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EFFECT LONG-TERM STORAGE OF CRYOPRESERVED BULL SEMEN IN LIQUID NITROGEN ON PARAMETERS OF QUALITY SPERM.

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The study of performance straight-forward motility and absolute survival rate of thawed sperm bulls of different breeds in long-term storage in the Bank of genetic resources. It is established positive high correlation between the indicators of motility and an absolute survival rate of sperm (r=0,89) (p<0,001). The studies found that the rates of sperm motility and survival of white-headed bull's ukrainian, lebedinsky, simmental and gray ukrainian breeds were higher than the current standard on average by 15 %.

Keywords: *cryopreserved sperm, straight-forward movement, survival, absolute survival rate of sperm, long-term storage, breeds.*

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Statement of the problem. Conservation of genetic resources sires endangered species has great importance in breeding and maintaining biodiversity. The full implementation of measures to preserve livestock breeding resources is provided through the creation genetic reserve herds combined with long-term storage and cryopreservation of genetic material in cryobanks [1, 4]. It is important to conduct periodic monitoring of the quality of genetic resources for setting appropriate to their subsequent storage and possible to use in the selection process.

Analysis of major studies and publications which discuss the problem. Nitrogen metabolism in sperm slowed a million times in extremely low temperatures of liquid. Sperm can maintain their biological properties and transmit genetic information for many years and even decades being in a state of suspended animation deep. Long-term storage of semen in liquid nitrogen is becoming increasingly important due to the possibility of preserving breeds, types and lines of endangered and rare animals [5, 6]. Experimental investigations of some authors have been found that frozen bull semen can store motility, survival and ability to fertilize on high level up to 10 years [2, 7]. The level of fertility of cow's insemination of frozen semen was kept at the same level for 15 years, according to Miksner [3]. Determination of qualitative semen of bulls of different breeds, stored in liquid nitrogen at the Bank of genetic resources for over 10 years is relevant.

Purpose and objectives of the research. The purpose of our study was to evaluate motility and survival of sperm bulls of different breeds under conditions of long-term storage of semen in liquid nitrogen. Task of research is to monitor the quality of bull semen Bank of genetic resources of IBGA NAASU.

Material and methods of the research. We used cryopreserved semen of 150 bull 20 breeds in research. Time storage of sperm under investigation ranged from 10 to 45 years. We have divided bull

semen into three groups: the first - with time storage of 10-20 years, 2-nd - 21-30 years and the third - 31-45 years. Assessment indicators of sperm motility and survival was performed in the laboratory for the production of livestock genetic products Main tribal venture PC SPA «Progres» using computer analysis software motility - Sperm Vision company «Minitub».

The results of research. The research found that the semen of bulls of different time storage meets the requirements of the state standard, except for some semen bulls simmental and brown carpathian breeds with the time storage of the second and third group. Survival of sperm bulls of some breeds data after thawing was 4 hours. Bull's semen of simmental, brown carpathian and white-headed ukrainian breeds was investigated with the time storage of all three groups. During the time storage of 10-20 years, straight-forward movement (hereinafter - SFM) and absolute survival rate of sperm (hereinafter - ASRS) had high value in bulls of white-headed ukrainian and brown carpathian breeds. The survival rate was more than 5 hours. SFM sperm bulls white-headed ukrainian breed was 6.5 points, up by 6 % than the SFM bulls sperm brown carpathian breed ($p>0,05$). Found that over the time storage of 21-30 years in the sperm of bulls white-headed ukrainian breed observed the highest motility and ASRS. SFM sperm was higher than similar indictor of other breeds on average 17,2 % ($p<0,05$), and ASRS on 44,4 % ($p<0,001$) (Figure 1).

