Table 2. Effect of honey bee supplementation in semen extender on V-line rabbit semen quality during incubation at 37°C for up 6 hours (Ls means ± SE)

Items	Incubation period (hours)	Honey bee levels (ml)				Ls Means ± SE
		0 (Control)	1	3	5	
Advanced Sperm Motility%	0.0	77.00±0.58	77.00±0.58	81.00±0.58	85.00±1.15	80.00^{A}±1.05
	2.0	65.00±1.54	70.33±0.88	78.00±1.73	78.00±0.58	72.83^{B}±1.73
	6.0	55.00±1.53	68.00±1.73	70.67±0.88	74.00±0.58	66.98^{C}±2.24
Ls Means ± SE		65.67^{d}±3.23	71.78^{c}±1.47	76.56^{b}±1.64	79.00^{a}±1.66	73.25±2.00
Sig. Interaction	**					
dead Spermatozoa %	0.0	18.00±0.58	17.00±0.58	15.00±0.58	13.00±0.58	15.75^{C}±0.63
	2.0	23.33±0.88	20.00±0.58	16.67±1.45	17.00±1.15	19.25^{B}±0.93
	6.0	31.33±0.88	22.67±0.88	21.67±1.20	21.00±0.58	24.27^{A}±1.32
Ls Means ± SE		24.22^{a}±1.98	19.89^{b}±0.89	17.78^{c}±1.15	17.00^{c}±1.22	19.72±1.31
Sig. Interaction	**					
sperm abnormalities %	0.0	14.00±0.58	14.33±0.88	12.00±0.58	12.00±0.58	13.08^{C}±0.43
	2.0	23.33±1.20	18.67±0.88	15.00±0.58	16.00±0.58	18.25^{B}±1.04
	6.0	28.33±0.88	22.67±1.20	19.00±0.58	16.00±0.58	21.50^{A}±1.43
Ls Means ± SE		21.89^{a}±2.15	18.56^{b}±1.30	15.33^{c}±1.05	14.67^{c}±0.73	17.61±1.30
Sig. Interaction	**					
Acrosomal damages %	0.0	16.00±1.53	14.67±1.20	14.00±0.58	14.67±0.33	14.83^{C}±0.49
	2.0	19.33±0.88	18.66±0.88	17.67±0.88	17.67±0.88	18.33^{B}±0.43
	6.0	24.67±1.20	20.00±0.88	18.33±0.88	17.00±1.53	20.08^{A}±1.00
Ls Means ± SE		20.00^{a}±1,40	17.89^{b}±0.98	16.67^{b}±0.78	16.44^{b}±0.69	17.75±0.96
Sig. Interaction	**					

Means within the same column (A, B, C) or the same row (a, b, c) within each parameter bearing different letter superscripts are significantly different (P≤0.05).

Table 3. Effect of honey bee supplementation in semen extender on V-Line rabbit semen quality during preservation at 5°C for up 72 hours (**Ls Means ± SE**)

