

THE CONSEQUENCES OF USING MIXTURE WITH BUFFERS EFFECTS ON SOME BIOCHEMICAL PARAMETERS IN BLOOD SERUM DURING THE FATTENING OF THE LAMBS

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Abstract: This work has an aim to explore the effects of the product based on the natural zeolit during the fattening of the lambs and also the effects on contents of calcium, phosphorus and magnesium in blood serum. The experiment lasted 15 days in the closed area of the Agricultural school in Kraljevo, and the lambs were divided into three groups of 15 lambs (Control group –C, Experimental group E1 and E2). They were fed with sheep's milk, concentrate for lambs' fattening and meadow hay. The lambs in the experimental groups, in contrast to Control group, were fed with the different concentration of the preparation based on the natural zeolit ($O_1=1\%$, $O_2=1.5\%$), so that the manifested differences would be treated as the result of the different concentration of the zeolit that was added to the lambs' food. At the end of the experiment the differences in the parameters of the lambs' blood serum were distinguished and especially in the concentration of calcium, phosphorus and magnesium.

Key words: lambs, zeolit, calcium, phosphorus, magnesium, blood serum

Introduction

The fodder that is covered with mould may be physically, chemically and energetically damaged that cannot be used as food (Stojković *et al.*, 1996; Radovanović *et al.*, 1997). Considering that during the last few years it has been researched the possibility of using the natural zeolite in cattle breeding. Since natural zeolite is able to absorb different spoiled material in cattle organism (micotoxin, heavy metals, carbon monoxide, ammonia, radionuclide etc), thereby it can contribute to better production results and sustain health (Masić *et al.*, 2003, Adamović *et al.*, 2001, Adamović *et al.*, 2003). Many experiments showed that

products based on zeolite bind toxins from food and thereby it has a good influence on production results. Considering above mentioned facts, the subject of the experiment would be the perceiving of biochemical values of fattening lambs' blood serum (calcium, phosphor, magnesium) fed by preparation based on zeolite in different amount of added, under commercial name Mix Plus in order to find possible solutions for effective, qualitative and ecologically desirable production of lambs' meat.

Materials and Methods

The experiment is taken on the farm of the secondary agricultural school "Dr. Djordje Radic" in Kraljevo, on the lambs that are produced by crossbreeding of "pramenka" lambs and "vitemberg" rams. There were 45 lambs. The experiment is based on group control system. The lambs that were chosen had ear tags and they were divided into three groups of 15 lambs. There were made three compartments which were properly signed as K, O1 and O2 with 15 lambs in each. They could drink water as much as they want with the help of automatic drinkers. Microclimatic and zoo sanitary conditions were optimal and pretty the same for all three groups. The meals were adjusted to the lambs' age and were consisted of milk, fodder and hay and the meals were configured and technologically usual that is the meals are used in regular farm breeding. The only difference between the groups was in the examined product that was added to the meals, so the manifested differences were treated as the consequences of the different amount of zeolite added in food. In order to accomplish that we analyzed nutritive and chemical structure of the fodder with standard and regular methods. During the experiment the blood of the lambs were taken at the beginning and at the end of the experiment.

Results and Discussion

At the beginning of the experiment the amount of calcium in the lambs' blood was in normal amount, the average amount was between 2.20 and 2.30 mmol/l (Table 1a). The other authors came up with the similar results (Jovanović, 1986.). We have to confirm that in period after decision the concentration of calcium, although physiologically normal amounts, was under average of 2.50 mmol/l. At the end of experiment the concentrations of calcium were normal, K1 = 2.55 mmol/l, O1 = 2.55 mmol/l and O2 = 2.64 mmol/l (Table 1b). Analyzing the concentration of calcium in lambs' blood from O2 group we can say that it was the lowest at the beginning and the highest at the end of the experiment in comparison to other two groups. We can conclude that it is the result of positive influence of

increased amount of natural zeolite (1.5%) for this group on using mineral substances from food. We must say that manifested differences are not significant.

