PERFORMANCE OF GROWING COTURNIX QUAILS (*COTURNIX COTURNIX JAPONICA*) FED DIFFERENT WATER SOURCES.

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Abstract

A study of 6 weeks was conducted to determine the effect of different water sources on the performance of growing Japanese quails. A total of two hundred 2-week old quail birds of mixed sexes were randomly allocated to four water treatments in a completely randomized design. The birds were allocated fifty per replicate. Every replicate has 15 birds with the extra birds distributed without bias at a bird per replicate. Feed given was an on-farm quail chick mash with feed and water supplied ad libitum for 6 weeks. The water sources were from borehole (control), well, stream and dam respectively. Birds on treatment A consumed the highest feed (17.42g), followed by those on treatment C (17.13), D (15.17) and B (15.16). However, the differences were not significant (p>0.05). Water intake of birds on treatment A was higher (39.97ml/bird) than those on treatment C (35.84), B (33.32) and D (32.86) respectively. However, differences were not significant (p >0.05). Birds on treatment D had a higher weight gain (3.88g/bird), followed by those on treatment C (3.67), B (3.62) and A (3.29) in that order. The differences were not also significant (p>0.05). Feed conversion ratio of birds seemed to follow a similar trend with water intake. It was better on treatment D (3.98) followed by those on B (4.14), C (4.76) and A (5.36) respectively. Result of this investigation showed that birds can be raised on any of the water sources. However, water from borehole and well have better control than those from other sources.

Key words: Water intake, feed intake, weight gain, Japanese quails.

Introduction

Japanese quails are little-known birds that are small-sized and early maturing (Robbins, 1981). This early maturing nature enables them to start laying as early as from the 5th week of life (Martins, 1987). It is recommended that persons prone to high blood pressure and related diseases could consume the meat and eggs with less risk. Recommended levels of some nutrients (CP, 25; ME, 2,600kcal/kg) when maintained in the feed is useful in achieving optimal performance in growing Japanese quails, (Edache *et al*., 2005). There is paucity of information regarding the use of water sources for growing quails hence the need for this study.

Water is the most important of all nutrients. Unfortunately, water is neglected in nutritional studies (Osuhor *et al*.2001) and survival time is limited with its absence (Atteh and Leeson, 1983). Water is needed in quantity and quality. In its pure form it is odourless, tasteless and transparent and it is essential to the developmental growth and survival all animals (Swick, 2003). According to Arujo (2010), water is available to animals through drinking water, water in the diet and metabolic water through catabolism of nutrients. Broilers are reported to have large appetite for water about twice or more than that of feed (Fairchild and Riz, 2012). It's usual for birds to consume more water when ambient temperature increases as a means of regulating body temperature (Fairchild and Riz, 2012). The possibility of water shortage affects livestock and therefore, all procedure involving water use must be reviewed (Gherman *et al*., 2012). Anaemia is indicated in the feeding of crude oil polluted water to cockerels (Eastham *et al*. 1993). An adequate knowledge and understanding of the behavior of an animal is inevitable in talking of the production, management and wellbeing and productivity of the animal (Kron *et al*. 2000). Wiseman (2010) opined that for efficient growth and production performance, rabbits need clean water at all times. Poultry house litter and fecal droppings became the major contaminants of water delivery systems, while algae, oil spills and gas flares became the most important contaminants as well as seepages and sewages disposed into water sources (Etuk *et al*., 2018). According to Enukwevwere *et al*. (2018), heavy metal concentrations in drinking water samples were high compared to WHO standards for drinking water. The objective of this study is to determine the effect of different sources of water on the performance of growing Japanese quails owing to the paucity of information regarding this.

Materials and Methods

Birds, housing and management: 200 two-week old Japanese quail birds of mixed sexes obtained from the National Veterinary Research Institute poultry farm were used in this study. They were uniform in size and housed in deep litter house partitioned into several pens with wire mesh to allow for adequate ventilation. The birds were offered one of four treatments involving borehole (control), well, stream and dam water respectively. The birds occupied 12 pens with 16 birds per pen. The experimental treatments were designated A, B, C and D respectively. The remaining birds were distributed without bias to treatments. All birds from each unit were weighed at the beginning and weighed weekly for six weeks. Feed and water were given *ad libitum*.

Water sources: borehole, well, stream and dam. The water was fetched fresh from the borehole, well, stream and dam and used for the experiment. A total of 200 birds were randomly assigned to the water sources in a completely randomized design at 48 birds per water source. This amounted to about 16 birds per replicate. The borehole was the control.

