



## Supplementary Materials:

Table S1. How sperm quality parameters influence DNA fragmentation.

Variables	Total	<5.4	5.4–8.86	8.87–13.76	≥13.77	<i>p</i> -value
Sample size	181 (100%)	45 (24.86 %)	44 (24.31 %)	46 (25.41 %)	46 (25.41 %)	
Sperm Concentration Median (IQR)	43.00 (29.10–65.90)	47.00 (34.00–72.00)	41.55 (30.30–64.38)	45.15 (31.40–79.38)	39.50 (24.60–51.62)	0.256
Progressive Motile Sperm Cells (%) Median (IQR)	43.00 (35.00–51.00)	48.00 (37.00–55.00)	44.50 (39.00–54.25)	41.50 (34.25–47.00)	36.00 (32.25–46.50)	0.002
Total Progressive Motile Sperm Count Median (IQR)	58.30 (30.78–89.90)	59.40 (35.28–112.50)	62.31 (36.25–90.48)	66.35 (33.48–108.02)	42.97 (27.51–72.61)	0.075
Sperm Vitality (%) Median (IQR)	81.00 (75.00–85.00)	82.00 (79.00–87.00)	83.00 (79.00–88.00)	77.00 (71.00– 83.00)	78.00 (71.00–82.75)	<0.001
Normal Morphology (%) Median (IQR)	2.00 (1.00–3.00)	2.00 (1.00–3.00)	2.00 (1.00–2.25)	2.00 (2.00–3.00)	2.00 (1.00–3.00)	0.143
Sperm Chromatin Stability (%) Median (IQR)	75.00 (67.00–82.00)	79.00 (73.00– 84.00)	79.00 (68.00– 88.00)	72.50 (67.50–77.25)	68.50 (61.75–78.00)	<0.001

\* Semen quality parameters by quartile of sperm DNA fragmentation index in unprocessed samples.

**Table S2.** SwimCount™ Harvester vs Density Gradient Centrifugation by quartiles.

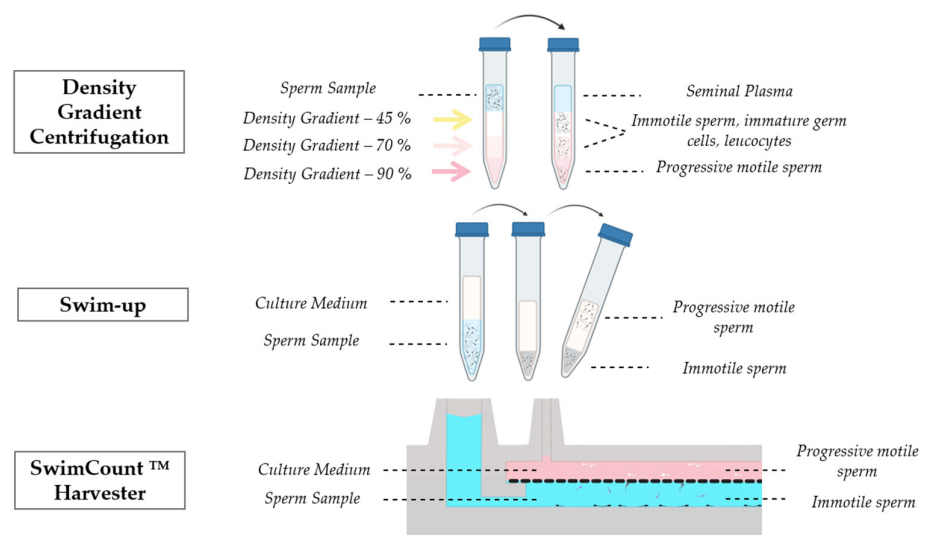
Sperm Quality Parameters Sample Size	Quartiles	Unprocessed	SwimCount™ Harvester	DGC	<i>p</i> -value a	<i>p</i> -value b	<i>p</i> -value c
<b>Sperm Concentration (mill/mL) Median (IQR) <i>n</i> = 100</b>	Q1	12.70 (5.65–18.35)	1.80 (0.85–2.95)	1.60 (0.45–2.85)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 1.00
	Q2	35.20 (28.00–37.15)	5.40 (4.65–6.80)	5.00 (3.75–6.20)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.652
	Q3	47.00 (41.80–52.30)	10.20 (8.70–13.25)	9.80 (7.95–12.65)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 1.00
	Q4	95.00 (76.70–117.5)	24.00 (19.05–32.70)	18.60 (17.60–26.50)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.728
<b>Progressive Motile Sperm Cells (%) Median (IQR) <i>n</i> = 100</b>	Q1	29.00 (24.00–31.00)	70.00 (64.50–74.00)	65.00 (52.00–67.00)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.083
	Q2	38.00 (36.50–40.00)	78.00 (76.00–79.00)	72.00 (70.50–73.50)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> < 0.001
	Q3	45.00 (43.00–46.00)	81.00 (80.50–83.00)	77.00 (76.00–78.00)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> < 0.001
	Q4	55.00 (51.50–57.50)	86.00 (85.50–87.50)	81.00 (80.00–86.00)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.021
<b>Total Progressive Motile Sperm Count (mill) Median (IQR) <i>n</i> = 100</b>	Q1	3.73 (2.25–18.15)	1.14 (0.59–1.78)	0.74 (0.22–1.10)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.180
	Q2	36.90 (30.36–43.10)	3.26 (2.84–3.77)	2.07 (1.63–2.32)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> < 0.001
	Q3	65.44 (58.81–73.24)	6.26 (5.38–8.48)	3.94 (3.08–4.74)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.001
	Q4	135.8 (106.5–189.6)	14.72 (11.92–20.72)	9.24 (6.89–11.43)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.009
<b>DNA Fragmentation Index (%) Median (IQR) DGC <i>n</i> = 90</b>	Q1	4.74 (3.71–5.92)	1.28 (0.86–1.54)	4.47 (3.12–5.63)	<i>p</i> < 0.001	<i>p</i> = 1.00	<i>p</i> < 0.001
	Q2	9.42 (8.65–9.88)	2.85 (2.30–3.38)	9.90 (7.75–10.98)	<i>p</i> < 0.001	<i>p</i> = 1.00	<i>p</i> < 0.001
	Q3	12.05 (10.97–12.97)	5.76 (4.45–6.26)	16.24 (13.91–19.31)	<i>p</i> < 0.001	<i>p</i> = 0.003	<i>p</i> < 0.001
	Q4	19.58 (16.21–23.39)	12.67 (11.15–20.32)	30.93 (25.25–41.86)	<i>p</i> = 0.032	<i>p</i> = 0.002	<i>p</i> < 0.001

