

Supplementary Table 1. Existing body condition scores for rhinos with literal description of individual scores.

Score	Source	Neck	Shoulder	Ribs	Spine	Rump	Abdomen	Tail Base
1	1	Neck very narrow, hollowing out of muscles very prominent	Spine of scapula obvious, muscles hollowed out strongly	Ribs very obvious	Back groove very obvious, from view very bony	Obvious depression	Pulled up distinctively	Very thin and bony
	2	Narrow, angular (bony) neck; nuchal ligament prominent	Angular, bony, deep prescapular groove very obvious, scapula very obvious	Very obvious	Back groove very obvious, spinous processes very prominent	Obvious depression	Tucked in, flank-fold obvious	Very thin and bony
2	1	Hollowing out of neck muscles obvious, neck groove obvious	Spine of scapula obvious, muscles hollowed out		Back groove obvious, from rear view bony	Concave	Pulled up	Raised above the rump, bony
	2	Hollowing out of neck muscles obvious, neck groove obvious	Flat, slightly angular (bony), prescapular groove obvious, scapula obvious	Obvious	Groove deep obvious, spinous processes prominent	Concave	Tucked in, flank-fold visible	Raised above the rump, bony
3	1	Neck groove visible, neck becomes flat, narrower, neck muscles start to hollow out	Spine of the scapula visible, part caudal of scapula slightly hollowed out	Ribs visible	Small back groove visible, from rear view pointy	Slightly concave	Slightly pulled up, stomach line does not run below flank fold	Slightly raised above rump, narrow
	2	Rounded	Flat, prescapular groove slightly visible, spine of scapula visible	Visible	Back groove back visible, spinous processes visible	Slightly concave	Slightly tucked in, flank-fold slightly visible	Narrow
4	1	Muscled, in the head down view a neck groove can be visible	Muscled, part of spine of scapula visible; small gradation caudal of scapula slightly visible	“Ribby” appearance, but ribs are covered with skin folds	No back groove, muscled, not bulging, from rear view slightly angular		Filled, small part of stomach below the flank fold	Rounded, not bulging
	2	Well-muscled, rounded	Rounded, prescapular groove not visible, scapula covered	Covered (skin folds)	Slightly angular, spinous processes slightly visible	Flattened	Filled, flank-fold sometimes visible	Rounded
5	1	Thick, well-muscled, no neck groove visible neck bulges with muscles	Well-muscled, scapula well not visible	No ribs visible, all well covered	Back rounded, muscles bulging; no back groove detectable, from rear view spine rounded and broad	Region well filled with muscles and fat deposit, rounded	Distended, taut	Broad, well rounded, bulging
	2	Thick, well-muscled, rounded	Well-muscled, rounded, prescapular groove not visible, scapula covered	Well covered (skin folds)	Rounded, spinous processes covered	Well rounded	Distended, taught, no flank-fold	Rounded (bulging)

(1) Heidegger et al. (2016), (2) Reuter and Adcock (1998)

Supplementary Table 2. Comparison of the BCS systems for white rhinos *C. simum* and black rhinos *D. bicornis*; species were compared by a nonparametric U-test. Data are nevertheless displayed as means, and significant differences highlighted in bold.

Body part	Scoring system	White rhino			Black rhino			P value
		Stages (steps)	Mean±SD	Min-Max	Stages (steps)	Mean±SD	Min- Max	
Neck	On site	5 (0.5)	4.07±0.64	2.0-5.0	5 (0.5)	3.63±0.51	2.0-5.0	<0.001
	Photo-based	5 (0.5)	4.16±0.58	2.5-5.0	5 (0.5)	4.23±0.53	2.5-5.0	0.469
	New	3 (1)	2.41±0.48	1.0-3.0	3 (1)	2.70±0.50	1.0-3.0	<0.001
Neck folds	New	2 (1)	1.48±0.46	1.0-2.0	2 (1+0.5)	1.64±0.33	1.0-2.0	0.045
Shoulder	On site	5 (0.5)	3.86±0.52	3.0-5.0	5 (0.5)	3.41±0.42	2.5-4.5	<0.001
	Photo-based	5 (0.5)	4.13±0.51	3.0-5.0	5 (0.5)	3.97±0.57	2.25-4.75	0.188
	New	4 (1)	3.20±0.61	2.0-4.0	4 (1)	2.84±0.75	1.0-4.0	0.006
Ribs	On site	5 (0.5)	4.01±0.58	2.5-5.0	5 (0.5)	3.49±0.43	2.5-4.5	<0.001
	Photo-based	5 (0.5)	3.80±0.46	3.0-5.0	5 (0.5)	3.64±0.40	2.25-4.75	0.055
	New	2 (1)	1.43±0.42	1.0-2.0	2 (1)	1.42±0.48	1.0-2.0	0.741
Thorax folds	New	3 (1+0.5)	2.21±0.60	1.0-3.0	3 (1)	1.91±0.65	1.0-3.0	0.002
Spine	On site	5 (0.5)	4.01±0.63	2.5-5.0	5 (0.5)	3.42±0.63	2.0-4.5	<0.001
	Photo-based	5 (0.5)	3.87±0.78	2.0-5.0	5 (0.5)	3.65±0.73	1.75-5.0	0.237
	New	5 (1)	3.99±0.73	2.5-5.0	5 (1)	3.47±0.91	1.0- 5.0	0.001
Rump	On site	5 (0.5)	4.15±0.57	2.5-5.0	5 (0.5)	3.59±0.56	2.0-4.5	<0.001
	Photo-based	5 (0.5)	4.03±0.49	2.25-5.0	5 (0.5)	3.82±0.56	2.0-4.5	0.030
	New	5 (1)	3.50±0.87	2.0-5.0	5 (1)	3.36±0.95	1.0-5.0	0.584
Abdomen	On site	5 (0.5)	4.20±0.52	3.0-5.0	5 (0.5)	3.74±0.48	2.5-5.0	<0.001
	Photo-based	5 (0.5)	4.21±0.42	3.5-5.0	5 (0.5)	4.01±0.43	2.75-5.0	0.007
	New	2 (1)	1.52±0.47	1.0-2.0	2 (1)	1.15±0.33	1.0-2.0	<0.001
Tail base	On site	5 (0.5)	4.12±0.54	3.0-5.0	5 (0.5)	3.62±0.54	2.0-4.5	<0.001
	Photo-based	5 (0.5)	4.26±0.54	3.25-5.0	5 (0.5)	3.73±0.80	1.75-4.75	<0.001
	New	4 (1)	3.19±0.77	1.0-4.0	4 (1+0.5)	2.65±0.83	1.0-4.0	<0.001
Overview	On site	5 (0.5)	4.06±0.52	2.5-5.0	5 (0.5)	3.51±0.54	2.0-4.5	<0.001
	Photo-based	5 (0.5)	3.94±0.50	3.0-5.0	5 (0.5)	3.60±0.59	2.0- 4.5	0.001
Overview Side	New	5 (1)	3.83±0.76	2.0- 5.0	5 (1)	3.39±0.85	1.0-5.0	0.003
Overview rear	New	5 (1)	3.57±0.88	2.0-5.0	5 (1)	3.32±1.06	1.0-5.0	0.253

Supplementary Table 3. Comparison of first and second score from the same photographs. All values are % consistency of both scoring rounds by the same assessor.

Score	Photograph old	Photograph new
Neck	46.8	79.4
Shoulder	35.5	66.7
Ribs	63.8	80.9
Spine	53.2	75.2
Rump	68.8	73.0
Abdomen	55.3	90.1
Tail base	35.5	71.6
Overview side	-	75.9
Overview rear	-	74.5
Neck folds	-	85.1
Thorax folds	-	78.7

Supplementary Table 4. Spearman's correlation coefficient and P values (*: significant) for the old and new scoring scheme and the proportion of non-forage feed in the diet, enclosure size, body weight and age for white rhinos *C. simum* in visited zoos.

