CHARACTERISTICS OF THE HEMATOLOGICAL PROFILE IN THE MEAT PREPARATIONS

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Abstract

Determination of the hematological profile quail is a necessity because this species is characterized by an intense metabolism. Any nutritional imbalance is reflected on metabolism influencing their health and production.

Research has shown that the hemoleucogram is different depending on age and gender. Thus, the red grouts had an increase of 0.77x10^6 mm^3 in quail chicks of one day, reaching 21 days at 1.72 x 10^6 mm^3. In adults, the variation limits were between 4.22 x 10^6 mm^3 in males and 3.31 x 10^6 mm^3 in females.

The same evolution occurred in white blood cells, which were 1 day of 10.2 thousand mm^3, reaching 21 days at 16.3 thousand mm^3. In adults, they were between 24.5 thousand mm^3 in males and 26 thousand mm^3 in females.

Changes related to age and sex also recorded the amount of hemoglobin and hematocrit. Leukocyte values, excluding eosinophils, were 0.8% for the two sexes. Lymphocytes, 26% in males and 25% in females, and neutrophils were 70.8% in males and 70.5% in females.

Hematological research has shown that quail blood has a high oxygenation capacity and remarkable lymphocyte character.

Key words: quail, hematology, limp, youth, adult

INTRODUCTION

Blood makes the connection between all organisms' tissues and systems, by the omnipresence of blood cells that have vital functions in them. Japanese quail introduced recently in husbandry systems for meat and eggs is likely to expand rapidly because of biological characteristics and demand for these products.

His high quality protein meat is great and cheap, representing a characteristic of this species makes it attractive for consumers. Reference data on quail hematology are relatively few and most of them refer to what grows for eggs.

Hematologic profile studies were conducted by Atwal and Col 1964, an ontogenic study on quail eggs (Hirmala and Robertson 1921). Morgan 1980 on adult quail in growing cages.

Other studies refer to the morphometric analysis of blood cells in adult quail Bhattacherjee Anania et al. Most research aims at determining the hematological profile under different conditions, for example, the imponderability, the administration of different additives in the diet, stress and more. There are no studies that dynamically modify the hemoleucosis formulations from day to day.

The purpose of the paper

Blood, as opposed to other systems of the body, has a characteristic: it has two sectors, one circulating mature cells and another one in which they form the hematopoietic organs (bone marrow and spleen).

Functional blood cells are continuously formed by proliferation, differentiating concurrently from hematopoietic cells of origin under the influence of specific stimuli. Precursor cells feed the proliferation sector and then the circulating sector.

All blood components cannot be reduced to component parts only, since blood has

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specific properties that do not have constituents. Japanese quail is an option in diversifying production through quality poultry eggs and meat are about offers consumers.

Special biological characteristics, such as: precocity, growth rate, small range intergenerational high percentage of laying relatively low feed consumption for the production of eggs and meat, poultry recommend this for great agricultural production.

Determination of the hematological profile sought to evaluate the health of the birds studied. Its determination in different periods of growth, aims to see whether age affects blood parameters and red blood cells indices. Research has also tracked the extent to which sexual maturity has altered the hematological profile.

The determination of the hematological profile has as main purpose the evaluation of the health status of the birds as well as the assessment of their physiological state. The diversity and complexity of the physiological functions of blood require research to help establish the normal boundaries between life without affecting the economic outcomes. The aim of the research was to determine the hematological profile of Japanese quail in different phases of growth.

Biological material

Hematological parameters were determined on a population of 10 healthy birds, having different ages: starting with a day, 7, 14, 21, 30, 40 and 50 days. and at adult age at 7 months (Figures 1 and 2).

Fig. 1 First day chicks

Fig. 2 Youth quails at aged 30 days

Quail chicks at one day of age are wearing down, being sensitive to variations in temperature and humidity. Their average weight was 11.02g. From the fourth day, feathers begin to rise at the wing level, and at the age of 7 days feathers are also present. At the age of 3 weeks, the chickens are completely clothed in feathers weighing 110-115g depending on sex. The age of the first egg is 45-50 days when they can be sacrificed for meat, the average weight being 250g.

Blood samples were processed with an Excel 2007 software.

