



## CHANGE OF MOISTURE, ASH, AND TOTAL ORGANIC SUBSTANCES IN THE ARCH OF THE SHOULDER BONE DURING POSTNATAL ONTOGENESIS OF CHICKENS

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**Annotation.** *The dynamics of changes in the relative indicators of natural moisture, ash, and total organic matter in the humerus of egg-laying chickens during postnatal ontogeny were studied. The relative amount of natural moisture content of the humerus is slightly higher on the first day of postnatal ontogenesis and gradually decreases up to 570 days, the ash content increases rapidly from the first day to 120 days of postnatal ontogenesis, continues this state without noticeable changes from 168 days to 570 days, the relative amount of total organic matter It was found that the index is higher in one-day-old chicks, it decreases until 168 days of postnatal ontogeny, and does not change significantly from 280 to 570 days.*

**Keywords:** *chickens, humerus, natural moisture, ash matter, total organic matter, relative index, postnatal ontogeny, growth factor.*

**Enter.** The skeletal system, along with performing support-mechanical and protective functions in the body, is an organ that provides the exchange of calcium, phosphorus, and many macro-microelements. The strength of bones is related to the amount of the above elements, they are formed during the postnatal development of organisms under the influence of external and internal factors and have certain morphofunctional properties.

The body of laying hens has its morpho-physiological characteristics, and taking into account that during the egg formation process, the rapid release of the main mineral substances in the bones into the blood, which in turn affects the morphofunctional indicators of the bones, is important to optimize their diet on a scientific basis. For this purpose, it is necessary to study the morphological, chemical, and physical changes that occur in the bones of laying hens at different physiological stages of postnatal ontogeny.





The need for calcium and phosphorus in poultry is influenced by several factors, such as the type of poultry, direction of production, breed or crosses, age, sex, physiological state, the chemical composition of calcium and phosphorus compounds in food, and the general nutritional content of the diet. The metabolism and absorption of mineral substances are significantly influenced by the amount of fiber and pH of food, the presence of enterosorbents and other minerals. According to the researchers, it is advisable to re-edit the average standards of mineral substances in the references for specific chicken crosses by regional natural conditions. Also, it is necessary to take into account that calcium and phosphorus enter the body of birds with the same nutritional supplements, and their interdependence is very close in absorption and metabolism [1, 3, 4, 7, 9].

The evolutionary regeneration of the locomotor apparatus of birds is the consequence of the pulling power of muscles and tendons, differentiation and integration of muscles, the effect of the gravitational force of the external environment, and the effect of resistance to the aerodynamic force during flight [5].


According to the researchers, it is recommended to increase the amount of calcium in the diet to 2 percent 3-4 weeks before laying eggs to accumulate calcium in the bone tissue of young birds. Later, when productivity reaches 5%, the amount of calcium is increased to 3.6%. When there is calcium deficiency in the diet, food consumption increases, egg weight increases, egg shells become thinner due to calcium deficiency, and egg quality, marketability, and hatchability decrease dramatically. The insufficient amount of calcium begins to leak from the bone tissue into the blood, and this condition leads to thinning and weakening of the bones [2, 6, 8, 10].

**The purpose of the study:** is to study the characteristics of changes in the chemical composition of stylopodial bones at different physiological stages of postnatal ontogeny of egg-laying chickens.

Research materials and methods. Scientific research work was carried out in the laboratory of the Department of Animal Anatomy, Histology, and Pathological Anatomy of Samarkand state university veterinary medicine of Livestock and Biotechnologies.

As an object of research 1, 16, 35, 85, 120, 168, 280, 420, and 570-day-old hens of the "Dekarb" cross were taken. The chickens were slaughtered and bled, and the wing (front leg) and hind leg bones were removed from the body and weighed on an analytical scale.





The methods of E.A.Petukhova, R.F.Bessarabova, P.T.Lebedev, and A.T.Usovich were used to study the chemical composition of bones, i.e., natural moisture, total organic matter, ash matter, macroelements.

To determine the natural moisture content of the bones, the bones were first weighed, then dried at room temperature for 10 days, and weighed again. The amount of evaporated moisture was determined and calculated as a percentage of bone weight.

To determine the amount of ash content in the bone, the dried bones were ground to a powder in a small electric mill. Bone powder was placed in large crucibles brought to a constant weight and burned in a MP-2UM muffle furnace at a temperature of 500-6000C for 4-5 hours. After the cremated bone powder (ash material) was cooled in a desiccator together with the crucibles, their weights were measured on a KERN.PBJ-N scale, and the air dry state and absolute dry state were calculated as a percentage of the bone weights.

Numerical data of indicators obtained as a result of the research were processed using the methods of variation statistics using Microsoft Excel computer programs.

