ЧЕЛЯБИНСКИЙ ГОСУДАРСТВЕННЫЙ ИНСТИТУТ КУЛЬТУРЫ

"INNOVATIVE ACHIEVEMENTS IN SCIENCE 2023"

CHARACTERISTICS OF CHANGES IN THE NUMBER OF MICROELEMENTS IN CHICKEN STYLOPODIAL BONES DURING POSTNATAL ONTOGENESIS

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Summary: *The dynamics of changes in the relative indices of zinc, manganese, and magnesium in the composition of the bones of the stylopodia of the wing (thoracic limb) and the pelvic limb of egg hens in postnatal ontogenesis were studied. It has been established that the relative index of the amount of Zn, Mn, and Mg in the composition of the humerus and femur intensively increases from the first day of postnatal ontogenesis to the 168th day, i.e. until the period of physiological maturity and, starting from the 280th day, this process slows down.*

Keywords: *chickens, stylopodium, humerus, femur, zinc, manganese, magnesium, relative indicator, postnatal ontogenesis, growth factor.*

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The skeletal system of poultry, like their other organs, is somewhat different from that of farm animals. In particular, during the formation of the eggshell in laying hens, the rapid release of the main mineral substances in the bones into the blood, in turn, affects the morphofunctional parameters of the bones. Several macro- and microelements stored in the bones ensure the normal course of the metabolism of mineral substances in the body. The morpho-physiological potential of bones is inextricably linked with the amount of mineral salts they contain, which is formed under the influence of several factors during the postnatal development of birds and exhibits certain morphofunctional properties.

In the effective use of science-based technologies for obtaining high-quality eggs and meat products from chickens, it is of great scientific and practical importance to determine the morphofunctional processes that take place at various physiological stages of the postnatal ontogeny of laying hens.

Many researchers have conducted scientific research on the importance of zinc in the formation and development of poultry bones, and according to their information, zinc is part of many enzyme systems, stimulates protein and

carbohydrate metabolism, participates in osteogenesis, blood production processes, normal eggshell formation, and feather - plays an important role in reproduction, affects the growth, development and reproductive functions of birds [1, 5, 6, 7, 8, 9, 10].

In organisms of animals and birds, manganese participates in oxidation-reduction processes, the formation and development of the skeleton, the regulation of the function of the nervous system, and the metabolism of fats and carbohydrates, and also has a great effect on the growth and development of young animals, reproduction, blood production, and the function of the endocrine glands [3].

In poultry, the element manganese activates oxidation processes and has a special lipotropic effect, has an effect against fatty dystrophy of the liver, participates in the process of bone formation, and stimulates the activity of dipeptidase and arginase enzymes. In the case of manganese deficiency in the body, there is a persis disease with a strong enlargement of the knee joint, twisting or bending of the lower end of the tibia and the upper end of the foot-palm bone, and deformation of the wing bones. When eggs obtained from chickens with a chronic deficiency of manganese in the diet are used for incubation, the embryo dies in 20-21 days, and when they are hatched, signs of chondrodystrophy are noted. Manganese deficiency is somewhat aggravated when the amount of calcium and phosphorus is more than normal. The criterion of manganese supply is determined by its amount in liver, kidney, and bone tissue [2, 4].

The purpose of the study is to study the characteristics of changes in certain microelements in the stylopod 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 SamDVMChBU. 1, 16, 35, 85, 120, 168, 280, 420, and 570-day-old hens belonging to the "Dekarb" cross were taken as research objects. 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 amount of trace elements in the bones was determined by the method of spectral analysis. Spectral analysis was carried out using the method of evaporation of the studied sample from the graphite electrode crater. An ISP-28 prism-quartz spectrograph was used for the analysis. An alternating current arc generated from a DG-2 generator was used as a source of excitation. Results were given in thousandths of a percent.

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 relative amount of microelements in chicken stylopodium bones exhibit specific dynamics of change at different physiological stages of postnatal ontogeny.

The relative index of Zn content in the humerus increased slightly from the first day of postnatal ontogeny to 16 days of chickens, reaching from 0.006±0.0002% to 0.009±0.0002% (K=1.5; p<0.02), from 35 days and in the next stages, this indicator was observed to increase without major changes. That is, this indicator increased by 0.011±0.0002% (K=1.22) in 35 days, by 0.012±0.0002% (K=1.09) in 85 days, by 0.013±0.0002% (K=1.09) in 120 days. K=1.08), in 168 days - by 0.014±0.0002% (K=1.07; r<0.02), in 280 days - by 0.015±0.0002% (K=1.07), In 420 days it was 0.017±0.0002% (K=1.13; r<0.02), and in 570 days it was 0.02±0.0002% (K=1.17). It was found that the reading coefficient of the relative index of the content of Zn in the humerus increased up to 3.33 times during the period from one day to 570 days of postnatal ontogeny of chickens.

