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INFLUENCE OF SEQUENTIAL FEEDING ON EGG PRODUCTION PERFORMANCE OF ATHULYA LAYER CHICKEN

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ABSTRACT

The present study was carried out to evaluate the effect of sequential feeding on egg production performance of Athulya (White Leghorn) layer chicken. At the end of 16th week of age, 75 birds were distributed in a completely randomized experimental design with three treatments each having five replicates of five birds each. T1 group (Control) was fed with complete layer diet, T2 group (sequential feeding) was fed with coarsely ground maize in the morning and balancer diet in the afternoon and the T3 group (loose mix) was given coarse maize combined with balancer diet. In all the treatments, feed was given in two distributions at 6.00 a.m. and 1.00 p.m. From the results, it could be observed that egg production in sequential feeding was similar to that of control but significantly ($p<0.05$) lower to that of loose mix. Lower egg production rate in sequential feeding could be due to a significant reduction in total feed intake.

Keywords: Sequential feeding, loose mix, Athulya layer chicken, egg production, feed intake

INTRODUCTION

Sequential feeding is an innovative system for laying hens which consists of splitting of energy, protein and calcium to fulfil nutrient requirements at the relevant time spot over a period of time. Distribution of a high energy diet in the morning when energy requirement is high for birds followed by a diet rich in protein and calcium in the afternoon (period of egg shell formation) is supposed to improve feed conversion efficiency and egg shell thickness. Moreover feeding coarse maize particles reduces grinding cost of feed production. It is therefore an effective system in improving the sustainability of egg production. So the present study was planned to access the effect of sequential feeding on egg production performance of Athulya layer chicken.

MATERIALS AND METHODS

Seventy five Athulya (White Leghorn) pullets (IWN × IWP) at 16 weeks of age obtained from AICRP on Poultry for Eggs, Mannuthy, Kerala were utilized for this experiment. At the end of 16th week of age birds were allotted randomly to three treatments viz., T1, T2, and T3 each having five replicates of five birds each. T1 (control) birds were fed with standard layer diet containing 2600 kcal of ME/ kg and 18 per cent CP (BIS, 2007). The T2

(sequential feeding) birds were fed with coarsely ground maize in the morning and balancer diet in the afternoon and T3 (loose mix) birds were given coarse maize combined with balancer diet. Balancer diet in this experiment is the portion of a standard layer diet excluding yellow maize with a CP, ME and calcium level of 27.3 per cent, 1900 kcal of ME/ kg and 7.14 per cent, respectively. The complete as well as balancer diet were ground in hammer mill by using 5mm sieve. The coarse maize was prepared by using 7 mm sieve. In all the treatments half of the diet was distributed in the morning at 6.00 a.m. and other half in the afternoon at 1.00 p.m. The diets were formulated to reach the nutritional balance as the control diet, with a ratio of 50 per cent maize and 50 per cent balancer diet. Thus in sequential and loose mix treatments, 55 g of the diet was fed as coarse maize and the remaining 55 g as balancer diet. Feed left over from previous distribution was always removed before the next distribution in all treatments. Each bird received 110 g of diet per day corresponding to Athulya birds' dietary requirements.

Daily egg production of birds from 17 to 40 weeks of age in each replicate was recorded and was expressed as hen housed egg production. Feed intake was recorded replicate-wise at the end of every 28 day period as the difference between total feed offered and the cumulative left over. Data on egg production and feed intake was analysed statistically using Statistical Package for Social Studies (SPSS) software version 21.0.

RESULTS AND DISCUSSION

Hen housed egg production per cent in six periods of 28 days duration in the three treatments are presented in Table 1. The hen housed egg production during period I of the experiment was similar among sequential feeding and control. However, it was significantly ($p<0.05$) higher in loose mix compared with the other two treatments. The hen housed egg production from period II to VI was similar among all treatments. Overall hen housed egg production (per cent) during the experimental period (17-40 weeks) was significantly ($p<0.05$) lower in sequential feeding (78.62) than loose mix (88.88). However, the egg production in control group was intermediate (83.48) and statistically comparable with other groups.

