Supplementary materials and methods

Justification of the sample size

We used a convenience sample of eight white rhinoceros as the study was performed in parallel with another study. Furthermore, to perform Bland-Altman method at an $\alpha = 0.05$ and $\beta = 0.90$, this study needed a minimum of 17 paired data sets (taken from eight individuals) to have power when the expected mean of differences is 3%, expected standard deviation of differences is 3% and the maximum allowed difference between methods is ± 10%. Therefore, from the eight rhinoceros, we obtained an adequate sample size to undertake the study.

Supplementary Table S1 Standard doses used in white rhinoceros by Veterinary Wildlife Services (VWS) based on body mass. Animals were weighed during the 2 weeks habituation period and at the end of the immobilization by encouraging them to enter a crate which was weighed using a crane balance. Rhinoceros weighed 1145 ± 75 kg (mean ± standard deviation).

Rhinoceros mass (kg)	**Etorphine (mg)**	**Butorphanol (10 times etorphine dose, mg)**	**Naltrexone (20 times etorphine dose, mg)**
1000-1250	2.5	25	50
1250-1500	3.125	31.25	62.5

Supplementary Table S2 Number of time-matched paired measurements of arterial oxygen haemoglobin saturation measured from the co-oximeter (SaO_2) and peripheral oxygen haemoglobin saturation from the pulse oximeters (SpO_2) at the four different attachment sites (eyelid, cheek, rectum, and tail). The number of paired measurements for all the data before the exclusion criteria were applied ("All data") and their pulse quality (green, amber, and red) are presented. In addition, the total number of data paired measurements that were not excluded ("Pass data"), the number of data paired measurements excluded ("Excluded data"), and the exclusion criteria applied, are also presented. SD, standard deviation. Sample size (*n*).

Attachment site	All data (*n*)	Pulse quality indicator light (% of total readings)	Excluded data sample size (*n*) and the exclusion criteria *		Pass data (*n*) †
			Triplicate (i.e., three) SpO_2 with SD > 3%	Red light (poor pulse quality)	
Eyelid	87	Green = 90% Amber = 10% Red = 0 %	7 (8%)	0 (0%)	80 (92%)
Cheek	79	Green = 84% Amber = 16% Red = 0%	12 (15%)	0 (0%)	67 (85%)
Rectum	83	Green = 92% Amber = 8% Red = 0%	24 (29%)	0 (0%)	59 (71%)
Tail	79	Green = 87% Amber =11% Red = 2%	0 (0%)	3 (4%)	76 (96%)

* Excluded data are triplicate SpO_2 readings where the pulse quality was poor (red light), or the standard deviation was ≥3%.

† Pass data are triplicate SpO_2 readings where the pulse quality was good or intermediate (green or amber light) and the standard deviation was < 3%.

Raw data

Third eyelid pulse oximetry SpO_2 *versus* co-oximetry SaO_2. Animal Identification (ID); peripheral oxygen haemoglobin saturation from the pulse oximeters (SpO_2); arterial oxygen haemoglobin saturation measured from the co-oximeter (SaO_2); SD, standard deviation; Pulse Rate (PR); beats per minute (bpm).

Animal ID	SpO_2 (%)	SpO_2 (%)	SpO_2 (%)	Mean SpO_2 (%)	SD	PR	PR	PR	Mean PR (bpm)	SD	Pulse Quality	Pulse Quality	Pulse Quality	SaO_2 (%)
B1	71	70	76	72	3	59	59	60	59	1	Green	Green	Green	51.7
B12	50	50	49	50	1	127	126	125	126	1	Green	Amber	Green	38.3
B12	82	82	81	82	1	65	75	70	70	5	Green	Green	Green	85.6
B12	98	93	92	94	3	59	67	56	61	6	Green	Green	Green	99.8
B11	78	75	76	76	2	108	110	110	109	1	Green	Green	Green	60.2
B9	67	67	67	67	0	117	116	103	112	8	Green	Green	Green	34.3
B9	87	87	86	87	1	99	99	95	98	2	Green	Green	Green	84.4
B10	32	34	35	34	2	143	144	144	144	1	Green	Green	Green	27.4
B10	32	31	31	31	1	135	136	136	136	1	Green	Green	Green	34.7
B5	95	95	93	94	1	107	102	106	105	3	Green	Green	Green	56.4
B12	27	33	33	31	3	141	139	139	140	1	Green	Green	Green	41.1
B12	32	34	37	34	3	129	129	128	129	1	Green	Green	Green	42.6
B12	41	45	45	44	2	105	105	103	104	1	Green	Green	Green	49.6
B12	49	46	47	47	2	95	94	88	92	4	Green	Green	Green	51.5
B12	48	49	49	49	1	88	87	84	86	2	Green	Green	Green	54.5
B11	89	88	88	88	1	50	51	50	50	1	Green	Green	Green	85.3
B11	90	89	94	91	3	48	48	53	50	3	Green	Green	Green	90.7
B11	94	93	96	94	2	49	49	48	49	1	Green	Green	Green	88.6
B9	26	26	22	25	2	147	146	145	146	1	Green	Green	Green	28.7
B9	25	24	23	24	1	136	134	134	135	1	Green	Green	Green	34.1
B9	36	35	30	34	3	123	122	122	122	1	Green	Green	Green	39.2
B9	37	40	37	38	2	112	112	109	111	2	Green	Green	Green	42.1
B9	42	39	37	39	3	102	102	102	102	0	Green	Green	Green	52.8
B10	23	24	23	23	1	130	129	129	129	1	Green	Green	Green	28.2
B10	83	83	84	83	1	53	52	54	53	1	Green	Green	Green	84.3
B10	73	73	76	74	2	60	59	63	61	2	Green	Amber	Green	82.2
B10	78	81	82	80	2	69	69	80	73	6	Green	Amber	Green	78.5
B5	29	28	27	28	1	110	112	111	111	1	Green	Amber	Amber	35.9
B5	46	48	53	49	4	100	101	102	101	1	Green	Green	Green	58
B1	61	63	63	62	1	95	95	94	95	1	Amber	Green	Green	50.2
B1	76	76	72	75	2	98	98	98	98	0	Green	Green	Green	54.4
B12	36	36	38	37	1	133	132	132	132	1	Amber	Amber	Amber	34.1
B12	38	36	36	37	1	124	123	122	123	1	Amber	Amber	Amber	37.2
B12	77	78	78	78	1	94	89	89	91	3	Amber	Green	Amber	39.6
B12	54	54	54	54	0	112	112	113	112	1	Green	Amber	Amber	38.4
B11	44	40	44	43	2	114	107	114	112	4	Green	Green	Green	44.3
B11	84	85	84	84	1	67	67	68	67	1	Green	Green	Green	82.9
B9	40	40	39	40	1	129	129	131	130	1	Green	Green	Green	27.1
B9	83	80	80	81	2	83	82	78	81	3	Green	Green	Green	83
B9	77	77	77	77	0	67	65	67	66	1	Green	Green	Green	77.2
B5	38	38	42	39	2	136	135	135	135	1	Green	Green	Green	36.1

