

Supplementary Table 1. Overall Effect of AI Technique on Reproductive Performance in Gilts (Related to Table 1 in the main manuscript)

Outcome	CAI (%)	PCAI (%)	OR (PCAI vs CAI)	95% CI	P-value
Non-return rate	67.8	81.0	2.02	1.14–3.59	0.016
Farrowing rate	57.6	74.4	2.13	1.24–3.66	0.006

Note: Odds ratios (OR) represent the effect of post-cervical artificial insemination (PCAI) relative to cervical artificial insemination (CAI), estimated from logistic regression models adjusted for semen dose.

Supplementary Table 2. Gilt litter outcomes (Poisson GLM): effect sizes and model p-values (Related to table 1 in main manuscript)

Outcome (gilts; farrowed only)	CAI (mean $\pm$ SEM)	PCAI (mean $\pm$ SEM)	IRR (PCAI vs CAI), 95% CI	P (AI)	P (Dose)	P (AI $\times$ Dose)	Dispersion
Total piglets born	5.37 $\pm$ 0.17	6.56 $\pm$ 0.14	1.32 (1.23–1.41)	<0.001	<0.001	<0.001	0.26
Piglets born alive	5.13 $\pm$ 0.16	6.36 $\pm$ 0.13	1.33 (1.25–1.42)	<0.001	<0.001	<0.001	0.24
Stillborn piglets	0.18 $\pm$ 0.05	0.16 $\pm$ 0.04	1.02 (0.43–2.44)	0.961	0.916	0.449	0.61
Mummified fetuses	0.06 $\pm$ 0.03	0.04 $\pm$ 0.02	1.06 (very wide CI)	0.997	0.566	0.590	0.28
Litter size at weaning	4.88 $\pm$ 0.14	6.11 $\pm$ 0.11	1.34 (1.26–1.42)	<0.001	<0.001	<0.001	0.20

Pre-weaning mortality	0.25 ± 0.06	0.23 ± 0.04	1.25 (0.55–2.83)	0.588	0.463	0.386	0.71
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Notes: (i) Dispersion values <1 indicate underdispersion; no evidence of overdispersion was observed, therefore, Poisson GLM was retained. (ii) For rare outcomes (e.g., mummified fetuses), confidence intervals may be wide due to very low event counts. IRR: Incidence Rate Ratios.

Supplementary Table 3. Overall Effect of AI Technique on Reproductive Performance in Sows (Related to Table 2 in the main manuscript)

Outcome	CAI (%)	PCAI (%)	OR (PCAI vs CAI)	95% CI	P-value (AI)
Non-return rate	73.1	85.2	2.30	1.41–3.74	<0.001
Farrowing rate	66.3	78.7	2.03	1.30–3.15	0.001

Note: Odds ratios (OR) represent the effect of post-cervical artificial insemination (PCAI) relative to cervical artificial insemination (CAI), estimated from logistic regression models adjusted for semen dose.

Supplementary Table 4: Sows litter outcomes (Poisson GLM): effect sizes and model p-values (Related to Table 2 in the main manuscript)

Outcome (sows; farrowed only)	CAI (mean ± SEM)	PCAI (mean ± SEM)	IRR (PCAI vs CAI), 95% CI	P (AI)	P (Dose)	P (AI×Dose)	Dispersion
Total piglets born	8.37 ± 0.19	11.21 ± 0.12	1.38 (1.28–1.48)	<0.001	<0.001	<0.001	0.25
Piglets born alive	7.97 ± 0.18	10.83 ± 0.11	1.40 (1.30–1.51)	<0.001	<0.001	<0.001	0.23
Stillborn piglets	0.36 ± 0.05	0.29 ± 0.04	0.78 (0.52–1.17)	0.225	0.286	0.811	0.88

Mummified fetuses	0.04 ± 0.02	0.09 ± 0.03	2.23 (0.80–6.17)	0.104	0.855	0.311	1.18
Litter size at weaning	7.58 ± 0.17	10.20 ± 0.10	1.38 (1.28–1.50)	<0.001	<0.001	<0.001	0.18
Pre-weaning mortality	0.39 ± 0.05	0.63 ± 0.05	1.73 (1.23–2.42)	0.001	0.031	0.180	0.81

IRR: Incidence Rate Ratios.