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Evaluation of different induce forced resting events in some bone and ovary characteristics of commercial laying hens.

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ABSTRACT

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 to 31/1/2023. There, 120 Lohman Brown commercial laying hens, aged 78 weeks, were employed. This research examined alterations in ovarian, and bone development by using several mechanisms of molting The birds were split up into five experimental treatments, with four replications of each treatment. Significant differences were observed between the treatments in both ovary weight and oviduct weight. The T1 and T3 were significantly higher than the other treatments (33.46 and 35.07 g, respectively). Moreover, the oviduct weight of the T1 was significantly higher than the other treatments (85.18) g. Significant differences were found between the treatments in both the tibia weight and femur weight; T1 had a higher significant difference in tibia weight and femur weight than the other treatments (21.14, 14.44) g, respectively. The dry Tibia weight and the dry Femur weight didn't show significant differences among the treatments. The effect of different methods of inducing molting on tibia length, femur length, and tibia diameter. Non-significant differences were found among the treatments in these traits. The results of this study indicate that giving laying hens broken rice diets for a short while is a good way to induce molting and might even be a good way to replace molting. The chickens' inability to produce eggs was likely brought on by the diet's suppression of appetite, which also resulted in ovarian regression.

***Keywords*:** *hen, resting, ovary, bone, oviduct, molting*.

INTRODUCTION

Commercial laying hens can resume a fresh laying cycle using a process called induced molting, which increases egg quality and immune function while also reestablishing high laying rates [1]. However, it can also have physiological effects, including the reduction of the cloaca and narrowing of the pelvic spacing, the reduction of body weight by 25% on the 12th day of fasting and 35% on the 16th, and the disruption of the synthesis of growth hormone [2], prolactin [3], thyroid stimulating hormone [4], follicle stimulating hormone [5], luteinizing hormone, adrenocorticotropic hormone, and growth hormone in the poultry pituitary gland [6].

High levels of ACTH cause the gonads to atrophy and the generation of eggs to stop during a molt [7]. Adrenocortico-steroids normally rise in molting chickens. The quantity of follicles in the ovaries decreases during molting and might be reabsorbed by the organism to provide energy [8]. For hens to have a large enough follicular pool and be able to reproduce, primordial follicles, which are made up of ovarian stromal cells and primordial germ cells, must grow [9]. The majority of follicles resorb by the body after experiencing atresia throughout development [10].

The weight and length of a chicken's Tibias can change during molting, but these impacts are less spoken about than feathering and egg production [11]. Hens lose body weight during molting, which causes their Tibia weight to drop [12]. Loss of muscle can also be caused by nutritional variables including inadequate nutrition. Since genetics and overall developmental phases play a major role in determining growth and development, Tibia length usually does not alter considerably during molting [13]. Severe malnourishment or molting-related health problems can also impact a bird's general health rather than just its Tibia length [14].

This research examined alterations in ovarian, and bone development by using several mechanism of molting.

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), Using 120 Lohman Brown commercial laying hens, aged 78 weeks, were employed. The birds were split up into five experimental treatments, with four duplicates of each treatment. The first treatment: standard control diet. The second treatment: following the traditional method of creating molting. The

third treatment: feeding on broken rice during the molting period. The fourth treatment: feeding on grape during the molting period. The fifth treatment: feeding on wheat bran during the molting period (Table1).

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

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	1-28 (1-12 days) From day (13-28) Feeding is done on yellow corn powder	Free	traditional from day to day 45 g/day/bird	8	Molting stage
Third		Free	Break the rice 45 g/day/bird		
Forth		Free	Grape 45 g/day/bird		
Fifth		Free	Wheat bran 45 g/day/bird		
	29	Free	The white bush	16	after the molt

The SAS software and general linear model (GLM) [15] were utilized to evaluate the impact of treatments on the ovarian and bone characteristics after molting. The difference between means was tested using the Duncan multiple range test ($P<0.05$) [16].

Results and Discussions

The table 2 shown the effect of different methods of inducing molting on some characteristics of ovary. Significant differences were observed between the treatment in both ovary weight, and oviduct weight. The T1, and T3 were significantly higher ten the other treatments (33.46, and 35.07) g respectively. Moreover, the oviduct weight of the T1 was significantly higher than the other treatments (85.18) g. our results agreed with [17] who found that using different methods of molting in chicken were significantly affected the ovary, oviduct, and yolk weight. Hens naturally stop producing eggs, which allows them to concentrate on growing new feathers rather than laying eggs. even though molting temporarily affects the ovaries, it is a normal and essential process that benefits the chickens' long-term health and productivity. Moreover, [18] found that molting decreased 45% of the ovary weight, and 47% of the oviduct weight.

Table 2: the effect of different methods of inducing molting on some characteristics of ovary.

Treatment	Ovary weight	Oviduct weight	Mean of yolk weight
T1	33.46±4.51 a	85.18±6.69 a	26.11±2.25 a
T2	16.86±3.82 b	63.93±15.46 ab	22.56±4.44 a
T3	35.07±3.71 a	64.59±4.97 ab	26.67±1.83 a
T4	28.68±3.27 ab	46.28±2.72 b	26.45±1.18 a
T5	27.46±5.83 ab	57.14±1.48 b	27.67±1.35 a
Over all mean	28.31±2.36	63.42±4.54	25.89±1.06
Sig.	*	*	N.S.

