

# SPERMOGRAM IN RAMS IN THE SECONDARY SESSION OF REPRODUCTION UNDER THE INFLUENCE OF BIOLOGICALLY ACTIVE DRUGS

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## Abstract

The influence of the bioactive drugs ZooBioR-1. and ZooBioR-2, on the stimulation of spermatogenesis in breeding rams in the secondary breeding season was studied. It was demonstrated that the drugs ZooBioR-1 and ZooBioR-2 had a positive influence on the quality of ejaculates taken from breeding rams in the secondary breeding season; the volume of the ejaculate at the end of the experiment was  $0.8 \pm 0.04$  ml ( $P \leq 0.001$ ), the mobility of the spermatozoa increased up to  $80.0 \pm 1.6\%$ , the concentration of spermatozoa in the ejaculate increased up to  $2.34 \pm 0.09$  billion/ml, the concentration of testosterone in the blood increased up to  $6.0 \pm 0.1$  ng/ml, compared to the control group, indices that correspond to the requirements for ejaculates admitted for processing.

**Key words:** ram, sheep, mobility, concentration, dilution, semen, artificial insemination, drug, spermatogenesis

## INTRODUCTION

Sheep have their breeding season in the autumn months (Woaster, 2005). During the period of transition to the market economy, sheep breeding went through a complicated economic time. These changes have led to a decrease in the efficiency of sheep breeding. However, in the last decade, a tendency to stabilize the branch has been established in the sheep breeding sector, there has been interest in sheep breeding, various more productive breeds have been procured, which will allow the restoration of sheep number from more productive breeds. The conditions that will allow the increase of production and herds, as well as the creation of a fodder base of very good quality and quantity, are: intensive reproduction, the maximum use of the biological potential of the sheep for mount and breeders of high zootechnical value [1,2,3,4,5,6].

A current problem of solving sheep reproduction problems is the exploitation of breeding rams throughout the whole year and the creation of a bank of cryopreserved semen, suitable for use in the artificial insemination of sheep. [7,8,9].

## MATERIAL AND METHOD

The efficiency of ZooBioR-1 and ZooBioR-2 drugs on the stimulation of spermatogenesis in rams in the secondary breeding season was carried out at the sheep farm of the TES "Maximovca" household on breeding rams of the Moldovan Tsgaie breed for wool-meat-milk. Breeding rams aged 2-4 years were selected for the research. There were formed 3 groups of rams -one control and two experimental- each having three heads. Semen collection from rams was performed from each ram twice a week. Quantitative and qualitative indices of raw sperm were tested at the

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beginning and end of the experiment. The breeding rams from the experimental groups selected for the research were administered 5g head/day of ZooBioR-1 and ZooBioR-2 drugs during 50 days. The resistance of spermatozoa to freezing was performed by studying the motility of spermatozoa after reanimation. To achieve the proposed goal, there was carried out a research that studied the effect of ZooBioR-1 and ZooBioR-2 drugs obtained from *Spirulina platensis* [7] by the Institute of Microbiology and Biotechnologies of the

Technical University of Moldova on the reproductive function of breeding rams in the secondary season of reproduction.

## RESULTS AND DISCUSSION

The main goal of the experiment was to study the influence of stimulating spermatogenesis in breeding rams by using biologically active drugs introduced as an additional component in the basic rations.

The experimental results are presented in figure 1.