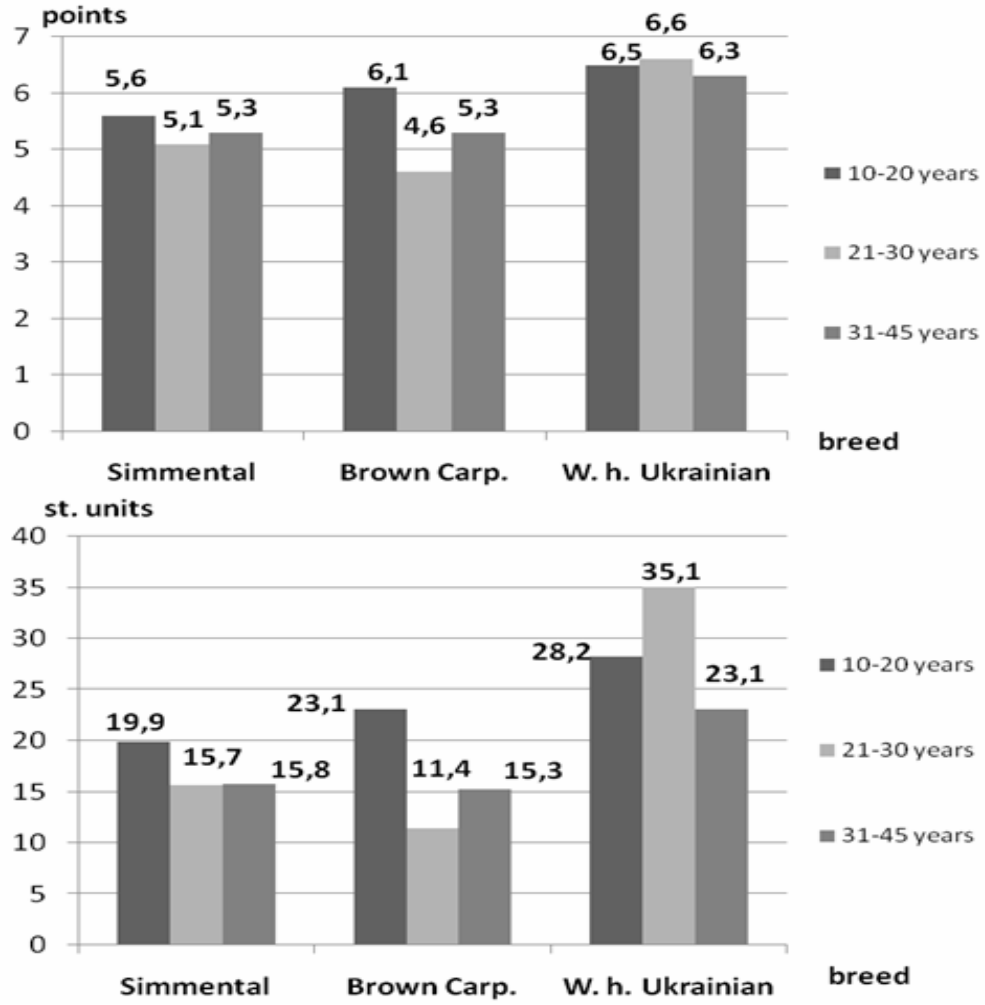

Figure 1. SFM and ASRS of bulls some species depending on the duration of storage (n=50)

It should be pointed out that for sperm bulls brown carpathian breed of the first group is characterized by the highest motility that is greater than the motility of the other groups on average by

18,9 % (p<0,05), and ASRS higher by 42,2 % (p<0,01). Found that for time storage of 21-30 years for this breed SFM is 4.6 points lower than that in other breeds an average of 20,0 % (p<0,05), and ASRS was below the current standard on 5 % and other breeds by an average of 47,0 % (p<0,01) (Figure 1).

The results show that SFM and ASRS of bulls sperm white-headed ukrainian breed with time storage 31-45 years are higher than these indicators in the brown carpathian bulls and simmental breeds an average of 20,0 % (p<0,05) (Figure 1).

It should be noted that the SFM and ASRS sperm bulls of meat breeds turned higher on average by 30,0 % (p<0,05) in the bulls breed charolais than in bulls ukrainian meat breed with time storage of 10-20 years. At the same time with the time storage of 31-45 years, conversely, turned out to be higher indicators SFM and ASRS sperm bulls ukrainian meat breed on average by 27,0 % (p<0,05) (Figure 2).

Found that SFM and ASRS sperm bulls of breed charolais in first group are higher than in the third group of bull sperm by an average of 42,7% (p<0,001). At the same time, SFM and ASRS of sperm bulls third group of ukrainian meat breed higher than in the first group of sperm bulls by an average of 18,1% (p<0,001) (Figure 2).

