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Prevention of Calcium Phosphorus Exchange Disorders in Chickens

Elmurodov Bozorboy Aktamovich
Scientific leader: v.f.d. professor
Research Institute of Veterinary Medicine

Eshburiyev Sobir Bakhtiyorovich
scientific advisor: v.f.d. associate professor
Research Institute of Veterinary Medicine

son of Hamraqulov Nuriddin Shokir
a foundation doctoral student (PhD)
Research Institute of Veterinary Medicine

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ABSTRACT

In the conditions of poultry farms, calcium-phosphorus exchange disorders in egg-oriented chickens are accompanied by various complex pathologies, such as general depletion, decreased appetite, delayed egg laying, small egg weight when they enter the egg, thin pods and without pods, anomalies such as changes in egg shape and weight, and signs such as chickens dipping each other and eating their feathers. A 16–18% decrease in egg productivity causes great harm to farms by reducing the average body weight of chickens by 350–550 grams.

Introduction: Poultry farming has served as an important resource in meeting the demand for food products among our people. The theoretical basis for ensuring the productivity of poultry at the genetic potential level and the development of preventive measures are two of the main tasks in the field of veterinary medicine today. Currently, in our qualification, there are high-yielding poultry breeds and crossbreeds. But the disadvantages of the storage and feeding of poultry—poor quality

feed, lack of vitamins, macro-microelements, calcium-phosphorus ratio, exchange energy content, and other biologically active additives in the diet—cause violations of their productivity, disease resistance, calcium-phosphorus metabolism, and other biologically active additives in the diet.

Relevance of the topic: Diseases of calcium and phosphorus metabolism disorders found in chickens are mostly common, and the derailment of the technological process causes great harm to the farm due to uneven distribution of feed, increased costs for growing products, decreased body weight, and decreased productivity.

In the body of chickens, calcium deficiency, a disease that is accompanied by a violation of phosphorus metabolism, is the main one. Therefore, the development of timely detection and prevention measures for calcium and phosphorus insufficiency in egg-oriented chickens is one of the problems that are relevant today and are waiting for a solution.

Anomalies of egg formation in chickens and disadvantages of eggshell formation mainly develop in them as a result of disturbances in the exchange of calcium and phosphorus and, next, other secondary factors (infectious bronchitis of chickens, pullorosis, prostogonymosis, traumatic exposure of the egg-forming organs) [2, 8].

The main drawback of eggshell is its softness. The main reason for this is a deficiency of lime or a violation of its digestion. Considering that each egg pod contains an average of 1.5–2.5 g of calcium, the calcium content of 200 eggs per year is an average of 400–500 g. Calcium is also important for physiological processes other than egg formation in the chicken's body. For example, the hardness of bones and the reserve in their composition [6, 8, 10]

When prophylaxis of softening of the egg pod or disorders of calcium and phosphorus metabolism is necessary, it is necessary to take into account the amounts required for the chicken body. For example, it was found that during the first egg-giving period of chickens, the amount of calcium in their bodies decreased by up to 20% compared to the norms when tested [6]. Deficiency of several minerals and vitamin substances at the same time in the body of poultry is accompanied by unclear signs without apparent pathology. Therefore, when diagnosing diseases accompanied by substance exchange disorders, clinical examinations and zootechnical analysis of the food ration are required, as are blood analysis and pathologoanatomic examinations.

Purpose of the study: Distribution of calcium and phosphorus exchange disorders in egg-oriented chickens, economic damage, causes, symptoms, and fractures, study of chemical and egg morphological changes in blood, early diagnosis of the disease, and introduction into practice of a high-efficiency group prophylaxis method

Place, object, and styles of inspection: Scientific verification work was carried out on broiler-bred mother chickens of the cross "ROSS 308", which are kept at Dargom poultry Faiz LLC in the Pasdargom District of the Samarkand region.

Laboratory tests were carried out in the laboratories of microbiology, veterinary pathology, and mating pathology of the Veterinary Scientific Research Institute and in the laboratory of chemical indicators of blood "No. 1 branch of the multicellular polycylinics of Urgut TTB".

