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Effect of Different Induced Molting Methods on Subsequent Productive Performance of Layers

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Abstract

The study was carried out at Poultry Research Center, Department of Poultry Husbandry, University of Agriculture, Faisalabad, Pakistan to investigate the effect of different induced molting methods on subsequent productive performance of Layers. White leghorn layers (67 weeks o f age) were randomly divided into 21 experiment units of 14 birds each under standard management condition. Seven treatments (Cu-1(3gm/kg feed), Cu-2(4gm/kg feed), Al-1(3gm/kg feed), Al-2(4gm/kg feed), Zn-1(3gm/kg feed), Zn-2(4gm/kg feed), No feed) were used. These treatments were randomly allotted to the units in such a way that each treatment got three experimental units. The body weight loss, Egg production, Feed consumption and mortality were recorded for eleven weeks. The Feed conversion ratio/dozen eggs was calculated. There was a significant ($P<0.01$) effect of molting methods on body weight reduction. Maximum body weight reduction was in control group (421.66) followed by Cu-2 (383.33), Al-2 (351.66), Zn-2 (340.00), Al-1 (333.33), Cu-1 (296.66), Zn-1 (291.66) gms respectively. The average egg production from the start (5% production) up to 8 weeks was recorded. Egg production increased significantly ($P<0.01$) in Cu-2 (666.33) followed by Al-2 (648.33) Zn-2 (645.66), Zn-1 (645.33), Al-1 (631.00), Cu-1 (619.33) and Control group (608.33) respectively. The Cu-2 group produced the maximum eggs and was non significantly different with Al-2, Zn-1 and Zn-2. There was significantly more feed consumption (77.63Kg)in Cu-1 group. Best feed conversion ratio was in-group Cu-2 (1.393) while poorest was in-group Cu-1 (1.497). Different molting methods showed significant ($P<0.05$) effect on mortality. The maximum mortality was in the control group (14.28) that was non significant with Al-2 (9.52) while all other group showed non-significant differences with one another.

Key words: Poultry, Induced molting, Productive performance

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Introduction

Complete and orderly replacement of all feathers result in molting, which occurs by natural and artificial means. An induced molt causes all of the hens in a flock to go out of production for a period of time. During this time regression and rejuvenation of the reproductive tract occurs, accompanied by the loss and replacement of feathers. After a molt, the hen's production rate usually peaks slightly below the previous peak rate, and egg quality is improved. (Carey and John 1989).

Technique of induced Molt has been recognized since early in 20th century as a tool to improve the productive performance and profitability of old laying hens. It has been claimed that forced molted flocks not only produce more number of eggs but also produced eggs of improved grades (Rolon et al., 1993)

Induced molting can be an effective management tool, enabling to match egg production with demand and reduce bird cost per dozen eggs. Through an induced molt, the productive life of a flock can be extended to an age of 105 weeks. The timing of a molt can be adjusted as part of a total profit plan that maximizes egg production over the life span of the hens and matches periods of maximum egg production to periods of highest egg prices (Carey et al, 1987). Because of increasing economic Pressures, the commercial egg industry must make maximum use of its resources. High interest costs and the need to lower production costs have led many enterprises to use induced molting programs

Several successful methods of induced molting has been used to recycle laying hens, the majority of which requires optimum weight loss of 25-30% to achieve max. egg production during the post molted period. (North and Bell, 1990) reported that the most effective method of molting creates least stress, produce a rapid molt and bring the flock back into production. Mineral induced molting procedures use high levels of either Al salt (Hussain and Cantor, 1989) or dietary Zinc and Copper diet (Cantor and Johnson, 1984; Breeding et al., 1992).

Materials and Methods

In this study, an attempt was made to investigate the effect of different induced molting methods on the subsequent productive performance of the layers. A poultry shed was properly washed and fumigated. Nineteen cages were adjusted in the prepared shed, then 294 birds of old White leghorn layers (67 weeks o f age) were shifted in these cages. White leghorn layers were randomly divided into 21 experiment units of 14 birds each under standard managemental conditions. In the pre molt period (one week prior to molting) deworming was done with Albendazole (100gms for 500-700birds). Broad Spectrum antibiotics (oxytetracycline) and vitamins were used. Birds were vaccinated against I.B and N.D. *Ad libitum* feeding and watering were provided along with 24 hours light. Seven treatments (Cu-1(3gm/kg feed), Cu-2(4gm/kg feed), Al-1(3gm/kg feed), Al-2(4gm/kg feed), Zn-1(3gm/kg feed), Zn-2(4gm/kg feed), No feed) were used. These treatments were randomly allotted to the units in such a way that each treatment got three experimental units .The light was reduced to 12 hours at the start of experiment and 35 gms respective diet per bird was provided in all treatments except the layers kept in control group which were kept without feed for fourteen days. The layers were provided with 50 gms grower ration for the next 28 days. Then 70 gms layer ration was provided for the next week with 14 hours light. Thereafter 110 gms layer ration was provided to each bird along with 16 hours light till the completion of the experiment. These molting methods were given for 14 days. During molt and post molt cycle, Body weight loss, Egg production, Feed consumption and mortality were recorded. The birds in each pen were weighed individually at the start of production and then after 4 weeks intervals until the peak production .The feed conversion ratio was worked out from the feed consumed per dozen eggs during the production. Daily record of egg production was maintained.