B5	35	36	40	37	3	130	130	129	130	1	Green	Green	Green	28
B5	38	38	43	40	3	123	123	119	122	2	Green	Green	Green	38.2
B5	42	44	46	44	2	119	123	119	120	2	Green	Green	Green	45.5
B1	48	50	51	50	2	128	129	127	128	1	Amber	Amber	Amber	38.8
B1	79	78	78	78	1	87	88	85	87	2	Green	Green	Green	79.3
B1	76	75	76	76	1	87	91	87	88	2	Green	Green	Green	73.8
B11	71	67	69	69	2	70	70	68	69	1	Green	Green	Green	73.1
B11	73	73	70	72	2	67	67	64	66	2	Green	Green	Green	72.5
B11	70	66	68	68	2	66	65	64	65	1	Green	Green	Green	69.7
B11	69	67	69	68	1	73	75	75	74	1	Green	Green	Green	69
B11	73	73	69	72	2	70	79	80	76	6	Green	Green	Green	74.7
B11	79	78	78	78	1	81	80	79	80	1	Green	Amber	Green	78.5
B11	84	78	79	80	3	81	81	79	80	1	Amber	Green	Green	78.1
B11	85	84	87	85	2	79	76	77	77	2	Green	Green	Green	94.7
B12	84	88	87	86	2	64	52	48	55	8	Green	Green	Green	86.9
B12	91	96	91	93	3	51	52	53	52	1	Green	Green	Green	92.1
B12	91	93	92	92	1	41	48	52	47	6	Green	Green	Green	94.8
B12	92	93	93	93	1	41	46	68	52	14	Green	Green	Green	96.8
B12	93	93	94	93	1	61	62	65	63	2	Green	Green	Green	93.3
B12	93	92	94	93	1	67	48	69	61	12	Green	Green	Green	94.9
B12	94	94	96	95	1	68	56	64	63	6	Green	Green	Green	95.8
B12	94	95	94	94	1	73	68	71	71	3	Green	Green	Green	97.3
B12	80	80	79	80	1	91	91	94	92	2	Green	Green	Green	79.1
B12	77	78	77	77	1	99	96	99	98	2	Green	Green	Green	79
B8	62	67	67	65	3	89	86	85	87	2	Green	Green	Green	64.8
B8	66	65	62	64	2	87	84	87	86	2	Green	Green	Green	60.8
B8	88	92	89	90	2	65	67	68	67	2	Green	Green	Green	93.9
B8	91	90	92	91	1	62	58	60	60	2	Green	Green	Green	87.9
B8	86	84	81	84	3	61	59	59	60	1	Green	Green	Green	90.4
B8	72	75	78	75	3	62	56	50	56	6	Green	Green	Green	76.6
B8	97	97	97	97	0	42	41	42	42	1	Green	Green	Green	99.7
B8	87	86	86	86	1	43	43	43	43	0	Green	Green	Green	87.8
B8	83	82	82	82	1	51	48	51	50	2	Green	Green	Green	87.4
B1	55	52	54	54	2	113	113	113	113	0	Green	Green	Green	37.1
B1	49	50	54	51	3	119	119	118	119	1	Green	Green	Green	45.8
B1	84	87	87	86	2	90	90	89	90	1	Green	Green	Green	80.9
B5	51	51	49	50	1	123	122	122	122	1	Green	Green	Green	44.7
B5	91	89	88	89	2	95	91	93	93	2	Green	Green	Green	91.3
B5	88	88	87	88	1	89	87	85	87	2	Green	Green	Green	90.2

Cheek pulse oximetry SpO_2 *versus* co-oximetry SaO_2.Animal Identification (ID); peripheral oxygen haemoglobin saturation from the pulse oximeters (SpO_2); arterial oxygen haemoglobin saturation measured from the co-oximeter (SaO_2); SD, standard deviation; Pulse Rate (PR); beats per minute (bpm).

