Bovine in vitro maturation medium with different protein supplementation influences the maturation and fertilization rates

J.S. Lopes[1], S. García-Martínez[1], E. París-Oller[1], R. Romar[1], P. Coy[1]

1 Department of Physiology, Faculty of Veterinary Medicine, University of Murcia, Murcia, Spain

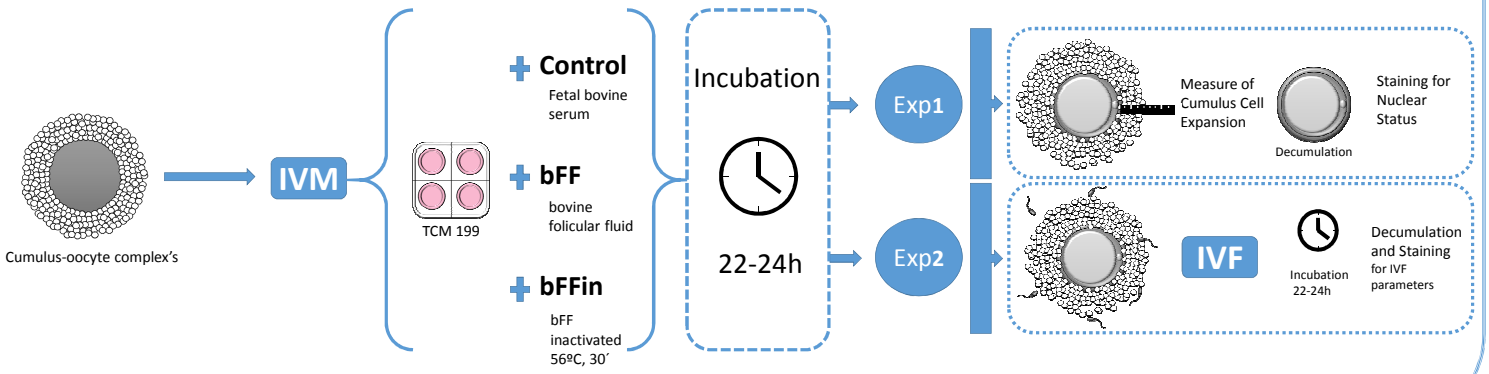
Introduction

While some studies show beneficial outcomes on the use of bovine follicular fluid (bFF) in *in vitro* maturation (IVM), others display neutral or even detrimental effects. The main problem is related to the inhibitory effect on the meiosis resumption when high concentrations are used[1].

Objective

We hypothesized that inactivation of bFF might avoid this feature, thus we conducted 2 experiments to evaluate the effect of bFF (either heat-inactivated or not) on the oocyte competence assessed by different parameters related to the nuclear and cytoplasmic maturation and the IVF efficiency.

Materials and Methods

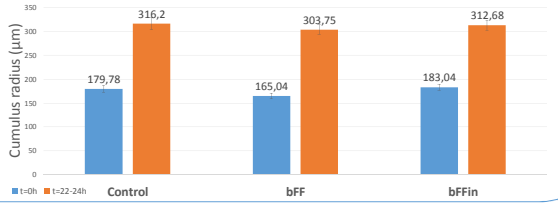


Results

Experiment 1

Nuclear Maturation		
	n	% ± SEM
Control	140	69,29 ± 3,91
bFF	123	68,29 ± 4,21
bFFin	124	68,55 ± 4,19

Cumulus cell expansion



Experiment 2

	n	SPenetration (%± SEM)	Monospermy (%± SEM)	S/O	MPN	ZPb	Efficiency (%± SEM)
Control	228	91.29 ± 1.9a	80.40 ± 2.8	1.31	86.35 ± 2.5	4.50a	73.45 ± 3.0a
bFF	229	83.37 ± 2.5ab	76.43 ± 3.1	1.32	87.33 ± 2.4	3.32b	63.48 ± 3.2ab
bFFin	234	78.41 ± 2.7b	75.44 ± 3.2	1.34	85.36 ± 2.6	1.98c	59.49 ± 3.2b

- Spenetration: sperm penetration; S/O: sperm per oocyte; MPN: Male Pronucleus formation; ZPb: Zona Pelucida binding

Conclusion

Adding bFF to the IVM medium, either heat-inactivated or not, did not improve nor decreased nuclear maturation rates. However, IVF efficiency was lower when using bFFin but not when untreated bFF was used. Most likely, as others studies have shown[2], heating might inactivate some crucial heat-labile proteins that will further influence the ability to form a viable embryo.

References

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2. Collins, A.R. and Wright, R.W., Jr. 1995. Effects on embryo development of heat treatment and filtration of bovine follicular fluid used to supplement IVM medium. Theriogenology. 43, 189.

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