Herding Ancient Domesticates:
From Bones to Genomes

<u>APPENDIX</u>

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Department of Genetics

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APPENDIX

List of Figures

List of Tables

Appendix Table 1. Chapter 3. *The screening results of archaeological samples screened for aDNA preservation. Lab name, and if different thesis name are given, along with the Assemblage name and site. Cultural period along with species ID post sequencing are also given. The estimation of endogenous were calculated like so: (reads after rmdup+q30/Total Reads Sequence)*100. As several different extraction methods were tried through this process as noted in Section 2.2.1.2 a symbol for which extraction method is given: S=Single, D=Double, T=Triple. If the sample was analysed post-Chapter 3 it is denoted in one of the three Chapter columns.*

Lab Name	Thesis Name	Assemblage Name	Site	Country	Lat	Long	Era	Species	Bone element	Direct Radiocarbon cal BC/AD	Approx Age BP	Total Reads	Reads After rmdup + q30	% Endogenous	Extraction	Chapter 4	Chapter 5	Chapter 6	Contact
VEM 001	VEM 001	FN 1548; Unit 15N25W, SW Quad, Lv. 7	Ais Yiorkis	Cyprus	34.916667	32.833333	Neolithic	Bos sp	longbone shaft		9500	368155	855	0.23	S				
VEM 002	VEM 002	BOUQRAS 1513; 611	Bouqras	Syria	35.016667	40.383333	early Neolithic	Bos sp	fragment		8800	6737459	15901	0.24	S				Ron Pinhasi
VEM 004	VEM 004	BOUQRAS 1513; 631	Bouqras	Syria	35.016667	40.383333	early Neolithic	Bos sp	fragment		8800	1475717	4041	0.27	S				Ron Pinhasi
VEM 006	VEM 006	BOUQRAS 1513; 314	Bouqras	Syria	35.016667	40.383333	early Neolithic	Bos sp	fragment		8800	952578	674	0.07	S				Ron Pinhasi
VEM 007	VEM 007	Oper 2000/ 15/ 104/ 617 sample # 9	Mentese	Turkey	40.286743	29.528623	Neolithic	B. taurus	mandible		8000	811738	463	0.06	D				Ron Pinhasi
VEM 008	VEM 008	Oper 2000/ 19/109/642 sample # 3	Mentese	Turkey	40.286743	29.528623	Neolithic	B. taurus	Phalanx		8000	276308	361	0.13	D				Ron Pinhasi
VEM 009	Turk11	Oper 2000/ 24/ 130/ 701 sample # 23	Mentese	Turkey	40.286743	29.528623	Neolithic	B. taurus	Femur	6076-5983	8000	461731	43771	9.48	D	X			Ron Pinhasi
VEM 010	VEM 010	Oper 2000/ 19/112/654 sample # 15	Mentese	Turkey	40.286743	29.528623	Neolithic	B. taurus	Carpal		8000	452206	474	0.10	D				Ron Pinhasi
VEM 011	Turk12	Oper 2000/ 24/ 128/ 695 sample # 24	Mentese	Turkey	40.286743	29.528623	Neolithic	B. Taurus	Calcaneum		8000	1331745	7535	0.57	D	X			Ron Pinhasi

VEM 012	VEM 012	Oper 2000/ 19/ 109/ 642 sample # 4	Mentese	Turkey	40.286743	29.528623	Neolithic	B. taurus	Phalanx		8000	302029	9357	3.10	D				Ron Pinhasi
VEM 013	Turk13	Oper 2000/ 21/ 122/ 679 sample # 16	Mentese	Turkey	40.286743	29.528623	Neolithic	B. taurus	Carpal	6078-5986	8000	334937	738	0.22	D	X			Ron Pinhasi
VEM 014	Turk06	Oper 2000/ 15/103/615 sample # 6	Mentese	Turkey	40.286743	29.528623	Neolithic	B. taurus	Phalanx		8000	459084	5154	1.12	D	X			Ron Pinhasi
VEM 016	VEM 016	63- 969:19325	unknown	unknown	unknown	unknown	Paelolithic	?	Bone tool		?	1599418	774	0.05	D				Ron Pinhasi
VEM 017	VEM 017	63- 969:19345	unknown	unknown	unknown	unknown	Paelolithic	?	Bone tool		?	1307315	210	0.02	D				Ron Pinhasi
VEM 018	VEM 018	22-45/27	unknown	unknown	unknown	unknown	Paelolithic	?	Bone tool		?	1148166	629	0.05	D				Ron Pinhasi
VEM 030	VEM 030	Sample 12	Yabalkovo	Bulgaria	42.0666667	25.45	Neolithic	Bos sp	bone		8000	1392071	9053	0.65	D	X			Songül Alpaslan/ Ron
VEM 031	VEM 031	Sample 1	Yabalkovo	Bulgaria	42.0666667	25.45	Neolithic	Bos sp	bone		8000	1667106	4333	0.26	D	X			Songül Alpaslan
VEM 063	VEM 063	South Town 1980	Khattara	Egypt	25.90	32.71	unkown	Bos sp	distal humerus		?	2251920	126	0.03	S				Achilles Gautier
VEM 065	VEM 065	Kadero	Kadero	Sudan	15.73	32.6	Neolithic	Bos sp	bone		6550	407608	416	0.03	S				Achilles Gautier
VEM 066	VEM 066	KG73 Surface	Khasm-el-Girba	Sudan	14.96	35.91	unkown	Bos sp	metatarsal		?	1329541	325	0.03	S				Achilles Gautier
VEM 068	VEM 068	JF 93 ADN B y3 F2 base (A209)	Dja'de	Syria	36.383306	38.183278	PPNA	B. primigenius	tarsel		11000	958885	935	0.10	S				Jean- Denis Vigne
VEM 069	VEM 069	JF 93 ADN B y3 F2 base (A210)	Dja'de	Syria	36.383306	38.183278	PPNA	B. primigenius	tarsel		11000	1199370	1058	0.09	S				Jean- Denis Vigne
VEM 070	VEM 070	JF 93 ADN B y3 F2 base (A211)	Dja'de	Syria	36.383306	38.183278	PPNA	B. primigenius	phalanx		11000	474348	449	0.09	S				Jean- Denis Vigne
VEM 071	VEM 071	JF 97 ADN A95 E91 us27 (A212)	Jerf El Ahmar	Syria	36.381389	38.183333	PPNA	B. primigenius	metatarsal		11000	732789	633	0.09	S				Jean- Denis Vigne
VEM 072	VEM 072	JF 97 ADN A95 E91 us27 (A213)	Jerf El Ahmar	Syria	36.381389	38.183333	PPNA	B. primigenius	phalanx		11000	647345	371	0.06	S				Jean- Denis Vigne

VEM 074	VEM 074	JF 92 ADN By4 F4 a (A215)	Dja'de	Syria	36.383306	38.183278	PPNA	B. primigenius	phalanx		11000	893006	909	0.10	S					Jean- Denis Vigne
VEM 075	VEM 075	JF 98 ADN ZV30 ZW26 E162 EA26 (A217)	Jerf El Ahmar	Syria	36.381389	38.183333	PPNA	B. primigenius	phalanx		11000	675548	435	0.06	S					Jean- Denis Vigne
VEM 076	VEM 076	JF 98 ADN ZV30 ZW26 E162 EA26 (A218)	Jerf El Ahmar	Syria	36.381389	38.183333	PPNA	B. primigenius	tarsel		11000	591142	260	0.04	S					Jean- Denis Vigne
VEM 077	VEM 077	JF 98 ADN ZV30 ZW26 E162 EA26 (A219)	Jerf El Ahmar	Syria	36.381389	38.183333	PPNA	B. primigenius	phalanx		11000	9967	1	0.01	S					Jean- Denis Vigne
VEM 078	VEM 078	JF 97 ADN A5 us12 (A220)	Jerf El Ahmar	Syria	36.381389	38.183333	PPNA	B. primigenius	bone		11000	667379	322	0.05	S					Jean- Denis Vigne
VEM 079	VEM 079	JF 97 ZV25 ZY23 us19 (A221)	Jerf El Ahmar	Syria	36.381389	38.183333	PPNA	B. primigenius	phalanx		11000	542970	270	0.05	S					Jean- Denis Vigne
VEM 080	VEM 080	JF 97 ZV25 ZY23 us19 (A222)	Jerf El Ahmar	Syria	36.381389	38.183333	Neolithic	B. primigenius	bone		11000	484698	178	0.04	S					Jean- Denis Vigne
VEM 081	VEM 081	AUG; Layer III.8; Grid K16c	Yeşilova Höyüğü	Turkey	38.4414	27.2139	Neolithic	Bos sp	bone		8000	413600	183	0.04	S					
VEM 082	VEM 082	AVL; Layer III.8; Grid L16a	Yeşilova Höyüğü	Turkey	38.4414	27.2139	Neolithic	Bos sp	bone		8000	1438996	278	0.02	S					
VEM 083	VEM 083	AVP; Layer III.8; Grid L16a	Yeşilova Höyüğü	Turkey	38.4414	27.2139	Neolithic	Bos sp	bone		8000	763905	119	0.02	S					
VEM 084	VEM 084	MT Per 1 (A237)	Maral Tappeh	Iran	35.954526	50.608521	Chalcolithic/ Bronze Age	Bos sp	Scapula		7000	1254684	60782	4.84	D	X				Marjan Mashkour
VEM 085	VEM 085	301 3089 SQ E2	Ecsegfalva	Hungary	47.150034	20.924492	early Neolithic	B. primigenius	carpal		8000	1701604	33056	1.94	D					
VEM 086	VEM 086	23B 327 E7 5002	Ecsegfalva	Hungary	47.150034	20.924492	early Neolithic	B. primigenius	distal phalanx		8000	1039976	8572	0.82	D					

VEM 087	VEM 087	Nivel 8 (A232)	Cueva del Mirair	Spain	42.341544	-3.510869	Late Neolithic	Bos sp	bone		5000	1037740	1372	0.13	D				Jean-Denis Vigne
VEM 088	VEM 088	1483; context 103; trench A	Windmill Hill	UK	51.441262	-1.876699	Neolithic	B. primigenius	femur		5800	717971	1366	0.19	D				Rick Schulting
VEM 089	VEM 089	9758; context 215; trench B	Windmill Hill	UK	51.441262	-1.876699	Neolithic	B. primigenius	proximal phalange		5800	1187193	2987	0.25	D	X			Rick Schulting
VEM 090	VEM 090	AMNH # 147191; MoMA field # M4C 1062	Thoth Hill	Egypt	25.767431	32.609568	XI Dynasty - Bronze Age	B. taurus	soft tissue		4000	1,773,788	2,335	0.13	S	X			
VEM 091	VEM 091	7-45/432	Sakajia	Georgia	42.60162	42.478638	unknown	Bison bonasus	bone		?	1186241	1820	0.15	D				Ron Pinhasi
VEM 092	VEM 092	7-45/282	Sakajia	Georgia	42.60162	42.478638	unknown	Bison bonasus	bone		?	1240798	1441	0.12	D				Ron Pinhasi
VEM 093	VEM 093	2-44/1-26	Mgvimari	Georgia	42.60162	42.478638	unknown	Bison bonasus	bone		?	1307531	537	0.04	D				Ron Pinhasi
VEM 095	Dub2	II : 1 : 289	Dublin	Ireland	53.120405	-7.382812	Medieval - Viking	B. taurus	Petrous		1167	2495146	662151	26.54	D	X	X		Finbar McCormick
VEM 096	Dub1	FS II : I : 430	Dublin	Ireland	53.120405	-7.382812	Medieval - Viking	B. taurus	Petrous		1167	1,141,673	364,060	31.89	D	X	X		Finbar McCormick
VEM 097	VEM 097	Ph IB1002, Box 40 5418	Kilshane	Ireland	53.424745	-6.330743	Neolithic	B. taurus	Petrous		5000	1938717	2202	0.11	D	X			Finbar McCormick
VEM 098	VEM 098	1418, Box 48	Kilshane	Ireland	53.424745	-6.330743	Neolithic	B. taurus	Petrous		5000	871,753	859	0.10	D	X			Finbar McCormick
VEM 099	VEM 099	5418, Box 37	Kilshane	Ireland	53.424745	-6.330743	Neolithic	B. taurus	Petrous		5000	931,653	3,137	0.34	D	X			Finbar McCormick
VEM 100	Yor1	2361/1984.32	Tanner Row	UK	53.95827	-1.087564	Roman	B. taurus	Petrous	2 BC- 135 AD	1900	1,224,697	714,245	58.32	D	X	X		Terry O'Connor
VEM 101	Yor7	1976.7/19739	Copper gate	UK	53.95755	-1.080891	Medieval - 9th Century	B. taurus	Petrous		1167	1,158,977	387,840	33.46	D	X	X		Terry O'Connor
VEM 102	Yor2	48021	Hungate	UK	53.959204	-1.076126	Medieval -13th Century	B. taurus	Petrous		767	998,775	411,625	41.21	D	X	X		Terry O'Connor
VEM 103	Yor8	48035	Hungate	UK	53.959204	-1.076126	Medieval - 13-14th Century	B. taurus	Petrous		717	1,536,289	387,597	25.23	D	X	X		Terry O'Connor