	Age	BM	ES	N	OO	POO	POSN	OST	PNO	PNN	OSS	PSO	PSN	OSR	PRO	PRN	OSS
BM	0.14																
ES	-0.07	-0.05															
N	-0.07	-0.06	0.33														
OO	-0.03	0.25	-0.16	-0.06													
POO	-0.09	0.42	-0.03	-0.04	0.62												
POSN	-0.18	0.37	0.03	0.00	0.68	0.85											
OST	-0.10	0.58	-0.07	0.03	0.52	0.40	0.45										
PNO	-0.22	0.36	0.06	0.04	0.29	0.48	0.57	0.38									
PNN	-0.34	0.13	0.07	0.24	0.26	0.34	0.50	0.33	0.64								
OSS	0.05	0.35	-0.10	-0.04	0.74	0.49	0.51	0.58	0.27	0.20							
PSO	-0.11	0.38	-0.01	-0.10	0.48	0.62	0.69	0.37	0.80	0.49	0.36						
PSN	-0.22	0.39	0.05	-0.02	0.49	0.59	0.71	0.45	0.67	0.50	0.34	0.75					
OSR	0.03	0.18	-0.08	-0.07	0.74	0.54	0.57	0.40	0.22	0.28	0.66	0.37	0.35				
PRO	0.13	0.08	0.01	-0.08	0.28	0.34	0.33	-0.04	0.06	0.08	0.12	0.19	0.20	0.42			
PRN	0.03	-0.02	0.05	0.03	0.14	0.14	0.16	-0.07	-0.08	0.08	-0.01	-0.03	0.15	0.24	0.72		
OSS	-0.07	0.24	-0.03	0.01	0.72	0.61	0.67	0.45	0.30	0.28	0.71	0.46	0.45	0.68	0.23	0.09	
PSpN	-0.28	0.22	-0.11	0.03	0.54	0.62	0.68	0.41	0.49	0.49	0.44	0.55	0.51	0.43	0.01	-0.09	0.68
PSpO	-0.23	0.23	-0.03	0.04	0.56	0.60	0.72	0.44	0.58	0.53	0.42	0.61	0.55	0.37	-0.03	-0.11	0.57
OSR	-0.07	0.24	-0.21	0.00	0.71	0.52	0.51	0.44	0.19	0.12	0.70	0.29	0.28	0.60	0.12	-0.01	0.60
PRuO	-0.22	0.41	0.00	0.04	0.54	0.72	0.75	0.52	0.52	0.34	0.47	0.63	0.63	0.45	0.08	-0.04	0.55
PRuN	-0.18	0.39	-0.04	0.01	0.63	0.66	0.72	0.51	0.50	0.43	0.48	0.58	0.55	0.44	-0.01	-0.16	0.59
OSA	0.03	0.08	-0.15	-0.01	0.74	0.39	0.46	0.35	0.10	0.19	0.74	0.30	0.22	0.72	0.23	0.06	0.71
PAO	-0.15	0.15	-0.18	-0.17	0.50	0.63	0.51	0.22	0.17	0.22	0.40	0.35	0.21	0.48	0.16	0.00	0.42
PAN	-0.05	0.21	-0.07	-0.12	0.36	0.48	0.37	0.26	0.07	0.04	0.29	0.23	0.15	0.19	0.16	0.02	0.34
OST	-0.11	0.09	-0.17	0.08	0.79	0.53	0.55	0.41	0.17	0.25	0.66	0.31	0.33	0.66	0.24	0.09	0.61
PTO	0.01	0.16	-0.21	-0.15	0.61	0.60	0.61	0.22	0.34	0.28	0.41	0.52	0.47	0.55	0.31	0.17	0.56
PTN	0.07	0.21	-0.20	-0.03	0.62	0.55	0.64	0.23	0.28	0.17	0.36	0.45	0.42	0.46	0.21	0.09	0.54
POR	-0.13	0.41	-0.01	0.06	0.63	0.68	0.74	0.49	0.54	0.43	0.47	0.63	0.61	0.47	0.06	-0.08	0.59
PN	0.11	-0.15	-0.07	-0.08	0.43	0.23	0.23	0.04	0.16	0.22	0.43	0.22	0.14	0.45	0.18	0.09	0.35
PTF	0.20	-0.06	0.02	-0.03	0.11	0.13	0.16	-0.21	-0.09	-0.04	-0.03	-0.03	0.05	0.24	0.79	0.69	0.01

Supplementary Table 4. Continued

	PSpN	PSpO	OSR	PRuO	PRuN	OSA	PAO	PAN	OST	PTO	PTN	POR	PN
BM													
ES													
N													
OO													
POO													
POSN													
OST													
PNO													
PNN													
OSS													
PSO													
PSN													
OSR													
PRO													
PRN													
OSS													
PSpN													
PSpO	0.86												
OSR	0.46	0.40											
PRuO	0.71	0.71	0.46										
PRuN	0.74	0.81	0.45	0.75									
OSA	0.38	0.35	0.64	0.38	0.36								
PAO	0.34	0.30	0.42	0.35	0.35	0.49							
PAN	0.28	0.28	0.31	0.30	0.32	0.34	0.40						
OST	0.43	0.41	0.77	0.41	0.49	0.71	0.48	0.34					
PTO	0.54	0.52	0.48	0.47	0.50	0.39	0.34	0.31	0.50				
PTN	0.51	0.56	0.46	0.47	0.53	0.37	0.34	0.28	0.52	0.74			
POR	0.69	0.78	0.47	0.71	0.94	0.34	0.34	0.30	0.49	0.59	0.58		
PN	0.22	0.20	0.32	0.09	0.08	0.46	0.27	0.09	0.39	0.45	0.22	0.13	
PTF	-0.15	-0.21	-0.06	-0.09	-0.19	0.08	0.01	0.08	0.09	0.14	0.12	-0.11	0.12

Supplementary Table 4. Continued

	Age	BM	ES	N	OO	POO	POSN	OST	PNO	PNN	OSS	PSO	PSN	OSR	PRO
BM	0.202														
ES	0.518	0.657													
N	0.522	0.579	0.003*												
OO	0.791	0.022*	0.142	0.557											
POO	0.427	0.000*	0.782	0.700	0.000*										
POSN	0.110	0.000*	0.774	0.985	0.000*	0.000*									
OST	0.356	0.000*	0.556	0.818	0.000*	0.000*	0.000*								
PNO	0.042*	0.001*	0.591	0.745	0.007*	0.000*	0.000*	0.000*							
PNN	0.001*	0.241	0.553	0.028*	0.016*	0.002*	0.000*	0.002*	0.000*						
OSS	0.676	0.001*	0.357	0.699	0.000*	0.000*	0.000*	0.000*	0.012*	0.067					
PSO	0.299	0.000*	0.913	0.364	0.000*	0.000*	0.000*	0.001*	0.000*	0.000*	0.001*				
PSN	0.042*	0.000*	0.633	0.884	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.002*	0.000*			
OSR	0.805	0.096	0.448	0.548	0.000*	0.000*	0.000*	0.000*	0.040*	0.010*	0.000*	0.000*	0.001*		
PRO	0.245	0.497	0.910	0.490	0.009*	0.002*	0.003*	0.730	0.591	0.487	0.297	0.081	0.073	0.000*	
PRN	0.754	0.891	0.651	0.764	0.196	0.207	0.156	0.549	0.469	0.487	0.950	0.791	0.180	0.027*	0.000*
OSS	0.507	0.027*	0.773	0.898	0.000*	0.000*	0.000*	0.000*	0.006*	0.011*	0.000*	0.000*	0.000*	0.000*	0.037*
PSpN	0.010*	0.048*	0.329	0.758	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.937
PSpO	0.033*	0.034*	0.775	0.722	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.001*	0.795
OSR	0.542	0.026*	0.056	0.993	0.000*	0.000*	0.000*	0.000*	0.076	0.260	0.000*	0.007*	0.009*	0.000*	0.291
PRuO	0.047*	0.000*	0.978	0.746	0.000*	0.000*	0.000*	0.000*	0.000*	0.001*	0.000*	0.000*	0.000*	0.000*	0.460
PRuN	0.107	0.000*	0.720	0.907	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.939
OSA	0.821	0.453	0.170	0.896	0.000*	0.000*	0.000*	0.001*	0.359	0.079	0.000*	0.006*	0.047*	0.000*	0.032*
PAO	0.170	0.173	0.107	0.131	0.000*	0.000*	0.000*	0.045*	0.119	0.043*	0.000*	0.001*	0.050	0.000*	0.153
PAN	0.677	0.054	0.503	0.265	0.001*	0.000*	0.001*	0.015*	0.511	0.705	0.008*	0.038	0.163	0.078	0.140
OST	0.302	0.413	0.112	0.464	0.000*	0.000*	0.000*	0.000*	0.132	0.023*	0.000*	0.004*	0.002*	0.000*	0.028*
PTO	0.915	0.156	0.055	0.160	0.000*	0.000*	0.000*	0.043*	0.002*	0.011*	0.000*	0.000*	0.000*	0.000*	0.005*
PTN	0.509	0.053	0.065	0.757	0.000*	0.000*	0.000*	0.035*	0.009*	0.112	0.001*	0.000*	0.000*	0.000*	0.061
POR	0.235	0.000*	0.955	0.580	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.569
PN	0.328	0.183	0.504	0.450	0.000*	0.037*	0.039*	0.699	0.141	0.048*	0.000*	0.049*	0.212	0.000*	0.097
PTF	0.074	0.619	0.833	0.801	0.317	0.235	0.149	0.057	0.406	0.714	0.757	0.816	0.666	0.025*	0.000*