Animal ID	SpO_2 1 (%)	SpO_2 2 (%)	SpO_2 3 (%)	Mean SpO_2 (%)	SD	PR 1	PR 2	PR 3	Mean PR (bpm)	SD	Pulse Quality 1	Pulse Quality 2	Pulse Quality 3	SaO_2 (%)
B1	93	93	93	93	0	60	60	60	60	0	Green	Amber	Amber	51.7
B12	76	77	77	77	1	67	67	67	67	0	Green	Green	Green	85.6
B12	70	70	70	70	0	102	102	101	102	1	Green	Green	Green	99.8
B12	93	90	90	91	2	138	140	138	139	1	Green	Green	Green	41.1
B12	75	77	80	77	3	129	129	128	129	1	Green	Green	Amber	42.6
B12	66	66	65	66	1	105	104	104	104	1	Green	Green	Green	49.6
B12	62	59	62	61	2	96	93	91	93	3	Green	Green	Green	51.5
B12	63	64	61	63	2	88	88	88	88	0	Green	Green	Green	54.5
B11	69	70	72	70	2	108	105	102	105	3	Green	Green	Green	56.4
B11	72	74	73	73	1	89	98	98	95	5	Green	Green	Green	58.9
B11	98	96	97	97	1	50	50	50	50	0	Green	Green	Green	85.3
B11	95	99	99	98	2	48	50	51	50	2	Green	Green	Green	90.7
B11	90	88	90	89	1	50	50	49	50	1	Green	Green	Green	88.6
B9	55	54	53	54	1	118	121	121	120	2	Amber	Amber	Green	28.7
B9	54	50	49	51	3	125	124	124	124	1	Green	Amber	Green	39.2
B9	49	52	48	50	2	112	111	111	111	1	Green	Green	Green	42.1
B9	58	57	56	57	1	100	100	101	100	1	Green	Green	Green	52.8
B10	94	96	94	95	1	55	54	54	54	1	Green	Green	Green	84.3
B10	93	96	97	95	2	56	56	58	57	1	Green	Green	Green	82.2
B10	86	86	87	86	1	64	66	63	64	2	Green	Green	Green	78.5
B5	54	53	58	55	3	98	99	103	100	3	Green	Green	Green	51
B5	59	60	61	60	1	107	103	104	105	2	Green	Green	Green	58
B1	51	52	50	51	1	99	99	97	98	1	Green	Green	Green	50.2
B1	55	55	51	54	2	94	94	93	94	1	Green	Green	Green	54.4
B12	67	67	67	67	0	118	119	119	119	1	Green	Green	Green	34.1
B12	74	74	74	74	0	120	121	121	121	1	Amber	Amber	Amber	37.2
B12	64	63	60	62	2	118	118	117	118	1	Green	Green	Green	39.6
B11	63	63	65	64	1	113	112	108	111	3	Green	Green	Green	44.3
B11	88	89	88	88	1	64	67	66	66	2	Green	Green	Green	82.9
B9	67	65	65	66	1	127	128	134	130	4	Green	Amber	Green	30.9
B9	62	62	61	62	1	128	129	130	129	1	Green	Green	Green	27.1
B9	89	85	86	87	2	90	98	89	92	5	Green	Green	Green	83
B9	79	79	79	79	0	70	70	70	70	0	Green	Amber	Amber	77.2
B5	75	73	73	74	1	107	101	101	103	3	Green	Green	Green	36.1
B5	70	70	71	70	1	152	154	154	153	1	Green	Green	Amber	28
B5	63	64	64	64	1	156	157	159	157	2	Green	Green	Green	38.2
B5	74	73	73	73	1	185	192	201	193	8	Green	Green	Amber	45.5
B1	77	78	77	77	1	126	126	126	126	0	Green	Green	Green	38.8
B1	86	85	86	86	1	90	89	88	89	1	Green	Green	Green	79.3
B1	81	83	80	81	2	89	87	90	89	2	Green	Green	Green	73.8
B11	76	75	74	75	1	83	82	83	83	1	Amber	Green	Green	73.1
B11	76	76	75	76	1	83	83	83	83	0	Amber	Amber	Amber	72.5