VEM 104	VEM 104	AMNH # 147192; MoMA field # M4C 1063	Deir el Bahri	Egypt	25.718835	32.65727	XI Dynasty - Bronze Age	B. taurus	soft tissue		4000	1,284,826	1,316	0.10	S	X	X		
VEM 105	Yor5	51107 (a)	Hungate	UK	53.959204	-1.076126	Roman/ Medieval	B. taurus	Petrous		700	1,001,100	444,466	44.40	D	X	X		Terry O'Connor
VEM 106	Yor9	1986.9/ 3342	Fisher gate	UK	53.950656	-1.075741	Medieval - 8th Century	B. taurus	Petrous		1267	1,033,656	294,037	28.45	D	X	X		Terry O'Connor
VEM 107	VEM 107	52252	Hungate	UK	53.959204	-1.076126	Medieval - 10th Century	Equus f. caballus	Petrous		1117	1,287,654	822,982	63.91	D				Terry O'Connor
VEM 108	Yor6	48036	Hungate	UK	53.959204	-1.076126	Medieval - 10th Century	B. taurus	Petrous		1067	2,044,232	888,240	43.45	D	X	X		Terry O'Connor
VEM 109	Yor3	1976.7/4620	Copper gate	UK	53.95755	-1.080891	Medieval - 13th Century	B. taurus	Petrous		767	1,196,919	575,805	48.11	D	X	X		Terry O'Connor
VEM 110	Yor13	48302	Hungate	UK	53.959204	-1.076126	Medieval - 11th Century	O. aries	Petrous		967	1,043,023	184,722	17.71	D				Terry O'Connor
VEM 111	Yor4	30352	Copper gate	UK	53.95755	-1.080891	Medieval- 10th Century	B. taurus	Petrous		1117	1,044,092	483,475	46.31	D	X	X		Terry O'Connor
VEM 112	Yor10	52252	Hungate	UK	53.959204	-1.076126	Medieval - 10th Century	B. taurus	Petrous		1067	1,043,122	205,138	19.67	D	X	X	X	Terry O'Connor
VEM 113	Yor11	2361b (1984.32)	Tanner Row	UK	53.95827	-1.087564	Roman	B. taurus	Petrous		1900	1,482,101	692,548	46.73	D	X	X		Terry O'Connor
VEM 115	New2	148/14	New grange	Ireland	53.69508	-6.475496	Iron Age	B. taurus	Petrous	321-425 AD	1645	1,159,426	426,181	36.76	D	X	X		
VEM 116	New3	NG 25-14-30	New grange	Ireland	53.69508	-6.475496	Neolithic	B. taurus	Petrous		4902	1,059,537	520,429	49.12	D	X	X		
VEM 117	New4	48-2	New grange	Ireland	53.69508	-6.475496	Neolithic	B. taurus	Petrous		4902	1,297,527	558,981	43.08	D	X	X		
VEM 118	VEM 118	13099	unknown	Israel	unknown	unknown	unknown	ovid/caprid	Petrous		?	1,522,111	709	0.05	D				Ron Pinhasi
VEM 119	VEM 119	Hovk	Hovk Cave	Armenia	unknown	unknown	Paleolithic	Caprid sp	Petrous	too old to date		970,527	274,441	28.28	D				Ron Pinhasi
VEM 121	Yor12	48647	Hungate	UK	53.959204	-1.076126	11-12th Century	B. taurus	Petrous		?	1,184,141	456,355	38.54	D	X	X		Terry O'Connor
VEM 122	VEM122	2E-11-7	New grange	Ireland	53.69508	-6.475496	Neolithic	B. taurus	Petrous		4902	762,270	1,055	0.14	D				

VEM 123	New1	24-40-12	Newgrang e	Ireland	53.69508	-6.475496	Neolithic	B. taurus	Petrous	2795-2580 BC	4902	1,448,376	803,450	55.47	D	X	X		
VEM 124	New5	27/15	Newgrang e	Ireland	53.69508	-6.475496	Neolithic	B. taurus	Petrous	3024-2894 BC	4959	1,608,733	829,547	51.57	D	X	X		
VEM 125	HF1	HF89 Ditch Section3	Haughey Fort	UK	54.345	-6.759	Bronze Age	B. taurus	Petrous		3000	1,248,830	409,204	32.77	D	X	X		Finbar McCormick
VEM 126	VEM 126	4079	unknown	Israel	unknown	unknown	unknown	O. aries	Petrous		?	1,429,578	15,894	1.11	D				
VEM 127	VEM 127	B13123	unknown	Israel	unknown	unknown	unknown	O. aries	Petrous		?	1,103,712	1,324	0.12	D				
VEM 129	Dub5	MCS4	Dublin	Ireland	53.120405	-7.382812	Viking	O. aries	Petrous		1167	462976	197384	42.63	D				Finbar McCormick
VEM 130	Dub3	FS I:2:12	Dublin	Ireland	53.120405	-7.382812	Viking	O. aries	Petrous		1167	592395	330140	55.73	D				Finbar McCormick
VEM 131	Dub4	FS II:I:379	Dublin	Ireland	53.120405	-7.382812	Viking	O. aries	Petrous		1167	645715	377274	58.43	D				Finbar McCormick
VEM 132	Dur4	DW06(886) DUR30 DBID 3463	Durrington Walls	UK	51.192714	-1.787236	Neolithic	B. taurus	Teeth		4500	599024	1635	0.27	D	X			Umberto Albarella
VEM 133	VEM 133	DW06(767) DUR33 DBID 3507	Durrington Walls	UK	51.192714	-1.787236	Neolithic	B. taurus	Teeth		4500	493344	613	0.12	D	X			Umberto Albarella
VEM 134	VEM 134	DW06(886) DUR5 DBID 3533	Durrington Walls	UK	51.192714	-1.787236	Neolithic	B. taurus	Teeth		4500	693400	2860	0.41	D	X			Umberto Albarella
VEM 136	VEM 136	DW)7 TRI(593) DUR32 DBIS3758	Durrington Walls	UK	51.192714	-1.787236	Neolithic	B. taurus	Teeth		4500	479299	888	0.19	D	X			Umberto Albarella
VEM 137	VEM137	DW06 (856) DUR 10 DBID 3485	Durrington Walls	UK	51.192714	-1.787236	Neolithic	B. taurus	Teeth		4500	450245	594	0.13	D	X			Umberto Albarella
VEM 139	VEM139	3275.30 (007) AG88	Ain Ghazal	Jordan	31.998793	35.98025	PPNC	B. taurus	Petrous		8526	82919	152	0.18	D	X			Louise Martin
VEM 140	VEM140	3077.261 (024) 11b AG83 PHASE111b	Ain Ghazal	Jordan	31.998793	31.998793	Neolithic	C. hircus	Petrous		9000	43129	1541	3.57	T				Louise Martin
VEM 141	VEM141	3080.122 (004) 1Va AG84	Ain Ghazal	Jordan	31.998793	31.998793	Neolithic	C. hircus	Petrous		9000	117035	374	0.32	T				Louise Martin

VEM ID	Code	Detail	Site	Country	Lat	Long	Period	Species	Element	Date	BP	N1	N2	Value	T/D	X1	X2	X3	Analyst
VEM 142	VEM 142	3077.275 (037) 111b AG83 PHASE 111b	Ain Ghazal	Jordan	31.998793	31.998793	Neolithic	C. hircus	Petrous		9000	47644	880	1.85	T				Louise Martin
VEM14 3	VEM 143	3079.243 (055) 1Va AG83	Ain Ghazal	Jordan	31.998793	31.998793	Neolithic	O. aries	Petrous		9000	60105	162	0.27	T				Louise Martin
VEM 144	VEM 144	3082 (14) 111a AG83	Ain Ghazal	Jordan	31.998793	31.998793	Neolithic	O. aries	Petrous		9000	16972	54	0.32	T				Louise Martin
VEM 145	VEM 145	3081.115 (032) 1Va AG84	Ain Ghazal	Jordan	31.998793	31.998793	Neolithic	ovid/caprid	Petrous		9000	22014	66	0.30	T				Louise Martin
VEM 146	Cla1	CH99 738 - phase12	Cladh Hallan	UK	57.1718	-7.410485	Bronze Age	B. taurus	Petrous	1054-826 BC	2940	182592	107986	59.14	T	X	X		Jacqui Mullville
VEM 147	Cla10	CH00 30/8/00 1414 House 401 NW Quad - phase11	Cladh Hallan	UK	57.1718	-7.410485	Bronze Age	O. aries	Petrous		2940	132518	59006	44.53	T			X	Jacqui Mullville
VEM 148	Cla3	CH99 23/7/99 1413 2073 - phase11	Cladh Hallan	UK	57.1718	-7.410485	Bronze Age	B. taurus	Petrous		2940	361156	64218	71.12	D	X	X		Jacqui Mullville
VEM 149	Cla2	CH99 8/7/99 731 - phase 12	Cladh Hallan	UK	57.1718	-7.410485	Bronze Age	B. taurus	Petrous		2940	138382	73357	53.01	T	X	X		Jacqui Mullville
VEM 150	Cla11	CH97 462 11/7/97 - phase8	Cladh Hallan	UK	57.1718	-7.410485	Bronze Age	O. aries	Petrous		2940	390728	241627	61.84	D			X	Jacqui Mullville
VEM 151	Cla14	CH00 1436 - phase14	Cladh Hallan	UK	57.1718	-7.410485	Iron Age	O. aries	Petrous		2500	443770	250817	56.52	D			X	Jacqui Mullville
VEM 152	VEM 152	AG84 4453.69 (037)	Ain Ghazal	Jordan	31.998793	31.998793	mid PPNC	ovid/caprid	Petrous		9000	83483	49	0.06	T				Louise Martin
VEM 153	VEM 153	AG88 3275.14 (007)	Ain Ghazal	Jordan	31.998793	31.998793	Neolithic	B. taurus	Petrous		8500	44621	64	0.14	T	X			Louise Martin
VEM 154	VEM 154	AG84 3080.136 (054)	Ain Ghazal	Jordan	31.998793	31.998793	Neolithic	ovid/caprid	Petrous		9000	21354	17	0.08	T				Louise Martin
VEM 155	VEM 155	AG83 3078 (033)	Ain Ghazal	Jordan	31.998793	31.998793	Neolithic	ovid/caprid	Petrous		9000	50151	55	0.11	T				Louise Martin
VEM 157	VEM 157	AG84 3080.133 046 iVa	Ain Ghazal	Jordan	31.998793	31.998793	Neolithic	C. hircus	Petrous		9000	197622	5261	2.66	D				Louise Martin

VEM 158	VEM 158	AG84 3283.126 027	Ain Ghazal	Jordan	31.998793	31.998793	Neolithic	C. hircus	Petrous		9000	428796	810	0.19	D				Louise Martin
VEM 159 a	VEM 159 a	AG84 3077 024 IIIB	Ain Ghazal	Jordan	31.998793	31.998793	Neolithic	C. hircus	Petrous		9000	366893	3428	0.93	D				Louise Martin
VEM 159 b	VEM159 b	CH01 3209 Phase4	Cladh Hallan	UK	57.1718	-7.410485	Late Bronze Age	Cervus elaphus	Petrous		3000	811094	78816	9.70	D				Louise Martin
VEM 160	Cla5	CH99 412 Phase11	Cladh Hallan	UK	57.1718	-7.410485	Late Bronze Age	B. taurus	Petrous		2940	1299886	715541	55.00	D	X	X		Louise Martin
VEM 161	Cla4	CH00 1423 Phase11	Cladh Hallan	UK	57.1718	-7.410485	Late Bronze Age	B. taurus	Petrous		2940	1149191	434709	37.80	D	X	X		Jacqui Mullville
VEM 162	Dur1	DW07 TRI (1394) 12200	Durrington Walls	UK	51.192714	-1.787236	Neolithic	B. taurus	Petrous	2410-2199BC	4410	1215697	363264	29.90	D	X	X		Mike Parker Pearson
VEM 163	Dur2	DW06 906 11737 TR1	Durrington Walls	UK	51.192714	-1.787236	Neolithic	B. taurus	Petrous	2695-2457BC	4576	1734768	879782	50.70	D	X	X		Mike Parker Pearson
VEM 164	Dur3	DW06 547 11264 TR1	Durrington Walls	UK	51.192714	-1.787236	Neolithic	B. taurus	Petrous		4576	569336	116539	20.50	D	X	X		Mike Parker Pearson
VEM 165	Da6	DA75 p813 (9) Box41 1 of pair	Danebury	UK	51.138304	-1.530941	Iron Age	B. taurus	Petrous	203-43BC	2133	936216	483690	51.70	D	X	X		David Allen
VEM 166	Da1	DA71 p110 (3) Box 182	Danebury	UK	51.138304	-1.530941	Iron Age	B. taurus	Petrous		2325	1343240	736056	54.80	D	X	X		David Allen
VEM 167	Da2	DA78 P1078 (2) Box107	Danebury	UK	51.138304	-1.530941	Iron Age	B. taurus	Petrous		2325	508106	41717	8.21	D	X	X		David Allen
VEM 168	Cla6	CH97 462 22/7 phase 14	Cladh Hallan	UK	57.1718	-7.410485	Early Iron Age	B. taurus	Petrous		2500	432061	227357	52.62	D	X	X		Jacqui Mullville
VEM 169	Cla7	CH00 1445 phase 11	Cladh Hallan	UK	57.1718	-7.410485	Late Bronze Age	B. taurus	Petrous		2940	505626	257920	51.01	D	X	X		Jacqui Mullville
VEM 170	Fisk1	Fisk 09 TR03 3.39.23 find 3.160	Fiskavik	UK	57.317058	-6.441363	Iron Age	B. taurus	Petrous		1789	396512	222457	56.10	D	X	X		Jacqui Mullville
VEM 172	Fisk2	Fisk 09 TR 03 C3.34 6 find 3.189	Fiskavik	UK	57.317058	-6.441363	Iron Age	B. taurus	Petrous		1789	292372	143178	48.97	D	X	X		Jacqui Mullville
VEM 173	Bor1	Bo 99/m1 450 box9	Bornais	UK	57.242442	-7.391052	Iron Age	B. taurus	Petrous		1517	542560	225906	41.64	D	X	X		Jacqui Mullville

VEM 174	Cla12	CH01 context 2405 phase9	Cladh Hallan	UK	57.1718	-7.410485	Late Bronze Age	O. aries	Petrous		2940	612455	130649	21.33	D			X	Jacqui Mullville
VEM 175	Cla13	CH01 context 2408 phase 11	Cladh Hallan	UK	57.1718	-7.410485	Late Bronze Age	O. aries	Petrous		2940	402744	91233	22.65	D			X	Jacqui Mullville
VEM 176	Bis1	DZWS 1965.13.83 G76	Bishop Cannings	UK	51.378325	-1.947318	Neolithic	B. taurus	Petrous	3529-3362BC	5445	464078	266912	57.50	D	X	X		Lisa Brown
VEM 177	Bis2	DZWS 1965.13.3	Bishop Cannings	UK	51.378325	-1.947318	Neolithic	B. taurus	Petrous	3638-3512BC	5575	419887	217851	51.90	D	X	X		Lisa Brown
VEM 178	Cla8	CH02 2746 Phase 8	Cladh Hallan	UK	57.1718	-7.410485	Bronze Age	B. taurus	Petrous	1060-899BC	2979	822946	478613	58.16	D	X	X		Jacqui Mullville
VEM 179	Cla9	CH01 2423 Phase 6	Cladh Hallan	UK	57.1718	-7.410485	Bronze Age	B. taurus	Petrous	1118-924BC	3021	810766	439945	54.26	D	X	X		Jacqui Mullville
VEM 180	Da3	DA71 P37 Phase 2	Danebury	UK	51.138304	-1.530941	Iron Age	B. taurus	Petrous	404-354BC	2379	433732	209040	48.20	D	X	X		David Allen
VEM 181	Da4	DA78 P1058 Phase 4	Danebury	UK	51.138304	-1.530941	Iron Age	B. taurus	Petrous		2325	547151	117266	21.40	D	X	X		David Allen
VEM 182	Da5	DA71 P37 Phase 1	Danebury	UK	51.138304	-1.530941	Iron Age	B. taurus	Petrous	511-357BC	2434	951348	534602	56.20	D	X	X		David Allen
VEM 183	VEM 183	DW07 12216 1394 TR1	Durrington Walls	UK	51.192714	-1.787236	Neolithic	Sus sp	Petrous		4576			60.00	D				Mike Parker Pearson
VEM 184	VEM 184	DW07 TR1 1126 902	Durrington Walls	UK	51.192714	-1.787236	Neolithic	Sus sp	Petrous		4576	fastqscreen		70.00	D				Mike Parker Pearson
VEM 185	VEM 185	DW06 TR1 547 11247	Durrington Walls	UK	51.192714	-1.787236	Neolithic	Sus sp	Petrous		4576			65.00	D				Mike Parker Pearson
VEM 186	Da7	DA71 P78 10	Danebury	UK	51.138304	-1.530941	Iron Age	O. aries	Petrous		2325	488272	183700	37.62	D			X	David Allen
VEM 187	VEM 187	DA74 P658 4	Danebury	UK	51.138304	-1.530941	Iron Age	O. aries	Petrous		2325	618506	58629	9.48	D				David Allen
VEM 188	Da8	DA71 P110 3	Danebury	UK	51.138304	-1.530941	Iron Age	O. aries	Petrous		2325	470813	103358	21.95	D				David Allen
VEM 189	VEM 189	Brighton Auroch	Cambridge	UK	52.205337	0.121817	unknown	Bos sp	Petrous		?	136783	212	0.15	D	X		X	Andy Maxted
VEM 190	VEM 190	R3688/143.13 p383	Whitehawk Enclosure	UK	50.822344	-0.097585	Neolithic	B. taurus	teeth		4700			0.03	D	X			Andy Maxted