Working method

For the determination of hematologic parameters, blood was harvested from the axillary area of the wings, with a 1 ml disposable syringe, and then transferred to anti-curative vacuum tubes (Figure 3).

Fig. 3 Blood samples collection

Were determined following hematological parameters: hemoglobin content, the number of red and white blood cells, hematocrit and cell counts and red blood cell indices: MCV, MCH, MCHC.

The quantification of hematological parameters, associated with the examination of the blood smear, brings information that leads to specific tests in the setting of some diagnoses.

Determination of erythrocyte count

In determining the number of erythrocytes and leukocytes quails was used patented method and Herrick Natl. As necessary materials Natl solution was used and Herrick, Neubauer counting chamber, the dilution for RBC pipette.

Make a dilution 1/200, homogenize the sample, displays the hemocytometer and leave for 3 minutes. Using 40x objective include red cells in the four corners and central squares within the large square room count. There are also the cells that intersect with the top and the left. There are no cells that intersect with the lower and right tapes. Increase the total number of cells by 10,000 to obtain the total number of erythrocytes (Figure 4).

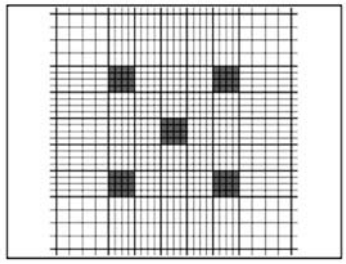


Fig. 4 Count room Neubauer

Counting leukocytes: This assay is used for all Natt and Herrick method. White cells tend toward a dark color, bluish to purple and may show granulation. The total leucocyte count is obtained by counting all the leukocytes present in all 9 large squares of the hemocytole (Figure 5).

WBC = (number of leukocytes 9 square ± 10% of WBC) x 200

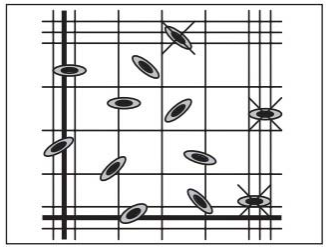


Fig. 5 Example of cell count in hemocytometer

Determination of hematocrit

Hematocrit represents the ratio between the total volume of erythrocytes and total blood volume, expressed as% after centrifugation. In practice, the methods of macrohematocrit and microhematocrit are used for their determination.

Macromatocrit method was used in our study, using the following materials: venous blood collected in anticoagulant, Wintobe hematocrit tubes, centrifuge, materials necessary for blood collection by venipuncture and Pasteur pipettes.

Blood taken with anticoagulant is introduced with a Pasteur pipette into a Wintrobe tube up to Division 100 if the tubes are graded or inserted up to 4mm^3. The tubes are centrifuged at 3000 rpm for 3 minutes. After centrifugation, the contents will have the following: the red cell is located at the bottom of the tube and the plasma will be at the top of the tube. The grayish-red color separation line consists of leukocytes and platelets.

Read the value expressed as a percentage of the erythrocyte pack height, the height of the blood column being 100%. For determination, use a ruler in case the tube does not measure it by measuring the height of the blood column (H) and the column of red cells (h) expressed in mm. The value Ht being determined by the formula:

$$\mathrm{Ht}(\%) = \frac{\mathrm{h}}{\mathrm{H}} \times 100$$

The microhematocrit method is much faster and more economical than the Wintrobe method. Required materials: special glass capillary tubes, microcentrifuge, glass rod, dimmed plastic capsule, materials required for blood sampling.

Blood is harvested in an anticoagulant container. Charge the capillary tube with blood in a proportion of 3/4 of the capacity. The opposite end closes by heating to the flame of a gas bulb. The tubes are placed in a centrifuge for 5 minutes at 15.000 rpm.

Making the blood smear

To produce a smear it is displayed by displaying the whole blood uncoagulated in the monolayer on the porthole blades.

Depending on the morphological exam. we can:

a) fresh, uncorrected preparations which are prepared as follows: the second drop of blood emerged after puncture on the central part of the blade, then covered with a slat and examined;

b) fresh colored preparations: the technique of obtaining the preparation is identical, the difference being the addition to the blade edge of a droplet of methylene blue which is capillary, under the color of the blood;

c) permanent fixed and colored preparations: the blood is harvested and applied to one of the ends of a porthole blade. Another slat is placed at 300 at the sample blade, several lateral movements are made to spread the blood across the entire line of contact of the two blades, followed by a slight sliding of the blood stream the length of the lamella. To fix the preparation either by shaking the blade, with methyl alcohol for 2 minutes, or with ethyl alcohol and ether in equal parts for 2-15 minutes.