B11	87	87	86	87	1	67	66	66	66	1	Amber	Amber	Amber	69.7
B11	72	71	75	73	2	76	76	76	76	0	Amber	Green	Green	69
B11	82	82	81	82	1	77	77	77	77	0	Green	Green	Green	74.7
B11	79	82	82	81	2	82	81	81	81	1	Green	Green	Green	78.5
B11	87	88	88	88	1	79	70	80	76	6	Amber	Amber	Green	78.1
B11	94	95	92	94	2	81	80	77	79	2	Amber	Green	Green	94.7
B12	86	87	84	86	2	42	44	46	44	2	Green	Amber	Green	96.8
B12	84	85	85	85	1	60	59	62	60	2	Green	Green	Green	94.9
B12	91	92	91	91	1	57	61	64	61	4	Green	Green	Green	97.3
B12	78	78	78	78	0	86	87	88	87	1	Green	Green	Green	79.1
B12	78	78	80	79	1	89	89	91	90	1	Green	Green	Green	79
B8	67	69	69	68	1	76	77	77	77	1	Green	Amber	Green	61.7
B8	70	69	70	70	1	83	84	85	84	1	Amber	Amber	Green	64.8
B8	69	70	67	69	2	85	85	85	85	0	Amber	Green	Green	60.8
B8	92	95	93	93	2	66	65	65	65	1	Green	Green	Amber	93.9
B8	75	76	76	76	1	76	72	68	72	4	Green	Green	Amber	76.6
B8	90	91	92	91	1	43	43	43	43	0	Amber	Green	Green	99.7
B8	94	94	94	94	0	43	43	43	43	0	Green	Green	Green	87.8
B8	91	90	88	90	2	48	48	48	48	0	Green	Green	Green	87.4
B1	65	66	63	65	2	112	112	112	112	0	Green	Green	Green	37.1
B1	55	55	59	56	2	116	110	109	112	4	Green	Green	Green	45.8
B1	62	62	64	63	1	85	86	92	88	4	Green	Amber	Green	80.9
B5	75	76	76	76	1	210	225	230	222	10	Green	Green	Green	44.7
B5	77	75	75	76	1	143	143	145	144	1	Green	Green	Green	91.3
B5	89	89	90	89	1	92	79	81	84	7	Green	Amber	Amber	90.2

Rectal pulse oximetry SpO_2 *versus* co-oximetry SaO_2.Animal Identification (ID); peripheral oxygen haemoglobin saturation from the pulse oximeters (SpO_2); arterial oxygen haemoglobin saturation measured from the co-oximeter (SaO_2); SD, standard deviation; Pulse Rate (PR); beats per minute (bpm).

Animal ID	SpO_2 1 (%)	SpO_2 2 (%)	SpO_2 3 (%)	Mean SpO_2 (%)	SD	PR 1	PR 2	PR 3	Mean PR (bpm)	SD	Pulse Quality 1	Pulse Quality 2	Pulse Quality 3	SaO_2 (%)
B1	58	60	61	60	2	61	61	61	61	0	Green	Amber	Green	51.7
B12	92	94	94	93	1	127	122	122	124	3	Green	Green	Green	38.3
B12	100	100	100	100	0	63	64	71	66	4	Green	Green	Green	85.6
B12	100	100	100	100	0	69	69	69	69	0	Amber	Green	Amber	99.8
B11	89	93	89	90	2	109	111	111	110	1	Green	Green	Green	60.2
B11	90	92	89	90	2	104	99	100	101	3	Green	Green	Green	58.9
B9	82	82	83	82	1	126	126	122	125	2	Green	Green	Green	84.4
B10	71	71	72	71	1	136	135	130	134	3	Green	Green	Green	27.4
B10	53	53	57	54	2	139	138	144	140	3	Amber	Green	Green	26.3
B10	92	89	90	90	2	133	134	134	134	1	Green	Green	Green	34.7
B10	100	100	100	100	0	104	104	104	104	0	Green	Amber	Amber	80.9
B5	74	65	74	71	5	104	100	106	103	3	Amber	Green	Green	56.4
B12	93	93	93	93	0	131	132	131	131	1	Green	Green	Green	34.1
B12	92	92	94	93	1	121	120	118	120	2	Green	Green	Green	37.2
B12	92	93	92	92	1	118	114	116	116	2	Green	Green	Green	39.6
B12	93	93	91	92	1	115	114	114	114	1	Green	Green	Green	38.4
B11	81	83	84	83	2	114	109	113	112	3	Green	Green	Green	44.3
B11	99	99	98	99	1	67	67	66	67	1	Green	Green	Green	82.9
B9	75	74	72	74	2	196	-	199	198	2	Green	Green	Green	30.9
B9	84	86	86	85	1	214	214	203	210	6	Green	Green	Green	27.1
B9	81	81	81	81	0	168	171	167	169	2	Green	Green	Green	83
B9	99	100	98	99	1	67	67	66	67	1	Green	Green	Green	77.2
B5	63	65	70	66	4	136	132	133	134	2	Green	Green	Green	36.1
B5	70	69	71	70	1	130	130	129	130	1	Green	Green	Green	28
B5	89	88	88	88	1	122	122	120	121	1	Green	Green	Green	38.2
B5	88	87	89	88	1	120	120	121	120	1	Green	Green	Green	45.5
B1	86	86	86	86	0	134	133	140	136	4	Green	Green	Green	38.8
B1	92	92	94	93	1	88	88	87	88	1	Green	Green	Green	79.3
B1	94	91	92	92	2	87	87	87	87	0	Green	Amber	Green	73.8
B11	91	99	100	97	5	71	68	66	68	3	Green	Green	Green	73.1
B11	98	98	98	98	0	67	66	63	65	2	Green	Green	Green	72.5
B11	98	98	97	98	1	65	66	67	66	1	Green	Green	Green	69.7
B11	96	95	96	96	1	73	75	76	75	2	Green	Green	Green	69
B11	97	97	96	97	1	80	83	84	82	2	Green	Green	Green	74.7
B11	96	97	97	97	1	84	80	78	81	3	Green	Green	Green	78.5
B11	98	97	96	97	1	82	81	77	80	3	Green	Green	Green	78.1
B11	98	99	99	99	1	79	77	80	79	2	Green	Green	Green	94.7
B12	89	92	91	91	2	156	156	157	156	1	Green	Green	Green	86.9
B12	91	90	88	90	2	144	144	145	144	1	Green	Amber	Green	92.1
B12	88	85	85	86	2	138	138	138	138	0	Green	Amber	Amber	94.8
B12	92	91	91	91	1	52	50	48	50	2	Green	Green	Green	96.8
B12	100	100	100	100	0	75	73	69	72	3	Green	Green	Amber	94.9

