

## Supplementary material

Species/Extract	Compound	Concentration /Dose	Target Species	Application	Analysis	Results	Reference
Comercial	BHA; Catalase; Desfetal; n-propyl gallate; Vitamin E	--	<i>Ovis aries</i> (ram)	Semen cooling	Preservation of motility	No effect	Upreti et al. (1997)
Comercial	Vitamin E; BHT; Time; Vitamin C	--	<i>Meleagris gallopavo</i> (turkey)	Semen cooling	Membrane integrity and motility	Positive effect	Donoghue e Donoghue (1997)
Comercial	GSH; SOD; Vitamin C; Hypotaurine; Tempo; Tempol	--	<i>Bos taurus</i> (bull)	Semen freezing	Lipid peroxidation	Positive effect	Foote et al. (2002)
Comercial	Vitamin E	10 or 40 µg/mL	<i>Meleagris gallopavo</i> (turkey)	Semen cooling	Lipid peroxidation	No effect	Long e Kramer (2003)
Comercial	Tris; d-glucose anhydrous; Citric acid; BHT	--	<i>Capra hircus</i> (goat)	Semen freezing	Progressive motility, acrosome abnormalities and lipid peroxidation	Positive effect	Khalifa e El-Saidy (2006)
Comercial	EGCG, Na pyruate; Catalase; SOD	--	<i>Sus scrofa</i> (boar)	Semen cooling	Acrosome and plasma membrane integrity	Positive effect	Vallorani et al. (2010)
Comercial	Vitamin E	0; 20; 200; 1000 or 2400 UI	<i>Ovis aries</i> (ram)	Food supplementatio n	Semen quality and quantity	Positive effect	Yue et al. (2010)
Comercial	Vitamin E	0,5; 1,0; 1,5 and 2,0 mg/ml	<i>Bos taurus</i> (bull)	Semen freezing	Standard semen quality parameters	Positive effect	Hu et al. (2011)
Comercial	BHT	0,5 mM, 1,0 mM, 2,0 mM and 3,0 mM	<i>Capra hircus</i> (goat)	Semen freezing	Motility, acrosome and plasma membrane integrity	Positive effect	Memon et al. (2011)
Comercial	Taurine; Hypotherpus; Vitamin C; Vitamin E	--	<i>Sparus aurata</i> (gilthead seabream ); <i>Dicentrarchus labrax</i> (European seabass)	Semen freezing	Cell viability, motility and DNA fragmentation	Positive effect	Cabrita et al. (2011)

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Comercial	Vitamin E	150 mg/kg/day/dry matter	<i>Coturnix coturnix japonica</i> (japanese quail)	Food supplementation	Standard semen quality parameters	Positive effect	Golzar Adabi et al. (2011)
Comercial	Selenium	0,3 mg/kg	<i>Meleagris gallopavo</i> (turkey)	Food supplementation	Semen quality and quantity	Positive effect	Słowińska et al. (2011)
Comercial	Arbutin	0,1; 0,2; 0,3 and 0,4 M	<i>Capra hircus</i> (goat)	Semen freezing	Motility and acrosome integrity	Positive effect	Aboagla e Maeda (2011)
Comercial	Vitamin E	100, 200, 300 and 400 mg/ml	<i>Sus scrofa</i> (boar)	Semen cooling	Lipid peroxidation	Positive effect	Mendez et al. (2013)
Comercial	Vitamin C, Vitamin E, Selênio	--	<i>Oryctolagus cuniculus</i> (rabbit)	Food supplementation	Testosterone, fertility, number of offspring	Positive effect	Attia et al. (2013)
Comercial	Vitamin E	30, 60 and 120 µM	<i>Ovis aries</i> (ram)	Semen freezing	Structural integrity (plasma membrane and mitochondria)	Positive effect	Silva et al. (2013)
Comercial	Catalase	50, 100 and 150 U/mL	<i>Bos taurus</i> (bull)	Semen cooling	Motility, acrosome and plasma membrane integrity	Positive effect	Peruma et al. (2013)
Comercial	Alginate	0.2, 0.4, 0.6, 0.8, and 1.0 mg/mL.	<i>Sus scrofa</i> (boar)	Semen freezing	Motility and functional integrity	Positive effect	Hu et al. (2014)
Comercial	Argan oil	1%, 2%, 5% and 10% v/v	<i>Ovis aries</i> (ram)	Semen cooling	Spermatologic parameters, lipid peroxidation and DNA fragmentation	Positive effect	Allai et al. (2015)
Comercial	Coconut water solution	--	<i>Sapajus apella</i> (capuchin monkey)	Semen cooling	Preserve sperm motility and viability	Positive effect	Leão et al. (2015)
Comercial	Melatonin	1, 2, 3 and 4 mM	<i>Bos taurus</i> (bull)	Semen cooling	Motility, acrosome and plasma membrane and nuclear integrity	Positive effect	Permural et al. (2015)

