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RESEARCH OF THE INFLUENCE OF ANTIOXIDANTS ON THE RAMS SPERMOGRAM

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Abstract

The study was conducted for the first time on rams of the Karakul Moldavian breed. As an antioxidant, two versions of the ZooBior preparation were used, which contains: BioR, spirulina, zinc and selenium. The preparation was given to rams in teenium for 50 days at the rate of 5 g/head/day. Studies have shown that the ZooBior drug increased the volume of ejaculate by 0.4 ml in the second experimental group, the motility by 11%, the concentration of sperm in the sperm by 0.1 billion/ml and the total number of sperm in the ejaculate with rectilinear movements. With 6.5%, the data are reliable compared with the indicators found at the beginning of the experiment. There have also been some fluctuations in sperm kinetics. Semen advancement rate increased in the experimental groups, but the data are not significant.

Key words*: antioxidants, ejaculated, mobility, ram, sperm.*

INTRODUCTION

Fertility is a process of primary necessity and is the most important in the breeding of animals.Low fertility in animal husbandry is considered a problem with the quality of sperm material obtained from males of zootechnical interest. There are several reasons for low fertility, including the influence of nutritional factors that adversely affect the reproductive success of animals (Sural, 1997). Research by Sural (1997) in the field of optimization of ratios in parallel with their supplement with biologically active drugs, revealed their availability and increased biological activity. Their influence was recorded in reproductive biotechnology and, especially, on the processes of spermatogenesis and improvement of the vital properties of spermatozoa (Sora, 2004; 2008;). At the same time, an imbalance between pro-concentration and antioxidants is known to negatively affect sperm quality (Sikka, 1995). Maintaining the intensity of spermatogenesis as a physiological process, encompassing all the transformations through which spermatozoa pass, is one of the priorities of biotechnology and is achieved through targeted training and regulation of physiological status in changing environmental conditions. (Furdui et al., 2002)

MATERIALS AND METHODS

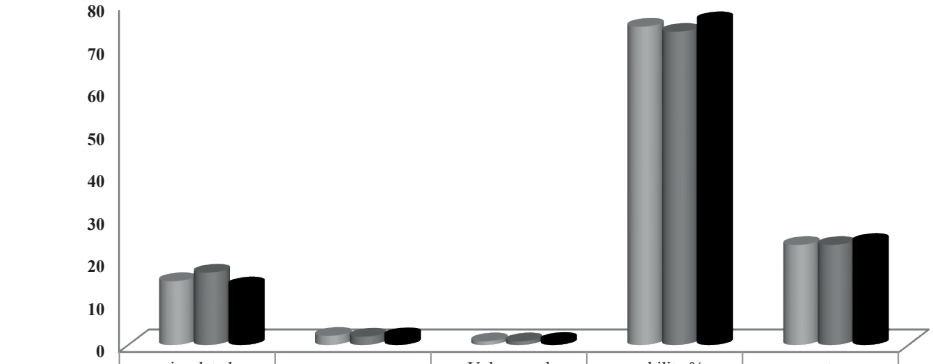
The study was conducted during the breeding season. The purpose of these studies was to determine, and then in a statistical interpretation of the data regarding the sperm material of rams of the Moldavian Karakul breed. The biological material used was a herd of 5 Karakul Moldavian sheep aged three and four years. Harvesting techniques included the preparation of an artificial vagina followed by harvesting. After harvesting, we analyzed the quantitative and qualitative parameters of sperm. A macroscopic analysis of the appearance and volume of sperm was accompanied by a microscopic analysis of sperm motility / ejaculate concentration and sperm velocity (VAP, VSL, VCL) using the CEROS computer method. During the breeding period of rams from the experimental group for 50 days, they were given 5 g per head/day of ZooBior preparation containing BioR spirulina selenium and zinc. Spermogram indices were monitored at the beginning and at the end of the experiment. Statistical analysis of experimental

data was carried out using parametric criteria according to student.