Supplementary Table 4. Continued

	PRN	OSS	PSpN	PSpO	OSR	PRuO	PRuN	OSA	PAO	PAN	OST	PTO	PTN	POR	PN
BM															
ES															
N															
OO															
POO															
POSN															
OST															
PNO															
PNN															
OSS															
PSO															
PSN															
OSR															
PRO															
PRN															
OSS	0.441														
PSpN	0.417	0.000*													
PSpO	0.309	0.000*	0.000*												
OSR	0.931	0.000*	0.000*	0.000*											
PRuO	0.723	0.000*	0.000*	0.000*	0.000*										
PRuN	0.147	0.000*	0.000*	0.000*	0.000*	0.000*									
OSA	0.568	0.000*	0.000*	0.001*	0.000*	0.000*	0.001*								
PAO	0.990	0.000*	0.002*	0.005*	0.000*	0.001*	0.001*	0.000*							
PAN	0.844	0.002*	0.010*	0.011*	0.004*	0.006*	0.004*	0.002*	0.000*						
OST	0.412	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.002*					
PTO	0.131	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.002*	0.004*	0.000*				
PTN	0.407	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.001*	0.002*	0.009*	0.000*	0.000*			
POR	0.443	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.002*	0.001*	0.006*	0.000*	0.000*	0.000*		
PN	0.402	0.001*	0.046*	0.074	0.003*	0.424	0.458	0.000*	0.014*	0.426	0.000*	0.000*	0.043*	0.240	
PTF	0.000*	0.945	0.166	0.054	0.584	0.424	0.086	0.497	0.934	0.468	0.402	0.193	0.271	0.308	0.290

Note: BM: Body mass, ES: Enclosure size, N: Nonforage, OO: On site overview, POO: Photo overview old, POSN: Photo overview side new, OSN: On site neck, PNO: Photo neck old, PNN: Photo neck new, OSS: On site shoulder, PSO: Photo shoulder old, PSN: Photo shoulder new, OSR: On site ribs, PRO: Photo ribs old, PRN: Photo ribs new, OSS: On site spine, PSpO: Photo spine old, PSpN: Photo spine new, OSR: On site rump, PRuO: Photo rump old, PRuN: Photo rump new, OSA: On site abdomen, PAO: Photo abdomen old, PAN: Photo abdomen new, OST: On site tailbase, PTO: Photo tailbase old, PTN: Photo tailbase new, POR: Photo overview rear, PN: Photo neckfold, PTF: Photo thorax fold

Supplementary Table 5. Spearman's correlation coefficient and P values (* significant) for the old and new scoring scheme and the proportion of non-forage feed in the diet, enclosure size, body mass and age for black rhinos *D. bicornis* in visited zoos.

	Age	BM	ES	N	OO	POO	POSN	OST	PNO	PNN	OSS	PSO	PSN	OSR	PRO	PRN	OSS
BM	-0.32																
ES	-0.28	0.28															
N	-0.04	-0.11	-0.24														
OO	-0.45	0.31	0.28	-0.18													
POO	-0.36	0.45	0.54	-0.04	0.59												
POSN	-0.32	0.40	0.49	-0.13	0.56	0.81											
OST	-0.40	0.46	0.07	0.09	0.52	0.41	0.35										
PNO	-0.40	0.39	0.36	-0.07	0.39	0.38	0.41	0.40									
PNN	-0.43	0.10	0.16	0.04	0.35	0.33	0.36	0.29	0.57								
OSS	-0.22	0.18	0.09	0.04	0.53	0.43	0.29	0.46	0.26	0.24							
PSO	-0.52	0.53	0.38	-0.01	0.50	0.58	0.57	0.51	0.71	0.36	0.25						
PSN	-0.33	0.42	0.42	0.00	0.43	0.54	0.61	0.40	0.54	0.35	0.35	0.67					
OSR	-0.18	0.13	0.21	-0.21	0.57	0.49	0.49	0.31	0.37	0.25	0.49	0.30	0.31				
PRO	-0.11	0.16	0.10	0.13	0.13	0.23	0.33	0.13	0.29	0.22	0.03	0.17	0.26	0.34			
PRN	-0.03	0.06	-0.06	0.18	0.04	0.08	0.17	0.03	-0.06	-0.03	0.07	-0.04	0.10	0.18	0.71		
OSS	-0.23	0.17	0.01	-0.15	0.57	0.45	0.40	0.41	0.25	0.31	0.55	0.32	0.41	0.66	0.11	0.02	
PSPN	-0.25	0.39	0.43	-0.07	0.45	0.71	0.74	0.39	0.23	0.16	0.38	0.45	0.51	0.35	0.07	-0.07	0.44
PSPo	-0.26	0.31	0.52	-0.01	0.40	0.62	0.73	0.30	0.33	0.21	0.27	0.41	0.53	0.20	0.13	-0.09	0.35
OSR	-0.34	0.13	-0.01	-0.01	0.58	0.31	0.35	0.21	0.16	0.29	0.46	0.23	0.13	0.42	0.11	0.17	0.50
PRuO	-0.21	0.40	0.38	0.02	0.31	0.55	0.51	0.17	0.25	0.21	0.24	0.35	0.41	0.19	-0.01	-0.14	0.34
PRuN	-0.31	0.36	0.44	0.07	0.47	0.75	0.77	0.32	0.34	0.24	0.31	0.52	0.54	0.31	0.06	-0.10	0.40
OSA	-0.10	0.07	0.19	-0.21	0.58	0.49	0.46	0.18	0.22	0.20	0.47	0.28	0.16	0.44	-0.11	-0.05	0.50
PAO	-0.23	0.33	0.45	-0.18	0.45	0.78	0.75	0.32	0.28	0.31	0.26	0.44	0.49	0.46	0.26	0.13	0.40
PAN	0.07	0.14	0.03	-0.24	0.10	0.27	0.39	0.07	0.04	0.10	-0.11	0.22	0.32	0.28	0.12	0.12	0.24
OST	-0.24	0.13	0.08	-0.11	0.54	0.39	0.29	0.12	0.21	0.32	0.60	0.17	0.18	0.44	0.09	0.11	0.48
PTO	-0.18	0.33	0.33	-0.04	0.52	0.71	0.70	0.31	0.16	0.18	0.42	0.26	0.45	0.40	0.19	0.04	0.46
PTN	-0.23	0.29	0.42	-0.02	0.46	0.63	0.65	0.17	0.25	0.19	0.34	0.32	0.47	0.35	0.02	-0.07	0.46
POR	-0.35	0.34	0.44	0.07	0.48	0.72	0.75	0.32	0.31	0.25	0.28	0.47	0.51	0.30	0.02	-0.09	0.41
PN	-0.44	-0.08	0.16	-0.03	0.31	0.20	0.30	0.06	0.27	0.44	0.10	0.23	0.05	0.23	0.26	0.16	0.17
PTF	-0.13	0.09	0.03	-0.07	0.23	0.14	0.11	-0.07	0.08	0.16	0.02	-0.07	-0.02	0.34	0.55	0.42	0.11