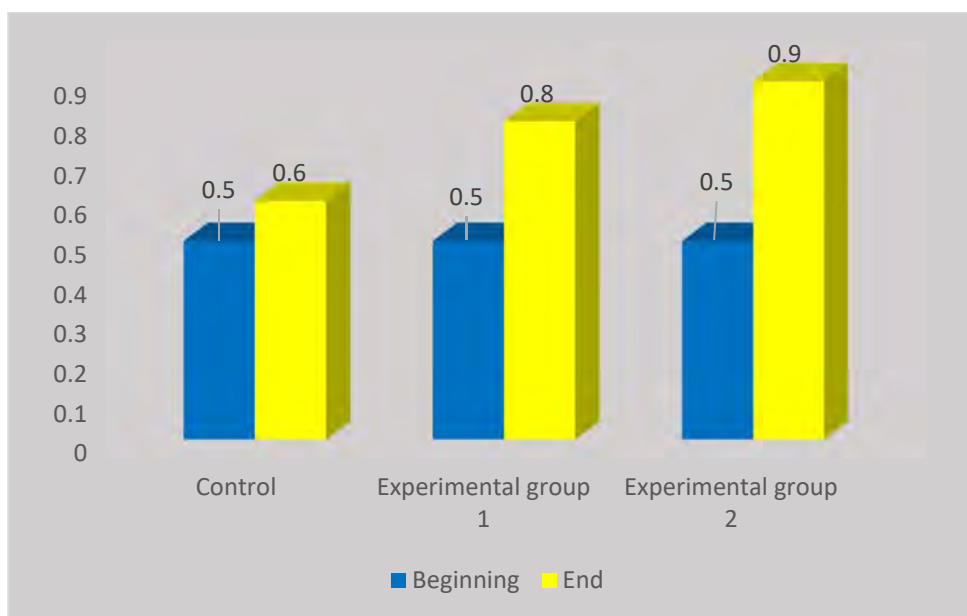


Fig. 1 Dynamics of ejaculate volume (n=24), ml

After 50 days of administering ZooBioR-1 drug to rams from experimental group 1, the ejaculate volume increased by 0.3 ml ( $P \leq 0.001$ ), compared to the beginning of the experiment.

In the rams of experimental group 2, which were administered ZooBioR-2, an increase of 0.4 ml ( $P \leq 0.001$ ) was recorded, compared to the initial result.

In the control group, only a tendency to increase the volume is observed. Statistically significant differences were

found in experimental groups 1 and 2 compared to the control group.

The dynamics of sperm mobility during the experiment is presented in figure 2.

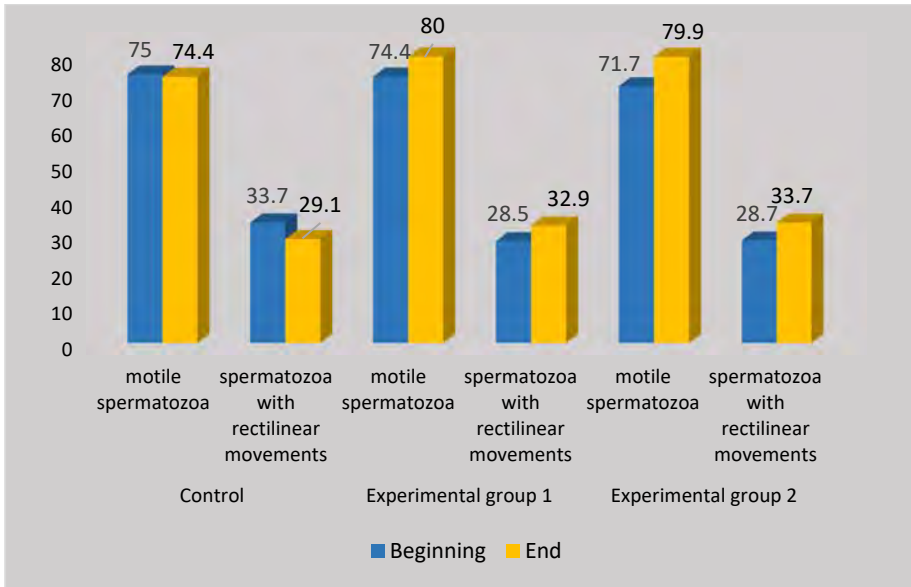


Fig. 2 Dynamics of sperm motility (n=24),%

From the experimental data presented in figure 2, it appears that the motility of the spermatozoa at the beginning of the experiment in the first experimental group was  $71.7 \pm 3.0\%$ , in the second experimental group  $74.4 \pm 1.7\%$  and in the control group  $75, 0 \pm 2.3\%$ . The differences between the experimental groups and the statistical control group are not genuine.

