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THE EFFECT OF TWO KIND OF PHOSPHATE GLASS FRITTE WITH MICROELEMENTS ADMINISTRATED AT BROILERS

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Abstract
In this paper is presented the effect of two kind of phosphate glass fritte with microelements that ensure different levels of microelements (Fe, Mn, Zn, Cu, Co, I, Se) on nutritive, bioproductives and blood parameters of broilers
The experiment was done in the Department of Animal's Nutrition from Didactic Farms of Timisoara. The experiment was done on six weeks length, respectively from hatchering to 6 weeks old using 66 broilers, divided in two experimental lots, with 33 chickens each lot. HYBRO line was used.
The experimental lot 1 (EL1) was feed with fodder supplemented with phosphate glass fritte with microelements (FRN 119). At this lot the I and Se was ensured by phosphate glass fritte with microelements because those microelement were incorporated in it. At the other experimental lot (EL 2) chickens were feed with the same fodder but the microelements were supplemented by one other kind of phosphate glass fritte with microelements (R2.2) that had value closed with NRC 1994. At this lot I and Se were ensured by inorganic slats respectively KI and Se_2Zn . At EL1, that received a bigger level of Se comparatively with 42,8% that NRC recommendations, all the other microelements were ensured at value between 25 – 75% from the needed values.
At EL 2, the microelements Zn and Se were ensured over the level recommended and the other microelements (Fe, Mn, Cu, Co, I) were under the recommended values with 96.8%. The broilers weight rise with 4.88% al the lot that received a higher microelements levels (EL2) but the differences between lots are not significant. The specific fodder intake decreased until 2.8% at the lot that received low levels of microelements comparatively with the lot that had higher levels microelements. The hemoglobin content of the blood decreased together with the reduction of the Fe level from the mineral premix. At the lot that the Fe content on phosphate glass fritte with microelements was lower the hemoglobin was lower with proxy. 1.6%. The content of the Fe of the liver ash was 3.5% higher at EL2 comparatively with EL 1because of the bigger Fe level in mineral premix
The use of a new type of FRN 119 that had in its structure both I and Se as well as the reduction of the levels of microelements from the mineral premix have not a significant influence on nutritive, bioproductiv and blood parameters at broilers. At EL 1, except of the Se content that was 42.8% higher than NRC 1994 recommendations, all the microelements were ensured at values of 25 – 75% from the needed values.
Key words:
phosphate glass fritte with microelements, broilers

1. INTRODUCTION

Beside the usual sources of microelements represented by the inorganic salts and organics compounds chelatate, in Romania, at the present, there is a product named phosphate glass fritte that ensure some bioelements as Fe, Mn, Cu, Co, Zn, I

and Se at the level demanded by species and different animals categories [1,2,3,4]. The inorganic chelated are obtained by complexing trace elements from inorganic salts with fodder polyphosphates. Was elaborate the structure of one kind of phosphate glass fritte, notify PM-BC 119 that satisfy the microelements demands of broilers.

2. MATERIAL AND METHODS

The experiment was done on six month length, respectively from hatchering to 6 weeks old using 66 broilers, divided in two experimental lots, respectively 33 chickens each lot. The organizing schema is presented in table 1.

TABLE 1. The experiment organizing scheme

Period: hatchering -6 weeks old	
Experimental lot 1	Experimental lot 2
Mineral premix 0,5%	Mineral premix 0,5%
Mineral provide by FRN 119 1 g/kg fodder	Mineral provide by R 2.2 1 g/kg fodder

TABLE 2. The values of principal microelements supplemented in each experimental lot (mg/kg fodder)

Microelements	NRC 1994	Experimental lot 1	Experimental lot 2
Fe (mg)	80	20	62,2
Mn (mg)	60	20	58,1
Zn (mg)	40	30	45
Cu (mg)	8	5	5,6
Co (mg)	-	0.2	0,6
I (mg)	0.35	0.2	0,2
Se (mg)	0.14	0.2	0,2

From the data in table 1 it could be established that on all experimental period the experimental lot 1 (EL1) was nourished with fodder in that microelements supplementation was done by fritte (FRN 119). Iodine and selenium provision was done through frrite by incorporation in this structure.

The experimental lot 2 was nourished with fodder that had the mineral supplementation with a different kind of frrite structure (R 2.2) at closely value with NRC 1994 recommendations. Inorganic salts as KI and SeZn provided the iodine and selenium.

These kinds of frite was provided in a proportion of 1 g at 1 kg fodder as is presented in table 1.Both frites were produced by Cerasil Oradea. The R 2.2 frrite is a structure that not include I and Se and FRN 119 is one with lower levels of microelements than R 2.2 but include I and Se.

3. RESULTS AND DISCUSSIONS

The nutritive and bioproductive parameters followed along researches were: the total quantity consumed on each period / chickens, the daily medium intake / period / chicken and the specific intake.

For the fodder intake determination were done measures of the fodder quantity allocate to each lot and the remains at 3 weeks old and also at 6 weeks old. By these differences the fodder consumption on each period and on chicken and the daily medium intake on each period were obtained. The intake data are presented in table 3.