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Acetone extract from <i>Opuntia ficus indica</i> cladodes	Opuntia ficus-indica	1%, 2%, 4% and 8%	<i>Ovis aries</i> (ram)	Semen cooling	Semen variables, lipid peroxidation and DNA fragmentation	Positive effect	Allai et al. (2016)
Comercial	Vitamin E	5 and 10 µg/mL	<i>Gallus gallus domesticus</i> (rooster)	Semen freezing	Membrane integrity and motility	Positive effect	Safa et al. (2016)
Comercial	Vitamin C and Vitamin E	--	<i>Gallus gallus domesticus</i> (rooster)	Food supplementation	Oxidative stress and fertility	Positive effect	Min et al. (2016)
Commercial extract from <i>Rosmarinus officinalis</i> leaves	Rosemary oil	0, 125, 250 ppm	<i>Coturnix japonica</i> (japanese quail)	Food supplementation	Spermatozoa production, testicular structures and lipid peroxidation	Positive effect	Türk et al. (2016)
Milling of pollen grains from <i>Phoenix dactylifera</i>	Pollen grains	50, 100, 150, 200 and 250 mg	<i>Bubalus bubalis</i> (buffaloes)	Semen freezing	Motility, alive sperm and intact sperm membrane	Positive effect	El-Sheshtawy et al. (2016)
Comercial	Resveratrol	10 mg/kg	<i>Rattus norvegicus</i> (rato)	Intraperitoneal injections	Motility, oxidative damage to lipids and proteins.	Positive effect	Ourique et al. (2016)
Comercial	Trehalose	15, 30, 45 and 60 mM	<i>Bubalus bubalis</i> (buffaloes)	Semen freezing	Antioxidant enzymes profile during cryopreservation, <i>in vitro</i> and <i>in vivo</i>	Positive effect	Iqbal et al. (2016)
Comercial	L-glutamine	2,5, 5 and 7,5 mM	<i>Gallus gallus domesticus</i> (rooster)	Semen freezing	Sperm viability, total and progressive sperm motilities	Positive effect	Khiabani et al. (2017)
Milling of sements from <i>Silybum marianum</i> and leaves <i>Rosmarinus officinalis</i>	Milk thistle seeds and rosemary leave	5 and 10 g/kg	<i>Oryctolagus cuniculus</i> (rabbit)	Food supplementation	Reproductive performance, semen quality and blood metabolites	Positive effect	Attia et al. (2017)
Comercial	Vitamin C and Vitamin E	--	<i>Litoria booroolongensis</i> (frog)	Semen cooling	Sperm motility activation	No effect	Keogh et al. (2017)
Comercial	Royal jelly	0,25, 0,5 and 0,75%	<i>Capra hircus</i> (goat)	Semen cooling	Post-thaw quality and incubation resilience	Positive effect	Alcay et al. (2017)