Items	Preservation Period (hours)	Honey bee levels (ml)				Ls Means ± SE
		0 (Control)	1	3	5	
Advanced Sperm Motility%	24	63.00±1.15	73.67±0.88	76.67±0.88	72.67±0.88	71.50^{A}±1.60
	48	57.67±1.45	67.00±1.53	73.00±0.58	74.67±0.88	68.08^{B}±2.07
	72	48.00±1.15	61.00±1.53	65.67±1.76	66.00±1.53	60.17^{C}±2.29
Ls Means ± SE		56.22^{c}±2.28	67.22^{b}±1.95	71.78^{a}±1.72	71.11^{a}±1.43	66.58±1.85
Sig. Interaction	**					
dead Spermatozoa %	24	23.33±0.88	19.67±0.33	17.00±1.15	14.67±0.88	18.67^{C}±1.04
	48	28.67±0.88	25.00±0.58	25.33±1.20	19.33±0.88	24.58^{B}±1.08
	72	30.33±0.88	25.67±1.20	26.00±0.58	24.67±1.45	26.67^{A}±0.80
Ls Means ± SE		27.44^{a}±1.44	23.44^{b}±1.03	22.78^{b}±1.53	19.56^{c}±1.55	23.31±1.39
Sig. Interaction	**					
Sperm abnormalities %	24	18.67±0.88	18.00±1.15	15.00±0.58	16.33±1.67	17.00^{C}±0.66
	48	25.00±1.15	24.00±1.53	19.67±1.20	18.00±0.58	21.67^{B}±1.01
	72	30.33±0.88	23.00±1.15	24.83±0.88	21.67±0.88	24.83^{A}±1.08
Ls Means ± SE		24.67^{a}±1,76	21.67^{b}±1.13	19.67^{c}±1.42	18.67^{c}±0.99	21.17±1.32
Sig. Interaction	**					
Acrosomal damages %	24	18.00±1.53	16.67±2.03	17.00±0.58	18.00±0.58	17.42^{C}±0.59
	48	22.00±1.15	21.67±0.88	20.67±0.88	20.67±0.88	21.25^{B}±0.45
	72	27.67±0.88	23.33±0.88	21.33±0.88	20.00±1.53	23.08^{A}±0.99
Ls Means ± SE		22.55^{a}±1.53	20.56^{b}±1.21	19.67^{b}±0.78	19.56^{b}±0.67	20.585±1.05
Sig. Interaction	*					

Means within the same column (A, B, C) or the same row (a, b, c) within each parameter bearing different letter superscripts are significantly different (P≤0.05).

Table 4. Effect of honey bee supplementation in semen extender on TAC and MAD of V-line rabbit semen during incubation period at 5°C for up to72 hour

Items	Incubation period (hours)	Honey bee levels (ml/100ml extender)				Ls Means ± SE
		0 (Control)	1	3	5	
Total antioxidant capacity (TAC) (nm/l)	0.0	0.95±0.03	1.54±0.05	1.76±0.03	1.86±0.03	1.53^{A}±0.11
	2.0	0.78±0.02	1.37±0.08	1.67±0.02	1.79±0.01	1.40^{B}±0.12
	4.0	0.69±0.01	1.23±0.07	1.45±0.05	1.56±0.04	1.23^{C}±0.10
	6.0	0.64±0.01	1.06±0.03	1.34±0.03	1.40±0.01	1.11^{D}±0.09
Ls Means ± SE		0.77^{d}±0.04	1.30^{c}±0.06	1.55^{b}±0.05	1.65^{a}±0.06	
Sig. Interaction	*					
Malonyaldehyde (MAD) (nm/l)	0.0	3.63±0.11	3.14±0.10	2.81±0.07	2.87±0.07	3.11^{C}±0.84
	2.0	3.67±0.8	3.36±0.09	2.90±0.08	2.45±0.08	3.10^{C}±0.15
	4.0	3.99±0.03	3.49±0.04	3.20±0.07	2.76±0.03	3.36^{B}±0.14
	6.0	4.09±0.02	3.66±0.07	3.41±0.03	2.94±0.05	3.53^{A}±0.13
Ls Means ± SE		3.85^{a}±0.07	3.42^{b}±0.07	3.08^{c}±0.08	2.75^{d}±0.87	
M Sig. Interaction	**					

Means within the same column (A, B, C) or the same row (a, b, c) within each parameter bearing different letter superscripts are significantly different (P≤0.05).

Table 5. Effect of honey bee supplementation in semen extender on TAC and MAD of V-line rabbits semen during incubation period at 5°C for up to72 hour

Incubation Period (hours)	Honey bee levels (ml/100 ml extender)				
	0 (Control)	1	3	5	Ls Means ± SE
0.0	$125.00\times10^{2}\pm153$	$86.33\times10^{2}\pm88$	$74.67\times10^{2}\pm203$	$73.00\times10^{2}\pm115$	$89.75\times10^{2D}\pm636$
2.0	$130.00\times10^{2}\pm580$	$92.00\times10^{2}\pm153$	$81.33\times10^{2}\pm145$	$76.33\times10^{2}\pm120$	$94.92\times10^{2C}\pm636$
4.0	$135.67\times10^{2}\pm125$	$104.104\times10^{2}\pm285$	$93.33\times10^{2}\pm120$	$83.67\times10^{2}\pm088$	$104.25\times10^{2B}\pm594$
6.0	$138.67\times10^{2}\pm330$	$106.00\times10^{2}\pm208$	$98.67\times10^{2}\pm145$	$87.33\times10^{2}\pm88$	$107.67\times10^{2A}\pm590$
Ls Means ± SE	$132.33\times10^{2a}\pm164$	$97.17\times10^{2b}\pm263$	$87.00\times10^{2c}\pm294$	$80.08\times10^{2d}\pm177$	$99.145\times10^{2}\pm224$
Sig. Interaction	**				