B12	100	100	100	100	0	78	74	74	75	2	Green	Green	Green	97.3
B12	100	100	100	100	0	87	90	93	90	3	Green	Green	Green	79.1
B8	88	87	89	88	1	80	84	84	83	2	Green	Green	Green	64.8
B8	83	86	87	85	2	83	85	87	85	2	Green	Green	Green	60.8
B8	99	98	99	99	1	63	66	67	65	2	Green	Green	Green	93.9
B8	99	98	99	99	1	62	60	60	61	1	Green	Green	Green	87.9
B8	94	94	94	94	0	63	59	61	61	2	Green	Green	Green	90.4
B8	91	91	92	91	1	61	55	50	55	6	Green	Green	Green	76.6
B8	100	100	100	100	0	42	41	41	41	1	Green	Green	Green	99.7
B8	98	98	98	98	0	43	43	43	43	0	Green	Green	Green	87.8
B8	96	98	97	97	1	51	48	51	50	2	Green	Green	Green	87.4
B1	87	88	88	88	1	105	110	110	108	3	Green	Green	Green	37.1
B1	86	86	86	86	0	113	116	117	115	2	Green	Green	Green	45.8
B1	91	91	91	91	0	91	91	90	91	1	Green	Green	Green	80.9
B5	89	89	92	90	2	124	124	123	124	1	Green	Green	Green	44.7
B5	91	92	91	91	1	99	99	99	99	0	Green	Green	Green	91.3
B5	84	83	82	83	1	97	104	105	102	4	Green	Green	Green	90.2

Tail pulse oximetry SpO_2 *versus* co-oximetry SaO_2.Animal Identification (ID); peripheral oxygen haemoglobin saturation from the pulse oximeters (SpO_2); arterial oxygen haemoglobin saturation measured from the co-oximeter (SaO_2); SD, standard deviation; Pulse Rate (PR); beats per minute (bpm).

Animal ID	SpO_2 1 (%)	SpO_2 2 (%)	SpO_2 3 (%)	Mean SpO_2 (%)	SD	PR 1	PR 2	PR 3	Mean PR (bpm)	SD	Pulse Quality 1	Pulse Quality 2	Pulse Quality 3	SaO_2 (%)
B1	91	91	92	91	1	60	61	60	60	1	Green	Green	Green	51.7
B12	98	96	96	97	1	125	124	123	124	1	Green	Green	Green	38.3
B12	100	100	100	100	0	62	66	78	69	8	Green	Green	Green	85.6
B12	100	100	100	100	0	63	66	71	67	4	Green	Green	Green	99.8
B11	100	100	100	100	0	110	110	109	110	1	Green	Green	Green	60.2
B11	100	100	100	100	0	104	103	102	103	1	Green	Green	Green	58.9
B9	85	85	85	85	0	139	139	140	139	1	Green	Amber	Green	34.3
B9	99	97	98	98	1	100	99	98	99	1	Green	Green	Green	84.4
B10	99	99	99	99	0	139	139	133	137	3	Green	Green	Green	27.4
B10	98	98	98	98	0	136	136	135	136	1	Green	Green	Green	26.3
B10	98	97	97	97	1	135	135	134	135	1	Green	Green	Green	34.7
B10	100	100	100	100	0	106	101	97	101	5	Green	Green	Green	80.9
B5	88	89	89	89	1	124	119	119	121	3	Green	Green	Green	56.4
B12	97	96	96	96	1	130	131	132	131	1	Amber	Amber	Amber	41.1
B12	94	93	93	93	1	127	128	125	127	2	Green	Green	Green	42.6
B12	93	93	96	94	2	105	103	100	103	3	Green	Green	Green	49.6
B12	96	96	96	96	0	94	92	88	91	3	Green	Green	Green	51.5
B12	94	95	96	95	1	87	84	86	86	2	Green	Green	Green	54.5
B11	95	95	95	95	0	101	99	102	101	2	Green	Green	Green	56.4
B11	97	96	96	96	1	92	101	96	96	5	Green	Green	Green	58.9
B11	100	100	100	100	0	50	51	50	50	1	Green	Green	Green	85.3
B11	100	100	100	100	0	48	51	53	51	3	Green	Green	Green	90.7
B11	100	100	100	100	0	53	51	50	51	2	Green	Green	Green	88.6
B9	86	86	87	86	1	119	122	120	120	2	Amber	Amber	Amber	39.2
B9	90	91	89	90	1	110	111	110	110	1	Green	Green	Green	42.1
B9	95	93	92	93	2	102	102	102	102	0	Green	Green	Green	52.8
B10	97	98	97	97	1	125	124	124	124	1	Green	Green	Green	28.2
B10	100	100	100	100	0	52	52	54	53	1	Green	Green	Green	84.3
B10	100	100	100	100	0	57	57	59	58	1	Green	Green	Green	82.2
B10	100	100	100	100	0	65	65	62	64	2	Amber	Green	Green	78.5
B5	99	99	100	99	1	136	136	135	136	1	Green	Green	Amber	35.9
B5	100	100	100	100	0	109	108	108	108	1	Green	Green	Green	41.1
B5	100	100	100	100	0	102	102	102	102	0	Green	Green	Green	51
B1	97	96	98	97	1	96	101	96	98	3	Green	Green	Green	50.2
B1	98	98	98	98	0	91	93	93	92	1	Green	Green	Green	54.4
B12	100	99	99	99	1	132	130	132	131	1	Amber	Amber	Green	34.1
B12	97	97	97	97	0	121	122	123	122	1	Green	Green	Green	39.6
B12	98	97	98	98	1	115	115	112	114	2	Green	Green	Green	38.4
B11	100	100	100	100	0	116	112	110	113	3	Green	Green	Green	44.3
B11	100	100	100	100	0	66	67	67	67	1	Green	Green	Green	82.9
B9	99	99	99	99	0	142	141	141	141	1	Amber	Amber	Amber	30.9
B9	100	100	100	100	0	89	87	85	87	2	Green	Green	Green	83