To determine the dynamics of changes depending on the age of the indicators, the growth coefficient was calculated. The growth factor was determined by dividing the indicators of the bones of older chickens by the corresponding indicators of younger chickens, and the entire examined period of postnatal ontogeny was determined by the formula developed by K.B. Svechin.

The obtained results and their discussion. It was observed that the amount of natural moisture, ash, and total organic matter in the humerus of egg-laying chickens changes in connection with the physiological processes taking place in their bodies at different stages of postnatal ontogenesis.

The relative index of the natural moisture content of the humerus is slightly higher on the first day of the postnatal ontogeny of chickens and gradually decreases up to 168 days, that is, this index is  $45.22 \pm 0.49\%$  in chicks on the 1st day,  $44.19 \pm 44.19\%$  on the 16th day. up to  $0.48\%$  ( $K=0.97$ ;  $p<0.03$ ), in 35 days - up to  $41.31 \pm 0.74\%$  ( $K=0.93$ ), in 85 days -  $36.61 \pm 0.45\%$  ( $K=0.88$ ), at 120 days -  $35.08 \pm 0.51\%$ , at 168 days -  $35.23 \pm 0.56\%$ , and it was observed that this situation continues almost at the same rate in the next youth. That is, this indicator increased by  $34.71 \pm 0.42\%$  ( $K=0.98$ ) in 280 days, by  $33.73 \pm 0.44\%$  ( $K=0.97$ ) in 420 days, and by  $33.55$  in 570 days. It was noted to be equal to  $\pm 0.46\%$  ( $K=0.96$ ). It was found that the growth coefficient of the relative amount of natural moisture content in the



humerus bone was reduced to 0.74 times from the first day of postnatal development of chickens to 570 days of age.

The relative index of gray matter in the humerus increased slightly from the first day of the postnatal ontogeny of chickens to the 120th day, from  $20.55 \pm 0.28\%$  to  $33.2 \pm 0.5\%$  by the 16th day ( $K=1.62$ ;  $p < 0.03$ ), in 35 days - up to  $40.54 \pm 0.49\%$  ( $K=1.22$ ), in 85 days - up to  $47.26 \pm 0.47\%$  ( $K=1.17$ ), in 120 days -  $54.92 \pm$  It was noted to increase to  $0.61\%$  ( $K=1.16$ ;  $r < 0.02$ ). This indicator of the shoulder bone does not change significantly in young people at 168 days and later compared to 120 days, that is, at 168 days - by  $55.05 \pm 0.57\%$ , at 280 days - by  $55.58 \pm 0.61\%$  ( $K=1.01$ ), It was found to be equal to  $56.36 \pm 0.69\%$  in 420 days, and  $56.49 \pm 0.56\%$  in 570 days. It was noted that the growth coefficient of the relative index of the content of ash content in the humerus increased up to 2.75 times during the period from the first day of the postnatal ontogeny of chickens to the 570th day.

The relative index of the amount of total organic matter in the humerus is slightly higher -  $79.45 \pm 0.09\%$  on the first day of the postnatal ontogeny of chickens, and until the next 168 days, this index is inversely related to the amount of ash in the bone, and gradually decreases, i.e. in 16 days - up to  $66.8 \pm 0.14\%$  ( $K=0.84$ ;  $r < 0.01$ ), in 35 days - up to  $59.46 \pm 0.14\%$  ( $K=0.89$ ), in 85 days -  $52.74 \pm 0.17\%$  ( $K=0.88$ ), in 120 days - up to  $45.08 \pm 0.15\%$  ( $K=0.85$ ), in 168 days - up to  $44.95 \pm 0.07\%$  done. The relative indicator of the amount of total organic matter in the bone does not change significantly in young people after 168 days, that is, at 280 days -  $44.42 \pm 0.14\%$  ( $K=0.98$ ), at 420 days -  $43.64 \pm 0.16\%$ , at 570 daily -  $43.51 \pm 0.11\%$  ( $K=0.97$ ;  $r < 0.02$ ). It was found that the growth coefficient of the relative index of the content of the total organic substance in the humerus is reduced to 0.55 times during the period from the 1st day to the 570th day of the postnatal ontogeny of chickens.

### **Conclusion**

- the relative amount of natural moisture in the humerus of laying hens is somewhat higher on the first day of postnatal ontogenesis, and this indicator gradually decreases up to 570 days;

- It is observed that the relative indicator of the amount of ash content of the humerus of chickens in the direction of the egg increases rapidly from the first day to the 120th day of postnatal ontogenesis, and this state continues without noticeable changes from the 168th day to the next 570 days;

- The relative index of the amount of total organic matter in the humerus is high in one-day-old chicks, and it was noted that this index decreased until the 168




th day of postnatal ontogenesis and did not change significantly from the 280 th to the 570 th day.

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