The data thus collected was analyzed by analysis of variance technique using completely randomized design in which treatment were randomly allotted to each experimental unit (Steel and Torrie, 1980). The differences between the means were calculated by Duncan's multiple range tests.

Results and Discussion

The data regarding to response of different molting methods on production performance parameters (Body wt loss, Egg production, feed consumption, Feed conversion ratio and mortality) has been given in Table 1.

There was a highly significant ($P<0.01$) effect of molting method on body weight reduction. Maximum body weight (gms) reduction from 1-21 days during molting was observed in control group (421.66) followed by Cu-2 (383.33), Al-2 (351.66), Zn-2 (340.00), Al-1 (333.33), Cu-1 (296.66) and Zn-1 (291.66) gms respectively. The body weight loss in the control group was significantly different from all other group. Baker et al. (1983) have reported similar results, according to them maximum post molt performance was in those birds which lost 27-32 % body weight during molting. The layers induced to molt by Aluminum oxide and Copper sulphate lost less weight as compared to feed deprivation method (Hussain and Cantor, 1989) but showed slightly better egg production. The results were in line with the findings of (Cleaver et al., 1986) who reported that moderate body weight reduction produced comparable results as that of excessive body weight loss. The reduction in body weight in the molted hens was due to the decreased muscles mass, utilization of the adipose tissues, decreased liver weight and involution of the reproductive organs (Berry and Brake, 1991).

Molting methods showed highly significant ($P<0.01$) effect on egg production. The average egg production from the start (5% production) up to 8 week was recorded.

Table 1: Mean values of Production performance parameters under different molting techniques.

Treatment/group	Body Wt Loss (gms)	Egg Production (Number)	Feed Consumption (Kg)	Feed Conversion (ratio/dozen eggs)	Mortality (%)
Cu-1(3gm/kg feed)	296.66 c	619.33 c	77.63 a	1.497 a	4.76 b
Cu-2(4gm/kg feed)	383.33 b	666.33 a	72.17 f	1.3936 c	2.38 b
Al-1(3gm/kg feed)	333.33 b	631.00 bc	77.34 ab	1.470 b	4.76 b
Al-2(4gm/kg feed)	351.66 b	648.33 ab	75.38 d	1.433 bc	9.52 ab
Zn-1(3gm/kg feed)	291.66 c	645.33 ab	76.36 c	1.440 abc	2.38 b
Zn-2(4gm/kg feed)	340.00 b	645.66 ab	76.92 b	1.440 abc	4.76 b
Control Group (No Feed)	421.66 a	608.33 c	74.56 e	1.413 bc	14.28 a

Same superscripts on means in various rows show non-significant difference.

Maximum egg production was recorded in Cu-2 (666.33) treatment and was non significantly different with Al-2 (648.33), Zn-2 (645.66) and Zn-1 (645.33). Minimum egg production was in Control group. The birds induced to molt by different methods showed improvement in the egg production as compared to the control. Higher egg production was noted in the copper sulphate and zinc oxide methods. The layers in the mineral induced methods perform significantly better. North and Bell (1990) reported that Molt induction increased the egg production in the post molt period. Maximum weight loss in this study was 42% while minimum was 29%. Productive performance was best between 29 to 38% weight reduction groups. However the result of this study are contrary to the findings of the Cleaver et al., 1986 who stated that body weight loss beyond 10% was detrimental to the egg production in Turkeys. This difference in the result may be due to the difference in the species of birds used for the study. The present study showed that moderate body weight reduction was desirable for the optimum egg production because at this body weight loss, most of the body fat was mobilized to fulfill the metabolic needs of the experimental birds.

Molting methods also showed highly significant ($P<0.01$) effect on feed consumption. The maximum feed consumption for 8 weeks was observed in Cu-1 (77.63Kg) followed by Al-1(77.34), Zn-2(76.92), Zn-1(76.36), and Al-2 (75.38) control (74.56) and Cu-2(72.17) groups respectively. Significant ($P<0.05$) effect of molting method was observed on feed conversion ratio. Best feed conversion ratio/dozen egg was in Cu-2. (1.393) which was non significant with control (1.413), Al-2(1.433), Zn-1(1.440) and Zn-2(1.440) groups. Lee (1982) reported improved feed efficiency in the forced molted layers as compared to Control group.

Albuquerque R de (1988) reported that feed deprivation and 2% ZnO molting technique resulted high body weight loss, lower feed consumption and better feed conversion than the other treatments. The higher mortality percentage was observed in the Control group while the layers in the Minerals Induced Method exhibited lower mortality rate particularly in the Copper Sulphate method. These results are also inline with Albuquerque R de (1988). The probable explanation of higher mortality rate in the Control group may be due to higher level of metabolic hormones due to stress particularly Cortisol.

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