Lucrări ştiinţifice **Zootehnie şi Biotehnologii**, vol. **42 (1)** (**2009**), Timişoara

# INFLUENCE OF CERTAIN BIOACTIVE PREPARATIONS ON THE DURATION OF BOAR SEMEN PRESERVATION

# INFLUENŢA UNOR PREPARATE BIOACTIVE ASUPRA DURATEI CONSERVĂRII SPERMEI DE VIER

V. HAREA[1], G. DARIE[1], P. CHINTEA[2], ELENA MARANDICI[3]

*1- The state Research Enterprise for Selection and Hybridization of pigs „Moldsuinhibrid", Orhei*
*2-Institute of Genetics and Plant Physiology of the ASM*
*3-Agrarian State University of Moldova*

*The experiences were held on the boar sperm. There were studied the bioactive substances with the role of antioxidizer made at the Institute of Genetic of Science Academy of Republic of Moldova. The bioactive substances (GL-2) were used as a structure dilution GHTS what is used for boars sperm dilution with the concentration of 0,1 – 1%. The experimental researches showed that the studied substances were not toxic for sperm used in the structure of GHTS dilution with the concentration of 0,1-1 whit gave the possibility to increase the period of boar sperm stoking till 168 hours, keeping the sperms mobility at the level of standard of artificial insemination.*
**Keywords**: boar, sperm, dilution, motility, bioactive substances, antioxidizer.

## Introduction

The continuous improvement of swine breeding methods has determined the need to develope more effective methods for the preservation of the boar semen. More and more researchers claim that the bioactive substances play a key role in the conservation of boar semen at hypothermal temperatures as components of diluents to dilute and preserve the semen. (Bogdan, 1984, 1999, Milovanov, 1977, 1962, Ostaşco, 1978, 2004, Nauc, 1991, 1987) In these studies the antioxidant substance GL-2 was tested. The GL-2 has been inserted as additional component in the GHŢS diluent, with a concentration of 0.01; 0.05 and 0.1%. The research results have shown that the GL-2 substance is not toxic for the spermatozoids, and it can ensure a good preservation of semen at a temperature of 16-18C for a period of 5-7 days without diminishing the sows' fertility.

## Material and Methods

The research carried out at the Institute of Genetics of the Moldovan Academy of Science, regarding the influence of the GL-2 substance on the conservation of boar semen, was divided into several levels, and namely:
- investigations on the compared aspects of the mobility of spermatozoids, in conditions of having the concentration of the GL-2 substance of 0.01; 0.02; 0.1% introduced in the composition of the GHȚS diluent;
- analysis of spermatozoids' viability;
- investigations on the fecundation and duration of sow gestation.

The boar semen of the Pietrain breed has been researched. The ejaculations have been collected manually at a five-day interval. The ejaculations have been examined using classical methods to assess the volume, spermatozoids mobility and concentration. Only ejaculations with standards values have been used in the experiment. After evaluating the ejaculations in terms of volume and concentration, the semen was diluted wiht the GHȚS diluent. The bioactive substance GL-1 in a concentration of 0.01;0.05 and 1% was added to the composition.

## Results and Discussion

The research conducted on the boar semen in the breeding laboratory of the State-owned Enterprise for Selection and Hybridization "Moldsuinhibrid" has shown that the semen preservation at a temperature of 16-18C is possible only for a period not exceeding 24 hours. Given the goal of the research, we intended to study the influence of the GL-2 preparation, introduced as additional component in the composition of the GHȚS diluent, on the preservation period of the semen diluted at a temperature of 16-18C.

After diluting the semen, the spermatozoids mobility in experimental groups reached 9.0±0.22 points (Table 1). After 24 hours of storage of the seminal fluid, diluted at 16-18C, the spermatozoids mobility slightly decreased. The highest mobility index was obtained in the experimental group where the GL-2 substance had a concentration of 0.05% - 8.30±0.16 points compared to 7.66±0.14 points where the bio-preparation GL-1 had a concentration of 0.1%.

Table 1 shows that the spermatozoids mobility, stored for 120 hours at a temperature of 16-18C, differs depending on the concentration of the GL-2 preparation introduced into the composition of the GHȚS diluent. In the experimental group, where the bio-preparation had a concentration of 0.01% the spermatozoids mobility was of 5.17±0.17 points against 2.30±0.19 points where the biopreparation had a concentration of 0.1%.

