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Quality Assessment Embryo and Day Old Chicks of Poultry.

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ABSTRACT

This article describes the traditional methods of evaluating embryos using biological control incubation of eggs (BCIE) and day-old chicks of poultry. On the basis of the set of experiments proposed methods to improve the assessment of chickens providing increased efficiency and reliability of the results. The proposed formula (based on the results of the BCIE for 0-11 days) for the prediction hatching of broiler. Assessment of chick quality were conducted on a 10-point scale "Optistart+". Uniformity of embryo development was determined by the proportion of embryos (category I) day old chicks using objective measures (body weight, total body length, body temperature in the cloaca).

Keywords: poultry, embryos, incubation, dissection the waste of incubation, day-old chicks, quality assessment.

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INTRODUCTION

One of the main trends of the modern poultry industry is its integration in the research, production and commercial activities. Between different countries and the domestic market there is an active movement of hatching eggs and day old chicks birds of different species crossbreed. [1]. The extent of compliance with the parameters of hatching eggs, embryos and daily (perinatal) young economic conditionality requirements is a necessary part of the monitoring and improving reserve maximize the genetic potential of breeds and crossbreed of poultry. However, the number of indicators to measure quality is limited, requiring the search for new methods of subjective-objective. Before managers of enterprises and companies the task of correctly predicting the hatching of broiler, as well as the growth and development of chickens in accordance with the genetic potential of poultry. Therefore, the work in this direction is relevant and has a practical significance.

MATERIALS AND METHODS

Experience 1. Comprehensive assessment of embryos of poultry

The effectiveness of the incubation of eggs of poultry (embryogenesis in artificial conditions) depends on a complex of factors: confounding factors - 38-52%, unbalanced feeding - 22-25%, not compliance with the storage of eggs before incubation 14-25%, violation of technology incubation 5-7% genetic abnormalities 5-8% [2, 3, 4].

Scientific and technical progress makes adjustments to the parameters of the technology and incubation of eggs of different species of bird that produces genetically conditional of hatched of broiler, as well as its sustainability and growth in the early postnatal period.

Established practice of incubating eggs crosses meat chickens after the onset of hatching is to reduce the air temperature to 36,6-36,8 ° C, while in the control mode of incubation - the transition from measuring the temperature of air temperature monitoring shell eggs (embryos). Normally, before hatching it is 36,8-38,5 ° C, after - 38,3-39,4 °C. The normal rotation angle eggs before hatching is 45°, critically unacceptable - 35°. The hatchery introduced circadian incubation (Circadian Incubation), the measurement of the mass loss in the eggs online (Dynamic Weight Loss System) and synchronization of hatching in intensity beginning hatching embryo shell (Synchro-Hatch) [5, 6, 7].

According to P. Surai and V. Fisinin [8], the scientific interest is the "mother programming» (early life programming). Recent advances in the field of epigenetics and molecular biology allow to approach the explanation of the mechanism of this phenomenon.

Monitoring of embryo development, the quality and viability of day-old chicks is carried out in the process of biological control incubation of eggs (BCIE). This allows you to objectively assess the quality of reproductive breeder birds and hatchery, to predict the final results of incubation and in a timely manner to eliminate undesirable factors.

BCIE in full - it is a time-consuming process, and without any special knowledge, skills and equipment, uniform methods of regularity, operative communication with the farms that produce hatching eggs and raise young, is not always true and fair outcomes.

During incubation poultry embryos were evaluated for their growth, morphological and physiological changes that are set in the preliminary BCIE. The developing embryos are partitioned into three categories [10].

First egg-candling (chickens 6,5-7 day):

Category I - the embryo is not visible; around the amnion in the form of milky spots; in the yolk vascularized;

Category II – the embryo is seen, its contours distinguishable; distinguishable eyes; development of blood-vascular system on the yolk;

Category III – lags behind in development of the embryo from shell.

Second egg-candling (chickens 11-11,5 day):

Category I – the embryo is visible in the center of the egg; allantois under the shell cover is closed and the protein in the acute end of the egg;

Category II – allantois at the sharp end are not closed up 1/3 egg white;

Category III - allantois at the sharp end are not closed up 1/2 egg white;

Third egg-candling (chickens 18-9 day):

Category I – embryo occupies 2/3 of the eggs; the pointed end of the egg is not X-rayed; border air chamber due to the winding protrusion of the embryo; shadow embryo mobile;

Category II – the pointed end of the egg is not X-rayed; border air chamber is even;

Category III – sharp end-rayed; border air chamber is even.

Normally, the number of embryos category I must be at least 80% in all periods raying.

The described method was used for the research project.

