

# EFFECTS OF VARYING PERCHES HEIGHT ON PERFORMANCE OF BROILER CHICKENS

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**Abstract:** Environmental enrichment is a process of enhancing the physical or social environment of an animal, and it is design to provide expression of natural species-appropriate behaviour of captive animals. Objects such as perches, straw-bale, mirror, dust bath, audio- visual tools and pecking devices are used to enrich the poultry environment. Environmental enrichment help in limiting stereotypical behaviours such as cannibalism and pecking in poultry, which have impact on the health, welfare and performance of broiler chickens. This study aimed at studying the effects of varying perches height on performance of broiler chickens. 288 Parodex line in a commercial broiler farm in Jalingo were used for period of 42 days. Varying perches height T0, T1, T2, T3, T4 and T5 with 8 replications were used to examine the effects on performance. The effects of varying perches height in the present study has no effects  $p > 0.05$  on the performance of broiler chickens. However, T4 shows optimal improvement in the body weight and feed conversion ratio 92g, 252g, 407g and 1.81, 1.54 and 1.60 at d0-d21 respectively. In order to draw final conclusion, future research is needed to examine the effects of varying perches height using different perches type and height.

**Keywords:** broiler, perches, performance.

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## 1. INTRODUCTION

Environmental enrichment has been inconsistently used without a specific definition. It is mostly refers to the changes concern with addition of one or more object to animal environment (Newberry 1995). However, Environmental enrichment is a process of enhancing the physical or social environment of an animal, and it is design to provide expression of natural species-appropriate behaviour of captive animals (young 2003). Objects such as perches, straw-bale, mirror, dustbath, audio- visual tools and pecking devices are used to enrich the poultry environment (Adeniji, 2012). Environmental enrichment help in limiting stereotypical behaviours which have impact on the health and welfare of animals such as wool-eating in sheep, weaving, pacing, cannibalism and pecking in poultry, bar biting in pigs, wind sucking in horse and tongue rolling in cattle (Price 2008). The work of (Altan *et al*, 2013) reported that the used of enriched devices in animals and no effects to their health and welfare. However, it is also confirmed that the use of mirror in some birds causes aggression (branch *et al* 2015) on the other hand the use of peches improves the bone strength (Bizeray *et al.*, 2002). As a result of a selective breeding, management system which leads to the storage of adipose on the birds as a results of lack of exercise (Hood, 1983), therefore, there is a strong relationship between the above mentioned factors which lead to health and welfare implication thereby affect the performance of a broiler chick (Ekelund *et al.*, 2006) the longer time spend by broiler on poor litter and lack of exercise causes lesion on the skin and the breast (Bessei 2006). However, environmental enrichment have been used to improve both physiological and physical state while pecking, foraging and perching (Hall, 1990), Stress in poultry is as a result of fear caused by a noise or a sudden sound, this have a negative impact on the behaviour and physiological response in broiler production, it was proved that

exposing birds to stress leads to substantial increase consumption of glucose which cause the liver to gives glycogen in order to maintain a balance glucose level in the blood(Garriga *et al.*, 2006) The stress level affects the behaviour, welfare and performance; there by induce the increase of oxytocin level causing calcification of egg in layers (Cockrem, 2007). Due to welfare requirement, WHO/OIE advice use of enrichment in poultry to improve welfare and limit stereotypical behaviours. Chickens are often prone to breaking their bones as a result of poor positioning on the perches, perch width and height, or insufficient space for exercise due to housing restriction (Nicol, 1987). According to Manson (2007), stereotypical behaviours are seen due to limited space or over-stocking, air quality contamination by ammonia gas which lead to conjunctivitis, immune depression and upper respiratory infection (Aziz and Barnes 2010)

The design of enrichment device in broiler house is aimed at studying the effects of varying perches height on performance of broiler chicken

## 2. METHODOLOGY

T0 Control (no enrichment)

T1 Perches set at 6cm

T2 Perches set at 12cm

T3 Perches set at 18cm

T4 Pecking device at 24cm

T5 Pecking device set at 30 cm

## 3. DESIGN

The design was conducted on Parodex line in a deep litter intensive commercial broiler farm in Jalingo for period of 42 days. 288 male and female broilers were used in allocated sample size. Six treatment were used i.e control (To), T1,T2, T3,T4 and T5 in 8 replications . The study design was conducted in accordance with the guideline of animal use (Animal welfare act 2006).