At the end of the experiment, sperm motility in experimental group one increased up to  $80.0 \pm 1.6\%$  and in experimental group two up to  $79.9 \pm 2.7\%$ ; in the control group, sperm motility practically did not change during the experiment.

The sperm concentration is shown in figure 3.

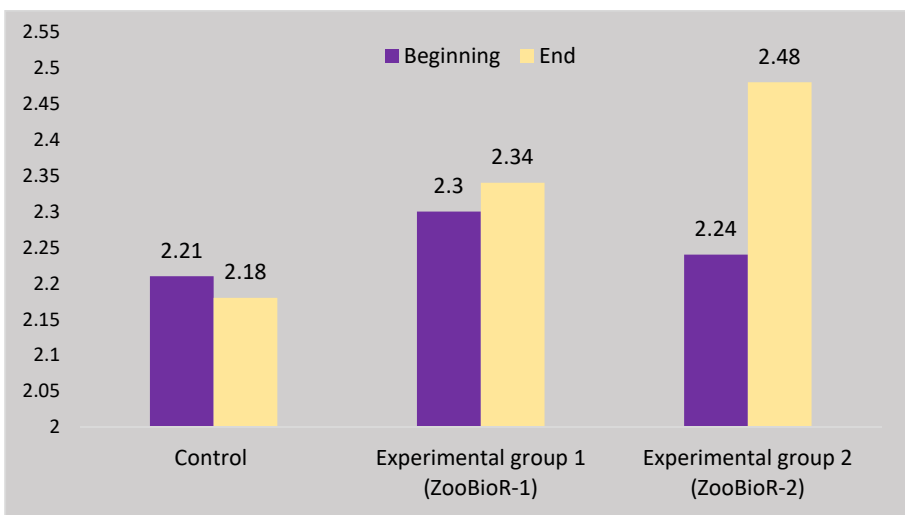


Fig. 3 Sperm concentration in ejaculate (n=24), mlrd/ml

The experimental results shown in figure 3 demonstrate that, during the experimental period, the concentration of spermatozoa in the ejaculate in the first experimental group was  $2.34 \pm 0.09$  billion/ml, in the second experimental group of  $2.48 \pm 0.09$  billion/ml ml, increased by 0.64 billion/ml and by 0.24 billion/ml consecutively, and no changes occurred in the control group.

In conclusion, we can mention that the ZooBioR-1 and ZooBioR-2 drugs had a positive influence on spermatogenesis in breeding rams in the secondary breeding season. The proposed method was patented with invention patent No. 1460.

The study of the influence of the introduction of ZooBioR-1 and ZooBioR-2 drugs into rams' rations on the level of testosterone in the blood of rams was studied. At the beginning and at the end of the experiment, blood samples were taken from all the rams selected for the study for testing the testosterone level by the ELISA method. The experimental data are presented in figure 4.

The concentration of the testosterone hormone in the blood serum of the rams selected for the study increased in the experimental groups compared to the control group (figure 4).

