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Evaluation of different induce forced resting events in the blood qualities of commercial laying hens.

Neyan Naser Al-deen Abd Al-Rahman **Qana Hussein Al-Jabari**
Tareq Khalaf Aljumaily
[1] *animal production department, college of agriculture, Kirkuk University, Kirkuk, IRAQ.*
[2] *animal production department, college of agriculture, Tikrit University, Tikrit, IRAQ.*
*Corresponding Author: niyan.zangana1@gmail.com.

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ABSTRACT

The current experiment was conducted in the poultry fields of the Animal Production department - College of Agriculture - University of Kirkuk from (20/10/2022 – 31/1/2023), where 120 Lohman Brown breed laying hens at 78 weeks of age were employed. The birds were divided into five experimental treatments, with four replicates of each treatment. The results show that there were highly significant differences between the treatments, as the first treatment significantly differing among the other treatments in alanine trasamninase (ALT) and aspartate aminotransferase (AST) enzymes (15.43, and 28.72) U/L respectively. As for the ALP enzyme, the third and fourth treatments were higher significantly then the other treatments (54.91, and 57.35) respectively. As a highly significant difference was found in the level of calcium in the blood, fourth and fifth treatments outperformed the other of the treatments (4.12, and 4.12) mg/dL respectively. The level of phosphorus in the blood was not significant. as the first treatment was significantly superior to the rest of the treatments in the levels of cholesterol, albumin, and glucose (4.10, 20.15, and 19.66) mg/dL respectively. As for total proteins, the first and second treatments outperformed the rest of the treatments (55.83, and 53.11) respectively. The using different recourse to induced molting improves the blood characteristics for the layer's hen and increase the level of calcium in the blood serum, and increase the level of ALP in the blood. We believe that these findings will contribute to enhance the molting of laying hens.

***Keywords*:** Hen, blood, moulting, laying.

INTRODUCTION

In the past, layer flocks in egg industry underwent a typical molt, which involved removing feed and reducing photoperiod, the birds are prepared for another production cycle during the rest period that follows by a feeding schedule that includes a pre-lay or pullet development diet and an energy-rich element (corn) [1]. The traditional molt has been replaced with a number of alternate molting procedures that maintain hen welfare and productive performance [2]. Numerous researchers have searched for physiological characteristics and measures that quantify the welfare of hens during molting [3].

Many non-fasting induced resting techniques have been proposed. These additional methods alter the diet to create an imbalance in nutrients, Positive results were obtained when high-corn or high-wheat middling resting diets were applied instead of feed withdrawal [4]. [5] found that a nonfasted molt using a wheat middling resting meal had less detrimental effects on bone mineralization than a fasted resting strategy. [6] looked at how well an ad libitum meal of wheat or maize might induce resting. They discovered that employing the feed deprivation strategy induces reduced resting layer performance.

To determine whether broken rice, wheat bran, and grapes are as effective as a short-term resting program and whether they are a cost-effective feed ingredient, this study compared their effects on blood qualities with feed withdrawal for induced resting in older laying hens.

Materials and Methods:

The current experiment was conducted in the poultry fields of the Department of Animal Production - College of Agriculture - University of Kirkuk from (20/10/2022 – 31/1/2023), where 120 Lohman Brown breed laying hens at 78 weeks of age were employed. The birds were divided into five experimental treatments, with four replicates of each treatment. The treatments and the breeding process are shown in table 1 below:

1. The first treatment: standard control diet.
2. The second treatment: following the traditional method of creating molting.
3. The third treatment: feeding on broken rice during the molting period.
4. Fourth treatment: feeding on grape during the molting period.
5. Fifth treatment: feeding on wheat bran during the molting period.

Table 1: the breeding procedure during the pre and post molting.

treatment	Time in day	Water	Feed	Lighting (hour/day)	case
		Free	Free	23	Before the molt
First		Free	According to the guide	16	after the molt
Second		Free	traditional from day to day 45 g/day/bird		
Third	1-28 (1-12 days) From day (13-28)	Free	Break the rice 45 g/day/bird	8	Molting stage
Forth	Feeding is done on yellow corn powder	Free	Grape 45 g/day/bird		
Fifth		Free	Wheat bran 45 g/day/bird		
	29	Free	The white bush	16	after the molt

After the experiment was over, the feed was removed before six hours, and three birds were selected at random to be scarified. At the end of the experiment, the hens had their blood extracted. The chicken wing vein was used to draw fresh blood samples, which were placed in test tubes devoid of anticoagulants and left to stand for six hours. After that, the samples were centrifuged for fifteen minutes at a speed of three thousand revolutions per minute to extract the serum, which was then kept at -20°C until the biochemical tests were carried out [7, 8, 9]. Pre- and post-molting treatments were evaluated using the general linear model (GLM) and SAS software [10]. The difference between means was tested using the Duncan multiple range test [11].

Result and Discussion:

Table 1. shows the effect of using factory waste in the resting process for Lohman females on the enzymes ALT, AST, and ALP. The results show that there are highly significant differences between the treatments, as the first treatment significantly differing among the other treatments in the level of ALT and AST enzymes (15.43, and 28.72) U/L respectively. As for the ALP enzyme, the third and fourth treatments were higher significantly then the other treatments (54.91, and 57.35) U/L respectively. Our results agreed with [12] who used different molting way for the layer's hen, and he found the AST and ALT were differing significantly between the treatments. Moreover, the ALP level was agreed with the result of [13], who used different method for molting and studied the effect on the blood characteristics.

