

Table 2: Post cooling spermatozoa progressive motility of diluted NZW rabbit semen (either included honey bee or/and RJ) stored at 5°C.

Extend er	Preservation time (hours)													Overall mean ± SE	Sig.
	0	2	4	6	24	48	72	96	120	144	168	192	216		
1	88.3	66.0	67.3	69.7	74.3	68.7	63.0	54.3	41.3	33.3	15.0	10.7	4.7	50.5±0.30 ^I	**
2	89.3	77.0	73.7	67.7	88.7	82.3	79.0	76.0	67.7	34.7	23.0	10.0	4.3	59.5±53.5 ^E	**
3	90.3	85.0	85.0	78.0	79.0	78.0	75.7	71.7	50.0	43.0	39.7	24.7	18.7	61.7 ±0.30 ^C	**
4	93.0	88.0	83.0	80.7	80.7	77.7	70.0	60.7	46.0	36.0	27.3	20.7	13.7	59.8 ±0.30 ^D	**
5	94.0	88.3	84.3	78.7	69.7	67.0	62.7	56.0	44.7	29.3	20.0	14.7	10.3	55.4 ±0.30 ^F	**
6	86.3	79.3	64.0	52.7	26.0	17.7	8.7	0.0	0.0	0.0	0.0	0.0	0.0	25.7 ±0.30 ^K	**
7	59.0	30.0	19.3	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6 ±0.30 ^L	**
8	60.3	33.3	17.3	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9 ±0.30 ^L	**
9	95.0	92.3	90.7	89.7	89.3	88.3	86.3	86.3	78.7	71.7	65.7	44.3	33.0	77.8 ±0.30 ^A	**
10	92.7	91.0	88.7	87.3	86.3	86.3	79.3	71.7	66.0	59.3	54.7	37.7	21.7	71.0 ±0.30 ^B	**
11	92.0	81.7	76.7	75.7	73.3	73.0	67.7	68.3	66.0	41.3	24.0	3.3	0.0	57.2 ±0.30 ^{EF}	**
12	92.0	77.3	75.3	70.7	68.3	67.7	66.0	65.7	59.3	40.7	20.7	1.7	0.0	54.3 ±0.30 ^G	**
13	92.3	75.7	71.3	69.3	67.7	64.7	64.0	63.0	57.3	38.7	18.7	0.0	0.0	52.5 ±0.30 ^H	**
14	90.7	82.0	80.0	68.3	41.0	18.7	2.7	0.0	0.0	0.0	0.0	0.0	0.0	29.5 ±0.30 ^J	**
Overall mean ± SE	86.8 ±0.32 ^A	75.0 ±0.32 ^C	69.2 ±0.32 ^E	64.1 ±0.32 ^G	60.3 ±0.32 ^H	58.4 ±0.32 ^I	51.8 ± 0.32 ^J	48.1 ±0.32 ^K	41.2 ±0.32 ^L	30.6 ± 0.32 ^M	22.1 ± 0.32 ^N	11.9 ± 0.32 ^O	7.6 ± 0.32 ^P		
Sig.	**	**	**	**	**	**	**	**	**	**	**	**	**		

Overall means within a column or a row with different superscript letters differ significantly (P< 0.05)

Standard error for all replicates within the treatments and time is equal to ±1.2

**P<0.01

Sig: Significance

Table 3: Post cooling spermatozoa dead percentage of diluted NZW rabbit semen (either included honey bee or/and RJ) stored at 5°C.