Table 1

Viabilitaty of spermatozoids

| Specification | Mobilitaty, points | | |
|---|---|---|---|
| | Concentration of preparation | | |
| | 0,01 | 0,05 | 0,1 % |
| Ejaculations | 44 | 44 | 44 |
| Mobilitaty, points after dilution | 9,10±0,22 | 9,0±0,22 | 9,0±0,22 |
| 24 hours | 8,0±,0,24 | 8,30±0,16 | 7,66±0,14 |
| 48 hours | 7,33±0,18 | 7,83±0,16 | 7,50±0,14 |
| 72 hours | 7,33±0,14 | 7,50±0,11 | 7,00±0,08 |
| 96 hours | 6,30±0,24 | 6,0±0,10 | 6,30±0,13 |
| 120 hours | 6,33±0,21 | 5,33±0,19 | 4,66±0,21 |
| 144 hours | 5,17±0,17 | 4,29±0,14 | 2,30±0,19 |
| 168 hours | 2,69±0,23 | 3,00±0,09 | 1,67±0,07 |
| Absolute index of viability | 248,3±80,2 | 249,3±76,4 | 192,2±51,7 |

Some interesting features can be highlighted depending on the concentration of the biopreparation. So, the absolute index of spermatozoids viability shows some differentiation in the concentration of the GL-2 preparation as a component introduced in the GHȚS diluent. Thus, at a concentration of 0.01 and 0.05 of the GL-2 preparation, the absolute index of spermatozoids viability shows higher indices 248.3±80.2 şi 249.3±76.4, against the experimental group where the concentration of the biopreparatului was 0.1%. Therefore, these differences reflect the ability of the GL-2 preparation to regulate the very special physiological processes in order to conserve the energy resources.

Table 2

Rezults of artificial fecundation of sows

| Specification | Grupele experimentale | | |
|---|---|---|---|
| | 0,01 | 0,05 | 0,1 |
| Fecundated sows, amount | 17 | 17 | 16 |
| Sows calved, % | 78,9±7,4 | 77,8±7,2 | 78,3±7,9 |
| Gestation period, days | 115 | 114,6 | 114,5 |
| Calved piglets, amount | 11,4±0,53 | 11,3±0,68 | 11,1±0,62 |
| weight of one living calved piglet | 1,20 | 1,20 | 1,18 |

According to the Table 2, the GL-2 biopreparations have different values regarding the fertility of sows inseminated with semen stored for 120 hours at temperature 16-18C. These values are not significant.

Depending on the concentration of the GL-2 biopreparations, introduced as additional components in the composition of the GHŢS diluent, there are differences in the duration of gestation, fertility and weight of living piglets at birth, which reflect certain characteristics of the spermatozoids' metabolism.

## Conclusions

1. The GL-1 biopreparations introduced as additional components in the composition of the GHŢS diluent show a number of characteristics depending on the concentration.

2. A concentration of 0.01 - 0.05% of the GL-2 biopreparation introduced in the composition of the GHŢS diluent shows higher values, against the semen preserved for 120 hours at a temperature of 16-18C, when the biopreparation had a concentration of 0.1%.

## References


1. Bogdan, A., Tîrnovean, I., Salaţiu, D., 1984, Fertilitatea, natalitatea şi prolificitatea animalelor de fermă. *Ed.Dacia*, Cluj-Napoca, vol.1, 1984.
2. Bogdan, A., şi col. 1999, Tratat de reproducţie şi însămânţări artificiale la suine. *Editura Tehnica Agricolă,* Bucureşti.
3. Милованов, В. 1977, Теория и практика длительного сохранения семени барана и хряка. Физиология воспроизведения сельскохозяйственных животных. *Харьков*, с. 65.
4. Милованов, В. 1962, Биология воспроизведения и искусственное осеменение сельскохозяйственных животных. *Москва*, с. 650.
5. Наук, В. 1991, Структура и функция спермиев сельскохозяйственных животных при криоконсервации. *Кишинев, Штиинца,* с.197.
6. Наук, В. 1987, Структурно – биохимические и функциональные особенности гамет самцов сельскохозяйственных животных при криоконсервации и разработка эффективных способов их длительного хранения. *Автореф.дис.д-ра биол.наук.* Харьков, с. 32.
7. Осташко, В. 1978, Глубокое замораживание и длительное хранение спермы производителей. *Киев. Урожай*, с. 255.
8. Осташко, В. 2004, Температурный шок клеток и гидравлический удар. Материалы международной научной-практической конференции. Роль и значение метода искусственного осеменения сельскохозяйственных животных в прогрессе животноводства XX и XXI веков. Дубровицы, с.81-84.