RESULTS AND DISCUSSIONS

The method for stimulating spermatogenesis in rams was based on the use of BDM¹-1plus and BDM²-2plus preparations synthesized from the cyanobacterial biomass Spirulina platensis.

The drugs were administered in the daily diet of sheep in the amount of 5 g per head per day for 50 days. Spermogram indices for rams during the experimental period are shown in Figure 1.

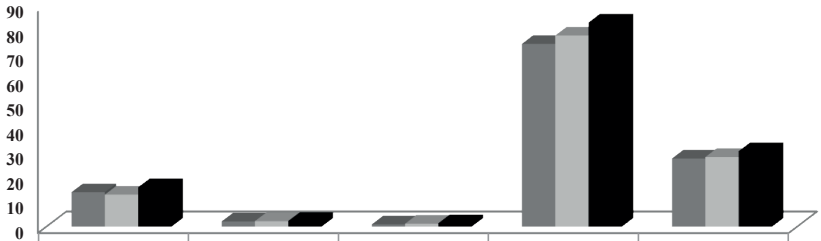


	ejaculated	sperm concentration, mlrd/ml	Volume, ml	mobility,%	spermatozoa with rectilinear movements,%
control group	15	2,19	0,9	74,7	23,5
BDM¹-1plus	17	1,98	0,9	73,5	23,5
BDM¹-2plus	14	2,09	1	76,2	24,2

Figure 1. Spermogram indices in rams at the beginning of the experiment

The data shown in Figure 1 shows that the ejaculate volume averaged 0.9 ml in the control group, 0.9 ml in the first experimental group and 1.0 ml in the second experimental group. The sperm concentration was 2.19 billion/ml in the control group, 1.98 billion/ml in the first experimental group and 2.09 billion/ml in the second experimental group. Mobility had control fluctuations of 74.7% in the control group, 73.5% in the first experimental group and 76.2% in the second experimental group. The proportion of sperm with rectilinear movements ranged from 23.5% to 24.2%. The experimental data obtained between the experimental groups and the statistical control group are insignificant.

Experimental data on the spermogram in sheep after administration of the drug ZooBior 1, in which includes BioR, zinc and selenium, administered to rams in the first experimental group of 5 g/day, and ZooBior 2, consisting of BioR, spirulina, zinc and selenium extract, administered to rams in the second experimental group, 5 g/capita/day is shown in Figure 2.



	ejaculated	sperm concentration, mlrd/ml	Volume, ml	mobility,%	spermatozoa with rectilinear movements,%
control group	14	2,1	0,9	74,3	27,7
BDM¹-1plus	13	2,23	1,2	77,7	28,3
BDM¹-2plus	16	2,3	1,4	83	30,7

Figure 2. Spermogram in rams at the end of the experiment

The experimental data shown in Figure 2 confirm the positive effect of BDM¹-1 plus and BDM¹-2 plus on spermatogenesis in sheep. Thus, the concentration of sperm in the ejaculate increased in experimental group 2 to 2.3 ± 0.02 billion/ml during the growing season, and in the control group to 2.1 ± 0.04 bilion/ml. The difference was statistically significant. The ejaculate volume statistically significantly increased in both experimental groups, amounting to 1.2 ± 0.04 ml and 1.4 ± 0.1 ml, respectively. Mobility was statistically significantly increased in experimental group 2, amounting to 83.0 ± 1.5% at the end of the experiment Computerized semen analysis CEROS is a modern and much more effective method than traditional sperm analysis methods with a large storage space, which are used in measurements to determine sperm quality. Sperm advancement rate data (VAP, VSL, VCL) are shown in Figures 3 and 4.