Table 1. Level of variation of Ca (mmol/l)

group	Level of variation of Ca (mmol/l) (a)				
	\bar{x}	Sd	S _x	C _v	%
K	2.28	0.47	0.12	0.21	100.00
O1	2.30	0.51	0.13	0.22	101.01
O2	2.20	0.54	0.14	0.25	96.32

group	Level of variation of Ca (mmol/l) (b)				
	\bar{x}	Sd	S _x	C _v	%
K	2.55	0.55	0.14	0.22	100.00
O1	2.55	0.57	0.15	0.22	99.96
O2	2.64	0.58	0.15	0.22	103.49

At the beginning of the experiment the concentration of phosphor in the lambs' blood was normal and average. It extended from 1.28mmol/l for K1 group up to 1.44mmol/l for O2 group which is in compliance with literature data (Table 2b). At the end of the experiment the increased amount of phosphor was noted but just in physiological boundaries and differences among the groups are insignificant (Table 2b). We have to emphasize that the lambs that were fed with Mix Plus based on natural zeolite had the increased concentration of phosphor at the end of the experiment, so we think that it has a positive influence on activity of micro flora and increased usage of phosphor.

At the beginning of the experiment the concentration of magnesium in the lambs' blood was equable and extended from 61.41mg/kg up to 61.75 mg/kg (Table 3). Our results match with *Jovanović et al. (1986)* results. We have to emphasize the fact that the lambs at the beginning of their lives, that is in the period of denial, have the amount of magnesium that are normal for grown animals.

At the end of the experiment we conclude that the concentration of magnesium is similar to the one at the beginning, which is confirmation of a very strong mechanism of saving the constant concentration Mg.

Table 2. Level of variation of P (mmol/l)

group	Table 2. Level of variation of P (mmol/l).(a)				
	\bar{x}	Sd	Sx	Cv	%
K	1.28	0.32	0.08	0.25	100.00
O1	1.42	0.45	0.12	0.32	110.52
O2	1.44	0.51	0.13	0.35	112.08
group	Table 2. Level of variation of P (mmol/l).(b)				
	\bar{x}	Sd	Sx	Cv	%
K	2.32	0.52	0.13	0.22	100.00
O1	2.40	0.41	0.11	0.17	103.27
O2	2.47	0.47	0.12	0.19	106.42

Table 3. Level of variation of Mg (mg/kg)

group	Level of variation of Mg (mg/kg). (a)				
	\bar{x}	Sd	Sx	Cv	%
K	61.41	18.49	4.77	0.30	100.00
O1	61.75	17.94	4.63	0.29	100.55
O2	61.61	18.16	4.69	0.29	100.33
group	Level of variation of Mg (mg/kg). (b)				
	\bar{x}	Sd	Sx	Cv	%
K	61.89	18.43	4.76	0.30	100.00
O1	61.48	17.20	4.44	0.28	99.34
O2	61.86	17.81	4.60	0.29	99.95

Conclusion

Based on the performed researches and results the following conclusions are made:

The concentration of Ca in the lambs' blood of O2 group was the lowest at the beginning and the highest at the end . It was 2.64mmol/l. We can conclude that it is the result of positive influence of increased amount of natural zeolite (1.5%) for this group on using mineral substances from food.

We have to emphasize that at the end of the experiment the lambs that were fed with Mix Plus based on natural zeolite had the increased concentration of phosphor, so we think that it has a positive influence on activity of micro flora and increased usage of phosphor.

At the end of the experiment we conclude that the concentration of magnesium is similar to the one at the beginning , which is confirmation of a very strong mechanism of saving the constant concentration of Mg. Adding the mixture with buffer activity did not influence on the amount of Mg in lambs' blood serum.

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Efekat korišćenja smeše sa pufernim dejstvom na neke biohemijske vrednosti krvnog seruma u tovu jagnjadi

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Rezime

Istraživanja u ovom radu postavljena su sa ciljem da se ispituju efekti korišćenja preparata na bazi prirodnog zeolita u ishrani jagnjadi u tovu kao i utvrđivanje efekata na sadržaj kalcijuma, fosfora i magnezijuma u krvnom serumu. Oglad je izveden u trajanju od 90 dana, u zatvorenom objektu Poljoprivredne škole u Kraljevu, a eksperimentalne životinje su podeljene u tri grupe po 15 jagnjadi (Kontrolna-K i Ogladne-O1 i O2). Obrok se sastojao od ovčijeg mleka, koncentrata za tov jagnjadi i livadskog sena. Jagnjad oglednih grupa, za razliku od kontrolne, dobijala su različite koncentracije preparata na bazi prirodnog zeolita ($O_1=1\%$, $O_2=1.5\%$), kako bi se na taj način ispoljene razlike tretirale kao posledica sadržaja različite količine dodatog zeolita u hrani. Na kraju ogleda su utvrđene razlike u ispitivanim parametrima iz krvnog seruma jagnjadi i to u koncentraciji kalcijuma, fosfora i magnezijuma.

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