Similar to present findings, Reichmann and Connor (1979) reported lowest egg production in laying hens with wheat-soyabean based diet provided as high energy fraction in the morning followed by high protein and calcium rich fraction in the afternoon. Robinson (1985) reported lower egg production rate in White Leghorn and Australorp laying hens fed with protein concentrate in the morning followed by limestone or cereal portion in the afternoon period. Umar *et al*. (2010b) also reported significantly lower egg production in ISA brown hens subjected to whole millet based sequential feeding for a period of 23 to 42 weeks of age.

However, Umar *et al*. (2010a) reported that whole wheat based sequential feeding and loose mix did not affect total egg production in laying hens.

The mean feed consumption per bird per day (g) from 17 to 40 weeks of age is presented in Table 2. During all the four week periods, feed consumption by birds in sequential feeding was less when compared to loose mix and control. The

overall feed consumption per bird per day from 17-40 weeks of age was found to be significantly ($p<0.05$) lower in sequential feeding (87.98 g) than that of loose mix (95.68 g) and control (92.93 g).

Similar to the present findings, Umar *et al*. (2010a) and Umar *et al*. (2010b) reported significantly lower feed consumption in laying hens subjected to sequential feeding based on whole wheat and whole millet in comparison with conventional feeding system. Similarly, Page (2017) reported 3.3 per cent decline in feed intake when laying birds subjected to split feeding regime (energy and protein rich diet in the morning followed by high calcium diet in the afternoon hours) when compared to traditional feeding program.

SUMMARY

In the present study, egg production was significantly lower in sequential feeding compared to other treatment groups. The lower egg production may be attributed to significantly lower feed intake by birds in sequential feeding compared to loose mix and control.

Table 1. Hen housed per cent egg production (mean ± SE) of standard diet, sequential and loose mix fed Athulya hens from 17-40 weeks of age

Period	Age in weeks	Treatment groups			p-value
		T1 (Control)	T2 (Sequential)	T3 (Loose mix)	
I	17-20	66.14^{b} ±3.73	65.71^{b} ±4.31	78.86^{a} ±2.36	0.016
II	21-24	94.00 ±1.36	83.71 ±3.87	90.00 ±3.00	0.050
III	25-28	90.86 ±3.21	88.57 ±2.53	95.14 ±1.47	0.177
IV	29-32	87.86 ±5.41	83.71 ±4.19	93.57 ±2.26	0.249
V	33-36	86.00 ±5.29	78.86 ±4.43	91.57 ±3.55	0.140
VI	37-40	76.00 ±6.26	71.14 ±4.74	84.14 ±4.30	0.206
Overall mean	17-40	83.48^{ab} ±3.19	78.62^{b} ±2.95	88.88^{a} ±1.59	0.030

Means bearing different superscript within a row differ significantly ($p<0.05$)

Table 2. Feed consumption (g/day) of standard diet, sequential and loose mix fed Athulya (mean ± SE) hens from 17-40 weeks of age

Period	Age in weeks	Treatment groups			p-value
		T1 (Control)	T2 (Sequential)	T3 (Loose mix)	
I	17-20	90.71[a] ±1.63	84.69[b] ±2.10	93.53[a] ±1.04	0.008
II	21-24	92.35[a] ±1.94	83.64[b] ±3.24	94.21[a] ±1.31	0.016
III	25-28	88.97[b] ±1.53	88.10[b] ±2.11	94.49[a] ±1.06	0.034
IV	29-32	94.59[ab] ±1.31	90.94[b] ±1.78	98.20[a] ±0.99	0.011
V	33-36	94.25 ±1.78	88.02 ±1.54	96.04 ±3.23	0.071
VI	37-40	96.7 ±1.29	92.51 ±1.94	97.62 ±3.64	0.337
Overall mean	17-40	92.93[a] ±1.20	87.98[b] ±1.82	95.68[a] ±1.53	0.013

Means bearing different superscript within a row differ significantly ($p<0.05$)

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