VEM 191	VEM 191	R3688/143.1 6 D387	Whitehawk Enclosure	UK	50.822344	-0.097585	Neolithic	B. taurus	teeth		4700			0.05	D	X			Andy Maxted
VEM 192	VEM 192	R3688/143.10 D375	Whitehawk Enclosure	UK	50.822344	-0.097585	Neolithic	B. taurus	teeth		4700			0.03	D	X			Andy Maxted
VEM 193	Pot1	1983.200 2580-2590 Box 4084	Potterne	UK	51.324181	-2.008973	Bronze Age	B. taurus	Petrous		3000	299980	107835	35.95	D	X	X		Lisa Brown
VEM 194	Pot2	1983.200 205-209 206 Box 4151	Potterne	UK	51.324181	-2.008973	Bronze Age	B. taurus	Petrous		3000	597754	183310	30.67	D	X	X		Lisa Brown
VEM 195	Pot3	1983.200 168-188 180 W35 Box 4149	Potterne	UK	51.324181	-2.008973	Bronze Age	B. taurus	Petrous		3000	260284	32093	12.33	D	X	X		Lisa Brown
VEM 196	Pot4	1983.200 2396-2412 2402 Box 4168	Potterne	UK	51.324181	-2.008973	Bronze Age	B. taurus	Petrous	769-472BC	2620	352692	169345	48.01	D	X	X		Lisa Brown
VEM 197	Pot5	1983.200 460-477 474 Box 4168	Potterne	UK	51.324181	-2.008973	Bronze Age	B. taurus	Petrous		2620	469699	67495	14.37	D	X	X		Lisa Brown
VEM 198	Pot6	1983.200 3427-3457 3447 Box 4114	Potterne	UK	51.324181	-2.008973	Bronze Age	B. taurus	Petrous		3500	337334	34807	10.32	D	X	X		Lisa Brown
VEM 199	VEM 199	1983.200 3120-3159 3125 Box 4110	Potterne	UK	51.324181	-2.008973	Bronze Age	C. hircus	Petrous		3500	fastqscreen	88.00	D					Lisa Brown
VEM 200	VEM 200	1983.200 3124 3120-3159 Box 4110	Potterne	UK	51.324181	-2.008973	Bronze Age	O. aries	Petrous		3000	325154	3677	1.13	D				Lisa Brown
VEM 201	Pot7	1983.200 2624 2616-2624 Box 4088	Potterne	UK	51.324181	-2.008973	Bronze Age	O. aries	Petrous		3000	417593	149608	35.83	D			X	Lisa Brown
VEM 202	Ness1	Nob'09 1237 Bag4 TRp 3331	Ness of Brodgar	UK	58.997027	-3.214885	Neolithic	B. taurus	Petrous		4526	520042	196889	37.86	D				Ingrid Mainland
VEM 203	Ness2	NOB'09 1237 Bag2 TRP 3331	Ness of Brodgar	UK	58.997027	-3.214885	Neolithic	B. taurus	Petrous		4526	386078	174225	45.13	D	X	X		Ingrid Mainland
VEM 204	VEM 204	Nob'09 1237 Bag4 TRp 3331	Ness of Brodgar	UK	58.997027	-3.214885	Neolithic	Cervus elaphus	Petrous		4526	850057	137665	16.19	D				Ingrid Mainland

VEM 205	Ness3	NOB'11 TRP 1403 Bone 222	Ness of Brodgar	UK	58.997027	-3.214885	Neolithic	B. taurus	Petrous		4526	625447	152976	24.46	D	X	X		Ingrid Mainland
VEM 206	Ness4	NOB'09 1403 TRp 4532	Ness of Brodgar	UK	58.997027	-3.214885	Neolithic	B. taurus	Petrous		4526	765844	312744	40.84	D	X	X		Ingrid Mainland
VEM 207	Ness6	NOB'09 1236 tRP Bag3 3331	Ness of Brodgar	UK	58.997027	-3.214885	Neolithic	O. aries	Petrous		4526	502999	236972	47.11	D	X	X	X	Ingrid Mainland
VEM 208	Ness7	NOB'09 1239 Bag3 3382	Ness of Brodgar	UK	58.997027	-3.214885	Neolithic	O. aries	Petrous		4526	404539	176160	43.55	D			X	Ingrid Mainland
VEM 209	Bor2	B099 21/6/99 M1 Newtrench 448 context Box90	Bornais	UK	57.242442	-7.391052	Iron Age	O. aries	Petrous		1517	344504	189649	55.05	D			X	Jacqui Mullville
VEM 210	Sil1	SL98 11.6.98 Context 18 TrenchA Mound3 1339	Silgenach	UK	57.264214	-7.33121	Bronze Age	O. aries	Petrous		3000	376508	190091	50.49	D			X	Jacqui Mullville
VEM 211	VEM 211	Bradley Fen left side petrous	Bradley Fen	UK	52.558118	-0.130096	Palaeolithic	B. primigenius	Petrous		200000	114339	83	0.07	D				Danielle Schreve
VEM 212	VEM 212	TVP06 Norton Bottoms	Norton Bottoms	UK	53.122532	-0.704952	Palaeolithic	B. primigenius	Petrous		200000	122411	309	0.25	D	X			Danielle Schreve
VEM 213	VEM 213	GCEG 2010/50	Gully Cave, Ebbor gorge	UK	51.23379	-2.684045	Holocene	B. primigenius	R. astragalus		11000	382673	932	0.24	D				Danielle Schreve
VEM 214	Ness5	NOB 09 237, 3331	Ness of Brodgar	UK	58.997027	-3.214885	Neolithic	B. taurus	Petrous	2588-2464BC	4526	853035	334392	39.20	D	X	X		Ingrid Mainland
VEM 215	VEM 215	context 17 Area2 493 95E061:F31 NC157	Roughan Hill	Ireland	52.988054	-9.095246	Bronze Age	B. taurus	Petrous		4000	605970	109	0.02	D				Ros O Maolduin
VEM 216	Rou1	context 9 area6 365 95E061:f6:NC152	Roughan Hill	Ireland	52.988054	-9.095246	Bronze Age	B. taurus	Petrous		4000	802365	338128	42.14	D	X	X		Ros O Maolduin
VEM 217	Rou2	context 1 Area11 479 95E061:F52:NC146	Roughan Hill	Ireland	52.988054	-9.095246	Bronze Age	B. taurus	Petrous		4000	1316027	596961	45.36	D	X	X		Ros O Maolduin

VEM ID	Code	Description	Site	Country	Lat	Long	Period	Species	Element	Date	Age	No. 1	No. 2	%	D	X1	X2	X3	Contributor
VEM 218	VEM 218	context 2 Area2(lower) 506 95E061:F19:NC148	Roughan Hill	Ireland	52.988054	-9.095246	Bronze Age	B. taurus	Petrous		4000	179144	56	0.03	D				Ros O Maolduin
VEM 219	Rou3	context10 Area10 380 95E061:F247:NC154	Roughan Hill	Ireland	52.988054	-9.095246	Bronze Age	B. taurus	Petrous		4000	500265	116756	23.34	D	X	X		Ros O Maolduin
VEM 220	VEM 220	context 14 Area 5 95E061:F16:NC156	Roughan Hill	Ireland	52.988054	-9.095246	Bronze Age	O. aries	Petrous		4000	512998	125	0.02	D				Ros O Maolduin
VEM 221	VEM 221	Context 7 Area 5 521 95E061:F37:NC151	Roughan Hill	Ireland	52.988054	-9.095246	Bronze Age	O. aries	Petrous		4000	416735	6702	1.61	D				Ros O Maolduin
VEM 222	VEM 222	Context 2 Lower Area 2 506 95E061:F19:NC147	Roughan Hill	Ireland	52.988054	-9.095246	Bronze Age	Sus sp	Petrous		4000	fastqscree n	12.00	D					Ros O Maolduin
VEM 223	Gen1	Gent 12-13th Century	Gent	Belgium	51.054342	3.717424	Medieval - 12-13th Century	B. taurus	Petrous		800	280378000	13195098	47.06	D	X	X		
VEM 224	VEM 224	Kil'96 #34	Kilpheder	UK	57.264214	-7.33121	Medieval/Norse 10-14th C	O. aries	Petrous		1150	4869815	215544	4.43	D				Jacqui Mullville
VEM 225	VEM 225	Kil'96 #091	Kilpheder	UK	57.264214	-7.33121	Medieval/Norse	O. aries	Petrous		1150	7786110	874841	11.24	D				Jacqui Mullville
VEM 226	Kil1	Kil'96 #022	Kilpheder	UK	57.264214	-7.33121	Medieval/Norse	B. taurus	Petrous		1150	699471	381183	54.50	D	X	X		Jacqui Mullville
VEM 227	Kil2	Kil'96 #303	Kilpheder	UK	57.264214	-7.33121	Medieval/Norse	O. aries	Petrous		1150	931826	611696	65.64	D			X	Jacqui Mullville
VEM 228	Ork1	SG 10 TR5 2204 phase 3	Snusgar	UK	58.98094	-2.960521	Medieval/Norse -11th century	O. aries	Petrous		1000	483257	302820	62.66	D			X	Ingrid Mainland
VEM 229	Ork2	SG10 TR5 2259	Snusgar	UK	58.98094	-2.960521	Medieval/Norse -12th century	O. aries	Petrous		800	2271878	755951	33.27	D			X	Ingrid Mainland
VEM 230	Sir1	SG10 TR5 phase6 2227	Snusgar	UK	58.98094	-2.960521	Medieval/Norse -12th century	B. taurus	Petrous	1039-1215AD	890	741862	448731	60.49	D	X	X		Ingrid Mainland
VEM 231	Par1	98E0230 CL153 C33 s.50 NC056	Parknabini a	Ireland	52.988054	-9.095246	Neolithic	B. taurus	Petrous		5000	27603496	13344689	48.34	D	X	X		Ros O Maolduin

VEM 232	Par2	98E0230 CL153 TRC 397 860 NC061	Parknabinia	Ireland	52.988054	-9.095246	Neolithic	B. taurus	Petrous		5000	30794021	18703907	60.74	D	X	X		Ros O Maolduin
VEM 233	Par3	98E0230 CL153 C.338 S 416 NC059	Parknabinia	Ireland	52.988054	-9.095246	Neolithic	B. taurus	Petrous		5000	28391956	16275243	57.32	D	X	X		Ros O Maolduin
VEM 234	Par4	98EO230 C453 c.363 S638 NC068	Parknabinia	Ireland	52.988054	-9.095246	Neolithic	O. aries	Petrous		5000	30536060	521225	1.71	D			X	Ros O Maolduin
VEM 235	Bal1	I3E04571 Area 11 site3 6028 GR1021 6000 NC018	Ballybane	Ireland	53.278928	-9.008853	Medieval	B. taurus	Petrous		?	40293809	23293323	57.81	D	X	X		Fiona Beglane
VEM 236	Rou4	RH1 COntext10 380 Area10 95E0611:F2 47:NC161	Roughan Hill	Ireland	52.988054	-9.095246	Bronze Age	B. taurus	Petrous		4000	21994773	3955119	17.98	D	X	X		Ros O Maolduin
VEM 237	VEM 237	Area5 context 14 95E0061:F16: NC155	Roughan Hill	Ireland	52.988054	-9.095246	Bronze Age	B. taurus	Petrous		4000	12470454	16361	0.13	D				Ros O Maolduin
VEM 238	Bal2	I3E0471 Site3 5027 5000 NC023	Ballybane	Ireland	53.278928	-9.008853	Medieval	B. taurus	Petrous		?	72888992	40493834	55.56	D	X	X		Fiona Beglane

Appendix Table 2. Chapter 2. *The modern cattle populations in the curated 770K Illumina Bovine SNP chip dataset used in Chapter 6.*

Abbreviation	Breed	Geographic Origin
ALE	Alentejana	Portugal
ANB	Anatolian Black	Turkey
ANG	Angus	Scotland
BLO	Blonde d'Aquitaine	France
BRM	Brahman	India
BSW	Brown Swiss	Switzerland
BUT	Butana	Ethiopia
CHL	Charolais (UK)	France
EAR	East Anatolian Red	Turkey
GAL	Galloway	Scotland
GIR	Gir	India
GNS	Guernsey	Guernsey
GOB	Gobra	E. Africa
HAR	Hariana	India
HIG	Highland	Scotland
HOL	Holstein (FR)	Netherlands
JER	Jersey (FR)	Jersey (Channel Island)
KEN	Kenana	Ethiopia
KER	Kerry	Ireland
LAG	Lagune	Benin (W. Africa)
LMS	Limousin	France
MAR	Maremmana	Italy
MAU	Maure	Mali
MON	Montbeliarde	France
MUR	Murutu	Nigeria (W. Africa)
NDA	N'Dama	Guinea (W.Africa)
NEL	Nelore	India
NOR	Normande	France
NRC	Norwegian Red Cattle	Norway
OGR	Gaur	Asia
OYK	Yak	Asia
PMT	Piedmontese	Italy
RGU	Red Angus	Scotland
RMG	Romagnola	Italy
SAH	Sahiwal	Pakistan
SAR	South Anatolian Red	Turkey
SHK	Sheko	Ethiopia
SIK	Sikia	Greece
SIM	Simmental	Switzerland
SIS	Sistani	Iran
SOM	Somba	W. Africa
TAL	Taleshi	Iran
WAG	Wagyu	Japan

Appendix Table 3. Chapter 2. The modern sheep populations in the Sheep HapMap dataset.