The relative index of the amount of Zn in the femur is 0.011±0.0002% in one-day chicks, and this index increases to 0.012±0.0002% (K=1.09) on the 16th day of postnatal ontogenesis, and on the 35th day - 0.013±0.0002 % (K=1.08; p<0.02), at 85 days - up to 0.014±0.0004%, at 120 days - up to 0.015±0.0002% (K=1.04), at 168 days - 0.018± up to 0.0002% (K=1.28), at 280 days - up to 0.02±0.0004% (K=1.1), at 420 days - up to 0.021±0.0006%, at 570 days - 0.023±0 .0006% (K=1.15; r<0.03) was noted. It was observed that the coefficient of growth of the relative index of Zn content in the femur of chickens increased up to 2.09 times during the period from the first day of postnatal ontogenesis to 570 days.

The relative index of Mg content in the humerus of chickens from the first day of postnatal ontogeny to 35 days of age is slightly faster than that of other ages, and from 1.2±0.03% to 2.1±0.03% by 16 days (K=1.75; p< 0.03), increasing up to 3.5±0.05% (K=1.67) up to 35 days, and in later youth this indicator remains almost unchanged, i.e. at 85 days – 3.7±0.05% (K= 1.06), in 120 days - by 3.8±0.05% (K=1.03), in 168 days - by 3.9±0.07%, in 420 days - by 3.7±0.04% ha, it was observed to be equal to 3.6±0.05% (K=0.95) in 570 days. The coefficient of growth of the relative indicator of

Mg content in the humerus was noted to increase up to 3.0 times during the period from the first day to 570 days of postnatal ontogeny of chickens.

The relative index of Mg content in the femur increases without significant deviations from the first day of postnatal development of chickens to 168 days of age, and it is 3.2±0.03% in one-day-old chicks, and 3.5±0.04% in 16-day-old chicks (K=1.09; r<0.02), at 35 days - by 3.7±0.04% (K=1.06), at 85 days - by 4.01±0.05% (K=1.08), 120 to 4.2±0.06% (K=1.05; r<0.02) per day, to 4.6±0.05 (K=1.1; r<0.03) in 168 days, and in the studied later ages of postnatal ontogeny, this indicator was almost unchanged compared to 168 days. That is this indicator in 280 days - by 4.5±0.08% (K=0.98), in 420 days - by 4.47±0.07%, in 570 days - by 3.8±0.07% (K =0.84; r<0.02). It was noted that the growth coefficient of the relative index of Mg content in the femur reaches 1.19 times during the period from the 1st day to the 570th day of the postnatal ontogeny of chickens.

The relative amount of Mn in the humerus remains unchanged (0.01±0.0002) until the 35th day of postnatal ontogeny of chickens, gradually increasing from the 85th to the 168th day, that is, at the 85th day – 0.03±0.0004% (K =3.0; r<0.01), in 120 days - 0.05±0.001% (K=1.7), in 168 days - 0.06±0.002%, and the next studied young people, this indicator decreased significantly and it was noted to be equal to 0.02±0.0006% in 570 days.

The relative indicator of the content of Mn in the femur of chickens remained unchanged from the first day of postnatal development to 16 days of age (0.01±0.0003%), and increased inconspicuously until 168 days and reached from 0.02±0.0005% to 0.06±0.001%. and it was noted that it will decrease to 0.03±0.001% (K=0.75) until the next 570 days, and its growth coefficient will be equal to 3.0 times during the period from one day to 570 days.

Therefore, the relative index of Mn content in stylopod bones is somewhat stagnant at the stages of postnatal ontogeny of chickens.

conclusion:

- it was found that the relative index of the amount of zinc in the humerus and femurs of laying hens gradually increases from the first day of postnatal ontogenesis to the 570th day, and the growth coefficient reaches 3.33 and 2.09 times, respectively;

- the coefficient of growth of the relative indicator of the magnesium content of the stylopodium bones from the first day of postnatal ontogeny of chickens to the 570th day increases up to 3.0 times in the humerus and 1.19 times in the femur;

- It was noted that the amount of manganese in the stylopodial bones of chickens in the egg direction increases rapidly up to 168 days of postnatal

ontogenesis, i.e., until the period of physiological adulthood, and this indicator gradually decreases until the next 570 days.

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