THE IMPACT OF LOCAL REMEDY BIOR ON PROTEIN METABOLISM OF RECONDITIONED QUAILS

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Abstract

In aviculture, in the context of obtaining qualitative and safe products, a major concern is the usage of substances with antistress, adaptive, and obviously growth stimulator properties. Thus, in our research on adult quails during the reconditioning process, we tested for the first time the BioRremedy, an autochthon product of algalorigin, obtained from Spirulina platensis, with antistress and adaptive properties. The remedy was administered intramuscular to 4 experimental groups of quails, in different doses (0,25; 0,5; 1,0; 1,5 ml/head), 2 times consecutively: at the beginning of the study, and during the study. To the control group was administered – 0,5 ml of 0,9% sol. NaCl in the same consecutiveness. The biochemical tests, performed on the quails from the experimental groups, revealed an increase of the protein metabolism parameters: the total proteinserum, albuminserum, and creatinine levels as compared to the control group. While, regarding serum urea and serum uric acid levels, was recorded a decrease of these parameters in the quails treated with BioR, compared to the control group. According to the obtained results, we can conclude tha tthe studied bioremedy manages to improve the health indices, the parameters that reflect the protein metabolism, and the functional state of the liver in quails treated with BioR.

Keywords: *BioR remedy, quails, protein metabolism, albumin serum, creatinine.*

Introduction

Currently, in terms of livestock, particularly poultry and other species, several factors interfere that may negatively influence the health, welfare and productive performance [5, 10, 20]. However, lately, on both nationally and internationally levels the concept is focused on improving the quality of human life by providing qualitative and harmless to humans, animals and the environment products of animal origin. We declare that the international practice does not put at doubt the use of biologically active remedies with various influences on metabolism and productivity, giving priority to those of natural origin, in particular plant [1, 5, 10, 17, 18].

It is significant that in conditions of the Republic of Moldova an ecologically pure cure, universally accepted and recognized was obtained from the cyanobacterium Spirulina platensis [2, 11, 15]. This remedy has been studied on multiple laboratory animals, farm animals and man [1, 2, 5, 6, 8, 14, 15]. Meanwhile, the BioR's product impact on protein metabolism and bio parameters on quails has not been elucidated. In this context, in this work we aimed to study the BioR's remedy impact on the basic parameters of protein metabolism and productivity of quails put under reconditioning, in physiological conditions.

Material and methods

To elucidate the influence of BioR product on health and in particular on the markers' parameters of protein metabolism: total protein, albumin, creatinine, urea, uric acid and productivity, a study has been realized on five batches of 40 quails at the end of the laying cycle. The principles for achieving the experience, the regimen and dosage of administration of the BioR remedy on quails varied according to the experimental scheme, shown in Table 1.

The birds included in the study were homogeneous in terms of weight and analogous by physiological status and age, staying in the same shelter where all hygienic and technological parameters were identical: microclimate, hygiene and welfare of the birds,

feeding, watering and veterinary care. During the research the quails were monitored and reviewed in order to assess the health and highlight them numerically.

Table 1.

Scheme of administration of the BioR remedy on adult quails, 0,05% sol.

Animal groups	**Nr. of heads**	**The administration regimen**	**Dose, ml**	
			1 time	**2 time**
Control	40	2 times intramuscularly at the onset of the study and at day 7-10 after the first administration	0,5 ml 0,9% NaCl sol.	0,5 ml 0,9% NaCl sol.
Experimental 1	40		0,25	0,25
Experimental 2	40		0,5	0,5
Experimental 3	40		1,0	1,0
Experimental 4	40		1,5	1,5

At the onset of the investigations, body temperature and the number of respiratory movements per minute were measured on random 5 quail, and during investigations nominees parameters were assessed at 5 quail from each batch of birds involved in this study. Blood samples were taken from 5 birds in several steps: at the start of the study till the administration of the BioR remedy, and then 2 times: 1st collection (in the middle of the trial), and 2nd collection, at the end of investigations, from 5 quail from each batch by beheading them, in two standard tubes - with and without anticoagulant.

Determination of total protein, albumin, urea, uric acid and creatinine in the blood serum of quail was performed using sets of reagents of the company "Elitech", France, according to the enclosed instructions. Statistical evaluation of biochemical indices was performed using the criteria t-Student parameter with the veracity less than 0,05 ($p<0,05$).

Results and discussions

From the data in Table 2 we note that the total protein in quail's blood, at the 1st collection on the control group shows a downward trend from 10.7% compared to onset of the study ($p< 0,05$), which can be attributed to stressogenic factors that occurred during the study.

This assumption can be also justified by the analysed parameter investigated in all experimental groups treated with BioR cure, but with different doses. Thus, the serum proteins level of the first investigation on the experimental groups was amplified by 7,7 to 34,8% compared to the reference group, and conclusive differences were signaled in three experimental groups. Similar results were reported by us earlier, by administrating the product on young pigs and broilers reared in intensive conditions [8, 13]. This assumption can be confirmed at the end of research when the index rising trend is observed in all investigated groups, including the control one (+ 37,3%, $p< 0,001$ compared to control group at the 1st investigation). The monitoring of serum proteins in dynamic showed an increase of 6,1 to 22,8% in the groups treated with the BioR product compared to the reference group, there are also significant differences. Similar trends were reported by us earlier as a result of BioR's and Catosal administration on broilers [10].

Table 2.

