney, Bursa and Spleen of broilers offered river and underground waters (cm/b).

Sizes	Groups A	Groups B	Standard	Probability
Thymus	1.13	1.19	±0.061	0.501
Kidney	3.92	3.99	±0.111	0.660
Bursa	2.18	2.59	±0.276	0.307
Spleen	1.67	1.58	±0.179	0.726

Feed Conversion Ratio: Highly improved F. C. R. reported in underground water indicates that broilers generally housed during hot season were highly efficient to convert major quantity of feed into production, while almost least energy may be utilized on their maintenance of body. It become possible through minimizing their feed related activities within an underground water consuming group.

Discussion

Underground water intake was significantly less due high level of chlorides in comparison with the river water. However, live bodyweight/weight again and carcass recovery recorded higher than low concentrated river water. These results are in agreement with Furlan *et al.*(1999), who reported that water intake was reduced in the birds that received chlorinated drinking water. The feed intake was increased in broilers received underground water with increased TDS as compared to those taken river water. These findings are further supported by Pourreza *et al.* (2000) Who reported that broiler received water with increased TDS levels consumed more feed.

Conclusions

It was concluded that waters with different alkalinity, salinity, chloride, total dissolved salts (TDS) and electrical conductivity affects on overall water and feed intake, live bodyweight/weight gain and dressed carcass recoveries of broilers.

References

Chohan, M.A., 1995. Drinking water quality for poultry. Monthly Pakistan Farming Decent Printing Enterprises, B-167, Hijrat Colony, Ahmad Raza Khan Road, Karachi-4.

Furlan, R.L., M. Macari, E.B. Malheiros, C. Ingraci and H.T. Meireles, 1999. Effect of drinking water chlorination and dietary energy level on body weight gain and water intake in broiler chickens. Revista Brasileira de zootecnia, 28: 542-547.

Hussain, T. and A. Jabbar, 1995. Soil, water and fertilizer analysis. Manual-2 and 3. Department of Soil Sci. Univ. of Agri. Faisalabad, PP: 2-13,24-25.

Merck, E.D., 1974. The testing of water (9th). Federal Republic of Germany PP: 224.

Minitab, 1992. Micro Computer Software for statistical Analysis, pp: 215.

Pourreza, J., H. Nasrollahi, A.H. Samie, M. Mohammadalipoure and A. Assadian, 2000. The effect of total dissolved solids on performances of broiler chickens. J. of Sci. and Tech. of Agri. and Natural Resources 3: 71-82.

Rodwell, V.W., 2000. Harper's Biochemistry (25th). Prentice- Hall International (UK) Limited, London, pp: 927.