Abbreviation	Breed
AA	Afec Assaf
AD	African Dorper
AWD	African White Dorper
AF	Afshari
AL	Altamurana
AR	Arawapa
AC	Australian Coopworth
AIM	Australian Industry Merino
AM	Australian Merino
APD	Australian Poll Dorset
APM	Australian Poll Merino
AS	Australian Suffolk
BGE	Bangladeshi BGE
BGA	Bangladeshi Garole
BBB	Barbados Black Belly
BHM	Black Headed Mountain
BL	Border Leicester
BOR	Boreray
BC	Brazilian Creole
BO	Bundner Oberlander Sheep
CA	Castellana
CH	Changthangi
CM	ChineseMerino
CHI	Chios
CHU	Churra
CO	Comisana
CFT	CyprusFatTail
DEC	Deccani
DH	DorsetHorn
EFB	East Friesian Brown
EFW	East Friesian White
EB	Egyptian Barki
ERS	Engadine Red Sheep
EM	Ethiopian Menz
FIN	Finnsheep
GAL	Galway
GAR	Garut
GT	German Texel
GCN	Gulf Coast Native
ICE	Icelandic

IAS	Improved Awassi
IGA	Indian Garole
IS	Irish Suffolk
KAR	Karakas
LEC	Leccese
LAS	Local Awassi
MM	Macarthur Merino
MEL	Meat Lacaune
MLA	Merinolandschaf
MIL	Milk Lacaune
MOG	Moghani
MNO	Morada Nova
NAF	Namaqua Afrikaner
NZR	NewZealand Romney
NZT	NewZealand Texel
NOR	Norduz
OJA	Ojalada
OIN	OldNorwegianspaelsau
QEZ	Qezel
RAM	Rambouillet
RAS	Rasaaragonesa
RMA	Red Maasai
RAF	Ronderib Afrikaner
SAK	Sakiz
SAN	Santalnes
SAB	Sardinian Ancestral Black
SCB	Scottish Blackface
SCT	Scottish Texel
SOA	Soay
SPC	Spael-coloured
SPW	Spael-white
SRL	SriLankan
STE	StElizabeth
SUM	Sumatra
SBB	SwissBlack-Brown MountainSheep
SMS	Swiss Mirror Sheep
SWA	Swiss White Alpine Sheep
TIB	Tibetan
VBS	Valais Blacknose Sheep
VRS	Valais Red Sheep
WIL	Wiltshire

Mutation Away from reference genome	
296C	10508G
893T	10590G
1086C	10777C
1594-5 deletion	11536G
1869T	11899C
2185C	12023A
2558A	122234T
2953T	12258T
2977C	12327C
3051G	12433C
3071C	12469T
3119C	12564C
3130T	12622G
33204A	12801A
33205C	12946C
3439G	13005G
3600T	13239C
3619A	13521C
3668T	13527C
3698C	13539C
3703C	13677G
4048T	13710C
4168C	13827T
4248C	13882c
4250C	13899T
4292C	13909C
4649A	14051C
5186T	14075C
5899G	14084G
5947C	14123G
6370C	14129A
6383T	14138A
6772T	14243C
7330C	14255C
7356G	14366C
7886G	14628G
8210A	14747T
8308G	14909T
8766A	15082C
9602A	15134T
9608T	15156A
9682C	15335T
9809C	15371T
10220C	157101C
10222C	158193G
10388T	

Appendix Table 5. Chapter 4. Modern samples used in Chapter 4. NCBI sample Accession number is given, along with the journal it was published in or a Direct Submission, First author as denoted by NCBI and the year submitted to NCBI.

NCBI Accession Number	Journal Published in or Direct Submission	First author	year submitted
AB074963.1	Direct Submission	Mannen	2001
AB074965.1	Direct Submission	Mannen	2001
AB074966.1	Direct Submission	Mannen	2001
AB074968.1	Direct Submission	Mannen	2001
AY126697.1	Direct Submission	Miretti	2002
AY526085.1	Direct Submission	Chung	2004
AY676855.1	Direct Submission	Shahid	2004
AY676858.1	Direct Submission	Shahid	2004
AY676859.1	Direct Submission	Shahid	2004
AY676860.1	Direct Submission	Shahid	2004
AY676861.1	Direct Submission	Shahid	2004
AY676862.1	Direct Submission	Shahid	2004
AY676863.1	Direct Submission	Shahid	2004
AY676864.1	Direct Submission	Shahid	2004
AY676865.1	Direct Submission	Shahid	2004
AY676866.1	Direct Submission	Shahid	2004
AY676867.1	Direct Submission	Shahid	2004
AY676869.1	Direct Submission	Shahid	2004
AY676871.1	Direct Submission	Shahid	2004
AY676872.1	Direct Submission	Shahid	2004
AY676873.1	Direct Submission	Shahid	2004
DQ124371.1	Direct Submission	Shin	2005
DQ124372.1	Direct Submission	Shin	2005
DQ124373.1	Direct Submission	Shin	2005
DQ124374.1	Direct Submission	Shin	2005
DQ124375.1	Direct Submission	Shin	2005
DQ124376.1	Direct Submission	Shin	2005
DQ124377.1	Direct Submission	Shin	2005
DQ124381.1	Direct Submission	Shin	2005
DQ124384.1	Direct Submission	Shin	2005
DQ124385.1	Direct Submission	Shin	2005
DQ124386.1	Direct Submission	Shin	2005
DQ124387.1	Direct Submission	Shin	2005
DQ124388.1	Direct Submission	Shin	2005
DQ124389.1	Direct Submission	Shin	2005
DQ124393.1	Direct Submission	Shin	2005
DQ124395.1	Direct Submission	Shin	2005
DQ124396.1	Direct Submission	Shin	2005
DQ124397.1	Direct Submission	Shin	2005
DQ124399.1	Direct Submission	Shin	2005
DQ124402.1	Direct Submission	Shin	2005
DQ124404.1	Direct Submission	Shin	2005
DQ124405.1	Direct Submission	Shin	2005
DQ124406.1	Direct Submission	Shin	2005
DQ124408.1	Direct Submission	Shin	2005
DQ124409.1	Direct Submission	Shin	2005
DQ124410.1	Direct Submission	Shin	2005

DQ124413.1	Direct Submission	Shin	2005
DQ124414.1	Direct Submission	Shin	2005
DQ124415.1	Direct Submission	Shin	2005
DQ124416.1	Direct Submission	Shin	2005
DQ124417.1	Direct Submission	Shin	2005
EU177815.1	Curr. Biol.	Achilli	2008
EU177816.1	Curr. Biol.	Achilli	2008
EU177817.1	Curr. Biol.	Achilli	2008
EU177818.1	Curr. Biol.	Achilli	2008
EU177819.1	Curr. Biol.	Achilli	2008
EU177820.1	Curr. Biol.	Achilli	2008
EU177821.1	Curr. Biol.	Achilli	2008
EU177822.1	Curr. Biol.	Achilli	2008
EU177823.1	Curr. Biol.	Achilli	2008
EU177824.1	Curr. Biol.	Achilli	2008
EU177825.1	Curr. Biol.	Achilli	2008
EU177826.1	Curr. Biol.	Achilli	2008
EU177827.1	Curr. Biol.	Achilli	2008
EU177828.1	Curr. Biol.	Achilli	2008
EU177829.1	Curr. Biol.	Achilli	2008
EU177831.1	Curr. Biol.	Achilli	2008
EU177832.1	Curr. Biol.	Achilli	2008
EU177833.1	Curr. Biol.	Achilli	2008
EU177834.1	Curr. Biol.	Achilli	2008
EU177835.1	Curr. Biol.	Achilli	2008
EU177836.1	Curr. Biol.	Achilli	2008
EU177837.1	Curr. Biol.	Achilli	2008
EU177838.1	Curr. Biol.	Achilli	2008
EU177839.1	Curr. Biol.	Achilli	2008
EU177841.1	Curr. Biol.	Achilli	2008
EU177845.1	Curr. Biol.	Achilli	2008
EU177846.1	Curr. Biol.	Achilli	2008
EU177847.1	Curr. Biol.	Achilli	2008
EU177849.1	Curr. Biol.	Achilli	2008
EU177851.1	Curr. Biol.	Achilli	2008
EU177854.1	Curr. Biol.	Achilli	2008
EU177855.1	Curr. Biol.	Achilli	2008
EU177857.1	Curr. Biol.	Achilli	2008
EU177858.1	Curr. Biol.	Achilli	2008
EU177859.1	Curr. Biol.	Achilli	2008
EU177860.1	Curr. Biol.	Achilli	2008
EU177861.1	Curr. Biol.	Achilli	2008
EU177863.1	Curr. Biol.	Achilli	2008
EU177864.1	Curr. Biol.	Achilli	2008
EU177867.1	Curr. Biol.	Achilli	2008
EU177868.1	Curr. Biol.	Achilli	2008
EU177869.1	Curr. Biol.	Achilli	2008
EU177870.1	Curr. Biol.	Achilli	2008
FJ971081.1	PLoS ONE	Achilli	2009
FJ971082.1	PLoS ONE	Achilli	2009
FJ971083.1	PLoS ONE	Achilli	2009
FJ971084.1	PLoS ONE	Achilli	2009

FJ971085.1	PLoS ONE	Achilli	2009
FJ971087.1	PLoS ONE	Achilli	2009
FJ971088.1	PLoS ONE	Achilli	2009
GQ129207.1	Direct Submission	Zeyland	2009
GU947008.1	Mitochondrion	Douglas	2010
GU947009.1	Mitochondrion	Douglas	2010
GU947012.1	Mitochondrion	Douglas	2010
GU947014.1	Mitochondrion	Douglas	2010
GU947016.1	Mitochondrion	Douglas	2010
GU947018.1	Mitochondrion	Douglas	2010
GU947019.1	Mitochondrion	Douglas	2010
GU947021.1	Mitochondrion	Douglas	2010
GU985279	PLoS ONE	Edwards	2010
HM045018.1	Direct Submission	Zeyland	2010
HQ184030.1	PLoS ONE	Bonfiglio	2010
HQ184032.1	PLoS ONE	Bonfiglio	2010
HQ184033.1	PLoS ONE	Bonfiglio	2010
HQ184034.1	PLoS ONE	Bonfiglio	2010
HQ184037.1	PLoS ONE	Bonfiglio	2010
HQ184039.1	PLoS ONE	Bonfiglio	2010
HQ184040.1	PLoS ONE	Bonfiglio	2010
HQ184041.1	PLoS ONE	Bonfiglio	2010
HQ184045.1	PLoS ONE	Bonfiglio	2010
JN817298.1	PLoS ONE	Bonfiglio	2011
JN817299.1	PLoS ONE	Bonfiglio	2011
JN817300.1	PLoS ONE	Bonfiglio	2011
JN817302.1	PLoS ONE	Bonfiglio	2011
JN817303.1	PLoS ONE	Bonfiglio	2011
JN817304.1	PLoS ONE	Bonfiglio	2011
JN817305.1	PLoS ONE	Bonfiglio	2011
JN817306.1	PLoS ONE	Bonfiglio	2011
JN817307.1	PLoS ONE	Bonfiglio	2011
JN817308.1	PLoS ONE	Bonfiglio	2011
JN817311.1	PLoS ONE	Bonfiglio	2011
JN817312.1	PLoS ONE	Bonfiglio	2011
JN817313.1	PLoS ONE	Bonfiglio	2011
JN817314.1	PLoS ONE	Bonfiglio	2011
JN817320.1	PLoS ONE	Bonfiglio	2011
JN817322.1	PLoS ONE	Bonfiglio	2011
JN817323.1	PLoS ONE	Bonfiglio	2011
JN817324.1	PLoS ONE	Bonfiglio	2011
JN817327.1	PLoS ONE	Bonfiglio	2011
JN817329.1	PLoS ONE	Bonfiglio	2011
JN817330.1	PLoS ONE	Bonfiglio	2011
JN817331.1	PLoS ONE	Bonfiglio	2011
JN817333.1	PLoS ONE	Bonfiglio	2011
JN817334.1	PLoS ONE	Bonfiglio	2011
JN817337.1	PLoS ONE	Bonfiglio	2011
JN817338.1	PLoS ONE	Bonfiglio	2011
JN817340.1	PLoS ONE	Bonfiglio	2011
JN817343.1	PLoS ONE	Bonfiglio	2011
JN817345.1	PLoS ONE	Bonfiglio	2011

JN817348.1	PLoS ONE	Bonfiglio	2011
JN817349.1	PLoS ONE	Bonfiglio	2011
JQ437479.1	Direct Submission	Lipinski	2012
KC153972.1	Anim. Genet.	Ludwig	2012
KC153974.1	Anim. Genet.	Ludwig	2012
KC153976.1	Anim. Genet.	Ludwig	2012
KC153977.1	Anim. Genet.	Ludwig	2012
KF163061.1	PLoS ONE	Horsburgh	2013
KF163062.1	PLoS ONE	Horsburgh	2013
KF163063.1	PLoS ONE	Horsburgh	2013
KF163066.1	PLoS ONE	Horsburgh	2013
KF163069.1	PLoS ONE	Horsburgh	2013
KF163073.1	PLoS ONE	Horsburgh	2013
KF163074.1	PLoS ONE	Horsburgh	2013
KF163075.1	PLoS ONE	Horsburgh	2013
KF163076.1	PLoS ONE	Horsburgh	2013
KF163078.1	PLoS ONE	Horsburgh	2013
KF163080.1	PLoS ONE	Horsburgh	2013
KF163089.1	PLoS ONE	Horsburgh	2013
KF163090.1	PLoS ONE	Horsburgh	2013
KF163091.1	PLoS ONE	Horsburgh	2013
KF163093.1	PLoS ONE	Horsburgh	2013
KF525852.1	Nat Commun	Zhang	2013
KF926377.1	Mitochondrial DNA	Wang	2014
KT184455.1	PLoS ONE	Olivieri	2015
KT184458.1	PLoS ONE	Olivieri	2015
KT184465.1	PLoS ONE	Olivieri	2015
KT184467.1	PLoS ONE	Olivieri	2015
KT184468.1	PLoS ONE	Olivieri	2015
KT184469.1	PLoS ONE	Olivieri	2015
KT184470.1	PLoS ONE	Olivieri	2015
KT184471.1	PLoS ONE	Olivieri	2015
KT184472.1	PLoS ONE	Olivieri	2015
V00654.1	J. Mol. Biol.	Anderson	1982

Appendix Table 6. Chapter 4. *The results of the mtDNA target capture of ancient samples. Sample name and cultural period are given, along with site and country. The number of captures performed on the sample and which capture array was used (4.3.1) is shown. Endogenous % post quality filtering is given, along with the coverage of the mitogenome.*