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Comercial	Glutathione reduced	0, 5 or 10 mM	<i>Canis lupus familiaris</i> (dog)	Semen cooling	Motility, viability, morphology	No effect	Andersen et al. (2018)
Comercial	Oligomeric proanthocyanidins	10, 30, 50 and 70 µg/mL	<i>Sus scrofa</i> (boar)	Semen cooling	Motility, acrosome integrity, membrane and mitochondria	Positive effect	Li et al. (2018)
Commercial cinnamon bark	Cinnamtannin B-1	0,1, 1, 10 and 100 µg/mL	<i>Cervus elaphus</i> (stag)	Semen fresh	Progressive motility, velocity and lipid peroxidation	Positive effect	Sánchez-Rubio et al. (2018)
Comercial	Pasture	--	<i>Gallus gallus domesticus</i> (rooster)	Food supplementation	Motility, acrosome integrity, membrane and morphology	Positive effect	Santiago-Moreno et al. (2018)
<i>Radix Isatidis</i> commercial irps isatis	Polysaccharide	0,2, 0,4, 0,6, 0,8 and 1,2 mg/mL	<i>Sus scrofa</i> (boar)	Semen cooling	Motility, acrosome integrity, membrane and mitochondria	Positive effect	Ren et al. (2019)
Comercial	Epigallocatechin and catalase	--	<i>Camelus dromedarius</i> (dromedary camel)	Semen freezing	Motility variables, viability and acrosome integrity	Positive effect	Malo et al. (2019)
Comercial	Resveratrol	10, 50, 100 and 250 µM	<i>Capra hircus</i> (goat)	Semen freezing	Motility, morphology, membrane and acrosome integrity, mitochondrial	Positive effect	Lv et al. (2019)
Residue from the pressing of <i>Vitis vinifera</i> grapes	Grape marc	2% and 4%	<i>Sus scrofa</i> (boar)	Food supplementation	Semen quality and Lipid peroxidation	Positive effect	Gloria et al. (2019)
Comercial	MnTBAP, NAC and FeTPPS	--	<i>Equus caballus</i> (stallion)	Semen freezing	Quality and function variables	Positive effect	Treulen et al. (2019)
Comercial	MnTBAP	150 mM	<i>Equus caballus</i> (stallion)	Semen freezing	Quality and function variables	Positive effect	Treulen et al. (2020)
Comercial	Astaxanthin	0,5; 5 and 15 µM	<i>Sus scrofa</i> (boar)	Semen freezing	Progressive motility, sperm viability, lipid peroxidation and apoptoticlike	Positive effect	Basioura et al. (2020)

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Comercial	BHT	0,5, 1,0, 1,5 and 2,0 mM	<i>Canis lupus familiaris</i> (dog)	Semen freezing	Motility, morphology, membrane and acrosome integrity, mitochondrial	Positive effect	Sun et al. (2020)
Hydroalcoholic extraction of herbs <i>Curcuma longa</i> Linn./ <i>Mentha spicata</i> L./ <i>Thymus vulgaris</i>	Mint, thyme and curcumin	50 or 100 µg	<i>Capra hircus</i> (goat)	Semen freezing	Progressive motility, vitality, and plasma membrane	Positive effect	Ismail et al. (2020)
Comercial	Resveratrol	0,01, 0,1 ou 1 mM	<i>Sus scrofa</i> (boar)	Semen cooling	Motility, kinetics, plasma and acrosome integrity, mitochondrial	No effect	Torres et al. (2021)
Comercial	Glutathione	0,1 mM, 0,5 mM and 1,0 mM	<i>Gallus gallus murghi</i> (red jungle fowl)	Semen freezing	Motility, membrane and acrosome integrity, mitochondrial and fertility	Positive effect	Ansari et al. (2021)
Commercial flaxseed oil	Flaxseed oil	3,0% (90 mL)	<i>Sus scrofa</i> (boar)	Food supplementation	Motility, viability, abnormality, acrosomal integrity and velocity	Positive effect	Singh et al. (2021)
Milling of Ripe fruits of <i>Ceratonia siliqua</i> L.	Carob fruit	1 g /kg of diet	<i>Gallus gallus domesticus</i> (rooster)	Food supplementation	Semen characters, testicular histology, and reproductive performance	Positive effect	Nemati et al. (2022)
Commercial flaxseed oil	Flaxseed oil	3,0% (90 mL)	<i>Sus scrofa</i> (boar)	Food supplementation	Motility, viability, abnormality, acrosomal integrity and velocity	Positive effect	Singh et al. (2022)