Influence of the administration of BioR remedy on lipids' per oxidation and antioxidant system's indices in the blood serum of an adult quail

Value		Groups of animals				
		CG	EG 1	EG 2	EG 3	EG 4
Total protein, g/l, 1 collection 2 collection	45,24±1,27	40,39±1,58* 55,44±1,05***	43,48±1,82 58,79±4,04	49,09±1,72** 68,07±1,82***	54,44±2,13*** 63,30±2,86*	48,50±2,17* 65,64±2,72**
Albumin, g/l, 1collection 2 collection	17,52±1,15	16,5±0,48 16,27±0,50	15,38±0,49 17,43±0,52	16,24±0,45 17,05±0,34	15,79±0,25 16,22±0,36	16,47±0,33 17,37±0,31
Urea, mmol/l, 1 collection 2 collection	0,97±0,14	1,24±0,16 1,38±0,29	1,33±0,13 0,86±0,05	0,97±0,15 0,87±0,07	0,96±0,15 0,84±0,08	1,08±0,19 0,68±0,04*
Uric acid, µmol/l, 1 collection 2 collection	397,03±13,19	369,98±15,84 434,89±19,46*	393,78±15,93 394,86±17,63	394,86±19,12 403,52±14,76	397,03±9,68 428,4±12,74	401,35±23,22 401,35±7,74
Creatinine, µmol/l, 1 collection 2 collection	99,08±5,54	95,77±9,66 79,56±6,78	86,93±10,80 92,45±5,58	71,46±6,19 99,82±6,93	82,14±5,62 74,77±10,10	76,61±9,47 90,98±10,04

Note: *p< 0,05;**p<0,01 compared to control

The research results indicate that serum albumin's level of intact birds from the 1st investigation suffers similar changes as the total protein, decreasing by 5,8% compared with the beginning of experience. On the background of medication with the BioR product, the value of albumin, from the 1st collection do not show clear changes compared to group references. Meanwhile, at the end of the investigation, the BioR remedy induces a growing trend analyzed parameter from 4,9 to 7,1% compared to the control group in all three experimental groups. Thus, the manifestations of both investigated parameters (total protein and albumin) are relevant to the biology of quail, given that both parameters investigated are synthesized in the liver, and several studies have highlighted the beneficial impact of the BioR product on the functional status of the liver [5, 6, 8, 10, 11, 13, 14, 15]. The dynamics of the level of serum urea of quail in the 1st investigation is state of interest, it increased by 27,8% and respectively 37,1% compared to data reported in the study onset in the control group and the experimental group 1 (minimum dose of BioR). At the same time the serum urea within the other three groups treated with BioR, was maintained at the level obtained at the beginning of the research data. In the study conducted and at the end of the investigation, the growth trend of urea concerns only the birds from the control group, contrary to data reported in the groups treated with the BioR remedy. Thus, the tested remedy fortified the basal metabolism and especially the protein one, inducing beneficial metabolic changes at the end of the technological cycle of exploitation of birds within which the serum level of urea decreased by 1,6-2,0 times compared to group reference. It must specified the fact that in another study conducted by us on broilers during intensive growth, the BioR remedy on contrary induced a growing trend of serum urea, which

is explained by the ability of this medicinal product to also enhance the protein metabolism of young bodies [10].

The researches carried out (table 2) showed that prior to starting therapy with BioR the uric acid's level of quail at the end of the technological cycle was high. While the investigated parameter of intact birds in the first investigation shows a downward trend of 6.8% compared to the reference group, when BioR maintained the uremia's level at the level of the study onset. The monitoring in dynamic of the uric acid's level of the birds from the intact control group showed a significant increase compared to data reported in 1st investigation (with 17,5%, $p< 0,05$). The data in Table 3 show that during the study, the investigated parameter in both experimental groups (1 and 2) treated with low doses of BioR there was a decreasing moderately tendency of the uric acid in serum with 7,2 to 9,2 % compared to control group, while high doses do not certify any clear trend. Creatinine playes an important role in the metabolic processes of muscles and other tissues, its level in blood depends on the formation and its excretion and creatinine directly depends on the state of the formation of muscle [19]. These specifications are very important for reconditioned quail, because this metabolite reflects muscle mass. Our researches (tab. 2) demonstrated that adult quail's serum's level of creatinine is high, hovering the values' level of this parameter in broilers. „Cobb-500" [10, 14]. The first investigation of creatinine shows a downward trend in all groups, less palpable in intact birds from the control group by 3,3% compared with the beginning of the study. Meanwhile, on the background of medication of BioR remedy the creatinine's value was reduced by 9,2-25,4% compared to the control group, which probably can be explained by the beneficial incursion of the product from the study. This hypothesis can be confirmed at the end of the study, when creatinine's level from the control group was decreased by 16,9%, repeating "late" downward trend previously reported in the groups treated with BioR. The beneficial influence of the tested remedy was highlighted by amplifying the investigated parameter in the experimental groups 1 and 2, treated with low doses of BioR with 16,2 to 25,5% compared to control group, but without statistical significance. The given effect of the BioR product in broilers has already been reported [10, 14]. Similar results on the beneficial impact of other biologically active compounds: suspension of Chlorella, PPZ premix of a protein level of 22,0% compared to 20% [12, 16, 20]. In this context of statement we can probably consider that the cyanobacterial remedy BioR intensifies in adult quail the energy processes in muscle, which may reflect on the quality of the finished product. Based on biochemical indices registered in adult quail for reconditioning, treated twice with BioR product denotes stimulation of basal metabolism in general and especially of protein, manifested as hepatoprotectors therefore, antistressors and lasting adaptive test product.

Conclusion

1. The cyanobacterial product BioR produced by modern technologies from cyanobacteria Spirulina platensis, given to the adult quail has a very good local and general tolerance.
2. The cyanobacterial product BioR helps improve metabolism and especially the protein one, suggesting an intensification of the proteolytic synthetic processes in the liver.
3. The results are dependent on the product's administered dose on quail, but to determine the optimal dose and regime of use of BioR remedy for quail in reconditioning requires further investigation.

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