Extender	Time (hours)													Overall mean ± SE	Sig.
	0	2	4	6	24	48	72	96	120	144	168	192	216		
1	10.7	11.3	12.3	12.7	13.7	17.3	21.7	28.7	41.7	48.7	61.0	70.0	81.3	33.2 ±0.27 ^D	**
2	9.7	10.0	10.3	10.3	10.3	10.7	11.0	12.7	17.0	38.0	47.7	61.0	73.0	24.7 ±0.27 ^H	**
3	6.0	6.3	7.7	8.3	8.7	8.7	9.3	9.7	27.7	31.7	35.7	42.3	57.0	19.9 ±0.27 ^J	**
4	7.3	8.3	9.3	9.7	10.0	10.7	12.7	20.3	25.7	33.3	40.3	50.3	59.7	22.9 ±0.27 ^I	**
5	6.7	8.3	8.7	10.7	12.3	17.3	17.7	23.7	36.3	39.0	50.0	60.7	69.7	27.8 ±0.27 ^G	**
6	8.3	10.3	14.7	27.7	36.0	56.3	71.0	81.0	85.7	91.0	94.7	94.0	97.7	59.1 ±0.27 ^B	**
7	25.3	35.3	53.0	73.3	81.0	82.7	83.3	85.0	89.0	94.3	93.7	96.7	97.7	76.2 ±0.27 ^A	**
8	26.3	33.7	55.7	73.7	81.0	82.7	83.3	85.0	89.0	93.7	94.3	96.7	97.7	76.4 ±0.27 ^A	**
9	3.7	5.3	6.7	6.7	7.3	7.7	9.3	9.7	14.0	18.3	26.3	36.0	50.0	15.5 ±0.27 ^K	**
10	4.7	6.0	5.3	8.7	8.7	8.3	12.3	17.7	26.3	31.3	32.3	47.7	63.3	21.0 ±0.27 ^J	**
11	5.3	12.0	15.0	15.3	15.7	15.7	17.7	20.0	24.0	36.0	40.0	79.0	86.0	29.4±0.27 ^F	**
12	5.3	13.3	15.0	16.0	17.3	18.0	18.7	18.7	20.3	36.3	43.7	78.3	86.3	29.8 ±0.27 ^{EF}	**
13	5.3	14.3	16.7	17.0	18.3	18.3	19.7	21.0	21.3	36.7	44.7	81.0	87.3	30.9 ±0.27 ^E	**
14	7.3	12.0	13.0	20.0	36.3	44.0	72.0	80.0	82.7	85.3	86.3	87.3	92.7	55.3 ±0.27 ^C	**
Overall mean	9.5	13.3	17.4	22.2	25.4	28.5	32.8	36.6	42.9	51.0	52.2	70.1	78.5		
± SE	±0.28^O	±0.28^N	±0.28^L	±0.28^J	±0.28^I	±0.28^H	±0.28^G	±0.28^F	±0.28^E	±0.28^D	±0.28^C	±0.28^B	±0.28^A		
Significance	**	**	**	**	**	**	**	**	**	**	**	**	**	**	

Overall means within a column or a row with different superscript letters differ significantly (P< 0.05)

Standard error for all replicates within the treatments and time is equal to ±1.2

**P<0.01 Sig: Significance

Table 4: Post cooling spermatozoa abnormalities percentage of diluted NZW rabbit semen (either included honey bee or/and RJ) stored at 5°C.

Extender	Preservation time (hours)													Overall mean ± SE	Sig.
	0	2	4	6	24	48	72	96	120	144	168	192	216		
1	8.7	10.0	10.0	10.3	10.7	11.7	13.3	14.3	16.3	17.3	18.3	20.3	21.7	14.1± 0.62 ^{CDE}	***
2	8.3	9.0	9.0	9.3	9.3	9.7	9.7	9.7	11.7	16.0	17.7	18.3	20.7	12.2±0.62 ^{DEF}	***
3	4.0	4.3	6.3	6.7	7.0	7.3	8.0	8.0	13.3	14.7	15.3	17.0	23.7	10.4± 0.62 ^{GF}	***
4	6.0	6.7	8.0	8.3	8.7	9.0	10.0	12.3	14.0	13.7	15.7	16.7	19.0	12.5±0.62 ^{EFG}	***
5	4.3	7.3	7.7	9.3	10.7	11.7	12.0	14.0	14.3	15.0	17.3	18.0	20.3	12.5± 0.62 ^{CD}	***
6	7.0	9.3	11.3	14.7	14.7	19.0	20.6	24.7	28.7	32.3	32.3	33.7	34.7	19.3± 0.62 ^B	***
7	12.3	17.0	22.0	23.0	24.7	26.0	27.3	28.3	29.3	32.3	32.7	34.7	34.7	26.5± 0.62 ^A	***
8	12.3	17.0	22.3	24.7	24.7	26.0	27.3	28.3	29.3	32.3	32.7	34.7	34.7	24.7± 0.62 ^A	***
9	2.7	3.0	5.3	5.7	6.0	6.3	7.7	7.7	10.3	12.0	15.0	15.0	23.7	9.3± 0.62 ^G	***
10	3.7	4.3	6.3	6.7	7.0	7.3	9.7	11.7	15.3	15.3	16.0	18.0	24.3	11.2± 0.62 ^{GF}	***
11	3.7	10.0	10.3	11.0	11.0	11.3	13.0	13.0	14.7	14.8	18.3	30.3	33.3	15.0±0.62 ^{CD}	***
12	3.7	10.0	10.7	11.7	12.7	13.3	13.3	13.7	15.3	16.3	19.7	26.3	32.7	15.3±0.62 ^{CD}	***
13	3.7	10.0	12.7	13.0	13.3	14.0	15.0	15.7	16.0	18.7	21.7	26.7	33.3	16.4±0.62 ^C	***
14	5.3	8.3	10.3	15.0	18.3	21.3	31.0	33.0	33.3	33.7	34.3	35.3	37.7	23.6±0.62 ^B	***
Overall mean ± SE	6.1± 0.6^{VK}	8.7± 0.6^{VJK}	9.0± 0.6^{VJK}	11.3± 0.6^{VHJ}	10.9± 0.6^{VHJ}	11.2± 0.6^{VGHJ}	12.1± 0.6^{VGHI}	12.7± 0.6^{VGH}	13.9± 0.6^{VFG}	15.6± 0.6^{VDE}	16.7± 0.6^{VEF}	18.7± 0.6^{VDE}	20.3± 0.6^{VCD}		
Significance	**	**	**	**	**	**	**	**	**	**	**	**	**	**	