Supplementary Table 5. Continued

	PSpN	PSpO	OSR	PRuO	PRuN	OSA	PAO	PAN	OST	PTO	PTN	POR	PN
BM													
ES													
N													
OO													
POO													
POSN													
OST													
PNO													
PNN													
OSS													
PSO													
PSN													
OSR													
PRO													
PRN													
OSS													
PSpN													
PSpO	0.83												
OSR	0.33	0.22											
PRuO	0.67	0.57	0.37										
PRuN	0.82	0.87	0.36	0.64									
OSA	0.38	0.28	0.45	0.29	0.42								
PAO	0.65	0.55	0.11	0.43	0.61	0.44							
PAN	0.29	0.14	-0.07	0.18	0.17	0.14	0.37						
OST	0.26	0.11	0.62	0.30	0.23	0.55	0.22	-0.05					
PTO	0.79	0.62	0.44	0.66	0.68	0.43	0.58	0.19	0.52				
PTN	0.67	0.70	0.53	0.59	0.81	0.45	0.45	0.08	0.39	0.75			
POR	0.77	0.83	0.40	0.65	0.96	0.43	0.56	0.15	0.23	0.69	0.88		
PN	0.21	0.18	0.20	-0.01	0.17	0.17	0.20	-0.02	0.26	0.09	0.06	0.12	
PTF	-0.12	-0.08	0.17	-0.02	-0.09	0.00	0.15	0.08	0.18	0.06	-0.09	-0.11	0.15

Supplementary Table 5. Continued

	Age	BM	ES	N	OO	POO	POSN	OST	PNO	PNN	OSS	PSO	PSN	OSR	PRO
BM	0.015*														
ES	0.033*	0.037													
N	0.752	0.437	0.073												
OO	0.000*	0.018	0.033*	0.183											
POO	0.007*	0.000*	0.000*	0.750	0.000*										
POSN	0.015*	0.002*	0.000*	0.324	0.000*	0.000*									
OST	0.002*	0.000*	0.596	0.495	0.000*	0.002*	0.008*								
PNO	0.002*	0.003*	0.005*	0.583	0.003*	0.004*	0.002*	0.002*							
PNN	0.001*	0.440	0.243	0.762	0.008*	0.012*	0.006*	0.028*	0.000*						
OSS	0.100	0.169	0.513	0.758	0.000*	0.001*	0.029*	0.000*	0.052	0.076					
PSO	0.000*	0.000*	0.004*	0.938	0.000*	0.000*	0.000*	0.000*	0.000*	0.007*	0.062				
PSN	0.012*	0.001*	0.001*	0.982	0.001*	0.000*	0.000*	0.002*	0.000*	0.008*	0.008*	0.000*			
OSR	0.186	0.336	0.124	0.112	0.000*	0.000*	0.000*	0.021*	0.005*	0.064	0.000*	0.022*	0.021*		
PRO	0.411	0.234	0.438	0.333	0.327	0.087	0.013*	0.329	0.030*	0.094	0.816	0.218	0.047*	0.011*	
PRN	0.828	0.632	0.650	0.192	0.777	0.571	0.211	0.805	0.652	0.837	0.614	0.787	0.448	0.170	0.000*
OSS	0.091	0.201	0.961	0.272	0.000*	0.001*	0.002*	0.002*	0.058	0.017*	0.000*	0.014*	0.002*	0.000*	0.423
PSpN	0.058	0.003*	0.001*	0.607	0.001*	0.000*	0.000*	0.002*	0.086	0.242	0.004*	0.000*	0.000*	0.007*	0.586
PSpO	0.055	0.020*	0.000*	0.951	0.002*	0.000*	0.000*	0.022*	0.013*	0.115	0.045*	0.002*	0.000*	0.137	0.332
OSR	0.009*	0.321	0.941	0.922	0.000*	0.020*	0.008*	0.117	0.237	0.029*	0.000*	0.092	0.347	0.001*	0.412
PRuO	0.114	0.002*	0.004*	0.910	0.021*	0.000*	0.000*	0.216	0.066	0.111	0.072	0.007*	0.001*	0.158	0.962
PRuN	0.019*	0.006*	0.001*	0.610	0.000*	0.000*	0.000*	0.017*	0.010*	0.071	0.019	0.000*	0.000*	0.020*	0.636
OSA	0.448	0.583	0.147	0.114	0.000*	0.000*	0.000*	0.182	0.105	0.136	0.000*	0.035*	0.220	0.001*	0.414
PAO	0.081	0.013*	0.001*	0.169	0.000*	0.000*	0.000*	0.016*	0.034*	0.018*	0.048*	0.001*	0.000*	0.000*	0.046*
PAN	0.627	0.295	0.807	0.071	0.459	0.044*	0.002*	0.615	0.746	0.457	0.419	0.105	0.014*	0.035*	0.359
OST	0.067	0.335	0.559	0.416	0.000*	0.002*	0.027*	0.362	0.113	0.015*	0.000*	0.211	0.186	0.001*	0.508
PTO	0.170	0.013*	0.014*	0.777	0.000*	0.000*	0.000*	0.018*	0.249	0.172	0.001*	0.049*	0.000*	0.002*	0.159
PTN	0.082	0.027*	0.001*	0.893	0.000*	0.000*	0.000*	0.198	0.056	0.165	0.010*	0.014*	0.000*	0.008*	0.866
POR	0.008*	0.010*	0.001*	0.593	0.000*	0.000*	0.000*	0.016*	0.019*	0.063	0.034*	0.000*	0.000*	0.025*	0.880
PN	0.001*	0.575	0.237	0.805	0.018*	0.135	0.025*	0.661	0.046*	0.001*	0.467	0.091	0.719	0.082	0.050*
PTF	0.328	0.526	0.823	0.629	0.090	0.287	0.402	0.617	0.545	0.223	0.868	0.621	0.903	0.009*	0.000*

Supplementary Table 5. Continued

	PRN	OSS	PSpN	PSpO	OSR	PRuO	PRuN	OSA	PAO	PAN	OST	PTO	PTN	POR	PN
BM															
ES															
N															
OO															
POO															
POSN															
OST															
PNO															
PNN															
OSS															
PSO															
PSN															
OSR															
PRO															
PRN															
OSS	0.876														
PSpN	0.621	0.001*													
PSpO	0.483	0.007*	0.000*												
OSR	0.212	0.000*	0.013*	0.094											
PRuO	0.285	0.009*	0.000*	0.000*	0.005*										
PRuN	0.475	0.002*	0.000*	0.000*	0.005*	0.000*									
OSA	0.686	0.000*	0.003*	0.038*	0.000*	0.032*	0.001*								
PAO	0.354	0.002*	0.000*	0.000*	0.428	0.001*	0.000*	0.001*							
PAN	0.387	0.075	0.026*	0.306	0.587	0.176	0.199	0.293	0.005*						
OST	0.408	0.000*	0.052	0.436	0.000*	0.023*	0.090	0.000*	0.097	0.715					
PTO	0.785	0.000*	0.000*	0.000*	0.001*	0.000*	0.000*	0.001*	0.000*	0.152	0.000*				
PTN	0.614	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.574	0.003*	0.000*			
POR	0.487	0.001*	0.000*	0.000*	0.002*	0.000*	0.000*	0.001*	0.000*	0.258	0.088	0.000*	0.000*		
PN	0.221	0.218	0.119	0.181	0.145	0.951	0.212	0.203	0.130	0.909	0.051	0.506	0.650	0.375	
PTF	0.001*	0.397	0.367	0.536	0.193	0.910	0.496	0.990	0.263	0.537	0.190	0.682	0.515	0.407	0.277