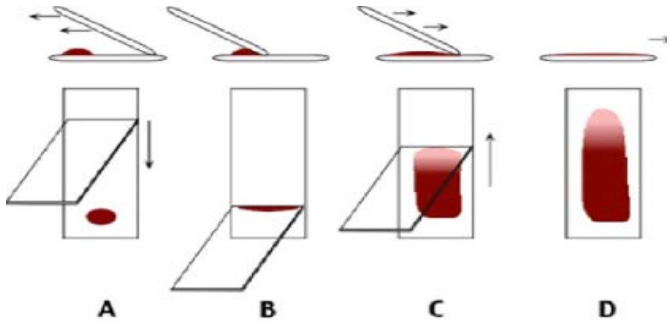


Fig. 6 Making a blood smear

Blood smear staining techniques

The method used for the preparation of the smears analyzed was the May-Grunwald Giemsa panoptic staining technique. This method provides complete details for hematology studies using eosin and methylene blue,

Steps of coloring a smear using the May-Grunwald Giemsa method

a) preparing the preparation;

b) using a pipette, drop over the entire surface of the May-Grunwald dye flake and leave for 3 minutes;

c) after the end of the 3 minutes, another pipette drips distilled water on the preparation, taking care not to run on the dips, leaving the solution for another 3 minutes;

d) after draining the solution on the slat, prepare the Giemsa solution (10 ml of distilled water / 15 drops of Giemsa), then drop by another pipette on the preparation, leaving the solution to act for 30 minutes;

e) dissolve the dye on the slat, rinse under a jet of water, avoiding direct contact of the preparation with water and leave to dry.

The leukocytes are: neutrophils, eosinophils, basophils, monocytes and lymphocytes. Neutrophils: represents the most numerous type of leukocytes, playing an important role in primary anti-infective defense, phagocytes and digesting micro-organisms. In case of a disorder, they can damage normal tissues by removing an enzyme and pathogens (Figure 7).

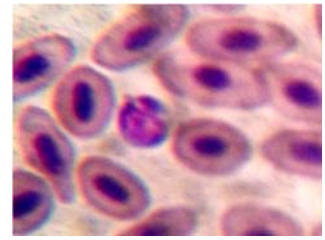


Fig. 7 Image with a neutrophil

Basophiles: They mature in the hematogenic marrow, circulating and retaining certain characteristic ultrastructural features from the blood after migration into tissues during inflammatory and immunological processes (Figure 8).

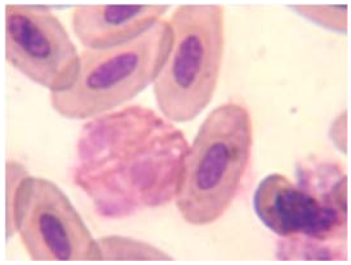
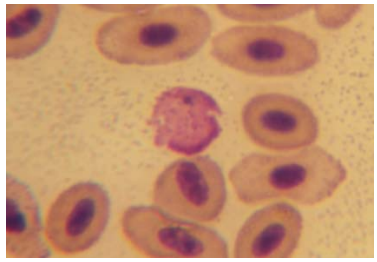


Fig. 8 Image with a basophilic cell

Bazocytes and mast cells play an important role in allergic reactions because immunoglobulin E has the property of attaching it.

Monocytes: are the largest blood cells with a red cell nucleus and abundant and gray cytoplasm. They are formed in the bone marrow where they stay very short time after which they are released into the blood by migrating into tissues as a response to different chemotactics (Figures 9 and 10). In the body they fulfill the following:

- ✓ remove impurities, dead or senile cells;
- ✓ regulates the functions of other cells;
- ✓ immune and in the case of inflammation.