B9	100	100	100	100	0	70	70	70	70	0	Amber	Amber	Green	77.2
B5	100	100	100	100	0	137	136	136	136	1	Green	Green	Green	36.1
B5	100	100	100	100	0	131	130	130	130	1	Green	Green	Amber	28
B5	100	100	100	100	0	125	125	125	125	0	Green	Green	Amber	38.2
B5	100	100	100	100	0	121	121	121	121	0	Green	Green	Green	45.5
B1	69	72	70	70	2	124	127	125	125	2	Green	Green	Green	38.8
B1	92	93	92	92	1	88	82	84	85	3	Green	Green	Green	79.3
B1	90	89	89	89	1	89	89	89	89	0	Green	Green	Green	73.8
B11	100	100	100	100	0	71	68	65	68	3	Green	Green	Green	73.1
B11	100	100	100	100	0	66	65	61	64	3	Green	Green	Green	72.5
B11	100	100	100	100	0	64	65	67	65	2	Green	Green	Green	69.7
B11	100	100	100	100	0	72	74	76	74	2	Green	Green	Green	69
B11	100	100	100	100	0	78	82	83	81	3	Green	Green	Green	74.7
B11	100	100	100	100	0	85	79	80	81	3	Green	Green	Green	78.5
B11	100	100	100	100	0	79	81	81	80	1	Green	Green	Green	78.1
B11	100	100	100	100	0	79	78	79	79	1	Green	Green	Green	94.7
B12	97	98	97	97	1	58	56	54	56	2	Amber	Green	Green	86.9
B12	99	99	99	99	0	45	44	43	44	1	Green	Green	Green	92.1
B12	100	100	100	100	0	42	41	47	43	3	Green	Green	Green	94.8
B12	100	99	100	100	1	46	42	50	46	4	Green	Green	Green	96.8
B12	100	99	100	100	1	57	59	61	59	2	Green	Green	Green	93.3
B12	100	100	100	100	0	64	61	57	61	4	Green	Green	Green	94.9
B12	100	100	100	100	0	62	66	57	62	5	Green	Green	Green	95.8
B12	100	100	100	100	0	68	68	66	67	1	Green	Green	Green	97.3
B12	99	99	99	99	0	90	89	91	90	1	Green	Green	Green	79.1
B12	99	100	100	100	1	95	98	97	97	2	Green	Green	Green	79
B8	100	100	100	100	0	81	83	85	83	2	Green	Amber	Green	61.7
B8	100	100	100	100	0	87	86	85	86	1	Green	Green	Green	60.8
B1	88	87	89	88	1	113	112	109	111	2	Green	Green	Green	37.1
B1	84	85	85	85	1	119	118	116	118	2	Green	Amber	Green	45.8
B1	98	97	97	97	1	89	89	91	90	1	Green	Green	Green	80.9
B5	93	93	95	94	1	122	122	122	122	0	Amber	Amber	Amber	44.7
B5	100	100	100	100	0	85	94	92	90	5	Green	Green	Green	91.3
B5	100	100	100	100	0	89	88	92	90	2	Green	Green	Green	90.2

ARMS statistics

Third eyelid pulse oximetry SpO_2 *versus* co-oximetry SaO_2. Peripheral oxygen haemoglobin saturation from the pulse oximeters (SpO_2); arterial oxygen haemoglobin saturation measured from the co-oximeter (SaO_2).

