Effect of deferoxamine mesylate on freezability of blood supplemented canine semen

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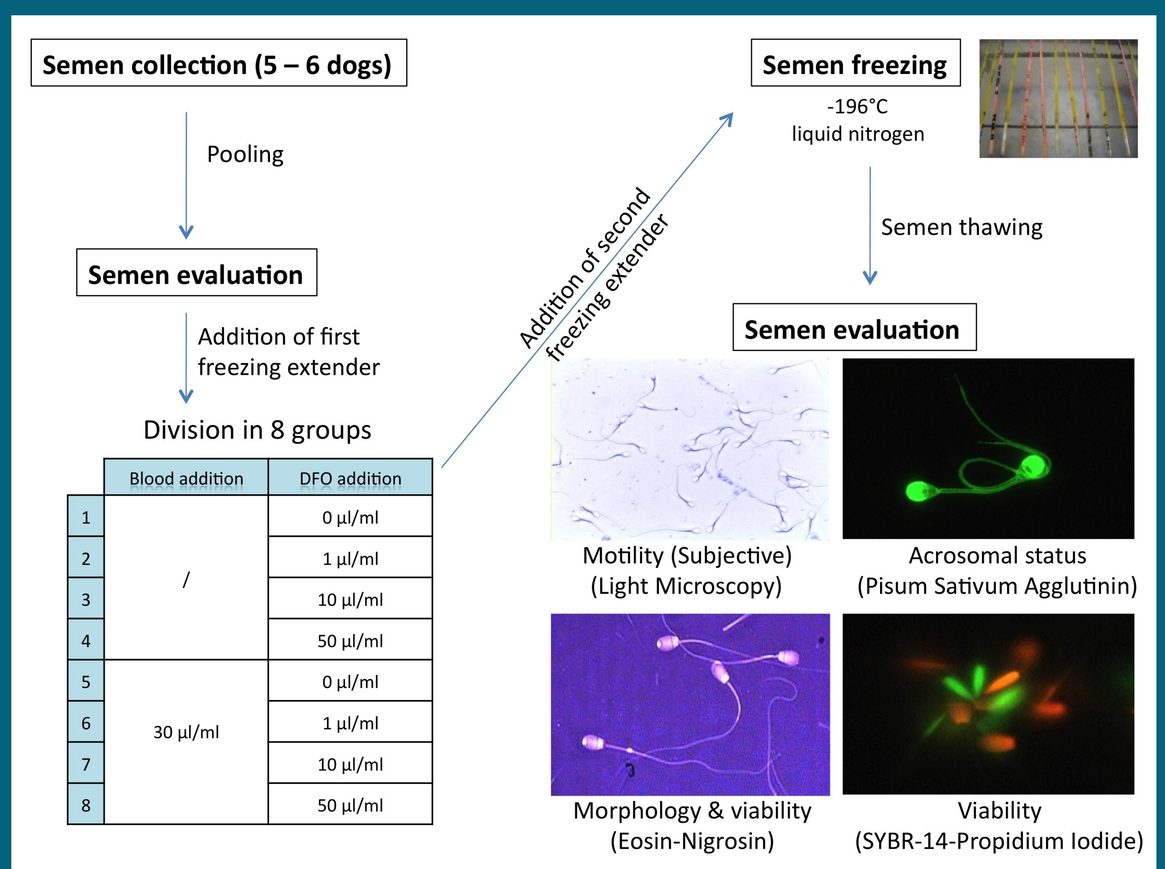
Introduction - Detrimental effects of blood contamination on total and progressive motility of frozen-thawed canine spermatozoa, caused by the release of haemoglobin during freezing have been previously reported.[1]

Purpose - It has previously been shown that deferoxamine mesylate (DFO) , an iron chelating agent, can diminish the effects of haemoglobin (for example in acute renal failure) and can probably eliminate iron from the haemoglobin molecule. This study investigated the effects of DFO (Desferal®, Novartis Pharma, Belgium) on semen freezability.

Methods - Semen of 5 to 6 Beagle dogs was pooled and frozen using a two-step dilution method. Semen was divided in 8 groups before adding the second extender. To the first 4 groups, no blood was added; groups 1 to 4 contained increasing concentrations (0, 1, 10 and 50 µl/ml) of DFO. Groups 5 to 8 each contained 30 µl/ml of blood and increasing concentrations of DFO (0 to 10 µl/ml). Post-thawing motility, viability (eosin-nigrosin; SYBR-14-Propidium Iodide), morphology (eosin-nigrosin) and acrosomal status (Pisum Sativum Agglutinin - PSA) were assessed. The experiment was repeated 5 times.



	Blood addition	DFO addition
1	/	0 µl/ml
2		1 µl/ml
3		10 µl/ml
4		50 µl/ml
5	30 µl/ml	0 µl/ml
6		1 µl/ml
7		10 µl/ml
8		50 µl/ml

Results - No significant differences were observed in sperm morphology, viability and acrosomal status among the 8 different groups. Blood admixture was detrimental on total ($p<0.05$) and a similar tendency ($p=0.08$) was observed on progressive motility.

Discussion – Although blood contamination showed detrimental effects on semen quality after thawing, this effect was not as marked as in previous reports. However in these experiments, blood was added just after semen collection and erythrocytes were centrifuged and equilibrated with the semen, possibly causing a weakening of their membranes. In our experiment, DFO adjunction did not alter blood-free semen quality nor did it improve it in the presence of blood. Our study shows the innocuity of DFO on semen and suggests centrifugation is an important step explaining toxicity of blood on semen.

Conclusions - More experiments are needed to further investigate how centrifugation affects blood contaminated canine semen freezability and if it can be improved by DFO.

[1]Rijsselaere T., Van Soom A., Maes D., Verberckmoes S., de Kruif A. (2004). Effect of blood admixture on in vitro survival of chilled and frozen-thawed canine spermatozoa. Theriogenology *61*, 1589-1602.

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