Diets: The diet used was the on –farm feed which was carefully prepared for the purpose..

Table 1. Composition of experimental diet (%)

	Diet
Ingredients	A
Maize	33.22
Rice offal	2.00
Ground nut cake	39.08
Calculated composition	
CP	25.00
ME (Kcal/kg)	2706.92
Ca	1.63
P	0.65
CF	5.25
Feedcost/kg(₦)	84.62

****Others:** palm kernel cake (20.00%), fish meal (1.50%), bone meal (2.00%), lime stone (1.50%), *premix (0.25%), salt (0.25%), methionine (0.10%), lysine (0.10%).

***** Hi Nutrient premix supplied the following per 100kg of diet: Vitamin A, 1,200,000 I.U; Vitamin D_3 250,000 I.U; Vitamin E, 3,000 I.U; Vitamin K, 200mg; Thiamin (B_1), 225mg; Riboflavin (B_2), 600mg; Pyridoxine (B_6), 450mg; Niacin, 4000mg; Vitamin B_{12}, 2mg; Pantothenic acid, 1,500mg; Folic acid, 150mg; Biotin, 8mg; Choline chloride, 30,000mg; Anti oxidant, 12,500mg; Manganese, 8,000mg; Zinc, 5,000mg; Iron, 2,000mg; Copper, 500mg; Iodine, 100mg; Selenium, 20mg; Cobalt, 50mg. Key: C.P, crude protein; M.E, metabolizable energy; Ca, calcium; P, phosphorus; C.F, crude fibre

Data Collection and analysis: The mean weekly body weights, water intake and feed intake were recorded throughout the experimental period. From the mean body weight and feed intake, feed conversion ratio was calculated. Feed cost/kg diet was calculated from prevailing local market price of feed materials. Data collection was subjected to analysis of variance; ANOVA (Steel and Torrie, 1980) and where significant differences occurred, means were separated by Duncan's new multiple range test (Obi, 1990). The analysis was carried out using Minitab version 14 (Minitab, 1991).

Results and Discussion

Data on feed intake, weight gain and feed conversion ratio are presented in Table 2. Data on feed intake was not significant throughout the period. The different water sources were significant for final body weight. This has been agreed to by Jegede *et al*. (2016) that different water levels affected final weight in their work with broilers. However, feed intake, weight gain and feed conversion ratio were not affected by the different water sources which is different from the findings of Jegede *et al*.(2016). Water intake for the different water sources were similar indicating tasteless and sweet water. This is

attested to by Folorunsho *et al*. (2016) and Czarick *et al*. (2001) that birds will consume more water with a sugar additive. Lower water intake is indicative of bitter water which was attested to by Watkins (2000) that it may be a natural response for birds to consume less of such water. Crina (1994) reported that chicks are sensitive to bitter –tasting substances and salt. Feed intake and weight gain were similar across the treatment even though the values were fluctuating but the levels of water intake are similar to that (39 – 44ml/bird/day) reported by Tuleun *et al*. (2009) for Japanese quails. However, quails have been reported to adjust feed intake across a wide range of energy levels (Weber and Reid, 1967) probably due to intrinsic habit developed in the wild. This adjustment may also include water intake.

Table 2. Effects of different rice offal levels on parameters measured

Parameters	A	B	C	D	SEM
Feed intake (g/b/d)	17.42	15.16	17.13	15.17	3.75NS
Water intake (ml/b/d)	39.97	33.32	35.84	32.86	7.70NS
Weight gain (g/b/d)	3.29	3.62	3.67	3.88	0.76NS
Feed/gain ratio	5.36	4.14	4.76	3.98	0.92NS
Initial weight (g/b)	78.27^{b}	52.05^{a}	78.27^{b}	52.53^{a}	1.36*
Final weight (g/b)	204.67^{b}	197.67^{c}	225.00^{a}	208.83^{b}	5.36*

a,b, means with different superscript letters within rows are significantly different ($p<0.05$)

Conclusion

Water is available all year round in many places in Nigeria. The choice of where to get water for birds is important consideration. Looking at the effects of the different water sources on feed intake, weight gain and feed conversion ratio, only the final body weight was significantly affected. Other values were not affected. Therefore, in order to obtain consistent water of high quality, water from borehole and well are recommended.

Acknowledgement

The authors are grateful to the Provost, FCAH&PT., Vom for the support.

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