PECULIARITIES OF WATER FREEZING IN CRYOPROTECTIVE MEDIUM IMPLEMENTED IN A MATRIX OF HYDROPHOBIC SILICA BULL SPERM

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The study of the process of melting water in lactose-glycerol-yolk kriomedium containing gametes bull, incorporated in the hydrophobic silica powder, which are adsorbed on the surface of fixed amounts of nonpolar hydrocarbon – n-decane was the aim of the work. The possibility of water polyassociates structuring with a solid surface of interfacial water and solubility of trifluoroethanoic acid in it have been studied. Thereat survival of the germ cell after contact with the surface was not analyzed.

State of water in initial cryoprotective glycerol-lactose-yolk medium and hydrophobic nanosilica TS-100 containing n-decane additive adsorbed on its surface incorporated in a matrix was studied using low-temperature $^1$H-NMR spectroscopy method. It is shown that the solid matrix induces formation of 6–7 water molecules per each dean molecule at the interface, which do not take part in formation of hydrogen bonds, and a sharp radius decrease (from 100 to 20 nm) of ice crystals formed in cell suspension at its freezing. The results could give rise to safety improving of their cells at their cryopreservation and low temperature storage conditions by incorporating into a powder composite environment.

**Key words:** $^1$H-NMR spectroscopy, bull gametes, strongly and weakly associated water, water clusters.

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