\* Quartile stratification of sperm quality parameters to compare SwimCount™ Harvester with Density Gradient Centrifugation. a Statistically significant differences between unprocessed samples and samples processed by SwimCount™ Harvester. b Statistically significant differences between unprocessed samples and samples processed by DGC. c Statistically significant difference between SwimCount™ Harvester and DGC.

Table S3. SwimCount™ Harvester vs Swim-up by quartiles.

Sperm Quality Parameters Sample Size	Quartiles	Unprocessed	SwimCount™ Harvester	Swim-up	<i>p</i> -value a	<i>p</i> -value b	<i>p</i> -value c
<b>Sperm Concentration (mill/mL) Median (IQR) <i>n</i> = 100</b>	Q1	24.00 (19.95–25.60)	6.80 (4.05–7.95)	3.00 (2.40–4.00)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.012
	Q2	38.00 (32.90–43.50)	10.60 (9.75–12.85)	7.00 (5.85–8.20)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> < 0.001
	Q3	55.00 (50.40–59.50)	19.20 (16.50–21.05)	11.80 (9.65–12.75)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> < 0.001
	Q4	88.10 (73.50–92.00)	30.70 (28.60–36.35)	22.40 (16.65–26.80)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.004
<b>Progressive Motile Sperm Cells (%) Median (IQR) <i>n</i> = 100</b>	Q1	31.00 (24.50–34.50)	82.00 (80.00–84.00)	80.00 (76.00–82.00)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.320
	Q2	41.00 (36.00–42.00)	87.00 (86.00–87.50)	86.00 (85.00–87.00)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.046
	Q3	50.00 (48.00–53.00)	90.00 (89.00–90.50)	88.00 (88.00–90.00)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.115
	Q4	57.00 (55.50–61.50)	95.00 (92.00–97.50)	97.00 (93.50–99.00)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.797
<b>Total Progressive Motile Sperm Count (mill) Median (IQR) <i>n</i> = 100</b>	Q1	25.03 (15.98–28.71)	4.46 (3.09–5.69)	2.28 (1.57–2.77)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.007
	Q2	48.00 (35.45–56.53)	7.67 (6.74–8.85)	4.51 (3.99–5.22)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> < 0.001
	Q3	76.00 (66.64)	13.19 (11.71–14.64)	7.73 (6.78–8.69)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> < 0.001
	Q4	134.79 (101.98–149.92)	21.57 (19.39–25.12)	14.34 (11.34–18.79)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.004
<b>DNA Fragmentation Index (%) Median (IQR) DGC <i>n</i> = 90</b>	Q1	3.47 (3.08–3.92)	1.12 (0.52–1.47)	0.85 (0.41–1.34)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 1.00
	Q2	5.49 (5.13–6.27)	2.38 (2.03–2.80)	2.77 (2.16–3.63)	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> = 0.390
	Q3	8.22 (7.25–9.40)	3.71 (3.45–4.35)	5.88 (5.08–6.83)	<i>p</i> < 0.001	<i>p</i> = 0.002	<i>p</i> = 0.001
	Q4	17.20 (14.20–20.48)	9.31 (6.17–11.75)	10.87 (9.39–15.02)	<i>p</i> < 0.001	<i>p</i> = 0.004	<i>p</i> = 0.111

\* Quartile stratification of sperm quality parameters to compare SwimCount™ Harvester with Swim-up. a Statistically significant differences between unprocessed samples and samples processed by SwimCount™ Harvester. b Statistically significant differences between unprocessed samples and samples processed by Swim-up. c Statistically significant difference between SwimCount™ Harvester and Swim-up.



**Figure S1.** Graphical explanation of each sperm selection technique used in this study. Created with BioRender.com.