Animal ID	Mean SpO_2 (%)	SaO_2 (%)	Difference	Difference^2
B1	72	52	-21	426
B12	50	38	-11	129
B12	82	86	4	15
B12	94	100	5	30
B11	76	60	-16	260
B9	67	34	-33	1069
B9	87	84	-2	5
B10	34	27	-6	39
B10	31	35	3	11
B5	94	56	-38	1439
B12	31	41	10	102
B12	34	43	8	68
B12	44	50	6	35
B12	47	52	4	17
B12	49	55	6	34
B11	88	85	-3	9
B11	91	91	0	0
B11	94	89	-6	33
B9	25	29	4	16
B9	24	34	10	102
B9	34	39	6	31
B9	38	42	4	17
B9	39	53	13	181
B10	23	28	5	24
B10	83	84	1	1
B10	74	82	8	67
B10	80	79	-2	3
B5	28	36	8	62
B5	49	58	9	81
B1	62	50	-12	147
B1	75	54	-20	411
B12	37	34	-3	7
B12	37	37	1	0
B12	78	40	-38	1449
B12	54	38	-16	243
B11	43	44	2	3
B11	84	83	-1	2
B9	93	31	-62	
B9	40	27	-13	158
B9	81	83	2	4
B9	77	77	0	0
B5	39	36	-3	10
B5	37	28	-9	81
B5	40	38	-1	2
B5	44	46	2	2
B1	50	39	-11	118
B1	78	79	1	1
B1	76	74	-2	3
B11	69	73	4	17
B11	72	73	1	0
B11	68	70	2	3
B11	68	69	1	0
B11	72	75	3	9
B11	78	79	0	0
B11	80	78	-2	5
B11	85	95	9	88
B12	86	87	1	0
B12	93	92	-1	0
B12	92	95	3	8
B12	93	97	4	17
B12	93	93	0	0
B12	93	95	2	4
B12	95	96	1	1
B12	94	97	3	9
B12	80	79	-1	0

B12	77	79	2	3
B8	65	65	-1	0
B8	64	61	-4	12
B8	90	94	4	18
B8	91	88	-3	10
B8	84	90	7	45
B8	75	77	2	3
B8	97	100	3	7
B8	86	88	1	2
B8	82	87	5	26
B1	54	37	-17	274
B1	51	46	-5	27
B1	86	81	-5	26
B5	50	45	-6	32
B5	89	91	2	4
B5	88	90	3	6
			Sum of diff^2	**7609**
			Sum of diff^2 / number of paired samples	**95**
			ARMS	**10**

Cheek pulse oximetry SpO_2 *versus* co-oximetry SaO_2. Peripheral oxygen haemoglobin saturation from the pulse oximeters (SpO_2); arterial oxygen haemoglobin saturation measured from the co-oximeter (SaO_2).

Animal ID	**Mean SpO_2 (%)**	**SaO_2 (%)**	**Difference**	**Difference^2**
B1	93	52	-41	1706
B12	77	86	9	80
B12	70	100	30	888
B12	91	41	-50	2490
B12	77	43	-35	1206
B12	66	50	-16	258
B12	61	52	-10	90
B12	63	55	-8	67
B11	70	56	-14	194
B11	73	59	-14	199
B11	97	85	-12	137
B11	98	91	-7	49
B11	89	89	-1	1
B9	54	29	-25	640
B9	51	39	-12	139
B9	50	42	-8	57
B9	57	53	-4	18
B10	95	84	-10	107
B10	95	82	-13	172
B10	86	79	-8	61
B5	55	51	-4	16
B5	60	58	-2	4
B1	51	50	-1	1
B1	54	54	1	1
B12	67	34	-33	1082
B12	74	37	-37	1354
B12	62	40	-23	517
B11	64	44	-19	375
B11	88	83	-5	30
B9	66	31	-35	1209
B9	62	27	-35	1195
B9	87	83	-4	13
B9	79	77	-2	3
B5	74	36	-38	1411
B5	70	28	-42	1792
B5	64	38	-25	649
B5	73	46	-28	775
B1	77	39	-39	1485
B1	86	79	-6	41
B1	81	74	-8	57
B11	75	73	-2	4
B11	76	73	-3	10
B11	87	70	-17	288
B11	73	69	-4	13

B11	82	75	-7	49
B11	81	79	-3	6
B11	88	78	-10	92
B11	94	95	1	1
B12	86	97	11	124
B12	85	95	10	105
B12	91	97	6	36
B12	78	79	1	1
B12	79	79	0	0
B8	68	62	-7	44
B8	70	65	-5	24
B8	69	61	-8	62
B8	93	94	1	0
B8	76	77	1	1
B8	91	100	9	76
B8	94	88	-6	38
B8	90	87	-2	5
B1	65	37	-28	760
B1	56	46	-11	111
B1	63	81	18	332
B5	76	45	-31	959
B5	76	91	16	244
B5	89	90	1	1
			Sum of diff^2	**23953**
			Sum of diff^2 / number of paired samples	**358**
			ARMS	**19**

Rectum pulse oximetry SpO_2 *versus* co-oximetry SaO_2. Peripheral oxygen haemoglobin saturation from the pulse oximeters (SpO_2); arterial oxygen haemoglobin saturation measured from the co-oximeter (SaO_2).