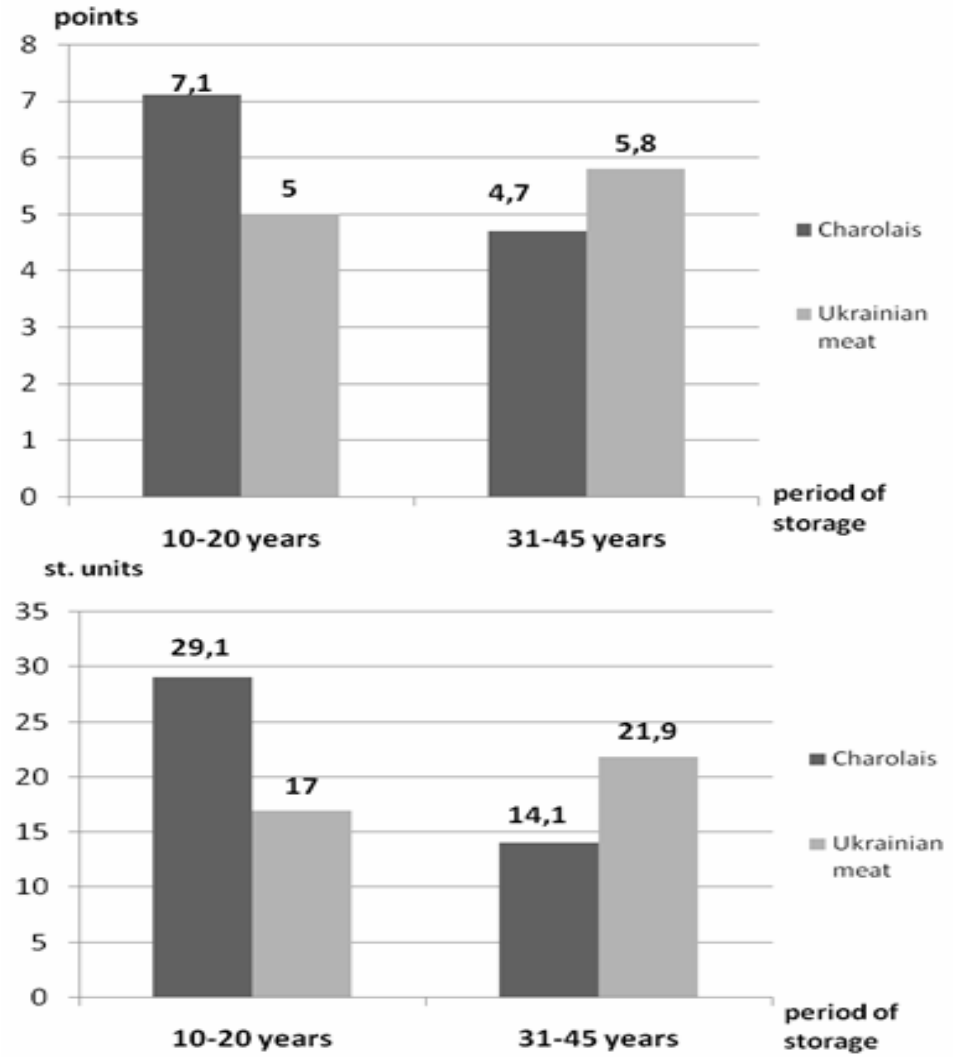

Figure 2. SFM and ASRS of bulls beef breeds depending on the duration of storage (n=60)

Conclusions. Semen some bulls brown carpathian, simmental and charolais breeds had low indicators of motility (less than 4 points) and survival (less than 4 hours), which we believe is result of the

individual impact of bull. Highly probable positive correlation between SFM and ASRS (r = 0,89) ($p<0,001$) has been found regardless of the duration storage of semen bulls. Over the period of storage of semen 21-30 years experienced the highest values of SFM, survival and ASRS of sperm bull's whitehead ukrainian breed, and the lowest value in sperm bulls of brown carpathian breed.

Inference. The research results indicate the need for periodic monitoring of quality indicators of sperm the all breeds to confirm the feasibility of further storage and possibility of usage in the selection process.

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