www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(8): 67-69

www.thepharmajournal.com
Received: xx-06-2021
Accepted: xx-07-2021

S Kalita
Assam Agricultural University, Assam, India

JD Mahanta
Assam Agricultural University, Assam, India

D Sapcota
Assam Agricultural University, Assam, India

R Saikia
Assam Agricultural University, Assam, India

MC Borah
Assam Agricultural University, Assam, India

S Laskar
Assam Agricultural University, Assam, India

P Deka
Assam Agricultural University, Assam, India

Corresponding Author
S Kalita
Assam Agricultural University, Assam, India

Effect of different sources of drinking water on the performance of commercial broiler chicken

S Kalita, JD Mahanta, D Sapcota, R Saikia, MC Borah, S Laskar and P Deka

Abstract
An investigation was carried out to study the effect of physical qualities of drinking water of different water sources on the performance of broiler chicken. The study showed average total water consumption (l/bird) of broiler chicken offered untreated pond water was lowest and highest for bore well water. After treatment of water the total water consumption per bird increased numerically for all the groups. The overall water/ feed consumption ratio was highest for untreated rain water (4.07). The total feed consumption of broiler chicken offered both untreated and treated bore well water was numerically higher. The bore well water offered broiler chicken of both untreated and treated exhibited significantly (P<0.05) highest final body weight. The treatment of water showed significantly (P<0.05) increased body weight of broiler chicken offered bore well, pond and rain water. Among the untreated sources of drinking water, the broiler chicken offered tube well and pond water exhibited the best FCR values of 1.77. The treatment of drinking water improved the FCR values numerically for all the five sources of water. Among the untreated and treated sources, highest BPEI values were shown by the broiler chicken offered rain and bore well water. Cent per cent livability was found to be the broiler chicken offered treated drinking water.

Keywords: water sources, treatment of water, acidifier and sanitizer, water and feed intake, body weight

Introduction
Water is a vital nutrient, involved in every aspect of metabolism in poultry. It plays important role in regulating body temperature, digesting food, transportation of nutrients and elimination of waste products (Abd-El-Kader *et al.,* 2009). A safe and adequate supply of water is therefore essential for efficient poultry production. Water is the most important nutrient for poultry and survival time is limited in its absence. Although the necessity of providing a plentiful supply and sufficient access is well understood, but the importance of water quality on performance is often overlooked (www.aces.edu). Numerous factors, including equipment, management practices, house environment and housing type play a role in broiler performance, but water quality may be the most critical and least appreciated. Good quality of water is essential for the production of livestock and poultry. It is an essential ingredient for life, and is also involved in many essential physiological functions such as, digestion, absorption, enzymatic function, nutrient transportation, thermoregulation, lubrication of joint and organs, elimination of waste. It is also an essential component of blood and tissues (Abdullah, 2011) [3]. Under normal conditions water intake of birds is about twice than the weight of feed intake. Lacy (2002) stated during the period of extreme heat, water requirements can easily quadruple than the weight of feed intake. Broiler drinks a great deal of water, during its lifetime, a 2.3 kg broiler will consume about 8.2 litre of water compared to approximately 4.6 kg of feed.

Materials and Methods
A total of 450 day-old commercial broiler chicks (Cobb 400) having similar body weight from a single hatch were procured from a local hatchery of Guwahati city. The chicks were weighed and randomly divided into ten experimental groups namely, untreated group with ring well water, treated group with ring well water, untreated group with tube well water, treated group with tube well water, untreated group with bore well water, treated group with bore well water, untreated group with pond water, treated group with pond water, untreated group with rain water and treated group with rain water. Further each group was again subdivided in 3 replicates containing 15 chicks in each group. The birds were offered both untreated and treated drinking water of these five sources.

The treatment of water was done with the combination of acidifier and sanitizer at the rate each of 0.05 ml per liter of drinking water. Water samples from all the untreated and treated groups were analysed for various physico-chemical parameters.