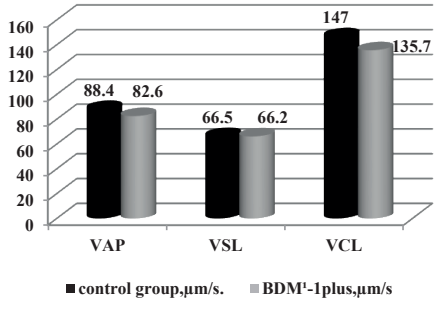


Figure 3. Analysis of VAP, VSL and VCL indices in the first experimental group at the beginning of the experiment

The data presented show that at the beginning of the experiment, in the first experimental group, statistically significant differences between VAP, VSL and VCL were not recorded. Data analysis shows that statistically significant differences in VAP, VSL and VCL have not been recorded, which shows that the rams studied were correctly selected.

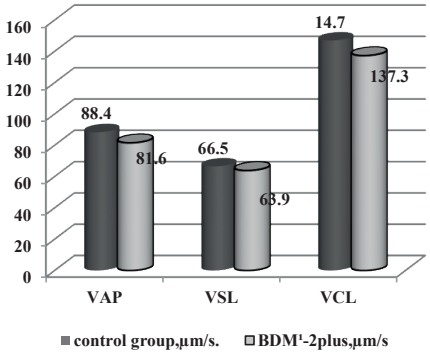


Figure 4. Analysis of VAP, VSL and VCL indices in the second experimental group at the beginning of the experiment

After 50 days of administration of 5 g of ZooBior-1 preparation, the sperm development rate did not show differences between the control and experimental groups compared with the indicators obtained at the beginning of the experiment.

Experimental data on the rate of sperm progression at the end of the experiment after 50 days of introducing 5 g/day of rams into the body from ZooBior 2, which includes Bior, an

extract of spirulina, zinc and selenium, are shown in Figures 5 and 6.

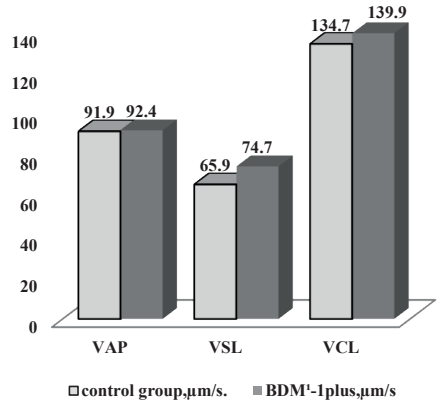


Figure 5. Analysis of VAP, VSL and VCL indices in the first experimental group at the end of the experiment

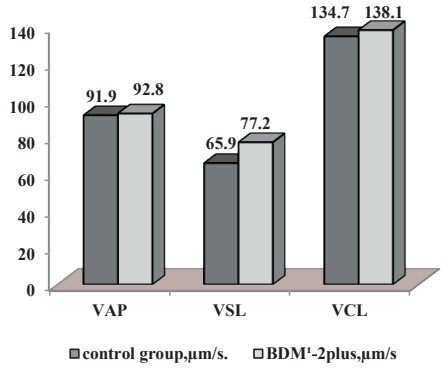


Figure 6. Analysis of VAP, VSL and VCL indices in the second experimental group at the end of the experiment

The data presented show that the sperm velocity was measured in a straight line (VAP), which measures the distance travelled by the sperm in the general direction and the given observation period, while the differences between the control and experimental groups are not determined, the average speed is 91.9 µm/s. Following the distance travelled by sperm (VSL) in a straight line from one point to another during the observation period, deviations between groups were detected. In the experimental group, VSL was 77.2 µm/s, and in the control group it was 65.9 µm/s ($P \leq 0.01$).

The experimental data show that at the end of the experiment in the control group and in the experimental group no statistically significant differences were presented or presented, and the linear velocity (VCL) in the control group was 134.7/91.9 µm/s. and 138.1/91.9 µm/s. in the experimental group.

Experimental data on hematological parameters of blood taken from sheep studied in the main breeding season are presented in Tables 1 and 2.

Analysis of blood parameters in the rams of the control and experimental groups revealed various fluctuations in hematological constants by the end of the study period.

