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Data Article

Data on the positive synergic action of dimethylacetamide and trehalose on quality of cryopreserved chicken sperm

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ABSTRACT

This data article contains supporting information regarding the research article entitled "Combined effect of permeant and non-permeant cryoprotectants on the quality of frozen/thawed chicken sperm"(Mosca et. al., 2016) [1]. The combined effect of the permeant cryoprotectants agent dimethylacetamide and the non-permeant cryoprotectants agent trehalose on the quality of frozen-thawed chicken semen was assessed. In particular, the quantitative dimethylacetamide/trehalose ratio was investigated freezing semen samples according to the following treatments: trehalose 0.1 M+0% dimethylacetamide (DMA-0), trehalose 0.1 M+3% dimethylacetamide (DMA-3), trehalose 0.1 M+6% dimethylacetamide (DMA-6).

Specifications Table

Subject area	*Biology, Animal Science*
More specific subject area	*Cryoconservation of chicken semen*

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Type of data	*Table*
How data was acquired	*Fluorescence microscopy, SCA (Sperm Class Analyzer)*
Data format	*Analyzed*
Experimental factors	*The natural osmoprotectant trehalose (0.1 M) was combined with different level (0–6%) of the permeant cryoprotectant dimethylacetamide to prevent cryodamages in chicken semen.*
Experimental features	*Sperm quality was assessed before and after freezing/thawing in chicken semen processed for cryopreservation using a range of quantitative dimethylacetamide/trehalose ratios to identify the most effective cryoprotective combination.*
Data source location	*Milano, Lodi (Italy)*
Data accessibility	*Data is available with this article*

Value of the data

- Data presented in this paper confirm a positive synergic action of dimethylacetamide and trehalose on quality of frozen-thawed chicken sperm.
- These data encourage the investigation on the interaction between permeating cryoprotectants, like dimethylacetamide, and natural osmoprotectants, such as trehalose, to improve the success of sperm cryopreservation in birds.
- These data contribute for designing further experiments aiming to identify a chicken semen cryopreservation reference procedure.

1. Data

Data include all sperm quality parameters recorded in fresh and cryopreserved chicken semen (Table 1) and the recovery rates of viable and motile sperm after freezing–thawing (Table 2). The most effective cryoprotectant combination includes both trehalose and DMA; in contrast, the absence of DMA (DMA-0) is responsible for more severe loss in sperm quality.

Table 1
Sperm quality parameters (LSMeans ± SE) measured in fresh semen and in semen frozen according the following treatments: 0.1 M trehalose+0% dimethylacetamide (DMA-0), 0.1 M trehalose+3% dimethylacetamide (DMA-3), 0.1 M trehalose+6% dimethylacetamide (DMA-6).

Sperm parameters[a]	Fresh	DMA-0	DMA-3	DMA-6	S.E.
Viability (%)	87.9^{A}	4.3^{B}	31.8^{C}	37.1^{C}	2.0
Motility (%)	81.7^{A}	8.0^{B}	24.2^{C}	29.1^{C}	2.1
Progressive motility (%)	14.1^{A}	0.1^{B}	1.5^{B}	1.2^{B}	1.3
VCL (μm/s)	47.4^{A}	25.7^{B}	35.6^{C}	33.7^{C}	1.5
VSL (μm/s)	17.0^{A}	4.6^{B}	10.1^{C}	9.3^{C}	0.8
VAP (μm/s)	28.3^{A}	10.2^{B}	18.4^{C}	17.8^{C}	1.0
LIN (%)	35.7^{A}	17.9^{B}	28.1^{C}	27.7^{C}	1.0
STR (%)	59.8^{A}	45.2^{B}	54.4^{C}	52.5^{C}	1.1
WOB (%)	59.6^{A}	39.3^{B}	51.6^{C}	52.7^{C}	0.9
ALH (μm)	2.8^{A}	0.9^{B}	2.5^{C}	2.7^{A}	0.1
BCF (Hz)	7.9^{A}	0.7^{B}	6.1^{C}	5.4^{C}	0.4

^{A,B} Values within each row with different superscript letters are significantly different ($p < 0.001$).

[a] Viability, the percentage of viable spermatozoa; motility, the percentage of motile spermatozoa; progressive motility, spermatozoa swim forward fast in a straight line; VCL, curvilinear velocity; VSL, straight-line velocity; VAP, average path velocity; LIN (VSL/VCL × 100), linearity; STR (VSL/VAP × 100) straightness; WOB (VAP/VCL × 100); ALH, amplitude of lateral head displacement; BCF, beat cross frequency.