Note: BM: Body mass, ES: Enclosure size, N: Nonforage, OO: On site overview, POO: Photo overview old, POSN: Photo overview side new, OSN: On site neck, PNO: Photo neck old, PNN: Photo neck new, OSS: On site shoulder, PSO: Photo shoulder old, PSN: Photo shoulder new, OSR: On site ribs, PRO: Photo ribs old, PRN: Photo ribs new, OSS: On site spine, PSpO: Photo spine old, PSpN: Photo spine new, OSR: On site rump, PRuO: Photo rump old, PRuN: Photo rump new, OSA: On site abdomen, PAO: Photo abdomen old, PAN: Photo abdomen new, OST: On site tailbase, PTO: Photo tailbase old, PTN: Photo tailbase new, POR: Photo overview rear, PN: Photo neckfold, PTF: Photo thorax fold

Score 1

Score 2

Score 3

		
neck clearly concave; nuchal ligament visible in every head position with a groove underneath	neck plain or slightly convex; nuchal ligament clearly visible with a groove ventrally in head-down position (eyes below shoulder); nuchal ligament possibly visible or indicated in head-up position	neck convex; nuchal ligament and its margins not visible independent of head position

Supplementary Figure 1. BCS for the neck in white rhino *C. simum*.

Score 1

Score 2

Score 3

		
neck clearly concave; distinct hollowing in front of shoulder blade over the entire height of the neck	neck plain or slightly convex; slight hollowing in front of shoulder blade	neck convex and bulging on top; no hollowing in front of shoulder blade

Supplementary Figure 2. BCS for the neck in black rhino *D. bicornis*.

Score 1

Score 2

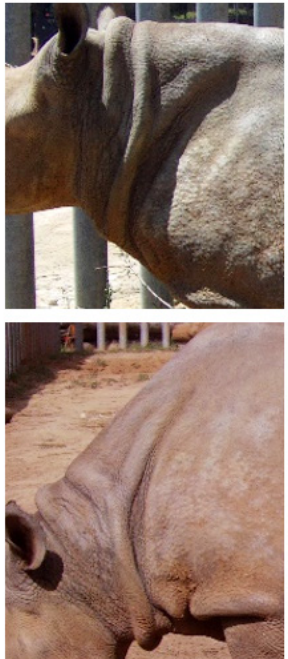
	
no folds visible up the side of the neck in head-up position; hint of small folds always visible ventrally at the transition from neck to shoulder; 1-2 folds when in head-down position, but quite thin	distinct neck fold extending to top, covers over two third of neck; second smaller fold visible; folds visible in all head positions

Supplementary Figure 3. BCS for the neck folds in white rhino *C. simum*.

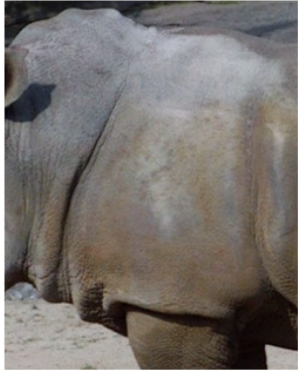
Score 1

Score 1.5

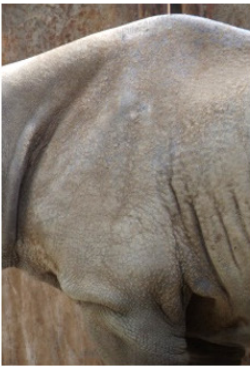
Score 2

		
no fold irrespective of head position	no fold in head-up position; fold distinct in head-down position	thick fold extending to the upper third of the neck; fold clearly independent from head position; second fold possible

Supplementary Figure 4. BCS for the neck folds in black rhino *D. bicornis*.

Score 1	Score 2	Score 3	Score 4
			
cranial margin of the scapula clearly visible as far as to the dorsal end; dorsal margin visible; spine of scapula visible in entire length	cranial margin of the scapula visible as far as to the upper end; dorsal margin not visible; spine of scapula visible or indicated	cranial margin of the scapula visible but not traceable to dorsal end; spine of scapula not visible	no bony parts of the scapula visible

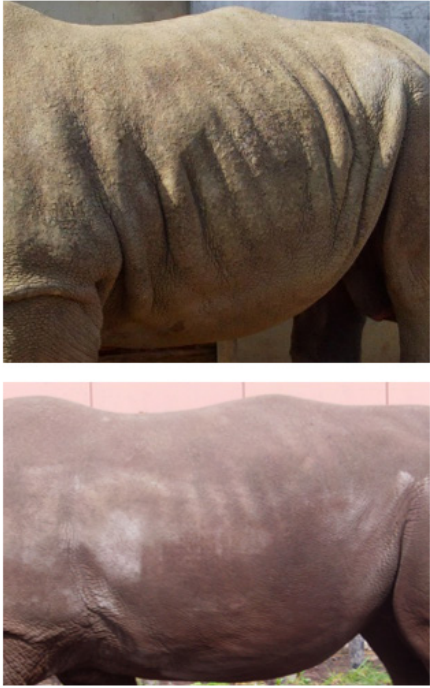
Supplementary Figure 5. BCS for the shoulder in white rhino *C. simum*.

Score 1	Score 2	Score 3	Score 4
			
cranial margin of the scapula clearly visible as far as to the dorsal end; dorsal margin visible or indicated; spine of scapula visible	cranial margin of the scapula clearly visible; spine of scapula visible or indicated; dorsal margin not visible	cranial margin of scapula visible but not traceable to dorsal end; spine of scapula not visible	no bony parts at the scapula visible at all

Supplementary Figure 6. BCS for the shoulder in black rhino *D. bicornis*.

Score 1

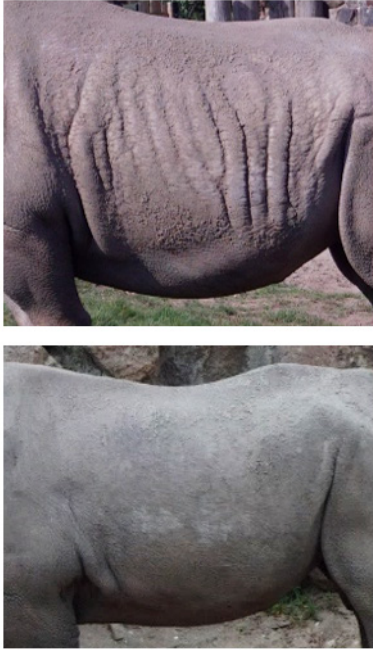
Score 2

	
ribs visible; skin folds may be present	ribs not visible; skin folds may be present

Supplementary Figure 7. BCS for the ribs in white rhino *C. simum*.

Score 1

Score 2

	
ribs visible; possibly mild folding on breast and flank	ribs not visible; skin folds may be present or absent