These differences both in the control group and in the experimental groups are within physiological deviations at the lower and upper levels of norms, which shows that the studied drugs do not have a negative effect on the animal organism.

Table 1. Influence of BDM[1]-1 plus and BDM[1]-2 plus preparations pnl on the hematological indices of the blood, the beginning of the experiment

BDM[1]-1 plus (*Experimental group 1*)

Specification	*Control group*	*Experimental group 1*
Erythrocytes (x10^{12}/L)	7.3 ±0.5	8.1 ±0.9
Leukocytes (x10^{9}/L)	10.6 ±3.8	15.2 ±3.0
Hb, g/L	92.5 ±4.3	108.2 ±4.2
VSE, mm/hour	2.8 ±0.5	2.0 ±0.6
E, %	11.0 ±1.2	9.7 ±1.9
segmented, %	20.8 ±4.4	20.7 ±5.2
not segmented, %	11.3 ±3.0	7.3 ±2.4
lymphocytes, %	59.5 ±3.8	62.3 ±5.5

BDM[1]-2 plus *(Experimental group 2*)

Specification	*Control group*	*Experimental group 2*
erythrocytes (x10^{12}/L)	7.3 ±0.5	7.3 ±0.6
leukocytes (x10^{9}/L)	10.6 ±3.8	12.4± 0.5
Hb, g/L	92.5 ±4.3	108.3 ±1.7
VSE, mm/hour	2.8 ±0.5	1.3 ±0.3
E, %	11.0 ±1.2	8.7 ±4.7
segmented, %	20.8 ±4.4	16.0 ±3.1
not segmented, %	11.3 ±3.0	10.0 ±3.2
lymphocytes, %	59.5 ±3.8	65.3 ±3.4

Table 2. Influence of BDM[1]-1 plus and BDM[1]-2 plus preparations pnl on the hematological indices of the blood, the end of the experiment

BDM[1]-1 plus (*Experimental group 1*)

Specification	*Control group*	Experimental group 1
erythrocytes (x10^{12}/L)	10.6 ±1.4	10.5 ±0.5
leukocytes (x10^{9}/L)	7.9 ±0.4	8.7 ±0.4
Hb, g/L	101.8 ±4.4	102.8 ±1.5
VSE, mm/hour	3.3 ±0.3	4.3 ±0.9
E, %	9.0 ±1.0	13.0 ± 0.6
segmented, %	13.7 ±0.3	17.3 ± 1.5
not segmented, %	15.9 ±1.7	12.3± 1.2
lymphocytes, %	60.7 ±0.9	57.3 ±2.0

BDM[1]-2 plus(*Experimental group 2*)

Specification	*Control group*	*Experimental group 2*
erythrocytes (x10^{12}/L)	10.6 ±1.4	9.4 ±0.6
leukocytes (x10^{9}/L)	7.9 ±0.4	8.5 ±0.6
Hb, g/L	101.8 ±4.4	101.0 ±3.1
VSE, mm/hour	3.3 ±0.3	4.7 ±0.3
E, %	9.0 ±1.0	8.0 ± 1.0
segmented, %	13.7 ±0.3	14.7± 0.9
not segmented, %	15.9 ±1.7	7.7 ±0.9
lymphocytes, %	60.7 ±0.9	70.7 ±0.9

CONCLUSIONS

The preparations BDM¹-1 plus and BDM¹-2 plus, introduced into the diets for feeding sheep, have a positive effect on the spermogram. After 50 days of administration in rams, the ejaculate volume increased significantly ($P \leq 0.001$), sperm motility from 74% at the beginning of the experiment and 80% at the end of the experiment in the first experimental group ($P \leq 0.1$).

Various fluctuations in hematological constants were identified, but the differences in the control group, as well as in the experimental groups, are within the physiological changes at the lower and upper levels of norms, which shows that the studied drugs do not adversely affect the animal organism.

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