

Influence of mercury on the body weight of *Isa brown* hibrid

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ABSTRACT

*The aim of this work was to investigate the influence of Hg ions on the body weight of the birds of hybrid *Isa brown*. In this study we have analyzed the influence of the Hg ion in the body weight during treatment within 19 days. We used HgCl₂ solid, dissolved in distillate water in different concentrations: 50, 100, 200 mg/l. We have used four groups, three of them we treated with different concentrations of Hg and one was as standard. Every group contains 6 birds of the hybrid *Isa brown*. We found that control group has increased the body weight for 11.67 g/day. The group which we have treated with 50mg Hg/l has increased the body weight for 12.14 g/day. When we treat with 100 mg Hg /l the body weight of hybrid *Isa brown* was increased for 15.48 g/day. Using the concentration of 200 mg Hg/l the body weight was increased for 10 g/day. From these results we can conclude that Hg ions have influence in the body weight of the hybrid *Isa brown*.*

Key Words: hybrid *Isa brown*, Hg ions, body weight.

INTRODUCTION

Mercury is not essential ion for birds [1]. It is located in two forms: inorganic and organic form which is the most dangerous forms of human and animal health [2]. Physical development is a fundamental part of biological system in the body; it can be defined as an increase in the number and size of cells in the body size per unit of time [3, 4]. In physical development affect a number of genetic and non-genetic factors [5, 6]. Mercury is quite big competitor of selenium in the body. Selenium is an essential dietary element, which is the necessary element for more than 25 different enzymes [7]. Mercury has affinity to act sulfur in the protein molecule, metallothionein, glutathione and cysteine [8]. Investigations that have been made with the provision of mercury acetate in chickens aged 6 to 9 weeks, determined that diets with 20 ppm were not toxic [9]. It is shown that small quantities of mercury in food affect the growth of young chickens' body weight [10]. After more drinking water treatment with HgCl₂ for 14 days in mice is not noticed any effect on body weight [11]. A number of studies made different animal's concerning to the use of mercury chloride in the manner orally resulted in a decrease on increase in body weight [12, 13].

The purpose of this research work was to investigate the influence of different concentration of mercury (given through the drinking water) in the development of body weight of the birds *Isa brown*.

MATERIALS AND METHODS

Organization of the experimental farms:

This research was done with the *Isa brown* hybrid birds. Birds were placed in cage and in each cage were placed two birds. Birds were treated for a 30-days period without using different supplement mercury salt (preparatory periods). The experiment was set up in the village Konjuh Lipjan municipality in Kosovo, with the following coordinates: height over sea 568m. LAT/LON. N 420 32. 4370. E 0210 08, 335'. The coordinates are measured with GPS. Experimental period was created with 4 groups with equal number of birds. The first group was treated as the control group. Three groups were treated with different doses of mercury chloride (groups 2, 3 and 4) in Table 1.

Table 1. Organizing the experimental farm groups.

1. Groups	Controlle
2. Groups	Treated with 50 ppm Hg/l
3. Groups	Treated with 100 ppm Hg/l
4. Groups	Treated with 200 ppm Hg/l

The amount of mercury salts were given via drinking water. In birds as the preparation and experimental periods was using the same food ration. Food ration during the experimental period was a mixture of cereals, food of animal origin, product of oil industry, flour industry sub-products, dired plant products, mineral and vitamins, as presented in Table 2.

Table 2. Food ration used in all groups of birds.

	%		%
Corn	61.5	Wheat chime	9
Soya oilcake	12.0	Sunflower oilcake	3
Fish flour	5	Animal fat	1
Jodge flour	4	Beer yeast	1
Bones flour	1	Bi-calcium phosphate	1
Sodium chloride	0.25	Premix	1

For the experiment were used 4 weeks ages of bird's hybrid *Isa brown*. In each group are determined by 6 birds. Birds were placed in cages in vertical form. In each cage were placed two birds. Intake of food by birds was *ad libidum*. Meals daily level was determined by the difference between giving food consumption for the entire experimental period with the remaining in the container. Experiment continues for 19 days. Before deciding we did a body weighing of all birds (first weighing), after 30 days (at the end of the preparatory period) has become the second weighing and at the end of the experiment was conducted the third weighing.

RESULTS AND DISCUSSION

By this research we have followed the dynamics of body weight of the bird's hybrid *Isa brown* in two periods, the preparatory period that lasted 30 days and the period of treatment with mercury chloride, which has leased 19 days. In Table 3 are presented in groups of three weighting averages. On this basis we have not noticed any great difference between the groups in the body weighting that is made at the beginning of preparatory period and at the end of the preparatory period, which 30 days period (preparatory period). After treatment the birds *Isa brown* with mercury it was seen that mercury ions have significantly affected the dynamics of the development of body weight [9,12], compared with the control group, whereas in the group treated with concentration 200 ppm Hg/l is observed a stagnation in growth dynamics of body weight compared to the control group.