Results and Discussion

The average weekly treated water intake was numerically higher for all the weeks under study as compared to untreated water. Manwar *et al*. (2012b) [11] also reported that water intake of treated well water was improved (196.4 ml/b) against untreated well water intake (174.2 ml/b) during starter phase. However, in the later phase, the water intake of treated well water was found to be comparable with untreated well water. Among the all water sources, the total water consumption by broiler chicken of untreated pond water offered group was numerically lowest (12.055 l/bird) and it was highest for treated bore well water. The difference in water consumption between untreated pond water and treated bore well water was 2.8 lit/bird. The lower water consumption of untreated pond and tube well water might be due to higher levels of mineral including iron which affected the taste of water. In the present findings there were numerical variations in the total water consumption by broiler chicken for various sources of water. Abbas *et al*. (2010) [2] reported that water consumption was not significantly ($P>0.05$) affected by the different sources of water. In a similar study, Abbas *et al*. (2008) [1] indicated that broiler chicken consumed significantly ($P<0.05$) higher Nile water per bird per week as compared to commercial and well water. Due to treatment with the combination of acidifier and sanitizer to all the different sources of water, there was increased water consumption for all the treated sources of water and the level of increase ranged from 0.360 to 2.075 lit per bird. One of the probable reasons for higher water consumption in treated water might be due to absence of hardness after treatment with acidifier and sanitizer (Manwar *et al*., 2012a) [10]. On perusal of the water/feed consumption ratio (Table 4.5), it was observed that during the 1st four weeks of age, the ratio was almost similar which ranged from 3.20 to 3.74. However, during 5th and 6th week of age the ratio increased up to 4.83. The higher ratio was due to increased ambient temperature and relative humidity during the later part of trial. The overall water/feed consumption ratio for different sources of water numerically varied from 3.67 to 4.07. In a similar work conducted by Abbas *et al*. (2010) [2] reported comparatively lower water/feed consumption ratio (2.65-2.83) for commercial, Nile and well water. These ratios did not differ significantly ($P>0.05$) between the different sources of water.

In the present experiment, the total feed consumption (g/b) of broiler chicken decreased numerically by 44.48 g in treated ring well water, 64.61 g in treated tube well water and 29.40 g in treated bore well water as compared to untreated groups of respective sources. On the other hand, the feed consumption per bird increased numerically by 191.94 and 108.74 g in treated pond and rain water offered group respectively. This finding was consistent with the report of Manwar *et al*. (2012) [10, 11] while conducting a study to assess the performance of broiler chicken offered different sources of water with or without treatment with acidifier and sanitizer. The cumulative feed intake of broiler chicken offered untreated and treated sources was numerically comparable in all the groups. In the present study, the total feed consumption per bird decreased numerically by about 44.41 g, offered ring well water treated with the combination of acidifier and sanitizer at the rate each of 0.05 ml per litre of drinking water. In a similar study, Das (2013) [7] found numerically higher feed intake by about 29.21 g in broiler chicken offered treated water. In the present findings, the body weight and body weight gain of broiler chicken offered different sources of drinking water differed significantly ($P<0.05$). The result of this study was consistent with the report of Saidy *et al.* (2015) [12]. Contrary to the present findings, several workers (Abbas *et al.*, 2008; Abbas *et al.*, 2010; Ibitoye *et al*., 2013; Zimmermann and Douglan, 1998; Folorunsho *et al.*, 2012; Asaniyan and Adene, (2013) [1, 2, 9, 14, 8, 6] reported that water from different sources had no significant ($P<0.05$) effect on body weight and body weight gain of broiler chicken. Among this previous workers Ibitoye *et al.* (2013) [9] found numerically higher body weight and body weight gain in broiler chicken offered bore well water.

In the present study it was found that among the different sources of untreated drinking water, broiler chicken offered pond water gained significantly ($P<0.01$) lowest body weight (1856.12 g) and for remaining sources there were no significant ($P>0.05$) differences in body weight of broiler chicken. Among the treated sources, broiler chicken offered bore well water achieved significantly ($P<0.05$) highest body weight (2159.73 g).

The reason of differences in body weight and body weight gain might be due to different concentration of minerals and other water qualities (Saidy *et al.*, 2015) [12]. In the present study the average weekly body weight and body weight gain of broiler chicken increased numerically and significantly ($P<0.05$) in all the weeks under study due to treatment with the combination of acidifier and sanitizer at the level of 0.01 %. This was in agreement with the report of Manwar *et al.* (2012a) [10] and Das (2013) [7] who reported that the final body weight of broiler chicken increased significantly ($P<0.05$) due to the addition with combination of acidifier and sanitizer at the rate of 0.01% in bore well, open well and ring well water. The improved body weight due to the addition of acidifier and sanitizer might be due to the reasons like Acidifier improved the quality of drinking water, Acidifier in drinking water reduce pH of drinking water as well as gastrointestinal tract of poultry, thus it controls the growth of pathogenic microbes, Acidifier decreases water viscosity and prevent formation of slime and growth of pathogen, Acidifier help the bird to populate with commensal in the gut, which in turn improved the total gut health and improves the absorption of nutrients, Addition of sanitizer to water decreases oxidation of iron and thus decreases formation of rust in pipes and waters, Sanitizer protects the pipeline from blocking due to growth of algae (Das, 2013) [7].