As an object of inspection, mother chickens of the breed "Ross-308" were taken, which entered the egg at 48–52 weeks of age, from which 4 groups were formed, each of which consisted of 35 heads. The storage conditions of chickens in all experimental groups were the same; chickens in the control group were fed the farm ration, while in the first experiment, bone flour and Introvit a+BC (rich in vitamins and minerals) were added to chickens in the group at the expense of 3% of the farm ration with an interval of 1 liter to 7 days. The second experiment was added to the chickens in the

group's farm ration with an interval of 1 liter to 7 days from 1 kg of "scrambled egg pods" and 4000 liters of water from the drug Introvit a+BC (rich in vitamins and minerals) per additional 1 ton of feed. The third experiment was given to the chickens in the group by adding 1 kg of NOVAMIX (mineral-rich premexis) to an additional 1 ton of feed to the farm ration. The experiments were challenged for 40 days. Clinical and hematological examinations of experimental and control group chickens were carried out once every 20 days. Hemoglobin in blood samples from chickens (hemoglabin-cyanide method), glucose (color reaction with ortho-toluidine), total protein in blood serum (refractometric method), total calcium (V.P. Vichev, L.V. Karakashov method), inorganic phosphorus (pulse buoy, V.F. Kromislov, and L.A. Kudryavtseva method), the satiety of the ration of chickens V.Dalakyan and B. (1980), A.P. Kalashnikov, V.I. Fisinina, and N.I. Kleymenova (2003) The quality indicators of the egg were determined using an organoleptic method by measuring the weight of the egg on the electron FEJ-1000B scales. All digital data obtained as a result of scientific investigations E.K. Merku'eva's style was carried out through a longitudinal mathematical operation, determining the average arithmetic value, the quadratic deviation of the average arithmetic value, the average arithmetic value error, the coefficient of variability, and the criterion of reliability.

The results obtained and their analysis: When the farm ration was analyzed, 32% of the ration was wheat grain, 22.85% was mackerel grain, 18% was soy schrote, 11.34% was sunflower schrote, 2.26% was vegetable oil, 0.65% was monocalcyphosphate, 10.4% was vestnyak, and 2.5% was premix (Figure 1). The total satiety of the racion was 264.0 kcal of exchange energy, 16% of raw protein, 5.1% of fiber, lysine 0.70, methionine 0.30%, threonine 0.42%, calcium 3.1e oil, 0.65% was monocalcyphosphate, 10.4% was vestnyak, and 2.5% was premix (Figure 1). The total satiety of the racion was 264.0 kcal of exchange energy, 16% of raw protein, 5.1% of fiber, lysine 0.70, methionine 0.30%, threonine 0.42%, calcium 3.1%, and phosphorus 0.64% in 100 g of feed.

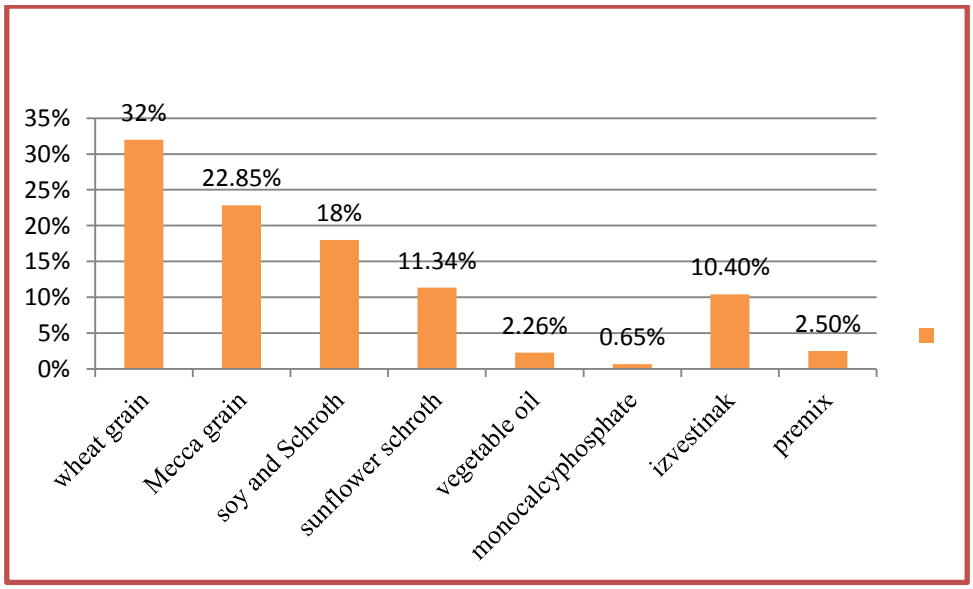

Figure 1. Composition of the farm ration

It was found that there is a deficiency of 26 kcal of exchange energy, calcium 0.5%, phosphorus 0.06%, retinol 300 HB, cholecalstiferol 80 HB, tocopherol 0.2 mg, ascorbic acid 0.5 mg, and choline chloride (b4) 5 mg in relation to ration feeding standards. Calcium in the racion (containing 100 g of feed) was found to be deficient by 3.3% compared to norms; exchange energy by 6 kcal; crude protein by 0.2%; phosphorus by 14.3%; retinol by 315 HB; cholecalciferol by 83 HB; tocopherol by 0.15 mg; ascorbic acid by 0.2 mg; and choline chloride (B4) by 3 mg. The

