Effect of incubation temperature on the Gross-pathology of chickens Embryos

Dr. Maudhir Dakhil mohammed ***University of Diayla, College of Education, Biology Department.***

ABSTRACT

Ross parents stock eggs were incubated at 35.7c, 36.7c, 37.7c and 38.7c.

The age of embryos mortality, the incidence of morphological abnormalities were recorded from all unhatched eggs.

Eggs incubated at 35.7c and 36.7c hatched later than eggs incubated at 37.7c. Eggs incubated at 38.7c hatched earlier than eggs incubated at 37.7c.

Lowheated eggs were characterized by a high incidence of small embryos with excess albumen ruptured yolk sacs, eyes closed and anabsorbed yolk sacs.

Overheated and were characterized with head in small end, with large albumen, ruptured yolk sacs, oedematous and offensive odour. The percentage for these changes recorded for each treatment.

Introduction

The optimum incubation temperature for chickens hatching eggs was 37.7c in the first 18^{th} days and 36c for the rest three days of hatching.

Increase or decrease in temperature affect the hatching (1). The identification of the cause of a decrease in hatchability is of considerable commercial importance (2). A commonly used technique for identifying the cause of hatch problems is to break-out. Opening unhatched eggs and inspecting the embryos for the presence of abnormalities (3). (4), has reviewed the extensive

literature reporting the factors that have been associated with morphological abnormalities in the embryos. In addition to abnormal morphology, the embryo may not be correctly developed and positiond within the egg to allow successful hatching. Embryo position its head in the blunted next to aircell and its head is under its right wing. Deviations from the correct hatching position are classified as malpositions (5). Successful artificial incubation of eggs is dependent on careful control of incubator temperature. Small deviations from the optimum have a major effect on embryos development growth and survival (6). Despite the considerable importance of incubating eggs at the correct temperature, there is littel information available on how to identify hatch problems caused by in correct temperature when performing a hatch break-out.

The present study was to investigate the decrease or increase temperature on the abnormalities in chicks embryo for mortality and pathologica changes.

Materials and Methods

480 eggs from Ross parents stock at age 35 week was used , 100 fertile eggs for each treatment with good selection were selected for each group. That all the eggs all same size and age and fumigated with formaline and permangnat before used (7). Four incubater each incubater with a 100 eggs capacity and the temperature fixed according to the treatment for 21 days between March and June 2006.These incubaters with themstate and checked with thermometer. The temperature checked requlary under and above the tray of eggs with alarming if any change happened to the temperature. Hpwevwe, all the other requirement for development of embryo were arranged such as humidity, rotating of eggs and ventilation during incubation and hatching periods.

Embryo pathology

All dead embryo were aged using the chicken embryo development chart of (8). Chicks that had piped the egg shell were classified as pips whether dead or live .cracked or obviously contaminated eggs were omitted from the data analysis .All dead embryos were examined for abnormal morphology or mal position according to (7)

Statistical analysis

All results were expressed as a percentage (%)of fertile eggs incubated .age of death distribution were compared used (9). Frequency data were compared (10).To test whether malposition or abnormalities occurred within the same embryo more frequently than predicted by a random association ,the observed number of embryos showing a combination of mal position and abnormality was tested using one way anylysis of variance (11).

Result and Discussion

The design of Experiment was show in table I and all the results mentioned in table 2,3 and4.

Table I: Design of Experiment

Treatment	Temperature Fertile eggs	Number of egg incubated
1	35.7c	100eggs
2	36.7c	100eggs
3	37.7c	100eggs
4	38.7c	100eggs

Table 2: percentage of hatching embryo from the 100 fertile eggs For each treatment.

Treatment	Temperature	number of fertile Eggs	% of hatch fertile eggs
1	35.7	100	33%
2	36.7	100	58%
3	37.7	100	86%
4	38.7	100	41%

at 4 days all the eggs checked for fertile eggs and lefted only 100 fertile eggs for each treatment from 120 eggs in started of experiment in each group.

Table 3:Effected of incubation temperature on weekly mortality During incubation(%)

Treatment	Temperature	week1	week2	week3
1	35.7c	12.4%	2.2%	1%
2	36.7c	8.7%	1.6%	0.5%
3	37.7c	6.8%	1.1%	0.8%
4	38.7c	8.6%	2.1%	14.2%

Table 4: incidence of embryo abnormalities as (%) a percentage Of fertile eggs incubated.