Name	Cultural Period	Radiocarbon Date calBC (2 Sigma)	Site	Country	Number of Captures	Agilent (A) or Mycroary capture (M)	Screening endogenous %	Coverage	Analysed in Chapter 4
VEM090	Bronze		Thoth Hill	Egypt	1	A	0.13	134.08	Yes
Dub2	Medieval		Dublin	Ireland	1	A	26.54	81.39	Yes
Turk11	Neolithic	6076-5983	Mentese	Turkey	1	A	9.48	44.59	Yes
VEM085	Neolithic		Ecsegfalva	Hungary	2	A	1.94	33.46	Yes
VEM099	Neolithic		Kilshane	Ireland	1	M	0.34	29.02	Yes
VEM086	Neolithic		Ecsegfalva	Hungary	2	A	0.82	22.32	Yes
VEM084	Chalcolithic		Maral Tappeh	Iran	2	A	4.84	17.78	Yes
Turk12	Neolithic		Mentese	Turkey	2	A	0.57	17.42	Yes
VEM104	Bronze		Deir el Bahri	Egypt	1	A	0.10	14.82	Yes
VEM097	Neolithic		Kilshane	Ireland	2	A/M	0.11	12.65	Yes
Turk6	Neolithic		Mentese	Turkey	3	A/M	1.12	11.47	Yes
VEM098	Neolithic		Kilshane	Ireland	1	M	0.10	9.74	Yes
VEM189	Unknown		Cambridge Fens	England	1	M	0.15	7.66	Yes
VEM132	Neolithic		Durrington Walls	England	1	M	0.27	6.83	Yes
VEM212	Marine Oxygen Isotope 7a		Norton Bottoms	England	2	M	0.25	1.86	Yes
Turk13	Neolithic	6078-5986	Mentese	Turkey	2	A	3.098	2.38	No
VEM030	Unknown		Yabalkovo	Bulgaria	2	A/M	0.65	1.93	No
VEM089	Neolithic		Windmill Hill	England	3	A/M	0.25	1.84	No
VEM133	Neolithic		Durrington Walls	England	1	M	0.12	1.67	No
VEM134	Neolithic		Durrington Walls	England	1	M	0.41	1.49	No
VEM136	Neolithic		Durrington Walls	England	1	M	0.19	1.46	No
VEM191	Neolithic		Whitehawk Enclosure	England	1	M	0.05	1.44	No
VEM031	Unknown		Yabalkovo	Bulgaria	2	A/M	0.26	0.88	No
VEM192	Neolithic		Whitehawk Enclosure	England	1	M	0.03	0.72	No
VEM137	Neolithic		Durrington Walls	England	1	M	0.13	0.24	No
VEM190	Neolithic		Whitehawk Enclosure	England	1	M	0.03	0.24	No
VEM139	Neolithic		Ain Ghazal	Jordan	1	M	0.18	0.05	No
VEM153	Neolithic		Ain Ghazal	Jordan	1	M	0.14	0.00	No

Appendix Table 7. Chapter 5. The site number for the Map (Figure 5.1) of Cattle analysed from predominantly Britain and Ireland for Chapter 5.

Site	Country	Map Number
Ballybane	Ireland	1
Bishops Cannings	Britain	2
Bornais	Britain	3
Cladh Hallan	Britain	4
Danebury	Britain	5
Dublin	Ireland	6
Durrington Walls	Britain	7
Fiskvaig	Britain	8
Gent	Belgium	9
Haughey's Fort	N. Ireland	10
Kilpheder	Britain	11
Ness of Brodgar	Britain	12
Newgrange	Ireland	13
Parknabinia	Ireland	14
Potterne	Britain	15
Roughan Hill	Ireland	16
Silgenach	Britain	17
York	Britain	18

Appendix Table 8. Chapter 5. The site number for the Map (Figure 5.2) of Cattle sampled by MV and AS which are analysed in Chapter 5

Site	Country	Map Number
Bedburg-Königshoven	Germany	1
Belovode- Veliko	Serbia	2
Britsum	Netherlands	3
Bunnik	Netherlands	4
Catal Hoyuk	Turkey	5
Dronrijp-zuid	Netherlands	6
Dyrotz 25	Germany	7
Dzulhunitsa	Bulgaria	8
Elst	Netherlands	9
Falkenwalde	Germany	10
Firdgum	Netherlands	11
Gent	Belgium	12
Houten-Hoogdij	Netherlands	13
Herxheim	Germany	14
Kalisz	Poland	15
Kierzkowo	Poland	16
Kirschbaumhöhle	Germany	17
Ludwinowo	Poland	18
Mentese	Turkey	19
Oosterbeintum	Netherlands	20
Plocnik	Serbia	21
Schipluiden	Netherlands	22
Stevenshofjesp	Netherlands	23
Stubline	Serbia	24
Suberde	Turkey	25
Trier-Brüderkrankenhaus	Germany	26
Vianen-Zijdervel	Netherlands	27
Winsum	Netherlands	28
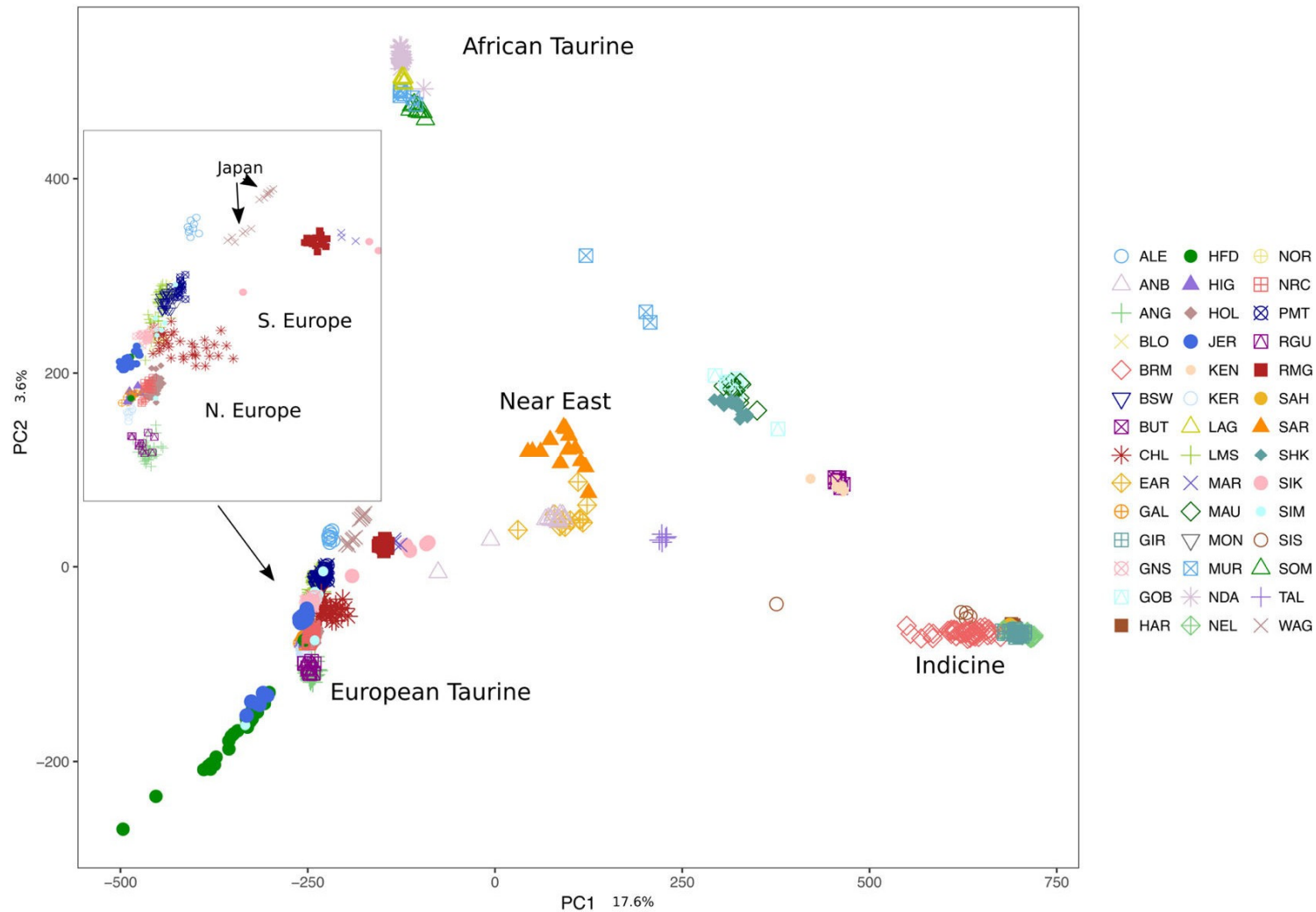
Appendix Figure 1. Chapter 5. *PCA of world wide cattle populations using variance from the 770K Illumina HD Bovine Chip. For abbreviations of the breeds see Appendix Table 2.*
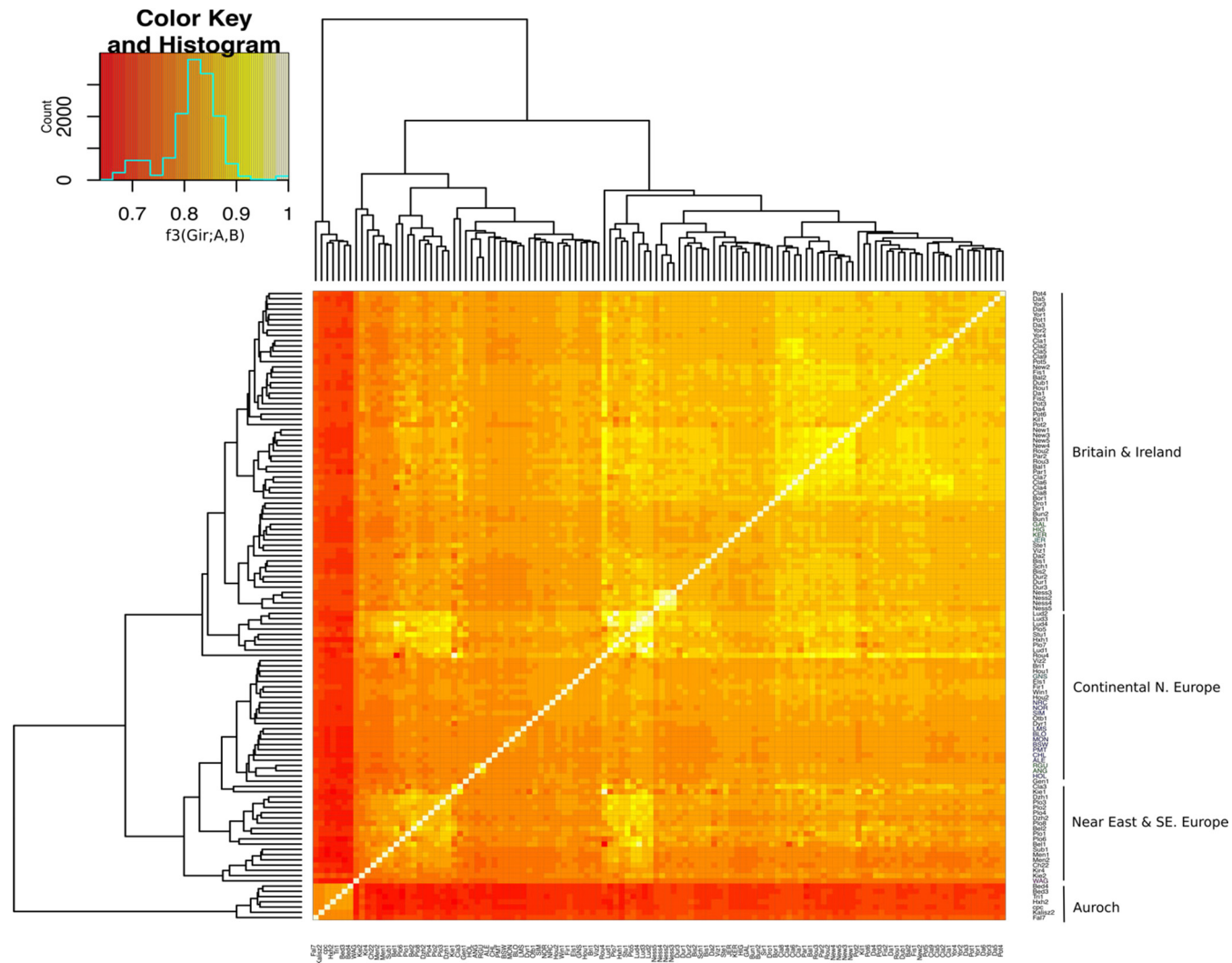
Appendix Figure 2. Chapter 5. *Pairwise calculations of the outgroup f₃-statistic demonstrate groupings of shared drift, similar to that of the PCA. Clusters are labelled with the geographical origin of the majority of the samples. Moderns are highlighted with geographic origin; pink= Japan, blue= Continental Europe, turquoise= Channel Islands, green= Britain and Ireland*

Appendix Table 9. Chapter 5. *Testing admixture scenarios using the f₃ -statistic (Target; Source1, Source2) within the Atlantic Edge. Z-scores are coloured to indicate significance level:* green*= P ≤ 0.001,* orange *= 0.001 < P ≤ 0.01,* red*= 0.01 < P ≤ 0.05.*

Source 1	Source2	Target	F3	Std. err	Z score	SNP no.
Neoltihic NED	Neolithic IRE 2	Bronze IRE	-0.008204	0.00528	-1.554	16647
Bronze GBR	Neolithic IRE 2	Bronze IRE	-0.004577	0.003632	-1.26	22547
Bronze GBR	Neolithic IRE 2	Bronze IRE	-0.004577	0.003632	-1.26	22547
Neolithic NED	Neolithic GBR 2	Bronze IRE	0.006012	0.003715	1.618	34736
Bronze NED	Neolithic GBR 2	Bronze IRE	0.005606	0.003268	1.716	41731
Neolithic NED	Neolithic GBR 3	Bronze IRE	0.007383	0.003863	1.911	34220
Bronze NED	Neolithic GBR 1	Bronze IRE	0.007212	0.00323	2.233	41371
Bronze NED	Neolithic GBR 3	Bronze IRE	0.008171	0.003338	2.448	40910
Neolithic NED	Neolithic GBR 1	Bronze IRE	0.016512	0.003744	4.41	34724
Neolithic GBR 2	Neolithic IRE 2	Bronze GBR 2	-0.005419	0.004189	-1.294	16164
Neolithic GBR 3	Neolithic IRE 2	Bronze GBR 2	-0.002994	0.004441	-0.674	15932
Neolithic GBR 1	Neolithic IRE 2	Bronze GBR 2	-0.002766	0.004384	-0.631	16014
Neolithic GBR 2	Bronze IRE	Bronze GBR 2	-0.001769	0.002897	-0.611	34408
Neolithic GBR 2	Neolithic IRE 1	Bronze GBR 2	-0.00145	0.002832	-0.512	36541
Bronze NED	Neolithic GBR 2	Bronze GBR 2	-0.000813	0.003423	-0.237	31523
Neolithic GBR 1	Bronze IRE	Bronze GBR 2	-0.000325	0.002922	-0.111	34044
Neolithic GBR 3	Bronze IRE	Bronze GBR 2	0.000014	0.003101	0.005	33589
Neolithic GBR 3	Neolithic IRE 1	Bronze GBR 2	0.000054	0.002957	0.018	35447
Neolithic GBR 1	Neolithic IRE 1	Bronze GBR 2	0.001431	0.002829	0.506	36092
Bronze NED	Neolithic GBR 3	Bronze GBR 2	0.001723	0.003331	0.517	30984
Bronze NED	Neolithic GBR 1	Bronze GBR 2	0.002897	0.003317	0.873	31253
Neolithic NED	Neolithic GBR 2	Bronze GBR 2	0.003622	0.003781	0.958	26456
Neolithic NED	Neolithic GBR 3	Bronze GBR 2	0.006355	0.004142	1.534	26148
Neolithic NED	Neolithic GBR 1	Bronze GBR 2	0.01545	0.00381	4.056	26472