imbalance of the racion of chickens in experiments, the lack of amounts of cholecalciferol, tocopherol, and macro-microelements in the foods in the racion, causes a violation of calcium-forphor metabolism in them. At the beginning of the experiments, clinical signs characteristic of calcium-phosphorus deficiency were observed in chickens of all groups, such as general depletion, whitening of crowns and earrings, hypodynamia, decreased appetite, lagging, weight loss, decreased productivity, thinning and drying of the skin, rustling of feathers, and falling feathers. These clinical signs at the end of the experiments were observed in 30.7–53.8% of chickens in control giruh alone. Clinical signs characteristic of calcium-phosphorus deficiency such as general depletion, crown and earring hypodynamia, decreased appetite, lagging, weight loss, decreased productivity, thinning and dryness of the skin, rustling of feathers, and feather fall were observed in 12–16% of chickens (Figure 2).

In the chickens of the first experimental group, the above signs were almost not observed.

Figure 2. Clinical signs of calcium and phosphorus metabolism disorders

By the end of the experiments, with respect to the indicators at the beginning of the tests, the average hemoglobin content in the first experimental group was 21.1 g/l, glucose by 1.38 mmol/l, total protein by 9.4 g/l, total calcium by 2.06 mmol/L, and inorganic phosphorus by 0.75 mmol/L. The average hemoglobin content in the second experimental group was 3.2 g/l, glucose by 0.72 mmol/l, total protein by 3.6 3.6 g/l, total calcium by 1.5 mmol/L, and inorganic phosphorus by 0.28 mmol/l. In the third experimental group, glucose by 1.21 mmol/l, total protein by 6.6 g/l, and an increase in total calcium to 1.16 mmol/l and inorganic phosphorus to 0.43 mmol/l was characteristic. This indicates that the biochemical indicators of blood in chickens during the egg-giving period change relative to physiological measures. Blood counts in control group chickens were characterized by a decrease in hemoglobin by an average of 10.6 g/L, glucose by 0.28 mmol/l, total protein by 2.3 g/l, total calcium by 0.37 mmol/l, inorganic phosphorus by 0.26 mmol/l by the end of the tests, and signs of calciferol deficiency such as egg reduction, softening of bones, and (Table 1).

Biochemical indicators of the blood of chickens in the experiment n=35 1-jadval

T / P	Inspections time	Hemoglabin g/l	Glucose mmol / l	General Protein g/l	Total calcium mmol/l	Inorganic phosphorus mmol/l
	in the amount of	89-129	4.8-6,2	42,8-52,6	2,5-4,5	1,5-2,5
Experiment	Experiments	95,3±1,5	4,72±0,5	42,8±0,12	2,42±0,3	1,68±0,1

group 1	in the beginning	98,2±1,1	5,41±0,2	48,8±0,18	3,85±0,5	1,84±0,2
	On day 20	116,4±1,3	6,1±0,1	52,2±0,36	4,48±0,2	2,43±0,2
Experiment group 2	On day 40	96,4±1,6	4,74±0,2	44,6±0,20	2,86±0,6	1,62±0,2
	Experiments	97,1±1,2	5,38±0,3	46,9±0,21	3,65±0,5	1,76±0,3
	in the beginning	99,6±1,5	5,46±0,1	48,2±0,32	4,36±0,3	1,90±0,1
Experiment group 3	On day 20	94,2±1,8	4,62±0,2	43,6±0,12	2,12±0,1	1,48±0,2
	On day 40	96,2±1,4	5,41±0,1	45,8±0,24	3,15±0,1	1,64±0,3
	Experiments	100,4±1,4	5,83±0,5	50,2±0,44	3,28±0,2	1,91±0,1
Control group 4	in the beginning	97,2±2,4	4,70±0,3	42,6±0,23	2,25±0,4	1,64±0,1
	On day 20	92,5±2,1	4,66±0,5	42,8±0,14	2,01±0,3	1,57±0,4
	On day 40	86,6±2,5	4,42±0,4	40,3±0,20	1,88±0,2	1,38±0,1