Table 3. P1, P2 and P3 are the number of weighting within 3 periods (initial, preparatory and final). D1-2 gram difference between the first and second weighting, D2-3 gram difference between the second and third weighting, I-g/D expansion in gram per day during the preparatory period, II-g/D increase in gram per day during the period of treatment.

Groups	P 1	P 2	P 3	D 1-2	D 2-3	I	II
	g	g	g	g	g	g/D	g/D
1	300	861	1142.1	561	281.1	18.7	11.67
2	262	816	1120.5	554	304.5	17.8	12.14
3	260	781	1169	521	388	17.4	15.48
4	259	766	1018	507	252	16.91	10.0

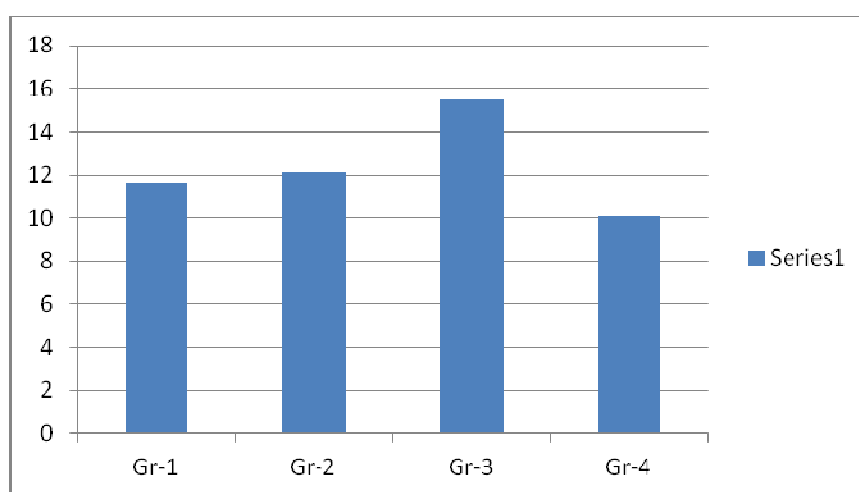
Table 4. Average values (M) of the standard error of the average (SEM) of body weight of the control and experimental group with mercury in *Isa brown* birds.

Note: Significance level: $p \leq 0.05^*$, $p \leq 0.01^{**}$, $p \leq 0.001^{***}$

Weighing in g/d	Gr.1 Control	Gr.2 Exp.	Gr.3 Exp.	Gr.4. Exp.	(t-statistics)					
	1	2	3	4	1:02	1:03	1:04	2:03	2:04	3:04
1 Period	18.69±0.53	17.81±0.55	17.38±0.48	16.91±0.71	1.14	1.82	2	0.59	1	0.55
2 Period	11.67±1.2	12.14±0.69	15.48±0.62	10.08±1.5	0.33	2.75*	0.81	3.59*	1.22	3.24*

Treatment Statistical data show that in the preparatory period no differences significant the dynamics of body weight development amongst control group and other groups, $P > 0.05$. Differences are seen significantly in the treatment period between the first and third group $P < 0.05$, statistical differences also have seen amongst the group of third and fourth $P < 0.05$, and between the first and second groups, the first and fourth, second and fourth $P > 0.05$ therefore have not differences significance.

Figure 1. Weighting in g/D during the treatment period.



In Figure 1 are presented the differences of body weight in grams per day amongst the control group and experimentally groups. It is clear that the first pillar which represents the control group differs from the other columns which represent the different concentrations of treatment. In the second and third groups we have seen the increase in body weight, while the quarter had a decrease compared to the control group.

CONCLUSION

We have investigate the effects of mercury ions in the dynamics of body weight in birds *Isa brown* hybrid. Based on the results optioned in experimental way, we can conclude that. Mercury ions have shown effects on body weight development in birds of hybrid *Isa brown*. The body weight began to increase with increasing amounts of 50 and 100 mg Hg/l, while the amount 200 mg Hg/l affected in reducing body weight gain. Control group has increased the body weight to 11.67 g per day. Group treated with 50 mg Hg/l water has had an increase in body weight gain. The increase was 12.14 g with in a day. Birds treated with concentration of 100 mg Hg/l had increased body weight of 15.48 g per day. Individuals treated with 200 mg Hg/l water had increase of body weight of 10.0 g per day. From this research we can conclude that the birds *Isa brown*.

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