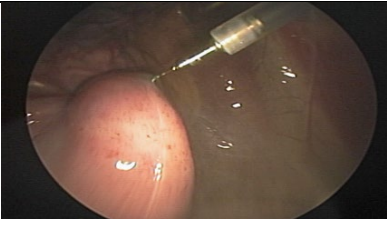


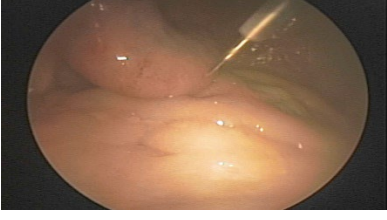
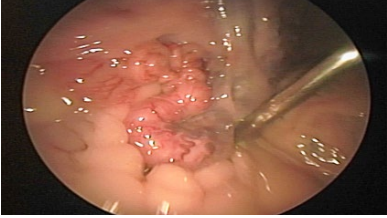


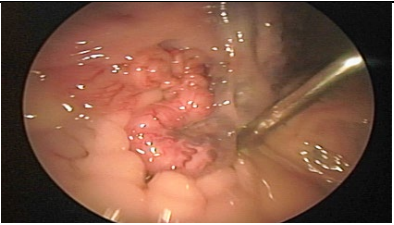
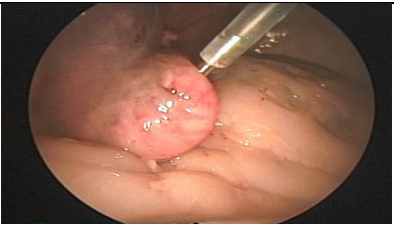
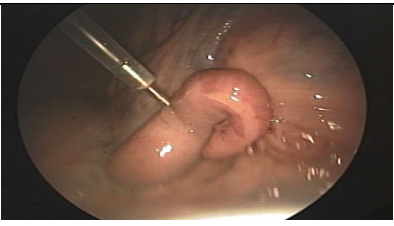
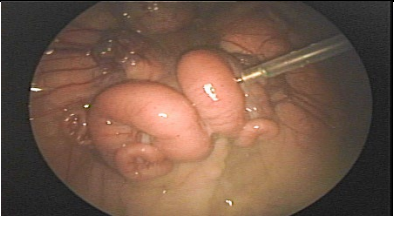
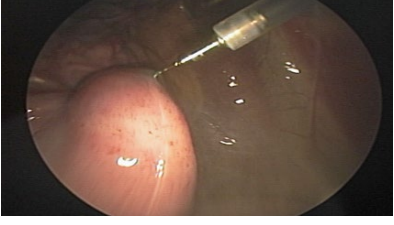
**Supplementary File 1:** Year of drop coloured electric ear tag identification for sheep (modified from [107]).

Year of Drop	Colour Ear Tag
2017	White
2018	Orange
2019	Green
2020	Purple
2021	Yellow

**Supplementary File 2.** The standardisation of intra-abdominal fat scores assessed at AI by inseminator, scored one to five.

Score	Figure	Visual Description
1		<p>Little to no fat is present within the abdominal cavity.</p>
2		<p>A small amount of fat lining the abdominal region of the ewe.</p>
3		<p>A moderate amount of fat lining the abdominal region of the ewe.</p>
4		<p>Large masses of internal fat covering the abdominal region of the ewe.</p>
5		<p>Excessive amount of fat around the abdominal region of the ewe.</p>

**Supplementary File 3.** The standardisation of uterine tone scores assessed at AI by inseminator, scored one to five.

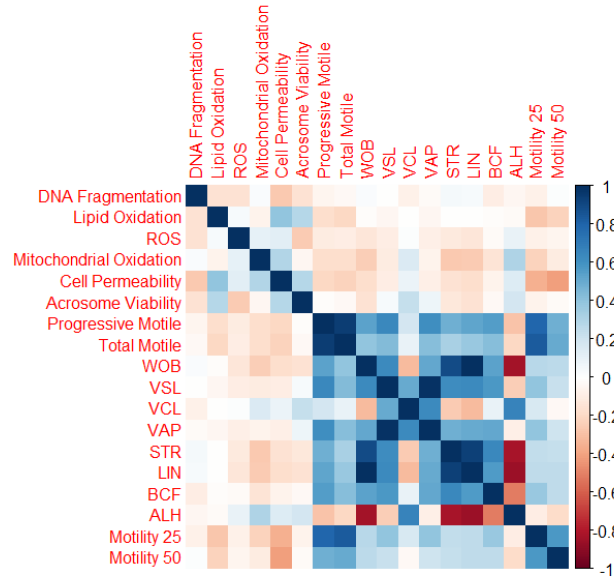
Score	Figure	Visual Description
1		Flaccid uterine horns.
2		Soft uterine horns.
3		Moderate swelling of uterine horns.
4		The greater amount of swelling and some resistance to penetration during insemination.
5		Swollen/ turgid uterine horns. Resistance to penetration during insemination.

**Supplementary File 4.** Describes the percentage of ewes pregnancy for each level within the categorical factors recorded in the data set.

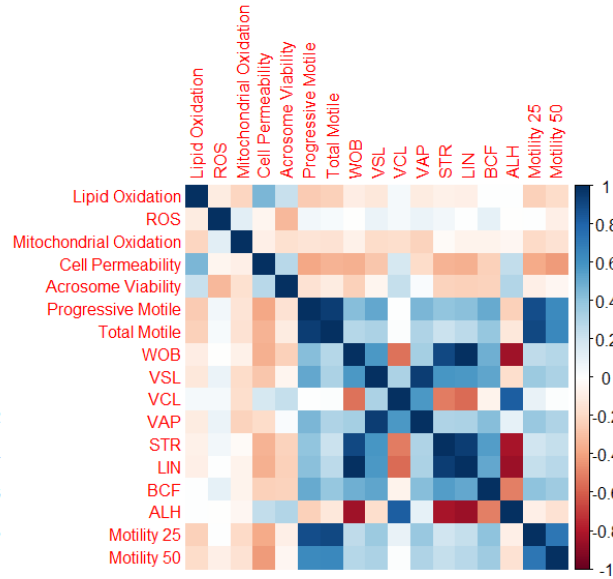
<b>Variable</b>	<b>Category</b>	<b>Number of ewes</b>	<b>Number of Pregnant ewes</b>	<b>Percentage of Ewes Pregnant (%)</b>
Intra-abdominal Fat (Grouped)	1+2	3922	2328	59.36
	3	13426	8794	65.50
	4+5	4789	3445	71.94
Ewe Age (Grouped)	<2	6562	4136	63.03
	3	7000	4658	66.54
	4	3920	2658	67.81
	5+	3614	2423	67.04
Uterine Tone (Grouped)	1+2	2792	1616	57.88
	3	12407	8089	65.20
	4+5	7162	5034	70.29
Semen Type	Frozen	27584	18379	66.63
	Fresh	2670	1744	65.32
Package Type	Straw	8260	5395	65.31
	Pellet	16129	10854	67.29
AI Time Post CIDR Removal	<48	460	259	56.30
	48-50	3002	2016	67.16
	50-52	9108	6009	65.97
	52-54	8319	5448	65.49
	54-56	2160	1396	64.63
	>56	240	163	67.92

**Supplementary File 5.** Correlation plots for *in vitro* semen traits at (a) 0h post-thaw, (b) 3h post-thaw, and (c) 6 h post-thaw

(a)



(b)



(c)