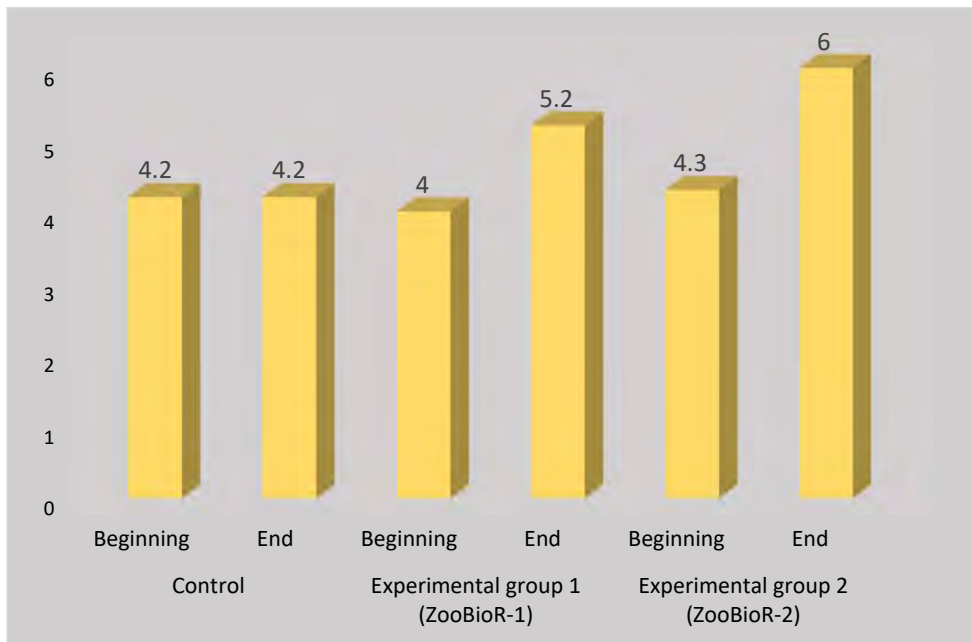


Fig. 4 The dynamics of testosterone in blood serum

The experimental results show that, during the experimental period, the concentration of testosterone increased in experimental group one from  $4.0 \pm 0.1$  ng/ml at the beginning of the experiment to  $5.7 \pm 0.4$  ng/ml ( $P \leq 0.05$ ) and in the second experimental group from  $4.3 \pm 0.4$  ng/ml to  $6.0 \pm 0.1$  ng/ml at the end of the experiment ( $P \leq 0.05$ ).

Based on the results achieved in this chapter, there was obtained Invention Patent No. 1460 - Procedure for stimulating spermatogenesis in rams in the off-season.

## CONCLUSIONS

ZooBioR-1 and ZooBioR-2 drugs had a positive influence on the quality of ejaculates taken from breeding rams in the

secondary breeding season; the ejaculate volume was  $0.8 \pm 0.04$  ml ( $P \leq 0.001$ ), sperm motility increased up to  $80.0 \pm 1.6\%$ , sperm concentration in the ejaculate increased up to  $2.34 \pm 0.09$  billion /ml, the blood testosterone concentration increased up to  $6.0 \pm 0.1$  ng/ml, which correspond to the requirements for ejaculates admitted for processing.

## REFERENCES

1. Ursescu, Ad., Ursescu A., Heritability and repeatability of the breeding season and the interval between calvings in Palas Merino sheep. *Scientific Works*. **1977**, ICDCOC Palas, p.277-285.
2. Tafta, V., Vintila, I., Stela Zamfirescu. Sheep production, improvement and reproduction, *Ceres Publishing House*, **1997**, Ceres, Bucharest.
3. Stanescu, L., Research on the influence of some environmental factors on reproductive and production traits in Palas Merinos. *Liviu Perieni. Doctoral thesis*, **2009**, USAMV, Iasi.
4. Pascal, C., Nechifor, I., Costica C., Research on the influence of natural factors on reproductive activity and sexual behavior in rams. *Scientific Works - Animal Husbandry and Biotechnology*, **2015**, Chisinau, ISBN 978-9975-64-246-0, p.221-227.
5. Nechifor, I. Research on the genetic improvement of the Karakul de Botosani breed. *Thesis*. USAMV, **2017**, Iasi.
6. Rotari, D. Research of the influence of antioxidants on the rams spermogram. *Scientific Papers. Series D. Animal Science*. Vol. 1.XIII, Issue 1, Bucharest, **2020**, pp. 71-82. ISSN 2285-5750.
7. Rotari, D., Bradu, N., Darie, G., Cibotaru, E., Djenjera, I. Stimulation of spermatogenesis in aries in the secondary season. In: *Scientific Papers. Series D. Animal Science S.Zootehnie, University of agricultural Sciences and Veterinary Medicine*. Vol. 75 (26), **2021**, pp.149-153, ISSN 1454-7368, CNCSIS.
8. Milovanov, V.K. Biology of reproduction and artificial insemination of animals. **1962**, 696 c.
9. Nauk, V.A. Structure and function of agricultural animal sperm during cryopreservation. Chişinău, Shtiintsa, **1991**, 200s.