The overall feed conversion ratio for untreated ring well, tube well, bore well, pond and rain water was 1.81, 1.77, 1.88, 1.77 and 1.79 respectively. The corresponding values for treated drinking sources were 1.75, 1.73, 1.71, 1.72 and 1.76 respectively. Among the untreated sources of drinking water, the broiler chicken offered tube well and pond water exhibited the best FCR values of 1.77. In respect of treated sources best result (1.71) was found in bore well water offered group followed by pond water, tube well, ring well and rain water. The treatment of drinking water improved the FCR values numerically for all the five sources of water. The improved FCR in pond water offered group during the initial four weeks of age might be due to positive correlation between FCR and sulphate level at water sources (Zimmermann and Douglan, 1998 and Abbas *et al*., 2010) [14, 2]. In the present findings, the

sulphate level was highest in pond water as compared to the other sources of water. In a study conducted by Saidy *et al*. (2015) [12] on differences of water, they found improved FCR in farm stored water which was due to high concentration of potassium and chloride ion comparing to the other sources of water. The present findings could not be corroborated with the report of Saidy *et al*. (2015) [12], because chloride level of pond water group was within the desirable level. In the present study, the performance of broiler chicken provided with rain water was satisfactory in respect of FCR which ranged from 1.76 to 1.79.

Among the untreated and treated sources, highest BPEI values were shown by the broiler chicken offered rain and bore well water. The per cent livability of broiler chicken offered untreated ring well, tube well, bore well, pond and rain water were 91.11, 91.11, 88.89, 95.56 and 100.00 respectively. On the other hand, cent per cent livability was found to be the broiler chicken offered treated drinking water. Similar observation was made by Manwar *et al*. (2012a) [10] and Das (2013) [7] in broiler chickens offered treated water.

Among the different sources of water, broiler chicken offered with treated bore well water showed the best performance in respect of body weight, FCR, BPEI and Gross profit per broiler.

Conclusion

Thus, it is concluded that during monsoon season, all the physico-chemical and microbiological qualities of drinking water were found to be within the maximum permissible level after treatment with the combination of Acidifier and Sanitizer @0.01%. Hence, all the treated sources of water under study will be more useful for broiler chicken production during monsoon season.

References

1. Abbas Talha EE, Elzubeir Elfadil A, Arabbi Omer H. Drinking water quality and its effects on broiler chicks performance during winter season. Int. J Poult. Sci 2008;7(5):433-436.
2. Abbas TEE, ELzubeir EA, Arabbi OH, Mohamed HE. Drinking water quality 1: Effects on broiler chicks performance during summer season. Res. J Anim. Vet. Sci 2010;5:58-63.
3. Abdullah AM. Impact of different locations water quality in Basra province on the performance and physiological changes in broiler chicks. Pakistan journal of nutrition 2011;10(1):86-94.
4. Akbari MR, Kermanshahi H, Kalidari GA. Effect of acetic acid administration in drinking water on performance and growth characteristic and ideal microflora of broiler chickens. Journal of Science and Technology of Agriculture and Natural Resources 2004;8(3):139-148.
5. Asaniyan EK, Adene IC, Adekunle SA. Effect of drinking water sources on performance and carcass indices of broiler chickens, Nigerian Journal of Animal Production 2012;39:46-53.
6. Asaniyan EK, Adene IC. Influence of drinking water sources on haematological indices of broiler chicken. Proc. 38th Conf., of Nig. Soc. Anim. Prod. 17th-20th March, Rivers State University of Sci. & Tech., Port Harcourt Nigeria 2013, 648-650.
7. Das Martina. Effect of Acidifier and sanitizer treated drinking water on the performance of broiler chicken. M.V.Sc. Thesis, College of Veterinary Science, Assam Agricultural University, Khaqnapara, Guwahati, Assam 2013.
8. Folorunsho OR, Laseinde EAO, Onibi GE. Performance, haematyology and carcass characteristic of broiler chicken given water from different sources. Nigerian Journal of Animal Production 2012;39(1):104-113.
9. Ibitoye EB, Dabai YU, Mudi L. Evaluation of different drinking water sources in Sokoto North-West Nigeria on performance, carcass traits and haematology of broiler chickens. Veterinary World 2013;6(11):879-883.
10. Manwar SJ, Awandkar SP, Gaikwad NZ, Sardar VM. The Effect of acidifier and sanitizer treatment of drinking water on immune response and blood biochemistry in broiler chicks. Anim. Sci. Reporter 2012a;6(3):99-103.
11. Manwar SJ, Awandkar SP, Munde VK, Waskar VS. The effect of different sources of drinking water and commercially treated water on the performance of broiler chicken: Int. J Poult. Sci 2012b;47(1):60-63.
12. Saidy ELN, Mohamed RA, Abouelenien F. Assessment of variable drinking water sources used in Egypt on broiler health and welfare. Vet World 2015;8(7):855-864.
13. Thirunavukkarasu M. Quality of drinking water supplied from open and bore wells to layer farm in Namakkal Taluk. M.V.Sc Thesis, Tamil Nadu Veterinary and Animal Science University, Namakkal. 2nd Edn., International programme on Chemical Safety, Geneva 1997, 2.
14. Zimmermann NG, Douglass L. A survey of drinking water quality and its effect on broiler growth performance on Delmerva. Poultry Science 1998;77(1):121.