The relationship of hematological parameters with growth indicators of young laying hens

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Abstract. The parent flock is updated by the introduction of the hatching egg or day-old chicks from the producing country. Renewal of the parent flock through the delivery of daily chickens reduces the stress resistance of this category of bird, which has a negative role in the morphophysiological status and growth of chickens. In the blood of two linear chickens (group I), the number of red blood cells was 3.25 ± 0.06 10^12/l, hemoglobin 67.61 ± 2.49 g/l; Group II, the number of red blood cells in the peripheral blood was 3.80 ± 0.06 10^12/l, hemoglobin 83.91 ± 1.86 g/l. The red blood cells and erythropoiesis organs in the body of chickens obtained at the poultry farm (group II) were highly reactive, which allowed the body to quickly compensate for the lack of oxygen and metabolic substrates, and thereby restore the state of homeostasis. In chickens imported from Germany, the reactivity of the blood-forming organs was reduced, which was a consequence not so much of the linearity of the cross, but of the presence of transportation at the age of 1 day. Four linear chickens for the repair of an industrial herd grew better and more intensively. On day 40 they had a live weight of 85 g or 19.4% more than two-line chickens subjected to transport stress in the first days of life. Therefore, they reliably exceeded their peers from the first series in the indicator and other growth indicators (p≤0.01). The safety indicator in the first 5 days was higher in the group of four-line hybrids (repair young stock of the industrial herd) by 19.7%. Chickens from Germany had a low safety rate of only 66.7.

1. Introduction
Poultry farming is a dynamically developing industry all over the world [1-5]. In our country, hens of foreign crosses are used at large industrial poultry enterprises, which have high productivity with fairly low levels of preservation and stress resistance [6-8]. The parent flock is updated by the introduction of the hatching egg or day-old chicks from the producing country, which in turn increases the cost of production. The authors believe that the renewal of the parent herd by importing day-old chickens...
reduces the stress resistance of this category of bird, which has a negative role on the morphophysiological status, as a combination of morphological and hematological parameters and growth and development of chickens [9-29].

Therefore, the relationship between the morphological parameters of blood and the growth of chickens of different breeding was evaluated.

2. Materials and methods
The object of the study was 40-day-old chickens (♀) of the cross-country Lohmann-White. Poultry was selected into groups according to the principle of analogues, taking into account the origin, live weight, gender and clinical condition. Group I consists of two linear cross-country chickens imported to the poultry farm from Germany by the company Lohmann Tierzucht (subjected to prolonged transport stress, including air travel, car transportation, followed by transplantation to the house). Group II consists of four linear chickens cross-country Lohmann-White, obtained in a poultry farm.

To determine the morphological parameters, blood smears were made immediately after taking the material, and then stained according to the Romanovsky-Giemsa method. Erythrocytes and leukocytes were counted using standardized methods.

3. Results
An increase in the degree of bird hybridity was reflected in the intensity of the respiratory function of the blood [30-31]. Thus, in four-linear chickens (group II) be above of red blood cells, hemoglobin, which determined the amount of hemoglobin in the erythrocyte (hereinafter MCH), which characterizes the intensity of hemoglobin synthesis and the size of red blood cells (figure 1).

An assessment of the baseline blood parameters of chickens in groups I and II testified that they had different gas exchange rates, which was reflected in the oxygen supply of the body.

In this case, the red blood cells and erythropoiesis organs in the body of chickens obtained at the poultry farm (group II) were highly reactive, which allowed the body to quickly compensate for the lack of oxygen and metabolic substrates, and thereby restore the state of homeostasis. In chickens imported from Germany, the reactivity of the blood-forming organs was reduced, which was a consequence not so much of the linearity of the cross, but of the transportation at the age of 1 day.

The chick weight growth indicators for the updating the parent flock, which were delivered to the poultry farm from Germany by air transport (two-line) and chickens raised for the productive herd obtained in the conditions of the poultry farm (four-line) at the age of 24 days were studied. Data on
changes in live weight of chickens with age, their average daily, absolute and relative growth are presented in figure 2.

They had a higher average daily increase of 1.2 g (11.9%), a relative growth of 4.61% and a growth rate of 2.3 times. Four-line chickens in live weight corresponded to the cross-passport, that is, they grew and developed in accordance with the standard and from them further high productivity indicators can be predicted. The two-line chickens brought in from Germany lagged behind the requirements of the passport in live weight and the forecast for their further productivity is worse than that of repair young animals.

An important indicator in determining the efficiency of the enterprise, the quality of young (chickens), and its viability is the safety indicator in the first 5 days (figure 3). It was higher in the group of four-line hybrids (repair young stock of the industrial herd) by 19.7%. Chickens from Germany had a low safety index of only 66.7%, which is most likely associated with stress during their transportation. In addition, transport stress in the early days of chickens affected their further growth.

![Figure 2. Chick growth indicators.](image)

![Figure 3. The safety of chickens, %](image)
4. Discussion
The direction of growing repair young stock of the parent and grandparent flock implies introducing the young stock into the egg laying at the optimum age for a given cross, with high uniformity of the herd, without deviating from the normative dynamics of growth and development during the growing period in order to achieve high, genetically determined productivity in the future, with large period of productive use. The cultivation of repair young animals can be conditionally divided into three periods: the first from daily to 8 weeks of age, the second from 8 to 13 and the third from 13 to 20 weeks. All of these periods are important, but the first period is important, especially in 4-5 weeks of life. What will be laid down during this period will be such a return in the future, since it is known that the higher the growth and development indicators, the higher the peak egg production and the duration of productive use. This was confirmed in the current research. It was established that the chickens of the first group, which were exposed to traffic stress at the age of one day, grew worse and had low safety indicators. Similar conclusions were made by L. Korshunova, R. Karapetyan, O. Ziadinova, V. Fisinin [10], N. Gueguinou, C. Huin-Schohn, N. Ouzren-Zarhloul, S. Ghislin, J. P. Frippiat [18]

5. Conclusion
Thus, the transport of chickens to update the parent flock has a negative impact on their growth and preservation.

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