Each experimental space was 4.28m sq with 2-3m structure raised from ground level, with both sides of the roof supported by an attached pole to the structure. The two longest sides of the structure will be covered with netting material, which will have tiny passages to prevent insects and reptiles, and to allow free-flow of cross ventilation into the house .the floor was cover with wood shavings of 5cm depth 5cm standard used in EU (Ohara *et al.*, 2015). Feed and water was supply via feeders and drinkers, temperature, humidity and ventilation was naturally provided and not controlled due to lack of constant electricity in both control and treatment room. Movable wooden perches of 6cm, 12cm, 18cm, 24cm and 30cm height with two parallel bars of 35cm slat width are placed on treatment (T0, T1, T2, T3, T4 and T5) in deep litter broiler house as specified by RSPCA (2013).

For easy grip, perches was used on each bar at 1.2cm thick and 4.8cm width, 220cm long as suggested by (Ohara *et al.*, 2015). However, 5cm width was used to enable proper positioning of the birds. Perches were place at a distance of 1.5 m spacing as recommended by RSPC. Similarly, perching tools was used at from d0-d42 simultaneously placed in line at the centre of the house in each treatment. At d7, d14, d21, d28, d35 and d42, the height of the perches was set at 6cm, 12cm, 18cm, 24cm and 30cm respectively. Performance records was measured on both control (T0) and treatments (T1-T5) at d7 d14, d21, d28, 35 and d42 which is equivalent to week 1- 6. General linear model (GLM) set at 95% and 0.05 confidence significant level respectively was used to determine the effects of using perches on performance of broiler chickens

## 4. RESULT AND DISCUSSION

The effects of varying perches height has no effects  $p > 0.05$  on the body weight gain of broiler chickens as shown in table 1. However. The values of the body weight obtain on T4 were slightly higher than the control (92g, 252g and 407g) in d7, d14 and d21 respectively. Whereas, at d42 (week 6) the body weight gain in T1 was higher (1004g) compared to other treatments as shown in Table 1.

**Table 1: Effects of varying perches height on body weight gain (g) of experimental birds**

Treatments	Week					
	1	2	3	4	5	6
T0	82	235	407	637	791	949
T1	88	254	405	628	752	1004
T2	84	239	368	592	742	953
T3	88	242	377	600	751	951
T4	92	252	407	572	768	906
T5	89	248	374	626	723	861
P-value	0.6811	0.787	0.583	0.362	0.741	0.154
SEM	1.71	4.25	8.42	9.68	12.04	15.62

Similarly as shown in table 2, the effects varying perches height has no effects ( $P > 0.05$ ) on the feed conversion ratio of broiler chickens. However, an improved feed conversion ratio of 1.81, 1.54 and 1.60 was observed in T4 compared to other treatments and the control. At week 6, feed conversion ratio of 1.53 was observed in T1 compared to other treatments.

**Table 2: Effects of varying perches height on feed conversion ratio of experimental bird**

Treatments	Weeks					
	1	2	3	4	5	6
T0	2.12	1.52	1.64	1.56	1.56	1.57
T1	1.92	1.42	1.64	1.68	1.56	1.53
T2	2.05	1.65	1.82	1.78	1.57	1.58
T3	1.83	1.58	2.20	1.68	1.56	1.58
T4	1.81	1.54	1.60	1.79	1.54	1.63
T5	1.84	1.55	1.75	1.59	1.57	1.71
P- value	0.474	0.661	0.519	0.590	0.805	0.268
SEM	0.07	0.04	0.09	0.04	0.02	0.02

The results of this study agreed with the result obtained by previous authors where the use of perches has no effects on the feed conversion ratio and the body weight gain of broiler chickens (Estervez *et al.*, 2002, Ulku *et al.*, 2008). The work of (Altan *et al.*, 2013) also proved that the use of enriched devices in animals has no effects on their health and welfare. However, in the brooding phase of the present study, there is an improvement in the body weight gain and the feed conversion ratio of birds on T4 compared to other treatments. This disagreed with the study of Ulku *et al.* (2008) where he reported that birds on control have higher body weight gain compared to other treatments with perches. Similarly, Ulku *et al.* (2008) suggested that it is possible that the use of perches could improve the body weight gain of broiler chickens at the growth phase of the study, and this is in conformity with the result found at week six in the present study. More so, the result presented by previous authors suggested that the perches used could lead to uneven distribution of birds thereby leading to crowding of birds which can affect the search of feed and water (Ulku *et al.*, 2008). It is also reported that the variety of exercise such as perching has a strong correlation with fat deposition in broiler birds (Ekelund *et al.*, 2006). In conclusion, the result presented in the present study shows that the use of perches has no statistical difference but can be used to improve the body weight gain and feed conversion ratio at the brooding phase in broiler production.

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