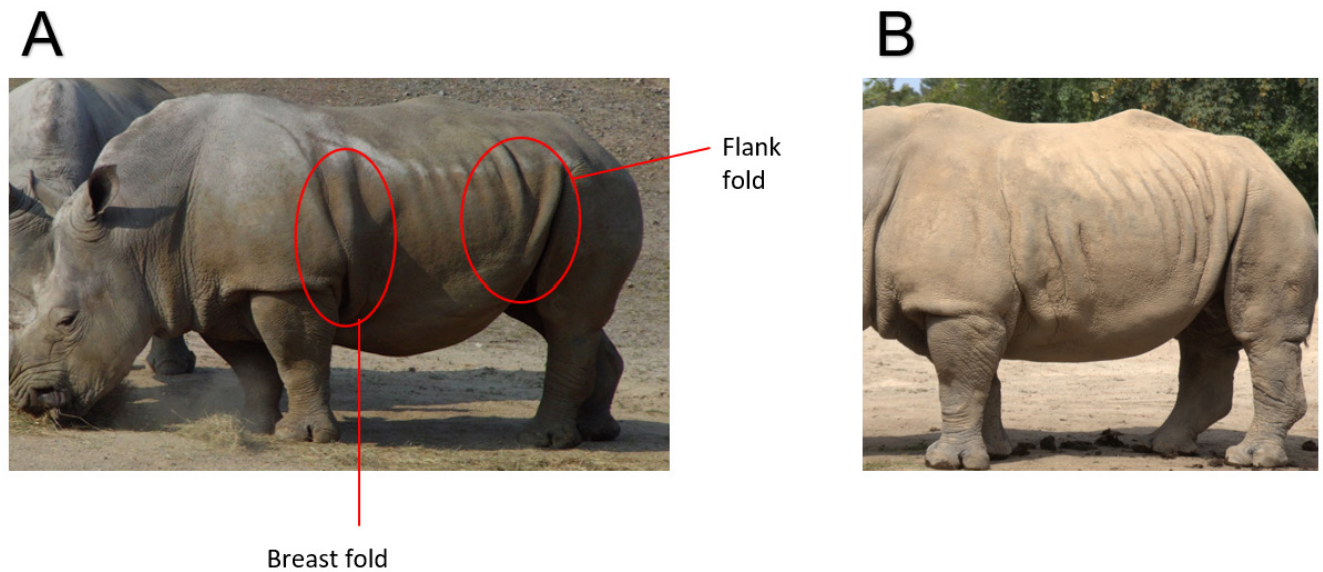
Supplementary Figure 8. BCS for the ribs in black rhino *D. bicornis*.

Score 1	Score 2	Score 2.5	Score 3
			
no folds at all or possibly beginning formation of a small breast fold	breast fold and flank fold; no folds on lateral thorax	breast fold and flank fold; beginning formation of folds only caudally on thorax	breast fold and flank fold; thick folds over the entire thorax length

Supplementary Figure 9. BCS for the thorax skin folds in white rhino *C. simum*.

Score 1	Score 2	Score 3
		
no folds on thorax or flank; breast fold slightly visible depending on leg position	breast fold clearly visible; no folds on lateral thorax or at the flank	breast fold prominent; additional folds on lateral thorax; small flank fold may be present depending on leg position

Supplementary Figure 10. BCS for the thorax skin folds in black rhino *D. bicornis*.



Supplementary Figure 11. (A) Thorax skin folds in white rhino *C. simum*. The flank fold might be divided into two folds. (B) Misleading “ribby” appearance due to thick skin folds.

Score 1

Score 2



no transition between costal arch and abdomen visible; abdomen does not appear distended



abdomen bulges out over costal arch at lower end and can form a small groove; abdomen seems distended

Supplementary Figure 12. BCS for the abdomen in white rhino *C. simum*.

Score 1

Score 2

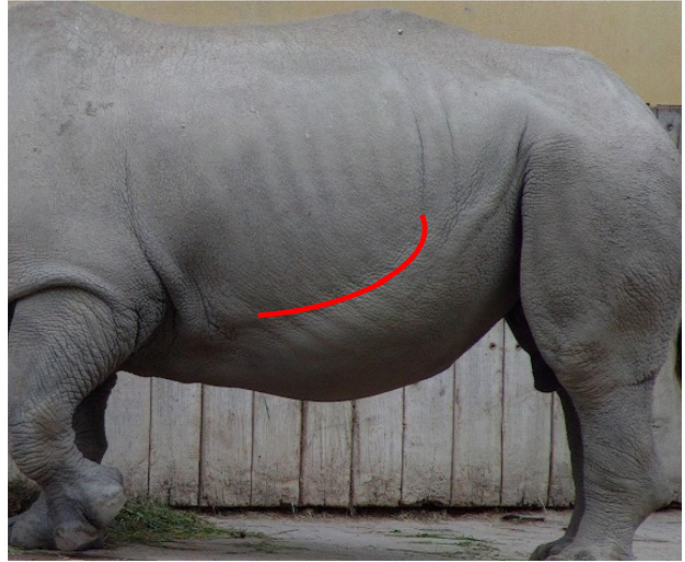
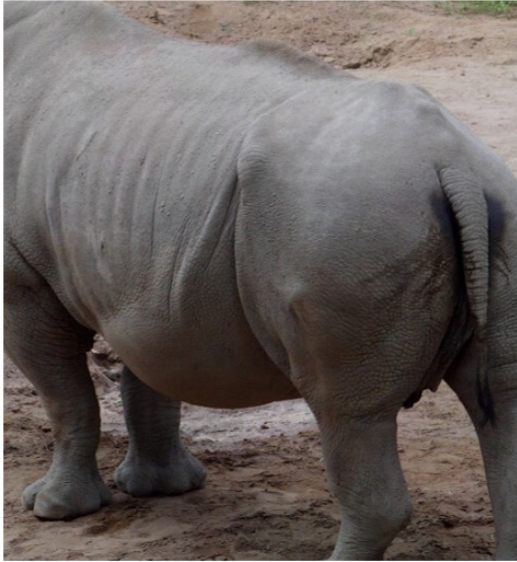


no transition between costal arch and abdomen visible; abdomen does not appear distended



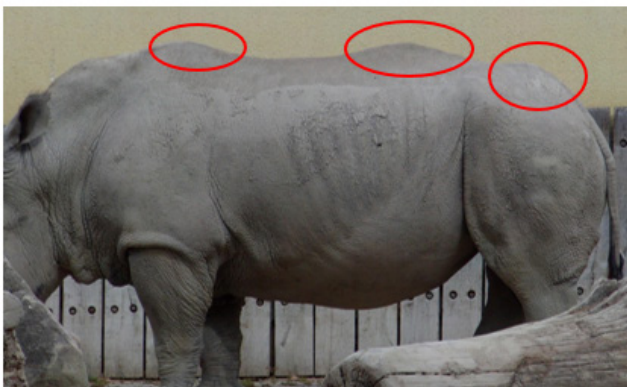
abdomen bulges out over costal arch at lower end and can form a small groove; abdomen seems distended

Supplementary Figure 13. BCS for the abdomen in black rhino *D. bicornis*.



Supplementary Figure 14. Abdomen bulges over costal arch and forms a line in two white rhinos *C. simum*.

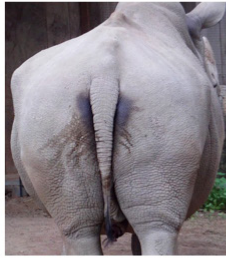
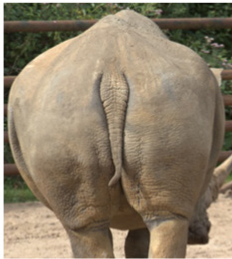
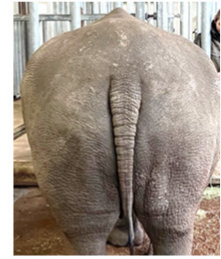
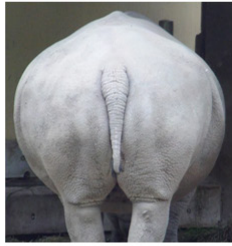
A



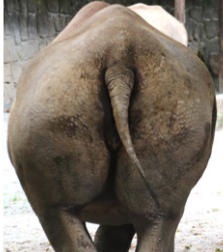
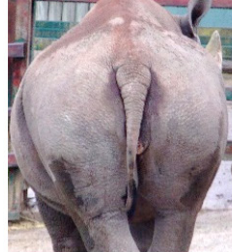
B



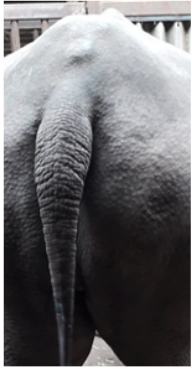
Supplementary Figure 15. (A) Three parts of the column are usually visible: withers, lumbar spine and sacrum. (B) Fat and muscles bulge on both sides of the spine and forms a groove in the middle in a white rhino of high body condition *C. simum*.