Table 3. Fodder intake by chickens from experimental lots

Characteristics	Experimental lot 1	Experimental lot 2
The period from 0 to 3 weeks		
The fodder intake on the period/chicken	0.992	1.096
Daily fodder intake/chicken/ period	47	52
Percent differences	100	110.63
The period from 3 to 6 weeks		
The fodder intake on the period/chicken	2,72	2,81
Daily fodder intake/chicken/ period	129,68	134,00
Percent differences	100	103.33

From these data it could be concluded that at experimental lot 1 (EL1) that had a microelements supplementation with frite FRN 119 the fodder intake was lower with 10.63% in the first period of breeding and with 3.33% in the second, from 3 to 6 weeks comparatively with the experimental lot 2 (EL2) that had a microelements supplementation with frite R 2.2 characterized by bigger levels of microelements;

It could be say that at both experimental lots the fodder consumes data are comparable by themselves. The fodder intake difference was with 10.63% lower at EL1 than EL 2.

To establish the body weight evolution measurements at one day old and at 3 and 6 weeks respectively were done. The results of these weightings are presented in table 4.

Table 4. Body weight evolution of chickens in the experimental variants

Characteristics	Experimental lot 1	Experimental lot 2
n	33	33
	X ± Sx	X ± Sx
The weight at hatchering	39	40
n	31	31
The weight at 3 weeks day old	673.21±74.43	706.12±97.3
Percent values	100	104.88
CV (%)	15.73	19.22
n	31	31
The weight at 6 weeks day old	2129.0±230,19	2179.0±305.12
Percent values	100	102.34
CV (%)	10.81	13.68

Table 5. The evolution of the specific fodder intake of the chickens from experimental lots

Characteristics	Exp. lot 1	Exp. lot 2
The period from 0 to 3 weeks old		
The fodder intake on the period /chicken	0.992	1.096
Total weight gain /chicken (g)	634.21	666.12
Specific fodder intake (kg fodder/kg weight gain)	1.56	1,64
Percent differences	100	105.12
The period from 3 to 6 weeks old		
The fodder intake on the period /chicken	2.72	2.81
Total weight gain /chicken (g)	1455.79	1472.88
Specific fodder intake (kg fodder/kg weight gain)	1.86	1.90
Percent differences	100	102.15
The period from 0 to 6 weeks old		
The fodder intake on the period /chicken	3.712	3.906
Total weight gain /chicken (g)	2090	2139
Specific fodder intake (kg fodder/kg weight gain)	1.77	1.82
Percent differences	100	102.82

At the age of 3 weeks old the chickens from EL2 had the biggest weight, with 4.88% bigger than those from EL 2. The same results were observed at 6 weeks old when the EL2 had a bigger weight with 2.34% comparatively with EL1. The differences between those two lots are not statistical ensured so it could be concluded that the different levels of microelements have not a significant influence on the chickens weight. Corroborating the data of fodder intake with those of weight gain we obtained the specific fodder intake (table5).

From these data it could be concluded the following:

- in the period of 0 to 3 weeks old the specific intake at EL2 is 5.12% bigger from that at EL1
- the same situation was recorded in the next period of breeding, from 3 to 6 weeks, when the specific fodder intake was bigger with 2.25% at EL 2 than EL1
- on all breeding period the situation was similarly, the El2 had a specific fodder intake 2.28% bigger than EL1

Based on the obtained results it was established that the differences between lots were very small, the results being comparable. After chickens slaughter, at 6 weeks old, blood and liver from five chickens from each lot was taken to determinate the some blood parameters and the hemoglobin and iron content from the liver ash. The results of the analyses are presented in table 6.

Table 6. The evolution of hemoglobin content at the chickens from experimental lots

Characteristics	Experimental lot 1	Experimental lot 2
Hemoglobin (g/dl)	9.2736±0.475	9.4232±0.466
Percent differences	100	101.61

From the data in the table it could be observed that at the experimental lot 1 that the iron received from frrite was 60% lower than the experimental lot 2 the hemoglobin level was lower with 1.6%. The iron content in the liver ash is presented in table 7.

Table 7. The iron content in liver ash

Characteristics	Experimental lot 1	Experimental lot 2
Fe content (µg/g ash)	785.25	812.79
Percent differences	100	103.5

There was a positive correlation between the iron level provided in mineral premix and the iron content of the lever ash. Thus, at experimental lot 2 that received a bigger level of iron (62 mg/kg of fodder) the liver ash contain a bigger iron concentration with 3.5% comparatively with experimental lot 1 that received only 20 mg of iron / kg fodder.

4. CONCLUSIONS

The frrite with microelements introduction in the structure of the fodder for chickens have the following effects:

- the fodder intake decrease with 10.63% at the lot that received microelements through the frrite FRN 119 that contain I and Se in its structure comparatively with the microelements provision through R 2.2 without I and se but had bigger levels of microelements;
- the weight gain increase with 4.88% at the experimental lot that received bigger levels of microelements (EL2), the differences between lot were not significant;
- the fodder intake decrease with 2.8% at the lot provided with lower levels of microelements comparatively with the lot that received bigger levels of microelements;

- the hemoglobin blood content decrease once with the iron reduction in the mineral premix, thus, at the lot that the iron was ensured at a lower level by frrite the hemoglobin content was lower with 1.6%;
- the iron content of the liver ash is bigger at EL2 comparatively with EL 1 with 3.5%, the EL2 had a bigger iron content in the fodder

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