Animal ID	**Mean SpO_2**	**SaO_2 (%)**	**Difference**	**Difference^2**
B1	60	52	-8	63
B12	93	38	-55	3029
B12	100	86	-14	207
B12	100	100	0	0
B11	90	60	-30	908
B11	90	59	-31	988
B9	82	84	2	4
B10	71	27	-44	1930
B10	54	26	-28	786
B10	90	35	-56	3095
B10	100	81	-19	365
B5	71	56	-15	213
B12	93	34	-59	3469
B12	93	37	-55	3077
B12	92	40	-53	2781
B12	92	38	-54	2909
B11	83	44	-38	1472
B11	99	83	-16	249
B9	74	31	-43	1829
B9	85	27	-58	3391
B9	81	83	2	4
B9	99	77	-22	475
B5	66	36	-30	894
B5	70	28	-42	1764
B5	88	38	-50	2513
B5	88	46	-43	1806
B1	86	39	-47	2228
B1	93	79	-13	179
B1	92	74	-19	343
B11	97	73	-24	555
B11	98	73	-26	650
B11	98	70	-28	782
B11	96	69	-27	711
B11	97	75	-22	483
B11	97	79	-18	330
B11	97	78	-19	357

B11	99	95	-4	16
B12	91	87	-4	14
B12	90	92	2	6
B12	86	95	9	77
B12	91	97	5	30
B12	100	95	-5	26
B12	100	97	-3	7
B12	100	79	-21	437
B8	88	65	-23	538
B8	85	61	-25	602
B8	99	94	-5	23
B8	99	88	-11	116
B8	94	90	-4	13
B8	91	77	-15	217
B8	100	100	0	0
B8	98	88	-10	104
B8	97	87	-10	92
B1	88	37	-51	2557
B1	86	46	-40	1616
B1	91	81	-10	102
B5	90	45	-45	2052
B5	91	91	0	0
B5	83	90	7	52
			Sum of diff^2	**53538**
			Sum of diff^2 / number of paired samples	**907**
			ARMS	**30**

Tail pulse oximetry SpO_2 *versus* co-oximetry SaO_2. Peripheral oxygen haemoglobin saturation from the pulse oximeters (SpO_2); arterial oxygen haemoglobin saturation measured from the co-oximeter (SaO_2).

Animal ID	**Mean SpO_2 (%)**	**SaO_2 (%)**	**Difference**	**Difference^2**
B1	91	52	-40	1571
B12	97	38	-58	3407
B12	100	86	-14	207
B12	100	100	0	0
B11	100	60	-40	1584
B11	100	59	-41	1689
B9	85	34	-51	2570
B9	98	84	-14	185
B10	99	27	-72	5127
B10	98	26	-72	5141
B10	97	35	-63	3923
B10	100	81	-19	365
B5	89	56	-32	1041
B12	96	41	-55	3051
B12	93	43	-51	2574
B12	94	50	-44	1971
B12	96	52	-45	1980
B12	95	55	-41	1640
B11	95	56	-39	1490
B11	96	59	-37	1401
B11	100	85	-15	216
B11	100	91	-9	86
B11	100	89	-11	130
B9	86	39	-47	2222
B9	90	42	-48	2294
B9	93	53	-41	1643
B10	97	28	-69	4779
B10	100	84	-16	246
B10	100	82	-18	317
B10	100	79	-22	462
B5	99	36	-63	4024
B5	100	41	-59	3469
B5	100	51	-49	2401
B1	97	50	-47	2190
B1	98	54	-44	1901
B12	99	34	-65	4255
B12	97	40	-57	3295

B12	98	38	-59	3513
B11	100	44	-56	3102
B11	100	83	-17	292
B9	99	31	-68	4638
B9	100	83	-17	289
B9	100	77	-23	520
B5	100	36	-64	4083
B5	100	28	-72	5184
B5	100	38	-62	3819
B5	100	46	-55	2970
B1	70	39	-32	994
B1	92	79	-13	170
B1	89	74	-16	241
B11	100	73	-27	724
B11	100	73	-28	756
B11	100	70	-30	918
B11	100	69	-31	961
B11	100	75	-25	640
B11	100	79	-22	462
B11	100	78	-22	480
B11	100	95	-5	28
B12	97	87	-10	109
B12	99	92	-7	48
B12	100	95	-5	27
B12	100	97	-3	8
B12	100	93	-6	41
B12	100	95	-5	26
B12	100	96	-4	18
B12	100	97	-3	7
B12	99	79	-20	396
B12	100	79	-21	427
B8	100	62	-38	1467
B8	100	61	-39	1537
B1	88	37	-51	2591
B1	85	46	-39	1511
B1	97	81	-16	270
B5	94	45	-49	2398
B5	100	91	-9	76
B5	100	90	-10	96
			Sum of diff^2	**120685**
			Sum of diff^2 / no of paired samples	**1588**
			ARMS	**40**