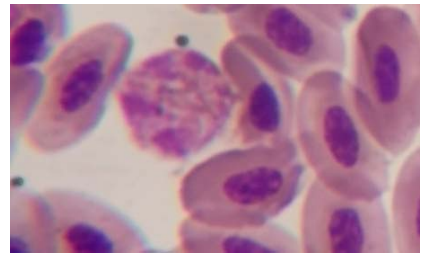
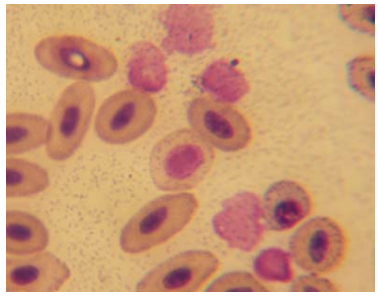


Fig. 9 and 10 image with a monocytic

Lymphocytes: have a spheroidal nucleus, having a blue protoplasm identical to the sky, with perinuclear halo, and the granulations are missing,

They are heterogeneous cellular protection, which differs depending on their origin, lifetime, localization in the lymphoid organs. They fall as follows: between 65-80% of the lymphocytes are T cells, 8-15% are B, and about 10% are a natural killer. Of the total, only 2% are in circulating blood,

Lymphocytes are found in lymphocyte organs (hematogenic marrow and Fabricius scholarship) with the role of differentiation, and then released and stored in specific areas of secondary lymphocytes (spleen, lymph nodes, Payer plaques). From a morphological point of view, these are of three types: small, medium and large lymphocytes (Figures 11 and 12).



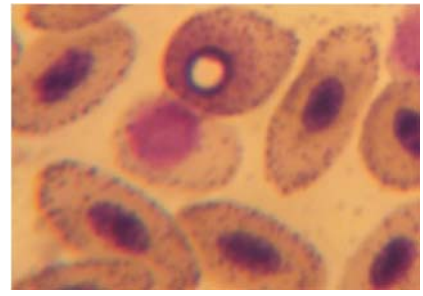


Fig. 11 and 12 Image with a small and medium-lymphocyte

Determination of chemical composition of blood

The method used to determine the concentrations of the existing constituents in the blood plasma was spectrophotometry. The principle of the method is based on the passage of the light of a known wavelength in a sample and the measurement of the amount of light energy being transmitted. This is done by placing a photocell on the opposite side of the sample, the light beam consisting of photons, when a photon encounters an analytic molecule, it is likely that it absorbs the photon.

This absorption reduces the number of photons from the light beam, reducing light intensity. All molecules absorb radiant energy at some wavelengths. Proteins and nucleic acids absorb light in the ultraviolet field. This technique uses the determination of organic and inorganic chemicals in all body humor (blood, urine, lymph, etc.).

RESULTS OBTAINED AND THEIR DISCUSSION

Table 1 Results on hemoleucogram counts in quail

Specification	Youth			Adult	
	One day	7 days	21 days	males	females
Red blood cells (10^6 / mm^3)	0.77±0.19	1.64±0.20	1.72±0.11	4.22±0.14	3.31±0.38
Hemoglobin	7.13±0.81	7.07±0.61	7.47±0.12	16.2±0.63	15.5±0.57
Hematocrit	21.21±2.13	26.91±1.54	30.65±1.83	40.3±2.01	38.3±1.69
White globules	10.2±1773.4	10.4±1088.3	16.3±2824.2	24.5±1457.3	26.6±854.7
Eosinophils%	2.27	1.13	1.25	0.8	0.8
Basophils	1.77	2.05	1.44	1.2	2.2
Monocytes	3.23	3.17	2.51	1.2	0.8
Lymphocytes	50.44	41.32	52.22	26	25
Neutrophils	40.06	49.11	40.66	70.8	71.5

Hemoglobin ranged from 15.5 g / dl in females to 16.2 g / dl in males, the amount of hemoglobin is influenced by the diet, an important role for complex B and folic acid.

The leukocyte count ranged between 24 mils / mm^3 in males and 26 mii / mm^3 in females. In terms of leucocyte value, the same eosinophil value was obtained in both females and males (0.8%). Basophiles recorded values similar to monocytes, and in males, 1.2% in females basophils were 2.2% and monocytes 0.8%.

Lymphocytes were 26% male and 25% female, Neutrophils were 70.8% in males and 71.5% in females.

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