

DEDICATION

*To the soul of my father, to my family
and sons Ahmed, Mutasim and Ammar*

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Acknowledgment

I would like to pay special thanks to my supervisor Dr. Abbaker Ali Idriss for guidance and advice throughout this graduate study. He has helped me to become a better person and a scientist. I would also like to express my thanks to my co-supervisor Dr. Emad M. Tahir for guidance and interest in the research objectives and my progress as a student.

I am especially grateful to Dr. Mohamed TajEldin of the College of Veterinary Medicine and Animal Production for helping in the statistical analysis. I owe a great debt to a number of people who helped me in various stages of my research, Prof. Osman S. Ali, Dr. Badr Hassab Elrasoul, Dr. Amal Omer, Dr. Shadia, and Elsadig Eldoud.

I would like to express my grateful appreciation to Prof. Ali Saad Mohamed, Dr. Osama E. Yassin for offering their expertise and generosity.

Finally, I would thank my family for whose love, support and confidence I could not have done without.

Abstract

A total of 450 commercial strain (Lohman) single comb white leghorn hens, 75wks of age and 43.6 % hen day production were used in this study to determine the effect of high dietary Zinc (ZFMM) versus the California (CFMM) forced molting programs on performance and egg quality traits of commercial layers in the Sudan. The hens were divided into two treatment groups of 150 hens and three replicates of 50hens each .The hens in the Zinc treatment group were watered and fed a layer ration containing 20000 ppm of zinc on adlib bases and received natural day light for five successive days .In the California group, the conventional layer ration was withdrawn for 10days and received natural day light, oyster shell and water were provided for ad libitum consumption .At day 11, hens were allowed sorghum grain and oyster shell ad libitum until day 30th and at day 31, hens were returned to a full feed layer ration and light was increased to 16h/day .Body weight ,egg production ,internal and external egg quality were measured. Liver weight and oviduct weight and length were also determined and mortality recorded. Total and differential circulating leukocyte counts were also measured.

The results demonstrated that induced molting significantly increased egg production from 43.6 ± 0.99 to levels ranging from 55.6 ± 0.99 to 65.6 ± 0.99 (%)

and shell thickness from 0.37 ± 0.01 to a range of 0.41 ± 0.01 to 0.47 ± 0.01 (mm) when compared to the post molting period.

Egg weight, specific gravity, yolk colour largely remained unaffected by either of the induced molting programs.

There was no significant difference in mortality rate between the two molting methods.

From 1st day till 14 days of the experimental period CAL group was significantly ($P < 0.05$) higher in body weight losses (26.7 ± 1.79 %). No treatment were observed in liver weight in the 2nd period of the study. During the 3rd period no significant differences ($P < 0.05$) were observed in the reproductive system parameters including ovary weight, oviduct weight and length.

Plasma progesterone levels decreased from between 0.60 ± 0.12 ng/ml on day 0 to undetectable levels 0.00 ± 0.00 ng/ml by day 7 and 14 in both CAL and Zn groups. By day 21 plasma progesterone started rising in CAL group to (0.40 ± 0.06 ng/ml), although it was significantly ($P < 0.05$) lower than that of premolted hens (0.77 ± 0.09 ng/ml) and Zinc group (0.81 ± 0.16 ng/ml).

Calcium level remained unaffected by either of the tested molting methods, while molting methods significantly ($P > 0.01$) reduced the plasma phosphorous and magnesium levels, they depicted significant elevation in the plasma levels of sodium and potassium in the blood plasma of the hens

subjected to forced molting total protein, albumin, glutamic oxaloacetate transaminase and glutamic pyruvate transaminase were decreased independent of the force molting method.

Total circulating leukocytes were also significantly lower in the molted hens. The heterophil to lymphocyte ratio was significantly increased, reaching 0.39 ± 0.05 versus that of nonmolted hens of 0.17 ± 0.01 .

It is concluded from the study that molting process has substantial impact on egg production and can be successfully practiced in the Sudan. In this study the high Zinc force molting program generally seemed to excel the California force molting program in recovering better egg production rate and egg quality.