	35.7c	36.7c	37.7c	38.7c
Mal position				
Head over wing	0.6	0.5	1.7	1.0
Head under left wing	0.4	0.2	0.2	1.3
Head in small end	7.3	3.2	1.0	9.0
Head between legs	4.9	2.6	1.6	4.2

Abnormalities

Sub cuttaneous haemorraghe	3.2	2.8	6.1	26.2
Chorio-allantoes heamorraghe	0.2	0.1	0.3	1.0
Ruptured yolk sac	2.0	0.8	1.7	1.6
Excess albumen	4.7	2.7	6.2	8.3
Oedema tow head	3.2	1.2	2.2	11.1
Eye cataract	1.0	0.4	0.1	4.2
Swollen down plumuies	0.9	0.3	0.1	1.6
Total embryos with abnor malities Or malpositions	11.2	7.2	9.8	36.2

Normal temperature for development of chicks embryos is very important and it was 37.7c for first 18th days and 36c for the other three days. Changes in this temperature affected the development of embryos and may be leads to death as the change critical for the embryos. Decreased in temperature delay the development and increased abnormal embryos while increased in temperature faster the abnormal development. From this experiment decrease temperature get high mortality as expressed in Table 2, this results were significant as compared with normal temperature 37.7c.

Malpositions of chicks embryos also occurred with increased with deviations in the temperature and this agreed with (12). However this malposition increased with the changes in temperature to high in comparism with lower temperature.

Embryo to developed normaly needs a constant temperature with humidity, oxgen and rotating of eggs, any mistake in these requirements affected the shape and development of the embryos. On the other hands, the development in the industry of incubares and hatcheries make the control of these conditions automaticallt easily to get good hatching chicks results if the sources of fertile eggs good.

References

1- Cherms, E.I. (1979). Development of the turkey embryo. Sonoma, USA, Turkey breeding farms.
2- Whoson, H.R. (1991). Physiological requirements of the developing embryo, temperature and turning. In Tulleta, S.G. Ed. Avian incubation PP: 113-116. London, Butterworth.
3- Romanoff, A.L. (1992). Influence of incubation temperature on the hatchability of eggs. Journal of Agricultural Science 25:318-325.
4- Coleman, M.A. and Motto, H.I. (1992). Using quick check of hatch debris to determine chick hatchability problems. 19th World Poultry Congress, PP: 652-654. Amesterdam, World Poultry Science Associations.
5- Romanoff, A.L. (1990). The avian embryo structural and functional development. Macmillion Company, New York.
6- Radaway, M.A. (1994). A quide in Embryology Ist ed. Al-zahar press Bashdad.
7- Patter, P.M. (1991) Embryology and chick, 5th ed. Me Graw. Hill bood Company, New york.
8- Lohamman, (1985). Chart quide for development of chicks embryo.
9- Gib, T. (1996). Improving hatchability. Zootecnica International.
10- Ingolf, S. (1984). How to improve hatchery management. Poultry Conference, Frankfurt.
11- Jack, H. (1990). Impotance of ventilation in the hatchery. International hatchery Practice, USA.
12- Romanoff, A.L. (1996). Influence of incubation temperature on the hatchability of eggs. Journal of Agricultural Science 25: 318-325.

[illegible]

[illegible]

[illegible]

بيض ملقح لأمهات فروج اللحم (روز) بعمر ٣٦ أسبوع وضع في أربع مجموعات للمقارنة بين درجات حرارة مختلفة للحضن وهي ٧٣٥ ٧٣٥ ٧٣٧ ٣٨ درجة مئوية
متابعة الهـ ات في الاجنة والتغيرات الشكلية والوضعية لـ جنة سجلت لكل البيض الملقح الغير فاقس نتيجة هذة التغيرات .

بيض حضن تحت درجة حرارة واطئة ٧٣٥ ٣٦ درجة مئوية حدث الفقس فية متاخراً في حين البيض الذي وضع تحت درجة حرارة عالية ٣٨ درجة مئوية حدث الفقس متاخر

البيض الموضوع في حرارة واطئة تميز بوجود أعداد من أجنة صغيرة مع زيادة في الالبومين ومح ممزق. الاعين مغلقة وعدم أمتصاص المح في حين في وجود ار تفاع بالحرارة لوحظ مي ن الرأس الى الجهة المبية من البيض مع زيادة و توسع في البطن مع تمزق يس المح وطراوة في الراس مع تجمع سوائل ورائحة ريهة في الاجنة نتيجة النمو غير الطبيعي وسجلت نسبة هذه التغيرات حسب المجموعة لكل معالجة من هذا البحث بعد عزل ٤٠٠ بيضه ملقحه من مجموع فى البدايه وبواقع مئة لكل مجموعة.
480