Means within the same column (A, B, C) or the same row (a, b, c) within each parameter bearing different letter superscripts are significantly different (P≤0.05).

Table 6. Effect of honey bee supplementation in semen extender on total bacterial count of V-line rabbit semen during incubation period at 37°C for up to 6 hours

Preservation period(hours)	Honey bee levels (ml/100ml extender)				
	0 (Control)	1	3	5	Ls Means ± SE
0	$125.00\times10^{2}\pm153$	$86.33\times10^{2}\pm88$	$76.67\times10^{2}\pm88$	$74.00\times10^{2}\pm153$	$90.42\times10^{2DA}\pm619$
24	$130.00\times10^{2}\pm580$	$100.00\times10^{2}\pm58$	$86.67\times10^{2}\pm145$	$78.67\times10^{2}\pm88$	$98.83\times10^{2C}\pm991$
48	$135.67\times10^{2}\pm125$	$119.00\times10^{2}\pm58$	$103.33\times10^{2}\pm338$	$83.00\times10^{2}\pm.88$	$110.33\times10^{2B}\pm588$
72	$138.67\times10^{2}\pm330$	$124.67\times10^{2}\pm145$	$106.00\times10^{2}\pm153$	$91.33\times10^{2}\pm88$	$115.17\times10^{2A}\pm545$
Ls Means ± SE	$132.33\times10^{2a}\pm164$	$107.42\times10^{2b}\pm466$	$93.17c\times10^{2}\pm374$	$81.83d\times10^{2}\pm189$	$103.66\times10^{2}\pm298$
Sig. Interaction	**				

Means within the same column (A, B, C) or the same row (a, b, c) within each parameter bearing different letter superscripts are significantly different (P≤0.05).

Table 7. Effect of honey bee supplementation in semen extender on total bacteria count of V-line rabbit semen during preservation at 5°C for up to 72 hours

Items	Preservation (hours)	Honey bee levels (ml)				Ls Means ± SE
		0 (Control)	1	3	5	
Total anti- oxidant capacity (TAC) (nm/l)	0	0.95±0.03	1.54±0.05	1.76±0.03	1.86±0.03	$1,53^{A}$±0.11
	24	0.79±0.01	1.48±0.04	1.71±0.03	1.75±0.02	1.43^{B}±0.17
	48	0.66±0.01	1.47±0.02	1.51±0.04	1.65±0.02	1.32^{C}±0.12
	72	0.59±0.01	1.36±0.03	1.33±0.03	1.56±0.01	1.21^{D}±0.11
Ls Means ± SE		0.75^{d}±0.04	1.46^{c}±0.02	1.58^{b}±0.05	1.70^{a}±0.04	
Sig. Interaction	**					
Malonyaldehyde (MAD) (nm/l)	0	3.63±0.11	3.14±0.10	2.81±0.07	2.22±0.04	2.95^{D}±0.16
	24	3.75±0.03	3.26±0.06	2.87±0.07	2.35±0.03	3.06^{C}±0.16
	48	3.73±0.03	3.35±0.03	3.06±0.04	2.50±0.04	3.17^{B}±0.14
	72	3.84±0.04	3.60±0.03	3.16±0.02	2.74±0.09	3.34^{A}±0.13
Ls Means ± SE		3.75^{a}±0.04	3.34^{b}±0.06	2.98^{c}±0.05	2.45^{c}±0.06	
Sig. Interaction	*					

Means within the same column (A, B, C) or the same row (a, b, c) within each parameter bearing different letter superscripts are significantly different (P≤0.05).