Means with different superscripts in each column differ significantly ($P<0.05$).

The table 2 shown the effect of different methods of inducing molting on some characteristics of Tibia and Femur. Significant differences were found between the treatments in both the Tibia weight and Femur weight, T1 was higher significant differ in Tibia weight, and Femur weight then the other treatments (21.14, 14.44) g respectively. The dry Tibia weight and the dry Femur weight didn't show and significantly differencing among the treatment. [19] found that using different methods for molting in chicken did not affect the Tibia, and Femur weight. The [20] found in their study when used

several methods of molting, the Femur weight did not affect by the molting methods, but the Tibia weight was affected significantly, which agreed with our study.

Table 3: the effect of different methods of inducing molting on some characteristics of Tibia and Femur.

Treatment	Tibia weight	Femur weight	Dry Tibia weight	Dry Femur weight
T1	21.14±1.33 a	14.44±1.15 a	10.92±0.74 a	7.55±0.37 a
T2	17.23±0.68 b	13.55±0.85 ab	10.04±0.39 a	8.03±0.30 a
T3	19.68±1.74 ab	14.00±0.83 ab	12.06±1.77 a	7.47±0.61 a
T4	18.25±0.37 ab	12.87±0.74 ab	11.29±0.22 a	8.34±0.63 a
T5	16.91±0.47 b	8.71±3.08 b	9.45±0.21 a	6.79±0.24 a
Over all mean	18.64±0.58	12.71±0.82	10.75±0.42	7.64±0.22
Sig.	*	*	N.S.	N.S.

Means with different superscripts in each column differ significantly ($P < 0.05$).

The effect of different methods of inducing molting on Tibia length, Femur length, and Tibia diameter. Non-significant differences were found among the treatments in these traits. [19] found that using different methods for molting in chicken did not affect the Tibia, and Femur length

Table 4: The effect of different methods of inducing molting on Tibia length, Femur length, and Tibia diameter

Treatment	Tibia Length	Femur length	Tibia diameter
T1	12.33±0.33 a	8.27±0.03 a	11.37±0.74 a
T2	12.00±0.58 a	8.17±0.03 a	12.44±0.45 a
T3	12.33±0.33 a	8.17±0.09 a	11.85±0.74 a
T4	11.67±0.33 a	8.20±0.06 a	12.00±0.25 a
T5	11.67±0.33 a	8.17±0.09 a	12.67±0.67 a
Over all mean	12.00±0.17	8.19±0.03	12.07±0.26
Sig.	N.S.	N.S.	N.S.

Means with different superscripts in each column differ significantly ($P < 0.05$)Conclusions

Conclusion:

The results of this study indicate that giving laying hens broken rice diets for a short while is a good way to induce molting and might even be a good way to replace molting. The chickens' inability to produce eggs was likely brought on by the diet's suppression of appetite, which also resulted in ovarian regression.

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تقييم الراحة القسرية المحفزة بطرق مختلفة في بعض خصائص العظام والمبيض في دجاج البياض التجاري.

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الخلاصة

أجريت التجربة الحالية في حقول الدواجن التابعة لقسم الإنتاج الحيواني، كلية الزراعة، جامعة كركوك، من 2022/10/20 إلى 2023/1/31. وتم استخدام 120 دجاجة بياضة من سلالة لوهمان براون، بعمر 78 أسبوعًا. تناول هذا البحث دراسة التغيرات في نمو المبيض والعظام باستخدام عدة آليات للراحة المحفزة. تم تقسيم الطيور إلى خمس معاملات تجريبية، مع أربع مكررات لكل معاملة. لوحظت فروق معنوية بين المعاملات في كل من وزن المبيض ووزن قناة البيض. كانت ***T1*** و ***T3*** أعلى بكثير من المعاملات الأخرى (33.46 و 35.07 جم، على التوالي). علاوة على ذلك، كان وزن قناة البيض في ***T1*** أعلى بكثير من المعاملات الأخرى (85.18) غم. وجدت فروق معنوية بين المعاملات في كل من وزن قصبة الساق ووزن عظم الفخذ؛ كان لدى ***T1*** فرق معنوي أعلى في وزن قصبة الساق ووزن عظم الفخذ من المعاملات الأخرى (21.14، 14.44) غم، على التوالي. لم يظهر وزن قصبة الساق الجاف ووزن عظم الفخذ الجاف فروقًا معنوية بين المعاملات. تأثير الطرق المختلفة لتحفيز طرح الريش على طول قصبة الساق وطول عظم الفخذ وقطر قصبة الساق. وجدت فروق غير معنوية بين المعاملات في هذه الصفات. تشير نتائج هذه الدراسة إلى أن إعطاء الدجاج البياض وجبات من الأرز المكسور لفترة قصيرة يعد وسيلة جيدة لتحفيز طرح الريش وقد يكون وسيلة جيدة لاستبدال طرح الريش. ومن المرجح أن يكون عدم قدرة الدجاج على إنتاج البيض ناجمًا عن قمع النظام الغذائي للشهية، مما أدى أيضًا إلى تراجع المبيض.

الكلمات المفتاحية: الدجاجة، الراحة، المبيض، العظام، قناة البيض.