

## Supplementary Materials

Statistical analysis of OXTR and PGR staining intensity in IHC.

**Table S1.** Statistical analysis of OXTR-immunopositive staining. Comparison of layers: longitudinal versus circular myometrial layer differentiated in interplacental (IP) and uteroplacental (UP) tissue. Groups (primary uterine inertia, PUI; obstructive dystocia, OD) are presented individually and summarized.

	Group	<i>p</i> -Value (Wilcoxon Matched-Pairs Signed Rank Test)
IP	PUI	$p = 0.0156$
	OD	$p = 0.0156$
	PUI + OD	$p = 0.0001$
UP	PUI	$p = 0.5$
	OD	$p = 0.5$
	PUI + OD	$p = 0.0769$
IP + UP	PUI + OD	$p = < 0.0001$

**Table S2.** Statistical analysis of OXTR-immunopositive staining in interplacental (IP) tissue. Comparison of groups (primary uterine inertia, PUI, versus obstructive dystocia, OD) for each specific myometrial layer (longitudinal/circular) and the combined IP-Myoscore.

	Myometrial Layer	Groups for Comparison	<i>p</i> -Value (Mann–Whitney Test)
IP	Longitudinal	PUI vs. OD	$p = 0.2941$
		PUI-N vs. OD	$p = 0.1939$
IP	Circular	PUI vs. OD	$p = 0.4199$
		PUI-N vs. OD	$p = 0.8869$
IP	Myoscore	PUI vs. OD	$p = 0.5320$
		PUI-N vs. OD	$p = 0.2796$

**Table S3.** Effect of litter size in the primary uterine inertia (PUI) group on OXTR-immunopositive staining in IP tissue differentiating the myometrial layer (longitudinal/circular). PUI bitches with normal litter size (PUI-N, average litter size of the respective breed  $\pm 1$  standard deviation) were compared with litters smaller (PUI-S,  $< -1$  SD) or larger (PUI-L,  $> +1$  SD) than the breed average.

	Myometrial Layer	Groups for Comparison	<i>p</i> -Value (Kruskal–Wallis Test)
IP	Longitudinal	PUI-S vs. PUI-N vs. PUI-L	$p = 0.2346$
IP	Circular	PUI-S vs. PUI-N vs. PUI-L	$p = 0.7273$
IP	Myoscore	PUI-S vs. PUI-N vs. PUI-L	$p = 0.655$

Statistical analysis of PGR staining intensity in IHC.

**Table S4.** Statistical analysis of PGR-immunopositive staining. Comparison of layers: longitudinal versus circular myometrial layer differentiating interplacental (IP) and uteroplacental (UP) tissue. Groups (primary uterine inertia, PUI; obstructive dystocia, OD) were presented individually and summarized.

	Group	<i>p</i> -Value (Wilcoxon Matched-Pairs Signed Rank Test)

IP	PUI	$p = 0.625$
	OD	$p \Rightarrow 0.9999$
	PUI + OD	$p = 0.4531$
UP	PUI	$p = 0.5472$
	OD	$p \Rightarrow 0.9999$
	PUI + OD	$p = 0.6127$
IP+ UP	PUI + OD	$p = 0.8462$

**Table S5.** Statistical analysis of PGR-immunopositive staining in interplacental (IP) samples. Comparison of groups (primary uterine inertia, PUI, versus obstructive dystocia, OD) depending on localization (interplacental, IP; uteroplacenta, UP) and specific myometrial layer (longitudinal/circular) or combined IP-Myoscore.

	Myometrial Layer	Groups for Comparison	$p$ -Value (Mann–Whitney Test)
IP	Longitudinal	PUI vs. OD	$p = 0.1323$
		PUI-N vs. OD	$p = 0.097$
IP	Circular	PUI vs. OD	$p = 0.1161$
		PUI-N vs. OD	$p = 0.1455$
IP	Myoscore	PUI vs. OD	$p = 0.0716$
		PUI-N vs. OD	$p = 0.0626$

**Table S6.** Effect of litter size on PGR-immunopositive staining in interplacental (IP) samples of the primary uterine inertia (PUI) group differentiating the myometrial layers (longitudinal/circular). PUI bitches with normal litter size (PUI-N, average litter size of the respective breed  $\pm 1$  standard deviation) were compared with litters smaller (PUI-S,  $< -1$  SD) or larger (PUI-L,  $> +1$  SD) than the breed average.

	Myometrial Layer	Groups for Comparison	$p$ -Value (Kruskal–Wallis Test Followed by Tukey’s Multiple Comparisons)
IP	Longitudinal	PUI-S vs. PUI-N vs. PUI-L	$p = 0.0306$
IP	Circular	PUI-S vs. PUI-N vs. PUI-L	$p = 0.1984$
IP	Myoscore	PUI-S vs. PUI-N vs. PUI-L	$p = 0.0391$