Neolithic GBR 2	Neolithic IRE 2	Bronze GBR 1	0.012912	0.003044	4.242	31718
Neolithic GBR 3	Neolithic IRE 2	Bronze GBR 1	0.015455	0.003181	4.859	31714
Neolithic GBR 1	Neolithic IRE 2	Bronze GBR 1	0.020682	0.003154	6.557	31753
Neolithic NED	Neolithic GBR 2	Bronze GBR 1	0.023626	0.002786	8.479	52820
Neolithic GBR 3	Bronze IRE	Bronze GBR 1	0.01892	0.002204	8.586	64240
Neolithic GBR 2	Bronze IRE	Bronze GBR 1	0.017289	0.002013	8.587	64325
Neolithic NED	Neolithic GBR 3	Bronze GBR 1	0.028533	0.003299	8.649	52888
Bronze NED	Neolithic GBR 2	Bronze GBR 1	0.019617	0.002257	8.693	60880
Neolithic GBR 3	Neolithic IRE 1	Bronze GBR 1	0.019249	0.002117	9.091	65434
Neolithic GBR 2	Neolithic IRE 1	Bronze GBR 1	0.017243	0.001841	9.367	65722
Bronze NED	Neolithic GBR 3	Bronze GBR 1	0.024461	0.002536	9.647	60844
Neolithic GBR 1	Bronze IRE	Bronze GBR 1	0.020822	0.001979	10.52	64318
Bronze NED	Neolithic GBR 1	Bronze GBR 1	0.024929	0.00233	10.699	60922
Bronze NED	Neolithic GBR 1	Bronze GBR 1	0.024929	0.00233	10.699	60922
Neolithic GBR 1	Neolithic IRE 1	Bronze GBR 1	0.022794	0.001953	11.669	65674
Neolithic NED	Neolithic GBR 1	Bronze GBR 1	0.038134	0.0031	12.301	53022
Neolithic NED	Bronze GBR 2	Bronze NED	0.006256	0.004978	1.257	17086
Neolithic NED	Neolithic GBR 2	Bronze NED	0.009963	0.004811	2.071	17672
Neolithic NED	Neolithic IRE 2	Bronze NED	0.014578	0.006865	2.124	8454
Neolithic NED	Bronze GBR 1	Bronze NED	0.009921	0.004246	2.336	19174
Neolithic NED	Neolithic GBR 3	Bronze NED	0.011864	0.004995	2.375	17353
Neolithic NED	Neolithic IRE 1	Bronze NED	0.017813	0.004425	4.026	18814
Neolithic NED	Neolithic GBR 1	Bronze NED	0.020755	0.004854	4.276	17577
Iron NED	Bronze GBR 1	Iron GBR 3	-0.011665	0.005976	-1.952	6890
Iron NED	Bronze GBR 1	Iron GBR 1	-0.001496	0.001561	-0.959	66265
Iron NED	Bronze GBR 1	Iron GBR 2	-0.000386	0.003039	-0.127	44152
Iron NED	Bronze GBR 2	Iron GBR 1	0.000231	0.00192	0.12	62272

Iron NED	Bronze GBR 2	Iron GBR 3	0.002079	0.007447	0.279	6013
Iron NED	Bronze GBR 2	Iron GBR 2	0.002392	0.003368	0.71	37786
Bronze GBR 2	Bronze NED	Iron NED	-0.003563	0.003494	-1.02	31397
Iron GBR 3	Bronze NED	Iron NED	0.000546	0.004685	0.117	18536
Iron GBR 1	Bronze NED	Iron NED	0.000974	0.00323	0.302	36680
Iron GBR 2	Bronze NED	Iron NED	0.002285	0.003691	0.619	32431
Bronze GBR 1	Bronze NED	Iron NED	0.004168	0.003299	1.264	36593
Iron GBR 3	Iron NED	rom_NED	-0.000544	0.002867	-0.19	35206
Iron GBR 2	Iron NED	rom_NED	-0.000034	0.002091	-0.016	59156
Iron GBR 1	Iron NED	rom_NED	0.001694	0.001664	1.018	62337
Iron NED	rom_NED	med_NED	0.003897	0.002156	1.807	55438
Iron NED	Iron GBR 1	med_NED	0.005384	0.002109	2.553	56440
Bronze IRE	med_GBR	med_IRE	-0.002992	0.002269	-1.319	53389
Bronze IRE	Iron GBR 1	med_IRE	-0.000249	0.001996	-0.125	55986
Bronze IRE	Bronze GBR 2	med_IRE	0.000119	0.002542	0.047	49704
Bronze IRE	Bronze GBR 1	med_IRE	0.002949	0.002116	1.393	55948

Appendix Table 10. Chapter 5. The population groupings of the ancient cattle samples used in D-statistic and f₃ -statistic tests. Where multiple geographic cultural populations are present extra information regarding the population is given. (Chapter 5)

Population	Sample	Population	Sample
Neolithic Turkey (~7000-5893 BC	Sub1	Bronze Netherlands (1500-1300 BC)	Viz1
	Ch22		Viz2
	Men2	Bronze British 1 (Cladh Hallan) - South Uist, Outer Hebrides (1118-826 calBC)	Cla1
	Men3		Cla2
Neolithic Bulgaria (~6074-5572 BC)	Dzh1		Cla3
	Dzh2		Cla4
Neolithic Serbia (~5200-4800 BC)	Plo1		Cla5
	Plo2		Cla7
	Plo3		Cla8
	Plo4		Cla9
	Plo5	Bronze British 2 (Potterne) - South England (~1000 calBC)	Pot1
	Plo6		Pot2
	Plo7		Pot3
	Plo8		Pot5
	Stu1		Pot6
Neolithic Poland (~5000 BC)	Lud1	Bronze Ireland (Roughan Hill) West of Ireland (~2000 BC)	Rou1
	Lud2		Rou2
	Lud3		Rou3
	Lud4		Rou4
Neolithic Germany (~5000BC)	Hxh1	Iron Britain 1 (Potterne + Danebury) South England (769-43 calBC)	Pot4
Neolithic Netherlands (~3500 BC)	Sch1		Da1
Neolithic Britain 1 (Bishops Cannings) - S. England, Early Neolithic (3638--3362 calBC)	Bis1		Da2
	Bis2		Da3
Neolithic Britain 2 (Durrington Walls) - S. England, Late Neolithic (2695-2199 calBC)	Dur1		Da4
	Dur2		Da5
	Dur3		Da6
Neolithic Britain 3 (The Ness of Brodgar) - Orkney, Late Neolithic (~2588-2464 calBC)	Ness2	Iron Britain 2 (Fiskaviag) - Isle of Skye, Iron Age (120-225 AD)	Fis1
	Ness4		Fis2
Neolithic Irish 1 (Newgrage) East of Ireland (3024-2580 calBC)	New1	Iron Britian 3 - South Uist, Outer Hebrides	Bor1
	New3		Cla6
	New4	Iron Netherlands (500-250 BC)	Bun1
	New5		Bun2
Neolithic Irish 2 (Parknibinia) West of Ireland (~3000 calBC)	Par1	Medieval British (900-1200AD)	Yor2
	Par2		Yor3
			Yor4
		Medieval Irish (321- ? AD) New2=late Iron	New2
			Dub1
			Bal1
			Bal2
		Medieval Netherlands (450-1199AD)	Fir1
			Hou1
			Hou2
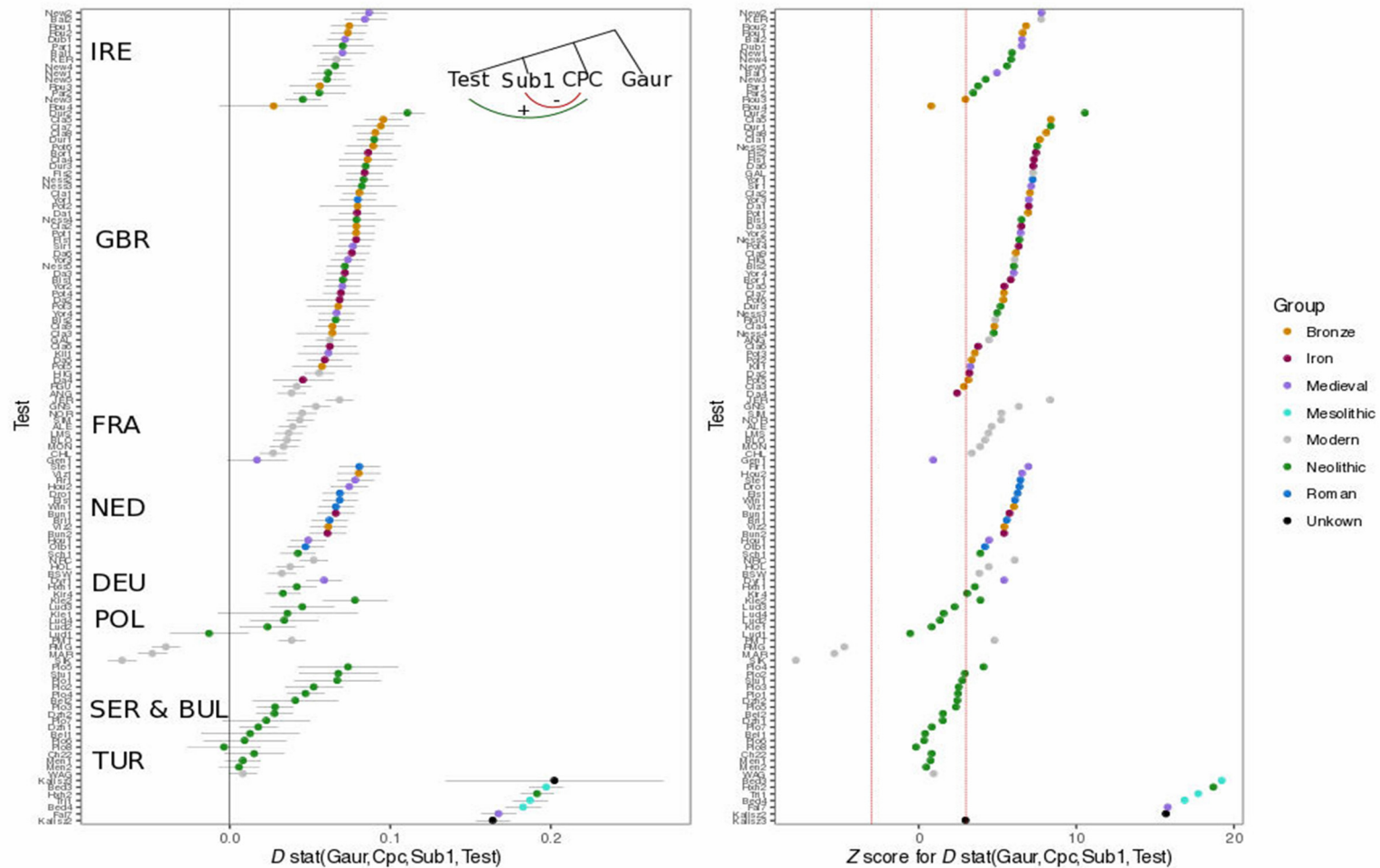
Appendix Figure 3. Chapter 5. *Auroch admixture into European cattle populations, calculated by the D-statistic. Auroch is represented by the British Mesolithic sample, CPC, while Sub1 is a Neolithic Anatolian (Turkey) sample. A Z-score of 3 or -3 is represented by the red lines. Sample time period is represented by the colour of the point. The pattern of an increase in the number of auroch derived alleles as distance from the Near East is repeated.*

Appendix Table 11. Chapter 5. *Full results for the testing of auroch admixture scenarios using the f$_3$-statistic (Target; Source1, Source2). Z-scores are coloured to indicate significance level: green= P ≤ 0.001, orange = 0.001 < P ≤ 0.01, red= 0.01 < P ≤ 0.05.*

Source 1	Source2	Target	F3	Std. err	Z score	SNP no.
auroch	Neolithic TUR	Neolithic POL 2	-0.00482	0.021544	-0.224	612
auroch	Neolithic TUR	Neolithic GBR 2	0.000196	0.003202	0.061	48536
auroch	Neolithic TUR	Neolithic GBR 1	0.011951	0.004026	2.968	46858
auroch	Neolithic TUR	Neolithic SRB	0.011477	0.00314	3.655	54804
auroch	Neolithic TUR	Neolithic BUL	0.01774	0.004144	4.281	48802
auroch	Neolithic TUR	Neolithic IRE 2	0.058368	0.01055	5.532	4407
auroch	Neolithic TUR	Neolithic POL	0.064504	0.006239	10.339	12763
auroch	Neolithic TUR	Neolithic GBR 3	0.085875	0.00635	13.524	44905
auroch	Neolithic TUR	Neolithic IRE 1	0.055625	0.003377	16.47	62554
auroch	Neolithic BUL	Neolithic GBR 2	-0.019022	0.003328	-5.717	45373
auroch	Neolithic SRB	Neolithic GBR 2	-0.01028	0.003271	-3.143	48054
auroch	Neolithic BUL	Neolithic GBR 1	-0.009216	0.004107	-2.244	43237
auroch	Neolithic BUL	Neolithic POL 2	-0.022692	0.021983	-1.032	569
auroch	Neolithic SRB	Neolithic POL 2	-0.000246	0.020605	-0.012	627
auroch	Neolithic SRB	Neolithic GBR 1	0.001967	0.003883	0.507	46419
auroch	Neolithic BUL	Neolithic IRE 2	0.038009	0.010425	3.646	4028
auroch	Neolithic BUL	Neolithic POL	0.031041	0.00596	5.209	11643
auroch	Neolithic SRB	Neolithic POL	0.049197	0.0058	8.483	12686
auroch	Neolithic BUL	Neolithic IRE 1	0.034434	0.003532	9.75	60171
auroch	Neolithic BUL	Neolithic GBR 3	0.06222	0.006344	9.809	41183
auroch	Neolithic SRB	Neolithic GBR 3	0.073097	0.00621	11.771	44509
auroch	Neolithic POL	Neolithic GBR 2	-0.026659	0.003614	-7.376	28655
auroch	Neolithic POL	Neolithic GBR 1	-0.017182	0.004315	-3.982	26636
auroch	Neolithic POL	Neolithic POL 2	-0.019051	0.027578	-0.691	402
auroch	Neolithic POL	Neolithic IRE 2	0.031306	0.013335	2.348	2508
auroch	Neolithic POL	Neolithic IRE 1	0.022662	0.003676	6.166	38134
auroch	Neolithic POL	Neolithic GBR 3	0.048129	0.006607	7.285	24929
auroch	Neolithic DEU (Hxh1)	Neolithic GBR 2	-0.024044	0.004024	-5.976	41099
auroch	Neolithic DEU (Hxh1)	Neolithic GBR 1	-0.014032	0.004671	-3.004	38099
auroch	Neolithic DEU (Hxh1)	Neolithic IRE 2	0.030833	0.011217	2.749	3477
auroch	Neolithic DEU (Hxh1)	Neolithic IRE 1	0.023653	0.004188	5.647	57154
auroch	Neolithic DEU (Hxh1)	Neolithic GBR 3	0.052398	0.006259	8.372	35423
auroch	Neolithic NED (Sch1)	Neolithic GBR 2	-0.012874	0.004125	-3.121	34713
auroch	Neolithic NED (Sch1)	Neolithic GBR 1	-0.009947	0.004728	-2.104	31980
auroch	Neolithic NED (Sch1)	Neolithic IRE 2	0.020669	0.012541	1.648	2926
auroch	Neolithic NED (Sch1)	Neolithic IRE 1	0.032153	0.004133	7.779	48048
auroch	Neolithic NED (Sch1)	Neolithic GBR 3	0.067489	0.00683	9.882	30032
auroch	Neolithic GBR 1	Neolithic GBR 2	-0.013905	0.003404	-4.086	45292
auroch	Neolithic GBR 3	Neolithic GBR 2	-0.000366	0.003527	-0.104	45082
auroch	Neolithic IRE 1	Neolithic IRE 2	0.010503	0.008755	1.2	4450
auroch	Neolithic GBR 1	Neolithic GBR 3	0.069493	0.006319	10.997	41177

