Supplementary material[1]

The effect of male age, extender, cooling time and freezing method on post-thaw Brahman cattle sperm motility

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Table S1 - Sperm quality variables (percentage means ± standard error of the mean) before freezing semen according to cooling time and age in Brahman bull semen

	Cooling time (h)			Age (months)	
Variable	0	4	6	24-48	>48
Total motility	62.13±0.97a	52.91±1.01c	57.13±1.13b	62.33±0.80x	52.44±0.89y
Progressive motility	46.14±0.84a	38.24±0.87b	40.16±0.98b	44.14±0.69x	38.89±0.77y
FSS*	38.83±1.38a	34.75±1.44a	36.33±1.61a	35.39±1.14x	37.88±1.27x
MSS*	7.57±0.27ab	6.75±0.28b	7.85±0.32a	8.28±0.22x	6.50±0.25y
SSS*	15.08±1.22a	10.79±1.27b	12.13±1.42a	17.98±1.01x	7.35±1.12y

0 h - fresh semen; FSS - fast speed spermatozoa; MSS - medium speed spermatozoa; SSS - slow speed spermatozoa.

* Spermatozoa with movement categorized as fast (>45 $\mu m \cdot s^{-1}$), medium (25 ≤ x < 45 $\mu m \cdot s^{-1}$), slow (10 < y < 25 $\mu m \cdot s^{-1}$).

Different letters (a–c) within the same row indicate statistical differences among cooling times ($P<0.05$), whereas different letters (x–y) within the same row indicate statistical differences among bull age groups ($P<0.05$).

[1] The supplementary material was neither revised nor formatted by this journal.

Table S2 - Kinematic variables (means ± standard error of the mean) before freezing semen according to cooling time and age in Brahman bull semen

	Cooling time (h)			Age (months)	
Variable	0	4	6	24-48	>48
VCL	101.97±0.28a	87.85±0.79c	91.34±0.69b	97.25±0.26x	90.19±0.68y
VSL	47.51±0.16a	38.66±0.46b	39.99±0.40b	41.92±0.15x	42.18±0.39x
VAP	57.10±0.16a	47.47±0.44c	49.76±0.38b	52.09±0.15x	50.80±0.38y
LIN	47.32±0.11a	45.51±0.30b	43.73±0.26c	45.08±0.10y	45.96±0.26x
STR	79.70±0.13a	77.67±0.35b	75.02±0.31c	78.29±0.12x	76.64±0.30y
WOB	56.98±0.08a	56.07±0.22b	55.59±0.19b	55.40±0.07y	57.03±0.18x
ALH	3.69±0.01a	3.35±0.03c	3.47±0.02b	3.63±0.01x	3.37±0.02y
BCF	9.92±0.02a	9.00±0.07b	8.72±0.06c	9.87±0.02x	8.55±0.06y

0 h - fresh semen; VCL - curvilinear velocity (μm·s^{-1}); VSL - straight line velocity (μm·s^{-1}); VAP - average path velocity (μm·s^{-1}); LIN - linearity of forward progression (%); STR - straightness (%); WOB - wobble (%); ALH - amplitude of lateral head displacement (μm); BCF - beat-cross frequency (Hz).
Different letters (a–c) within the same row indicate statistical differences among cooling times ($P<0.05$), whereas different letters (x–y) within the same row indicate statistical differences among bull age groups ($P<0.05$).