In 7,5; 11,5 and 18,5 days accomplish egg-candling individually in control trays (at least 3 on the incubator), starting with the last row. At the same time withdrawn and accumulate in the egg strips eggs with dead embryos in the traditional categories. After taking into account the amount of waste they celebrate incubation conventional signs and placed in the ranks of the extreme tray. These those eggs is not candles again and saves time for the evaluation BCIE. In the process of shifting from the hatching eggs to the hatching trays labeled trays retain control. As a result from these trays do sampling, sorting, counting conditioned young, the weak, the crippled and the opening of the hatch debris.

Experience 2. Comprehensive assessment of day-old chicks of poultry

Day-old chicks regardless of the type of bird not uniform in age from hatching (exemption from the shell) to the sample tray for transportation to the place of cultivation [14, 15].

The prelaunch (prenatal) period - 5-10 days from hatching, young embryos and retains the features of a particular exterior: a relatively large head and long legs, short neck and wings and elongated shape of body [16,17].

The sampling time of chickens directly affects its physiological state. Normally, a decrease of live weight broiler chickens after hatching 0.45 g / h. Reliably estimate the day-old chicks can be 8-12 hours of hatching at 24-30 ° C and humidity of 60-65%.

The most popular features of assessing the quality of day-old chicks are the appearance, mobility and size - live weight, which characterizes the degree of assimilation of nutrients embryo eggs during incubation. The representativeness of the sample mean to estimate the day-old chicks of live weight is 30-100 heads on the exterior and behavior - to 2% of the total number, but not less than 100 goals [12].

The simplest type of assessment of day-old chicks of the exterior: a) «good», «bad»; b) «bad", «good», «very good» [18].

Subjective signs of quality day old chicks (Chick Grading Standarts) the following: good mobility and stability on your feet; active response to sound (tapping); a well-defined pecking reflex; head - wide and proportional; beak - correct form, pigmented; eyes - round, prominent, brilliant; body (touch) - tight; stomach (touch) - soft, hand-picked; the shank - straight, strong, pigmented; wings - held tightly to the body; fluff - dried up, evenly distributed over the body, smooth; umbilical ring - tightly closed; cloaca - clean, pink and moist.

In recent years, the proposed scale testing of broiler chickens «Pasgar» (10-point) and «Leuven» (100-point) for abnormalities in motor reflexes, the state of the umbilical cord (dried eschar of «umbilical legs»), beak, legs and abdomen, due to their connection with the development of the internal organs and the subsequent productive poultry. In fact, it adapted the medical perinatal scale «Apgar».

RESULTS AND DISCUSSION

Experience 1. Comprehensive assessment of embryos of poultry

Final BCIE held in the following order:

- all the eggs before start hatching with the blunt end of the shell fragment removed 2-3 cm in diameter;
- clarification of the previously announced categories of waste in the amount of incubation categories;
- the distribution of waste categories in the egg strips;
- writing down the amount of waste by categories in the protocol;
- autopsy of dead embryos and counting the number of pathological changes;
- the summation of the results and the establishment of the major causes of death of embryos.

Diagnosing the cause of fetal death rate of birds is often difficult because of the similar actions of a number of factors and non-specific changes in the embryo. It is advisable to make an emphasis on those who hold not less than 25-30% of the total.

In order to predict the results of incubation of life in BCIE we have analyzed the results of incubation of 3861 thousand. Pieces. eggs from breeder meat chickens cross «Ross-308» in «Agrokormservis plus» for 2011-2014.

All parties eggs were divided into five classes according to BCIE for 0-11 days. For each class determined by the average hatching of chicks. The average hatching of broiler chickens without age of the bird, and the shelf life of eggs in the same conditions of incubation was 79,4% (limit of 74,5-85,9%), and corresponded to the minimum level [12].

It was further established the difference between waste incubation for 0-21 days. and 0-11 days. for each class, added 1% - based on the category of «weak and crippled»" and calculated the coefficient of the forecast hatch debris - KFHD (Table 1).

Table 1: Contact waste incubation for 0-11 days. with a coefficient of the forecast hatch debris – (KFHD)

Index	Classes waste incubation for 0-11 days				
	I	II	III	IV	V
Range of waste incubation (WI) 0-11 days, %	8,0 or less	8,1-10,0	10,1-12,0	12,1-14,0	14,0 and more
KFHD, %	11,2	11,1	9,9	9,7	9,3

Thus it was obtained the formula for calculating the predicted hatching of broiler chickens (PHBC) cross «Ross-308» for a specific program content breeder and incubating eggs: $PHBC (\%) = 100 - (HD + KFHD)$.

The procedure for calculation of the following. For example, in the group was included in the incubation was 69 058 units eggs. As a result BCIE 12 days incubation trays is determined by the control deviation incubation for 0-11 days. (6,8%) and the appropriate class KFHD (I. «8.0% or less») and calculated PHBC : $82,0\% = 100\% - (6,8\% + 11,2\%)$. In this example, the predicted actual output was greater by 0,5%.