Appendix Table 12. Chapter 5. *Full results for the testing of auroch admixture scenarios within the Atlantic Edge using the f_3-statistic (Target; Source1, Source2). Z-scores are coloured to indicate significance level:* *green*= *P ≤ 0.001,* *orange* = *0.001 < P ≤ 0.01,* *red*= *0.01 < P ≤ 0.05.*

Source 1	Source2	Target	F3	Std. err	Z score	SNP no.
auroch	Neolithic IRE 1	Bronze IRE	-0.014622	0.003014	-4.852	51630
auroch	Neolithic IRE 2	Bronze IRE	-0.0153	0.00443	-3.454	21528
auroch	Neolithic IRE 2	Medieval IRE	-0.010499	0.003619	-2.901	25196
auroch	Neolithic IRE 1	Medieval IRE	-0.003763	0.002548	-1.477	57086
auroch	Neolithic NED (Sch1)	Bronze NED	-0.005738	0.004975	-1.154	18083
auroch	Neolithic NED (Sch1)	Roman NED	-0.002255	0.0032	-0.705	49899
auroch	Neolithic NED (Sch1)	Iron NED	-0.001435	0.004439	-0.323	28281
auroch	Iron NED	Roman NED	-0.000374	0.002245	-0.167	60854
auroch	Neolithic GBR 1	Bronze GBR 2	-0.000198	0.003599	-0.055	35240
auroch	Neolithic NED (Sch1)	Medieval NED	0.001535	0.003584	0.428	43515
auroch	Bronze IRE	Medieval IRE	0.001315	0.002689	0.489	53759
auroch	Iron NED	Medieval NED	0.003376	0.002561	1.318	54181
auroch	Roman NED	Medieval NED	0.003225	0.002262	1.426	60074
auroch	Bronze NED	Roman NED	0.003563	0.00246	1.448	58237
auroch	Neolithic GBR 1	Iron GBR 3	0.010947	0.0072	1.52	6742
auroch	Bronze NED	Iron NED	0.006123	0.003824	1.601	34437
auroch	Neolithic GBR 1	Iron GBR 2	0.008306	0.003991	2.081	42518
auroch	Bronze NED	Medieval NED	0.005968	0.002719	2.195	51529
auroch	Neolithic GBR 3	Iron GBR 3	0.017712	0.007188	2.464	6679
auroch	Neolithic GBR 2	Iron GBR 3	0.020609	0.007766	2.654	6940
auroch	Neolithic GBR 1	Iron GBR 1	0.006823	0.002506	2.722	66691
auroch	Neolithic GBR 3	Bronze GBR 2	0.011708	0.00377	3.105	34956
auroch	Neolithic GBR 2	Bronze GBR 2	0.012285	0.003297	3.726	35985
auroch	Neolithic GBR 2	Iron GBR 2	0.021482	0.003652	5.883	43797
auroch	Neolithic GBR 3	Iron GBR 2	0.023585	0.003949	5.973	42277
auroch	Neolithic GBR 2	Iron GBR 1	0.016114	0.002292	7.03	66843
auroch	Neolithic GBR 3	Iron GBR 1	0.019703	0.002611	7.548	66568
auroch	Neolithic GBR 1	Bronze GBR 1	0.020737	0.002673	7.759	65489
auroch	Neolithic GBR 3	Bronze GBR 1	0.032317	0.002859	11.303	65472
auroch	Neolithic GBR 2	Bronze GBR 1	0.030933	0.002457	12.592	65794

Appendix Table 13. Chapter 5. *Proportions of European auroch introgression into European cattle calculated by the f₄ ratio statistic. * denotes European auroch. (Section 4.3.3.2)*

Name	Time	Country	F4	Std. err	Z
Hxh2*	Neolithic	Germany	0.978118	0.047396	20.637
Bed4*	Mesolithic	Germany	0.967617	0.051229	18.888
Tri1*	Mesolithic	Germany	0.962548	0.048133	19.998
Fal7*	Medieval	Germany	0.839744	0.04679	17.947
Kalisz2*	Unknown	Poland	0.833093	0.045272	18.402
Dur2	Neolithic	Britain	0.521334	0.043384	12.017
Cla7	Bronze Age	Britain	0.508439	0.080651	6.304
Cla5	Bronze Age	Britain	0.447002	0.047932	9.326
Ness3	Neolithic	Britain	0.429176	0.074354	5.772
Cla8	Bronze Age	Britain	0.427735	0.046252	9.248
Dur1	Neolithic	Britain	0.425406	0.044368	9.588
New2	Medieval	Ireland	0.414715	0.047531	8.725
Dur3	Neolithic	Britain	0.408731	0.071491	5.717
Bor1	Iron Age	Britain	0.404464	0.061509	6.576
Bal2	Medieval	Ireland	0.402307	0.054194	7.423
Fis2	Iron Age	Britain	0.400327	0.047465	8.434
Kie2	Neolithic	Poland	0.392024	0.088517	4.429
Ness2	Neolithic	Britain	0.39083	0.045439	8.601
Pot6	Bronze Age	Britain	0.387547	0.06489	5.972
Cla1	Bronze Age	Britain	0.382032	0.044163	8.65
Viz1	Bronze Age	Netherlands	0.377039	0.055625	6.778
Yor1	Roman	Britain	0.376884	0.04657	8.093
Cla2	Bronze Age	Britain	0.37536	0.047249	7.944
Pot1	Bronze Age	Britain	0.374464	0.04753	7.878
Fis1	Iron Age	Britain	0.372785	0.044965	8.291
Ste1	Roman	Netherlands	0.372631	0.050814	7.333
Da1	Iron Age	Britain	0.371744	0.046005	8.08
Fir1	Medieval	Netherlands	0.369521	0.046033	8.027
Pot3	Bronze Age	Britain	0.368282	0.089082	4.134
Sir1	Medieval	Britain	0.365359	0.045541	8.023

Ness4	Neolithic	Britain	0.361136	0.066602	5.422
Da6	Iron Age	Britain	0.359864	0.043407	8.29
Da2	Iron Age	Britain	0.35812	0.096692	3.704
Cla4	Bronze Age	Britain	0.355778	0.064892	5.483
Rou1	Bronze Age	Ireland	0.350327	0.048307	7.252
Hou2	Medieval	Netherlands	0.348948	0.047113	7.407
Yor3	Medieval	Britain	0.348687	0.044418	7.85
Rou2	Bronze Age	Ireland	0.343662	0.044373	7.745
Kil1	Medieval	Britain	0.343594	0.09095	3.778
Dub1	Medieval	Ireland	0.34134	0.045576	7.49
Pot2	Bronze Age	Britain	0.340457	0.088358	3.853
Bal1	Medieval	Ireland	0.337551	0.060601	5.57
Dro1	Roman	Netherlands	0.336366	0.047466	7.086
Ness5	Neolithic	Britain	0.336074	0.045708	7.353
Da3	Iron Age	Britain	0.33523	0.046294	7.241
Plo5	Neolithic	Serbia	0.3344	0.134911	2.479
Yor2	Medieval	Britain	0.332633	0.046068	7.22
Par1	Neolithic	Britain	0.332349	0.079485	4.181
Els1	Roman	Netherlands	0.330211	0.046829	7.051
Plo1	Neolithic	Serbia	0.33019	0.115504	2.859
JER	Modern	Channel Islands	0.329704	0.032625	10.106
Pot4	Iron Age	Britain	0.326175	0.04575	7.129
Bis1	Neolithic	Britain	0.325927	0.044491	7.326
Cla6	Iron Age	Britain	0.323107	0.075855	4.26
Yor4	Medieval	Britain	0.320386	0.047913	6.687
KER	Modern	Ireland	0.316566	0.034574	9.156
Win1	Roman	Netherlands	0.309404	0.04569	6.772
Cla9	Bronze Age	Britain	0.309383	0.044938	6.885
Bis2	Neolithic	Britain	0.30862	0.045913	6.722
Bun1	Iron Age	Netherlands	0.305831	0.047292	6.467
New4	Neolithic	Britain	0.302424	0.047169	6.411
GAL	Modern	Britain	0.298226	0.034407	8.668
Stu1	Neolithic	Serbia	0.295512	0.099125	2.981

Cla3	Bronze Age	Britain	0.293483	0.088403	3.32
Bri1	Roman	Netherlands	0.293399	0.047533	6.173
Pot5	Bronze Age	Britain	0.290111	0.079415	3.653
Da5	Iron Age	Britain	0.290075	0.047884	6.058
Viz2	Bronze Age	Netherlands	0.288245	0.047423	6.078
Bun2	Roman	Netherlands	0.287673	0.047533	6.052
New1	Neolithic	Britain	0.28214	0.043891	6.428
New5	Neolithic	Britain	0.281107	0.045265	6.21
Dyr1	Medieval	Germany	0.276405	0.047048	5.875
HIG	Modern	Britain	0.266846	0.037351	7.144
Rou3	Bronze Age	Ireland	0.26234	0.079144	3.315
GNS	Modern	Channel Islands	0.252459	0.033924	7.442
NRC	Modern	Norway	0.251106	0.034956	7.184
Par2	Neolithic	Ireland	0.246286	0.063114	3.902
Hou1	Medieval	Netherlands	0.224344	0.045683	4.911
Da4	Iron Age	Britain	0.223193	0.080739	2.764
Plo2	Neolithic	Serbia	0.221325	0.069467	3.186
Otb1	Roman	Netherlands	0.221101	0.047401	4.665
NOR	Modern	France	0.214251	0.035378	6.056
New3	Neolithic	Ireland	0.211171	0.045918	4.599
SIM	Modern	France	0.209531	0.034056	6.153
Plo4	Neolithic	Serbia	0.20384	0.045424	4.487
RGU	Modern	Britain	0.20127	0.036281	5.548
Sch1	Neolithic	Netherlands	0.195015	0.045613	4.275
Kie1	Neolithic	Poland	0.191186	0.198796	0.962
ANG	Modern	Britain	0.187447	0.03691	5.079
ALE	Modern	Portugal	0.185715	0.035454	5.238
Hxh1	Neolithic	Germany	0.185275	0.048505	3.82
HOL	Modern	Germany	0.182027	0.035885	5.073
PMT	Modern	Italy	0.18191	0.032585	5.583
Lud3	Neolithic	Serbia	0.181243	0.072664	2.494
LMS	Modern	France	0.174154	0.034452	5.055
Bel2	Neolithic	Serbia	0.169082	0.099442	1.7

BLO	Modern	France	0.168408	0.035386	4.759
MON	Modern	France	0.160294	0.036465	4.396
Lud4	Neolithic	Serbia	0.157651	0.091346	1.726
BSW	Modern	Switzerland	0.153784	0.035666	4.312
Kir4	Neolithic	Germany	0.152759	0.045918	3.327
Rou4	Bronze Age	Ireland	0.141176	0.149296	0.946
Plo7	Neolithic	Serbia	0.140732	0.148355	0.949
CHL	Modern	France	0.130097	0.034558	3.765
Plo3	Neolithic	Serbia	0.125244	0.046439	2.697
Dzh2	Neolithic	Bulgaria	0.119838	0.045741	2.62
Lud2	Neolithic	Poland	0.113161	0.077367	1.463
Bel1	Neolithic	Serbia	0.085566	0.170141	0.503
Gen1	Medieval	Belgium	0.085411	0.086539	0.987
Plo6	Neolithic	Serbia	0.084926	0.189548	0.448
Dzh1	Neolithic	Bulgaria	0.077351	0.049	1.579
Ch22	Neolithic	Turkey	0.067343	0.07657	0.879
Men1	Neolithic	Turkey	0.035946	0.044419	0.809
Men2	Neolithic	Turkey	0.027748	0.05134	0.54
Plo8	Neolithic	Serbia	-0.009473	0.114873	-0.082
Lud1	Neolithic	Poland	-0.050248	0.111511	-0.451
RMG	Modern	Itlay	-0.188499	0.047063	-4.005
MAR	Modern	Italy	-0.227397	0.050818	-4.475
SIK	Modern	Greece	-0.325771	0.053939	-6.04

Appendix Table 14. Chapter 5. *Results of D-statistic tests for auroch introgression into modern breeds when compared with the Irish Neolithic population. A minus D and Z-score indicates more auroch derived alleles in Neolithic IRE than the test, whilst a positive score suggests more auroch derived alleles in the test. Z-scores are coloured to indicate significance level: green= P ≤ 0.001, orange = 0.001 < P ≤ 0.01, red= 0.01 < P ≤ 0.05. (section 4.3.3.3)*