Organoleptic tests have revealed egg productivity, egg weight, changes in eggs, the thickness and thinness of the eggshell, the weight of the eggshell, the calcium content of the eggshell, and at what time of day the hens will hatch. According to the results of organoleptic tests in experimental chickens experiments on head indicators by the end of the experiments, the egg productivity of chickens in the first experimental group was on average 13.4%, the egg weight was on average 7.8 gr, the egg weight was on average 0.98 gr, the calcium content in the egg pod was on average 0.74 gr, the thin weight on average 1.48 GR, the amount of calcium in the egg pod averaged 0.67 gr, thin-pod eggs were found in 3.6% of experiments on the head, eggs productivity of chickens in the third experimental group averaged 10.5%, egg weight averaged 3.9 gr, egg pod weight averaged 0.7 gr, egg pod calcium averaged 0.58 gr, thin-pod eggs had 3.4% of experiments on the head, while experiments did not evidence of insufficient supply of calcium and phosphorus to the body of chickens. (Table 2).

Organoleptic indicators of the eggs of chickens in the experiment (n = 35a)

2-jadval

T/R	Chickens	Seed productivity (%)	Of the egg. weight (gr	Thin-pod eggs (%)	Egg pod weight (gr	Calcium content (gr)in egg pods
	Age	84-92	62,5-64,5	1-2	6,2-6,4	2,2-2,6
Experiment group 1	in the amount of	76,9±0,1	55,4±0,5	3,2	5,23±0,2	1,84±0,1
	Experiments	84,5±0,3	58,6±0,4	2,2	5,45±0,1	2,92±0,2
	in the beginning	90,3±0,2	63,2±0,5	-	6,21±0,4	2,58±0,1
Experiment group 2	On day 20	74,6±0,2	56,6±0,2	3,6	4,64±0,3	1,89±0,01
	On day 40	79,5±0,1	58,2±0,4	1,9	5,49±0,1	2,45±0,2
	Experiments	86,4±0,3	61,4±0,5	-	6,12±0,2	2,56±0,2

Experiment group 3	in the beginning	77,8±0,5	56,3±0,1	3,4	5,32±0,2	1,87±0,1
	On day 20	84,5±0,3	59,7±0,2	1,7	5,67±0,3	2,38±0,3
	On day 40	88,3±0,2	60,2±0,3	-	6,02±0,4	2,45±0,1
Experiment group 4	Experiments	77,0±0,2	56,8±0,4	3,7	5,37±0,1	2,01±0,2
	in the beginning	72,2±0,1	52,2±0,5	4,4	5,21±0,3	1,92±0,3
	On day 20	68,5±0,1	49,4±0,2	4,8	4,88±0,2	1,86±0,2

Control group hens were found to have reduced egg productivity by an average of 8.5%, egg weight by an average of 7.4 gr, egg pod weight by an average of 0.49 gr, egg pod calcium by an average of 0.15 gr (Figure 4), and thin-pod eggs gave birth by 4.8% (Figure 4); these signs are characteristic of calcium-phosphorus deficiency, leading to productivity and table.

Egg productivity indicators of chickens in experiments

3.Image. Physiological eggs and thin powdery eggs

4.Image. Calcareous egg

Conclusions: - The main causes of calcium and phosphorus deficiencies in productive chickens are the fact that chickens are not meyorized the ration without taking into account the age, physiological state, and productivity stages; feeding the ration in a low ration; ration type, composition, and satiety are not fully satisfying the needs of the organism of tall chickens; and the supply of feed baits made of low As a result of the tests, signs such as general depletion in 30.7–53.8% of chickens, whitening of crowns and earrings, hypodynamia, decreased appetite, lagging from growth, weight loss, decreased productivity, thinning and dryness of the skin, rustling of feathers, and falling feathers in 12–16% of chickens, and disorders of calcium–phosphorus exchange were characterized by signs.

In productive chickens, calcium and phosphorus exchange disorders were characterized by an average of 10.6 g/l of hemoglobin in the blood (hypogemoglobinemia), a decrease in glucose to 0.28 mmol/l (hypoglycemia), a total protein of 2.3 g/l, a total calcium of 0.37 mmol/l (hypocalcemia), and an inorganic phosphorus of 0.26 mmol/l (hypophosphoremia), and this decreased oviposition, softening of bones, and signs of calciferol deficiency, such as being sinuous, led to observation.

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