Table 1: the effect of using factory waste in the resting process for Lohman females on the enzymes ALT, AST, and ALP

Treatment	ALT (U/L)	AST (U/L)	ALP (U/L)
1	15.43±0.02 a	28.72±0.60 a	28.19±0.07 d
2	14.70±0.04 b	26.56±1.03 b	34.74±0.29 c
3	14.37±0.09 c	24.61±0.22 c	54.91±0.32 a
4	14.43±0.11 c	25.79±0.24 bc	57.35±0.54 a
5	14.34±0.01 c	25.78±0.23 bc	48.49±2.94 b
Sig.	***	**	***

Each column's means with distinct superscripts show a significant difference ($P<0.01$).

Table: 2 shows the effect of using factory waste in resting Lohman females on the level of calcium and phosphorus in the blood. As a highly significant difference was found in the level of calcium in the blood, the fourth and fifth treatments outperformed the other of the treatments (4.12, and 4.12) mg/dL respectively. The level of phosphorus in the blood was not significant. The Ca level was agreed with the result of [13], who used different method for molting and studied the effect on the blood characteristics, and found the level of Ca differed significantly between the treatments.

Table 2: the effect of using factory waste in the process of resting Lohman females on the level of calcium and phosphorus in the blood

Treatment	Ca (mg/dL)	PH (mg/dL)
1	4.06±0.01 c	1.02±0.01 a
2	4.06±0.01 c	1.02±0.01 a
3	4.09±0.01 b	1.02±0.01 a

4	4.12±0.01 a	1.02±0.01 a
5	4.12±0.01 a	1.02±0.01 a
Sig.	***	N.S.

Each column's means with distinct superscripts show a significant difference (P<0.01).

Table: 3 shows the effect of using factory waste in the resting process for Lohman females on some biochemical characteristics of the blood. The table shows highly significant differences, as the first treatment was significantly superior to the rest of the treatments in the levels of cholesterol, albumin, and glucose (4.10, 20.15, and 19.66) mg/dL respectively. As for total proteins, the first and second treatments

outperformed the rest of the treatments (55.83, and 53.11) mg/dL respectively. The Glucose, cholesterol level was agreed with the result of [13], who used different method for molting and studied the effect on the blood characteristics, and found the level of them were differ significantly between the treatments. Still, the Total protein, and Albumin levels were non-significantly differing between the treatment.

Table 3: the effect of using factory waste in the resting process for Lohman females on some biochemical characteristics of the blood

Treatment	Cholesterol (mg/dL)	Alb (mg/dL)	TP (mg/dL)	Glucose (mg/dL)
1	4.10±0.01 a	20.15±0.10 a	55.83±0.32 a	19.66±0.38 a
2	3.33±0.13 b	19.03±0.28 ab	53.11±1.89 a	17.85±0.25 b
3	3.47±0.09 b	18.13±0.14 bc	46.20±0.59 b	16.26±0.60 c
4	2.50±0.06 c	16.48±1.11 cd	44.39±0.32 b	14.69±0.16 d
5	3.57±0.03 b	15.14±0.24 d	42.37±2.09 b	14.27±0.08 d
Sig.	***	***	***	***

Each column's means that have distinct superscripts show a significant difference (P<0.01)

Conclusion:

The using different recourse to induced molting improves the blood characteristics for the layer's hen and increase the level of calcium in the blood serum, and increase the level of ALP in the blood. We believe that these findings will contribute to enhance the molting of laying hens.

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تقييم أحداث القلش الاجباري بطرق مختلفة في صفات الدم للدجاج البياض التجاري

نيان نصر الدين عبدالرحمن قانا حسين الجابري طارق خلف الجميلي

[1]قسم الإنتاج الحيواني، كلية الزراعة، جامعة كركوك، كركوك، العراق.

[2]قسم الإنتاج الحيواني، كلية الزراعة، جامعة تكريت، تكريت، العراق.

الخلاصة:

أجريت التجربة الحالية في حقول الدواجن التابعة لقسم الإنتاج الحيواني – كلية الزراعة – جامعة كركوك من (2022/10/20 – 2023/1/31)، حيث تم توظيف 120 دجاجة بياضة من سلالة لوهمان براون بعمر 78 أسبوعًا. تم تقسيم الطيور إلى خمس معاملات تجريبية، مع أربع مكررات لكل معاملة. وأظهرت النتائج وجود فروق ذات دلالة إحصائية عالية بين المعاملات، حيث تفوقت المعاملة الأولى معنوياً على باقي المعاملات في مستوى إنزيمي(ALT و AST) 15.43، 28.72 على التوالي. أما بالنسبة لإنزيم ALP فقد كانت المعاملات الثالثة والرابعة أعلى معنوياً من المعاملات الأخرى (54.91، و57.35) على التوالي. كما وجد فرق ذو دلالة إحصائية عالية في مستوى الكالسيوم في الدم، حيث تفوقت المعاملات الرابعة والخامسة على المعاملات الأخرى (4.12، و4.12) على التوالي. أما مستوى الفسفور في الدم فلم يكن معنوياً. ويوضح الجدول وجود فروق ذات دلالة إحصائية عالية، حيث تفوقت المعاملة الأولى معنوياً على باقي المعاملات في مستويات الكوليسترول والألبومين والكلوكوز (4.10، و20.15، و19.66) على التوالي. أما بالنسبة للبروتينات الكلية فقد تفوقت المعاملات الأولى والثانية على باقي المعاملات (55.83، و53.11) على التوالي. إن استخدام طرق مختلفة لتحفيز نزع الريش يحسن من خصائص الدم لدى الدجاج البياض ويزيد من مستوى الكالسيوم في مصل الدم ويزيد من مستوى الفوسفاتيز القلوية في الدم ونعتقد أن هذه النتائج سوف تساهم في تعزيز طرح الريش لدى الدجاج البياض.

الكلمات المفتاحية: الدجاج البياض، الدم، القلش، نزع الريش.