ملخص الدراسة

تم استخدام عدد 450 دجاجة من الهجين التجاري (لوهمان) بعمر 75 اسبوع ونسبة انتاج 43.6% لدراسة اثر القلش الاجباري علي انتاج البيض وبعض الخصائص النوعية للبيض. وذلك باستخدام اثنين من طرق القلش هما اكسيد الزنك والتصويم (الكلفورنيا) . تم تقسيم الدجاج لمجموعتين 150 دجاجة لكل مجموعة ومن ثم قسمت كل مجموعة الي ثلاثة تكرارات تحتوي كل منها علي 50 دجاجة. تم تقديم عليقة تحتوي علي 20000 جزء من المليون من اكسيد الزنك (مجموعة اكسيد الزنك) مع توفير الماء للاستهلاك الحر واستخدام اضاءة طبيعية وذلك لمدة خمسة ايام متتالية. وفي المجموعة الثانية (مجموعة التصويم) تم تصويم الدجاج لمدة عشرة ايام مع توفير الماء والصدف للاستهلاك الحر واستخدام الاضاءة الطبيعية وفي اليوم الحادي عشر تم توفير ذرة غير مجروش بالاضافة للصدف للاستهلاك الحر حتي اليوم الثلاثون وفي اليوم الواحد والثلاثون تم توفير عليقة دجاج بياض ومع زيادة عدد ساعات الاضاءة الي ستة عشرة ساعة في اليوم.

تم تسجيل وزن الدجاج قبل وبعد القلش وانتاج البيض وقياس بعض الخصائص الخارجية والداخلية للبيض بالاضافة لقياس وزن الكبد وطول ووزن المبيض مع تسجيل النفوق ان وجد.

كذلك تم عد الخلايا البيضاء وقياس معدل هرمون البروجستيرون. اظهرت النتائج زيادة معنوية في نسبة الانتاج وسمك القشرة حيث ارتفعت نسبة الانتاج الي 55.6 ± 0.99 و 65.6 ± 0.99 (%) وتحسن سمك القشرة الي 0.41 ± 0.01 و 0.43 ± 0.01 (ملم) مقارنة مع فترة قبل القلش 43.6 ± 0.99 (%) و 0.37 ± 0.01 (ملم) وذلك عند القلش بواسطة اكسيد الزنك وحذف العلف غلي التوالي.

اشارت النتائج لعدم وجود فروق معنوية في وزن البيضة والكثافة النوعية ولون الصفار بين الطرق المستخدمة مقارنة مع الفترة قبل القلش.

استخدام طريقة التصويم في القلش ادت الي نقصان معنوي ($P < 0.05$) في معدل وزن الدجاج 26.7 ± 1.79 (%) خلال الاسبوعين الاولين للتجربة ولايوجد تأثير معنوي للطرق المستخدمة علي وزن الكبد في الفترة من 15 الي 32 يوم من التجربة كما لا يوجد تأثير علي وزن المبيض ووزن وطول قناة البيض خلال الفترة من 33 الي 58 يوم من التجربة. كما لا يوجد فرق معنوي في نسبة النفوق بين الطرق المستخدمة في القلش.

اوضحت الدراسة انخفاض معدل هرمون البروجستيرون من 0.12 ± 0.60 نانوجرام قبل بدء التجربة الي 0.00 ± 0.00 نانوجرام في الاسبوع الاول من التجربة وذلك عند استخدام اكسيد الزنك اوالتصويم ، وفي اليوم الحادي والعشرون ارتفع معدل هرمون البروجستيرون الي 0.06 ± 0.40 نانوجرام في مجموعة التصويم مقارنة مع مجموعة اكسيد الزنك 0.16 ± 0.81 الفترة قبل القلش 0.09 ± 0.77 .

باستثناء الكالسيوم اظهرت الدراسة وجود نقصان معنوي في تركيز الفسفور والماغيزيم وارتفاع معدل الصوديوم والبوتاسيوم والبروتين والالبويومين و GOT مقارنة مع معدلات قبل القلش.

كما تلاحظ وجود نقصان معنوي في معدل كريات الدم الحمراء مع ارتفاع نسبة الكريات البيضاء الي 0.39 ± 0.05 (%) عند التصوير مقارنة مع نفس الفترة عند القلش بواسطة اكسيد الزنك والفترة قبل القلش 0.17 ± 0.01 . من نتائج الدراسة ونسبة للاثر الايجابي للقلش الاجباري علي نسبة الانتاج نستخلص امكانية تطبيق القلش الاجباري في السوان. كما وأن برنامج استخدام الزنك للقلش اظهر نتائج افضل من برنامج التصوير خاصة في معدل انتاج ونوعية البيض بعد القلش.