Score 1	Score 2	Score 3	Score 4	Score 5
				
				
distinct depression at hip region; sacrum clearly protruding; depression dorsally of point of hip; cranial and caudal edges of iliac crest detectable	hip region concave; sacrum clearly visible; point of hip clearly visible; all bony structures distinct; iliac crest slightly visible	hip region slightly concave; sacrum visible; point of hip visible; iliac crest covered and only indistinctly recognisable	hip region flattened or slightly rounded; sacrum visible; point of hip only indicated; rear appears higher than broad	hip region rounded and filled; sacrum barely detectable; point of hip not visible; rear appears broader than high

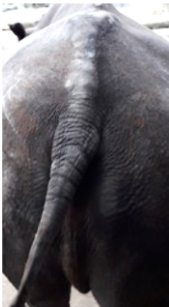
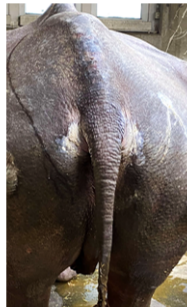
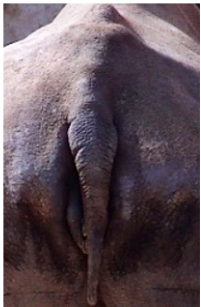
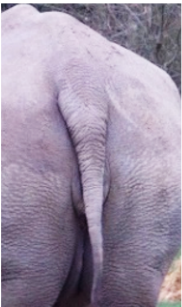
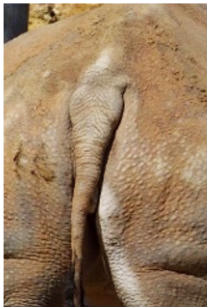
Supplementary Figure 16. BCS for the rump in white rhino *C. simum*.

Score 1	Score 2	Score 3	Score 4	Score 5
				
				
distinct depression at hip region; sacrum clearly protruding; point of hip entirely distinct; iliac crest visible with depressions alongside the cranial and caudal edge	hip region concave; sacrum clearly visible; point of hip clearly visible; all bony structures distinct; iliac crest slightly visible	hip region slightly concave; sacrum visible; point of hip visible; iliac crest only indistinctly recognisable	hip region flattened; sacrum visible; point of hip only indicated; rear appears higher than broad	hip region rounded and filled; sacrum hardly detectable; point of hip not visible; rear appears broad

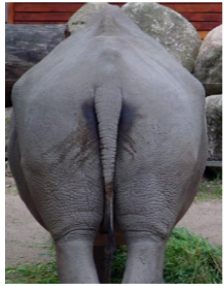
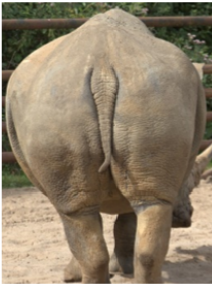
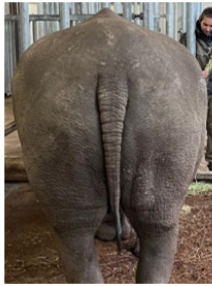
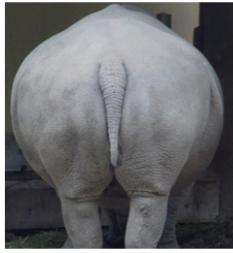
Supplementary Figure 17. BCS for the rump in black rhino *D. bicornis*.

Score 1	Score 2	Score 3	Score 4
			
tail narrow and bony; tail base raises slightly over adjacent rump muscles; tissue sunken on both sides next to tail; vertebrae protruding and distinctly visible from tail base up to sacrum	tail straight or slightly broad; transition from rump to tail smooth; no depression or wrinkles; adjoined rump muscles at the same level as tail base; upper tail may be slightly wider than at base; no vertebrae visible	tail broad; transition from back to tail smooth; adjacent rump muscles bulging; tail widens in upper third and curves outwards in a roundish shape; no vertebrae visible	tail broad; transition from back to tail smooth; adjacent rump muscles bulging; tail widens in upper third and curves outwards in a roundish shape; no vertebrae visible

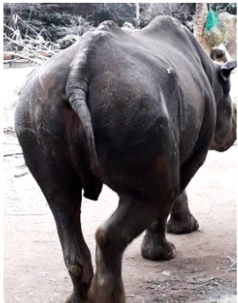
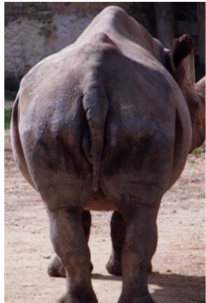
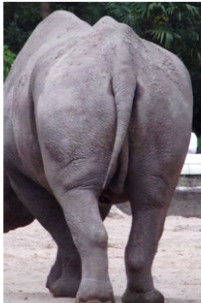
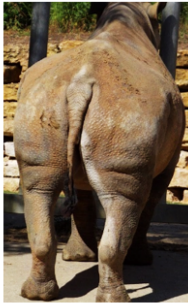
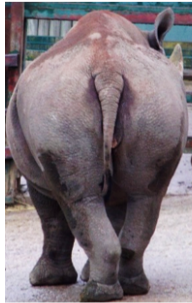
Supplementary Figure 18. BCS for the tail base in white rhino *C. simum*.

Score 1	Score 1.5	Score 2	Score 3	Score 4
				
tail narrow and bony; tail base raises slightly over adjacent rump muscles; single vertebrae protruding from tail base up to sacrum; distinct depression on both sides at tail base	tail straight; tail base raises over adjacent rump muscles; tail widest at base; no single vertebrae visible but protruding strand from tail base up to sacrum; depression on both sides at tail base	tail straight; tail base raising over adjacent rump muscles; tail as wide as base; lowest vertebrae indicated over tail base, but no vertebrae distinct up to sacrum; only slight depression on both sides at tail base	tail broad; tail base raising slightly over adjacent rump muscles; upper tail may be wider than at base; vertebrae not visible; slight to no depression on both sides of tail base	tail broad; tail base at same level as adjacent rump muscles; no depression on both sides at tail base; upper tail area curving outwards in a rounded shape and wider than base; wrinkling at base of tail; no bony structures at or above tail base visible

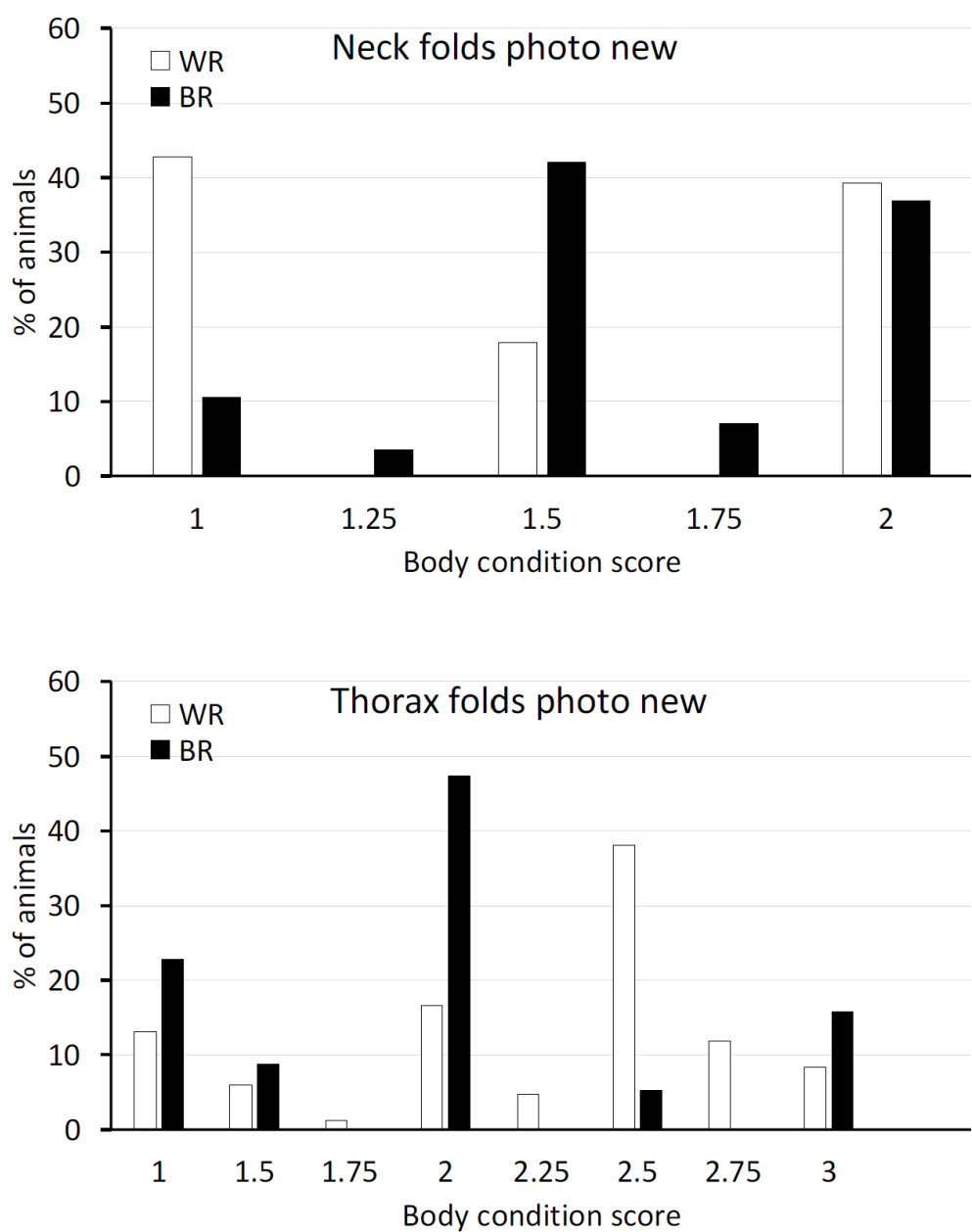
Supplementary Figure 19. BCS for the tail base in black rhino *D. bicornis*.