In the case of the eggs with storage of more than six days, every day has to be added at least 1% for dead embryos [13].

This formula was tested in February-April 2015, with volume production batches 522,610 units eggs. Difference between actual and projected hatching ranged from -0,1 to + 1,2%.

Experience 2. Comprehensive assessment of day-old chicks of poultry

Testing scale "Pasgar" in which each criterion is assigned a score of 0-2, or a total of a maximum 10 points, the organization of experimentation and production monitoring showed that its development and application does not cause difficulties.

Broiler live weight at day old and 43 g of a group referred to as «hypertrophy» (100%), 40-42 – «normal» (95%), 39 g or less – «hypotrophy» (91%).

In our opinion, it is necessary to assess the state of the neck (mobility) and feathers from the day-old chicks.

The muscle in the neck (conditionally - "muscle of hatching") before nestling hatching shell significantly increases in size, it activates the synthesis of mucopolysaccharides under the control of adrenal steroids. Following the withdrawal of this muscle atrophy. The highest deposition of fat in the neck occurs in chicken meat, eggs derived from medium and high weight [16].

M. Burian [19] A.S. Kavtarashvili, E.N. Novotorov, D.N. Kolokol'nikova [15] propose to use to assess the day-old chicks of poultry indicator «total body length» - the length from the tip of the beak to the tip of the third toe, which is less dependent on the age of the young compared to its weight. It was found that the chickens with a total length of more bodies are large internal organs are growing and developing intensively.

In our experience, the accuracy of the determination of the total body length (L) of broiler chickens is still low due to human error especially in the absence of skill and measurement of different researchers. This is especially true of weak chicks that have insufficient body tight and they are relatively easy to conditionally «stretched» along the gauge, it is difficult to do with conditioned chickens with its already good resistance to mechanical stress.

There is no consensus about the constant body temperature of day-old chicks of poultry as an indicator of his clinical status is not and therefore requires clarification. The average temperature in the cesspool of day-old chicks is 39,0-40,1 ° C at physiologically mature - 39,4-40,6 ° C, the weak and at a low temperature in the sample below - 37,4-38,5 °C. [20, 21, 22, 23, 24, 25].

All the above have been taken into account in the development of the author's scale «Optistart +» (Table 2).

Table 2: Quality criteria on a scale of day-old chicks «Optistart +»

Indicator (quality criterion)	Norma	Abnormality
1. Live weight with an accuracy of $\pm 0,1$ g	At least 34 g	Less than 34 g
2. The total length of the body with an accuracy of $\pm 0,1$ cm	Not less than 17 cm	Less than 17 cm
3. The body temperature to within ± 0.1 ° C	Not less than 39,3°C	Less than 39,3°C
4. Refleks coup	From the position on the back of the chicken and at least 2 seconds, turns over on its feet	From the position of the chicken on the back of more than 2 seconds turns over or rolls over on his feet
5. Muscle tone of the neck	From the position of «head sagged down» chicken raises head	From the position of «head sagged down» chicken is not raising its head
6. Stomach	On palpation soft and trim	On palpation is more compacted (preloaded) or large
7. Beak	Uniformity of color, short, thick, defect-free and redness, nostrils clean	Red spots at the base, nostrils clogged with protein, narrow, curved, soft
8. Umbilical ring	Tightly closed, dry scab or as strings	Not closed, bleeding, scab black or white with a diameter greater than 2,5 mm
9. Cloaca	Pink, moist and clean	Increased, pollution down around her meconium green or brown, salts
10. Pros and fingers	Straight, strong, uniform color, no defects	Red thin, swollen knee joints, swollen claws

Testing of chickens on a scale of "Optistart +" conducted individually. Normally, the amount of points is 10. In the event of (a defect) criterion was estimated at 0 points. Therefore, the chicken was awarded the score less than 10 points [26].

Comprehensive subjective-objective evaluation of daily young birds of different species on a scale of «Optistart +» has been successfully tested under production conditions of a number of poultry farms and the organization of experiments in the vivarium «Stavropol State Agrarian University» [27].

CONCLUSION

On the basis of these studies we can conclude about the prospects of improving the methods of testing embryos and daily (perinatal) young poultry for scientific and industrial purposes. Forecast output of broiler appropriate to do on the proposed formula based on the results BKIYA for 0-11 days., And their starting quality - on a 10-point scale «Optistart +». Uniformity of embryos for the development of the embryo is determined by the share of the I category. Day-old chicks by objective indicators (body weight, total body length, body temperature in the cesspool) - the coefficient of variation Cv and uniformity (Ku) at a deviation from the average value at $\pm 5\%$.

GRATITUDE

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