Overall means within a column or a row with different superscript letters differ significantly (P< 0.05)

Standard error for all replicates within the treatments and time is equal to ±1.2

**P<0.01

Sig: Significance

Table 5: Post cooling fertilizing capacity of diluted NZW rabbit semen stored at 5°C.

Extender	Preservation time (hours)									
	0		24		72		120		168	
	Conception rate % (/ 10 does)	Litter size /doe	Conception rate % (/ 10 does)	Litter size /doe	Conception rate % (/ 10 does)	Litter size /doe	Conception rate % (/ 10 does)	Litter size /doe	Conception rate % (/ 10 does)	Litter size /doe
1	80.0±12.57	7.6±0.29 ^{CD}	70.0±12.57	6.9±0.29 ^{CD}	70.0±12.08	5.3±0.27 ^C	40.0±13.45	6.0±0.42 ^C	-	-
2	80.0±12.57	7.9±0.29 ^D	80.0±12.57	7.6±0.29 ^{ABC}	80.0±12.08	6.9±0.25 ^B	60.0±13.45	7.2±0.34 ^{ABC}	-	-
3	90.0±12.57	8.0±0.28 ^A	80.0±12.57	7.6±0.29 ^{ABC}	70.0±12.08	5.9±0.27 ^C	50.0±13.45	6.8±0.37 ^{BC}	-	-
4	90.0±12.57	7.9±0.29 ^D	70.0±12.57	7.0±0.29 ^{BC}	60.0±12.08	5.8±0.29 ^C	40.0±13.45	7.3±0.42 ^{AB}	-	-
5	90.0±12.57	7.9±0.28 ^D	70.0±12.57	7.1±0.29 ^{BC}	60.0±12.08	5.8±0.29 ^C	40.0±13.45	7.3±0.42 ^{AB}	-	-
6	80.0±12.57	7.6±0.29 ^{CD}	-	-	-	-	-	-	-	-
7	50.0±13.45	7.2±0.34 ^D	-	-	-	-	-	-	-	-
8	60.0±12.08	7.1±0.29 ^D	-	-	-	-	-	-	-	-
9	90.0±12.57	8.3±0.29 ^B	90.0±12.57	8.3±0.29 ^A	90.0±12.08	9.3±0.24 ^A	80.0±13.45	8.1±0.28 ^A	70.0±6.04	7.9±0.28
10	90.0±12.57	8.3±0.29 ^B	90.0±12.57	7.9±0.29 ^{AB}	70.0±12.08	7.0±0.28 ^B	60.0±13.45	6.8±0.34 ^{BC}	50.0±6.04	7.2±0.34
11	90.0±12.57	8.1±0.28 ^{AB}	80.0±12.57	6.8±0.29 ^{CD}	60.0±12.08	6.8±0.29 ^B	60.0±13.45	6.8±0.34 ^{BC}	-	-
12	90.0±12.57	7.6±0.29 ^{CD}	50.0±12.57	6.0±0.29 ^{DE}	60.0±12.08	6.8±0.29 ^B	50.0±13.45	6.2±0.37 ^{BC}	-	-
13	90.0±12.57	7.3±0.42 ^D	40.0±12.57	7.0±0.29 ^{BC}	-	-	40.0±13.45	4.0±0.37 ^D	-	-
14	80.0±12.57	7.2±0.34 ^D	30.0±12.57	5.3±0.29 ^D	-	-	-	-	-	-
Sig.	*	*	**	**	**	**	**	**	**	NS

Overall means within a column or a row with different superscript letters differ significantly (P< 0.05)

NS = Not significant *P<0.05 **P<0.01

Sig: Significance