Score 1	Score 2	Score 3	Score 4	Score 5
				
overall appearance skinny; prominent bony structures of pelvis; spine and single tail vertebrae; distinct depression caudal to the iliac crest and alongside the spine	overall appearance thin. bony structures of pelvis, spine and tail vertebrae; depression alongside the spine and caudal the iliac crest	overall appearance ideal; bony structures of the caudal part of the spine and the pelvis visible; hip area flattened with slight depression caudal to the iliac crest	overall appearance rounded; bony structures only slightly recognisable at the pelvis and caudal spine; hip area rounded; tail base straight to broad	overall appearance obese; no bony points except slightly the sacrum; hip area and region alongside the spine rounded and bulging; tail base broad

Supplementary Figure 20. Overall BCS for the general appearance in white rhino *C. simum* from a rear view.

Score 1	Score 2	Score 3	Score 4	Score 5
				
overall appearance skinny; prominent bony structures of pelvis, spine and single tail vertebrae; distinct depression caudal to the iliac crest and alongside the spine	overall appearance thin; bony structures of pelvis, spine and tail vertebrae; depression alongside the spine and caudal the iliac crest	overall appearance ideal; bony structures of the caudal part of the spine and the pelvis visible; hip area flattened with slight depression caudal to the iliac crest	overall appearance, rounded; bony structures only slightly recognisable at the pelvis and caudal spine; hip area flattened; tail base straight to broad	overall appearance obese; no bony points except for the sacrum; hip area and region alongside the spine well-rounded; tail base broad

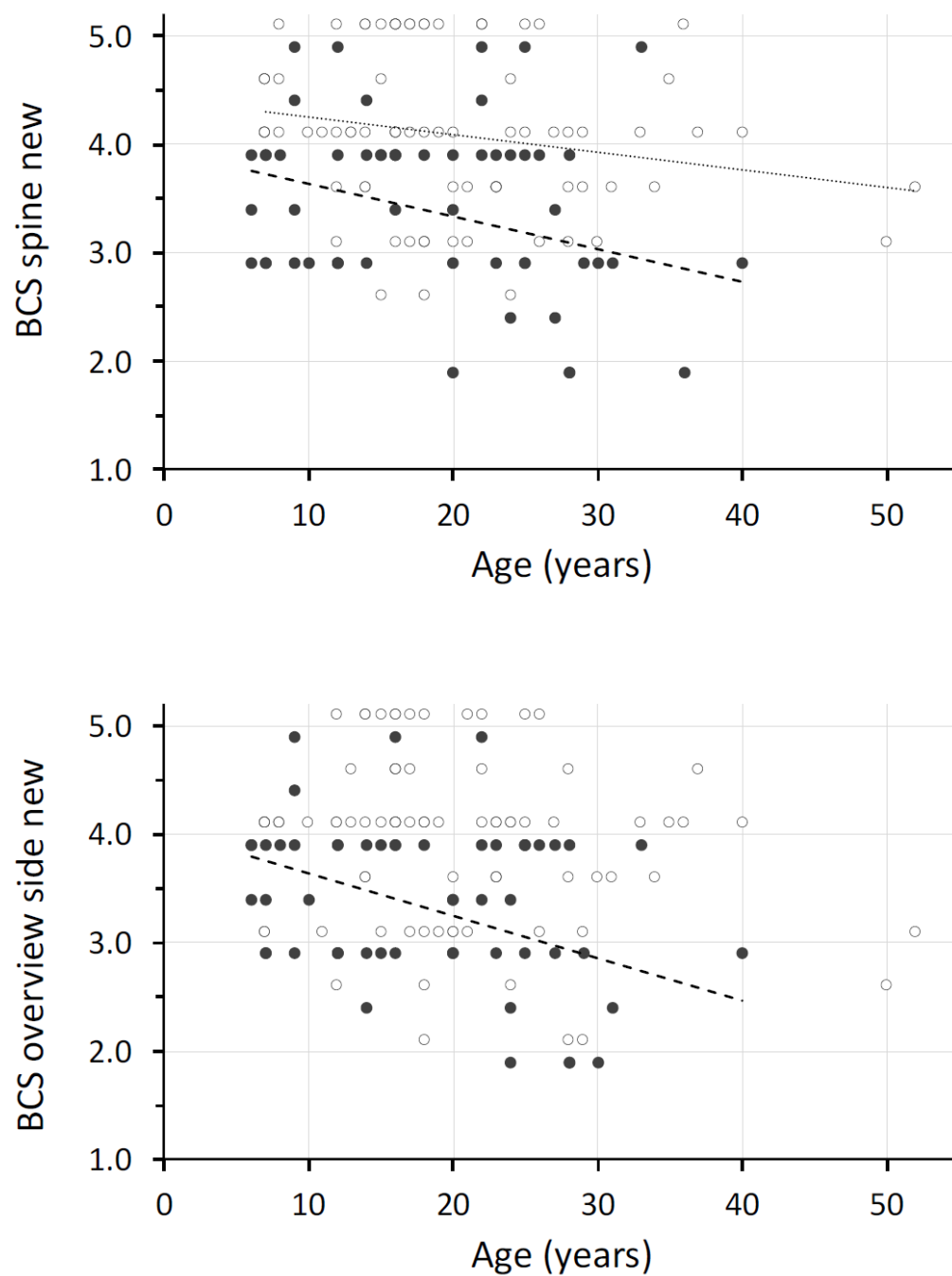
Supplementary Figure 21. Overall BCS for the general appearance in black rhino *D. bicornis* from a rear view.



Supplementary Figure 22. Additional body condition scores for the folds in 84 white *C. simum* and 57 black rhinos *D. bicornis* kept in European zoos according to the new scoring scheme developed in this study.



Supplementary Figure 23. BCS for the spine and overview side according to the new scheme in correlation with body mass in adult white rhinos *C. simum* and adult black rhino *D. bicornis*. For easier visibility, data for white rhino are displayed slightly above and for black rhino slightly below a BCS step.



Supplementary Figure 24. BCS for the spine and overview side according to the new scheme in correlation with age in adult white rhinos *C. simum* and adult black rhino *D. bicornis*. For easier visibility, data for white rhino are displayed slightly above and for black rhino slightly below a BCS step.