Pop3	Pop4	*D*-stat	stdr error	*Z*-score	BABA	ABBA	Sites
			D(Pop4,Neolithic IRE 1)auroch,Gaur))				
Neolithic IRE 1 (Newgrange)	SIK	-0.1223	0.0055	-22.253	5928	7580	96288
	RMG	-0.1001	0.0052	-19.323	5985	7316	96288
	MAR	-0.1042	0.0060	-17.419	6002	7398	96287
	CHL	-0.0324	0.0044	-7.327	6207	6623	96288
	BSW	-0.0265	0.0048	-5.521	6173	6510	96288
	LMS	-0.0235	0.0045	-5.277	6202	6500	96288
	PMT	-0.0224	0.0043	-5.258	6194	6478	96288
	HOL	-0.0221	0.0046	-4.755	6261	6545	96288
	ANG	-0.0232	0.0050	-4.685	6205	6500	96288
	BLO	-0.0229	0.0050	-4.594	6203	6494	96288
	MON	-0.0233	0.0051	-4.589	6224	6520	96288
	ALE	-0.0217	0.0049	-4.409	6219	6495	96288
	RGU	-0.0225	0.0052	-4.349	6195	6480	96288
	NOR	-0.0147	0.0049	-3	6214	6399	96288
	SIM	-0.0135	0.0046	-2.937	6275	6447	96288
	NRC	-0.0071	0.0043	-1.647	6287	6377	96288
	GNS	-0.0059	0.0046	-1.283	6215	6289	96288
	HIG	0.0026	0.0050	0.515	6216	6183	96288
	GAL	0.0041	0.0045	0.902	6218	6168	96288
	KER	0.0052	0.0047	1.111	6260	6195	96288
	JER	0.0056	0.0045	1.237	6406	6334	96288

Appendix Table 15. Chapter 5. Results of D-statistic tests for auroch introgression into modern breeds when compared with the Irish Neolithic population. A minus D and Z-score indicates more auroch derived alleles in Neolithic GBR (Early British Neolithic) than the test, whilst a positive score suggests more auroch derived alleles in the test. Z-scores are coloured to indicate significance level: green= P ≤ 0.001, orange = 0.001 < P ≤ 0.01, red= 0.01 < P ≤ 0.05. (section 4.3.3.3)

| Pop3	Pop4	*D*-stat	stdr error	*Z*-score	BABA	ABBA	Sites
		D(Pop4,Neolithic GBR 1)auroch,Gaur))					
Neolithic GBR 1 (Bishops Cannings)	SIK	-0.1385	0.0063	-22.127	5840	7717	95994
	RMG	-0.1168	0.0062	-18.85	5898	7458	95994
	MAR	-0.1211	0.0065	-18.618	5893	7517	95993
	CHL	-0.0501	0.0057	-8.809	6125	6771	95994
	PMT	-0.0404	0.0055	-7.301	6111	6625	95994
	LMS	-0.0414	0.0058	-7.087	6117	6645	95994
	HOL	-0.0402	0.0058	-6.88	6139	6653	95994
	RGU	-0.0402	0.0060	-6.756	6142	6656	95994
	ANG	-0.0407	0.0060	-6.751	6151	6673	95994
	BLO	-0.0409	0.0061	-6.703	6112	6633	95994
	MON	-0.0412	0.0063	-6.57	6134	6661	95994
	ALE	-0.0398	0.0061	-6.496	6137	6645	95994
	SIM	-0.0313	0.0056	-5.568	6212	6614	95994
	NOR	-0.0327	0.0063	-5.177	6161	6578	95994
	NRC	-0.0248	0.0056	-4.444	6224	6541	95994
	GNS	-0.0243	0.0060	-4.022	6164	6470	95994
	HIG	-0.0158	0.0061	-2.594	6182	6380	95994
	GAL	-0.0144	0.0061	-2.36	6175	6356	95994
	JER	-0.0125	0.0058	-2.168	6324	6485	95994
	KER	-0.0134	0.0062	-2.148	6278	6448	95994

Appendix Table 16. Chapter 5. *Results of D-statistic tests for auroch introgression into modern breeds when compared with the Irish Neolithic population. A minus D and Z-score indicates more auroch derived alleles in Neolithic GBR 2 (Late British Neolithic) than the test, whilst a positive score suggests more auroch derived alleles in the test. Z-scores are coloured to indicate significance level: green= P ≤ 0.001, orange = 0.001 < P ≤ 0.01, red= 0.01 < P ≤ 0.05. (section 4.3.3.3)*

Pop3	Pop4	D-stat	stdr error	Z-score	BABA	ABBA	Sites
			D(Pop4,Neolithic GBR 2)auroch,Gaur))				
Neolithic GBR 2 (Durrington Walls)	SIK	-0.1527	0.0058	-26.355	5751	7824	95613
	RMG	-0.1315	0.0056	-23.329	5802	7559	95613
	MAR	-0.1352	0.0059	-22.858	5829	7651	95612
	CHL	-0.0657	0.0051	-12.827	6012	6858	95613
	PMT	-0.0558	0.0050	-11.237	6014	6725	95613
	BSW	-0.0599	0.0054	-11.009	5987	6749	95613
	LMS	-0.057	0.0053	-10.765	6011	6738	95613
	ANG	-0.0568	0.0054	-10.501	6026	6752	95613
	BLO	-0.0561	0.0055	-10.177	6033	6750	95613
	RGU	-0.056	0.0055	-10.171	6031	6746	95613
	HOL	-0.0553	0.0054	-10.161	6079	6791	95613
	ALE	-0.0551	0.0055	-10.02	6013	6715	95613
	MON	-0.0562	0.0060	-9.406	6061	6783	95613
	SIM	-0.0473	0.0052	-9.072	6094	6699	95613
	NOR	-0.0483	0.0056	-8.626	6054	6668	95613
	NRC	-0.0412	0.0053	-7.741	6105	6629	95613
	GNS	-0.04	0.0053	-7.484	6048	6552	95613
	HIG	-0.0315	0.0057	-5.533	6061	6456	95613
	GAL	-0.0302	0.0055	-5.479	6076	6454	95613
	JER	-0.0282	0.0051	-5.476	6202	6562	95613
	KER	-0.0291	0.0058	-5.058	6102	6468	95613
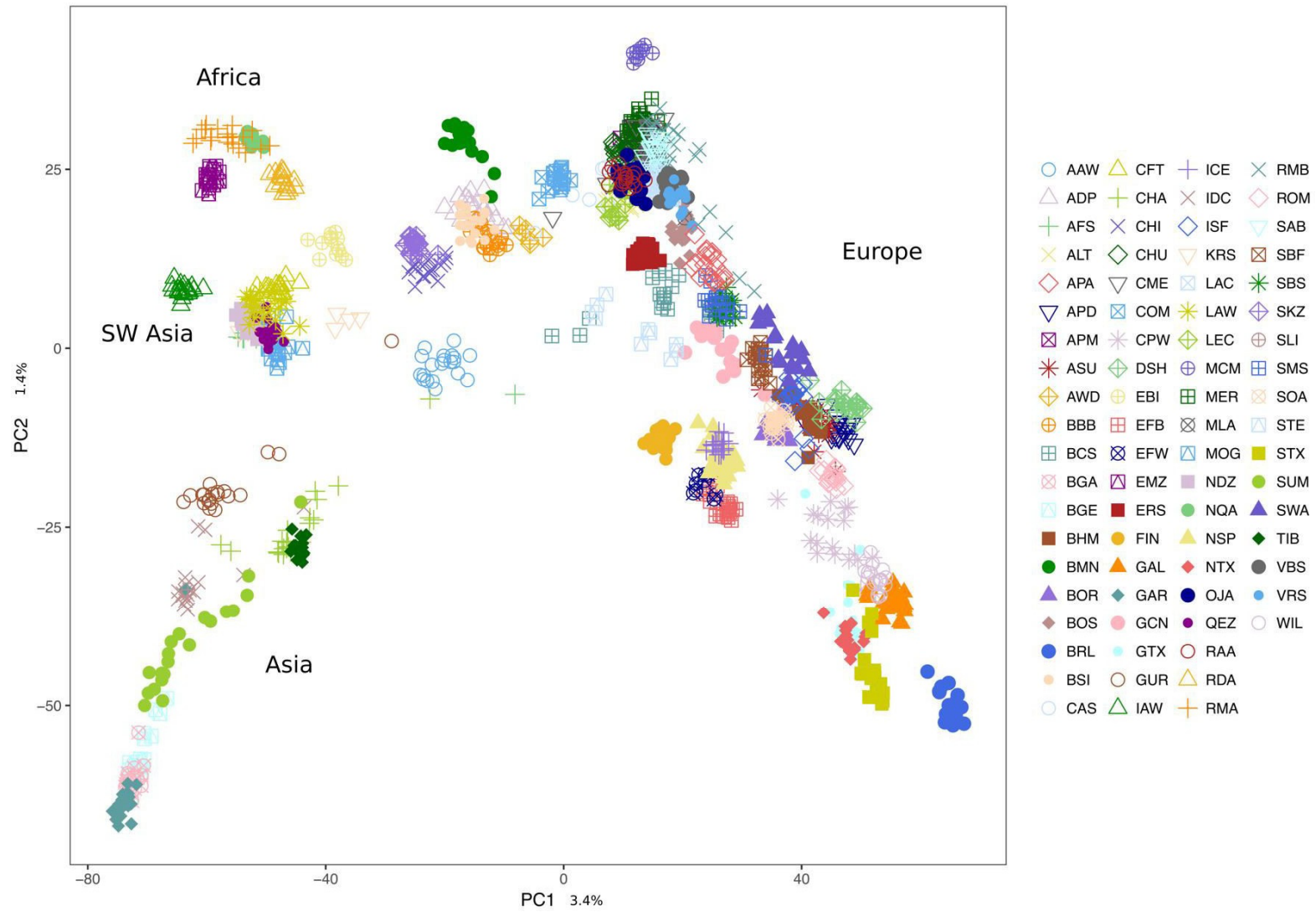
Appendix Figure 4. Chapter 6. *PCA of world wide sheep populations using variance from the 50K Sheep DB HapMap (PC1, PC2). For abbreviations of the breeds see Appendix Table 3.*

Appendix Table 17. Chapter 6. *Groupings of ancient samples into populations as used in Chapter 6.*

Population	Samples
Neolithic Balkans	Dzh1
	Bub1
Neolithic Britain	Ness7
	Ness8
Bronze Age Britain	Cla12
	Cla13
	Cla11
	Sil1
	Cla10
Iron Age Britain	Da8
	Da7
Iron Age Uzbekistan	San1
	Pad1
Roman Germany	Alz1
	Mai1
Medieval Dublin	Dub3
	Dub5
	Dub4
Medieval (Norse) Britain	Ork1
	Ork2
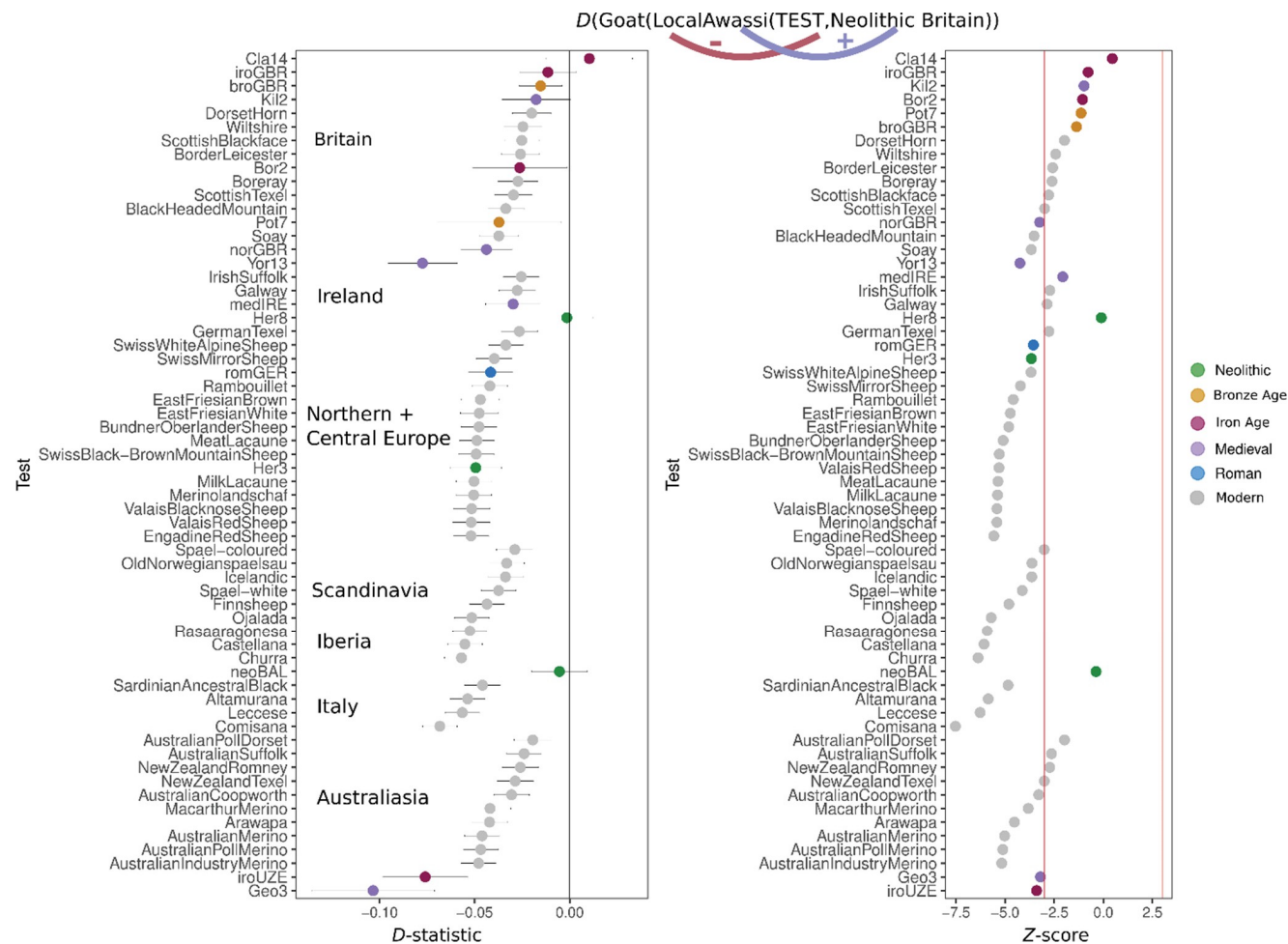
Appendix Figure 5. Chapter 6. *D-statistics to measure introgression from the Local Awassi Breed, into European derived breeds and ancient samples in comparison to a Neolithic British population. Where possible ancient samples were combined into populations based upon temporal and geographical information. Abbreviations are as follows: neoBAL= Neolithic Balkans, broGBR= Bronze Age Cladh Hallan (GBR), iroGBR= Iron Age Danebury (GBR), medIRE= Medieval Dublin (IRE), norGBR= Medieval (Norse) Orkney (GBR), iroUZE= Iron Age Uzbekistan and romGER= Roman Germany. Colour denotes cultural period and geographic labels denote the country/region of the modern breeds. The ancient samples from Asia are included in these statistics as a reference point. Note: the Australian breeds are derived from European breeds, hence they have been included in the test*
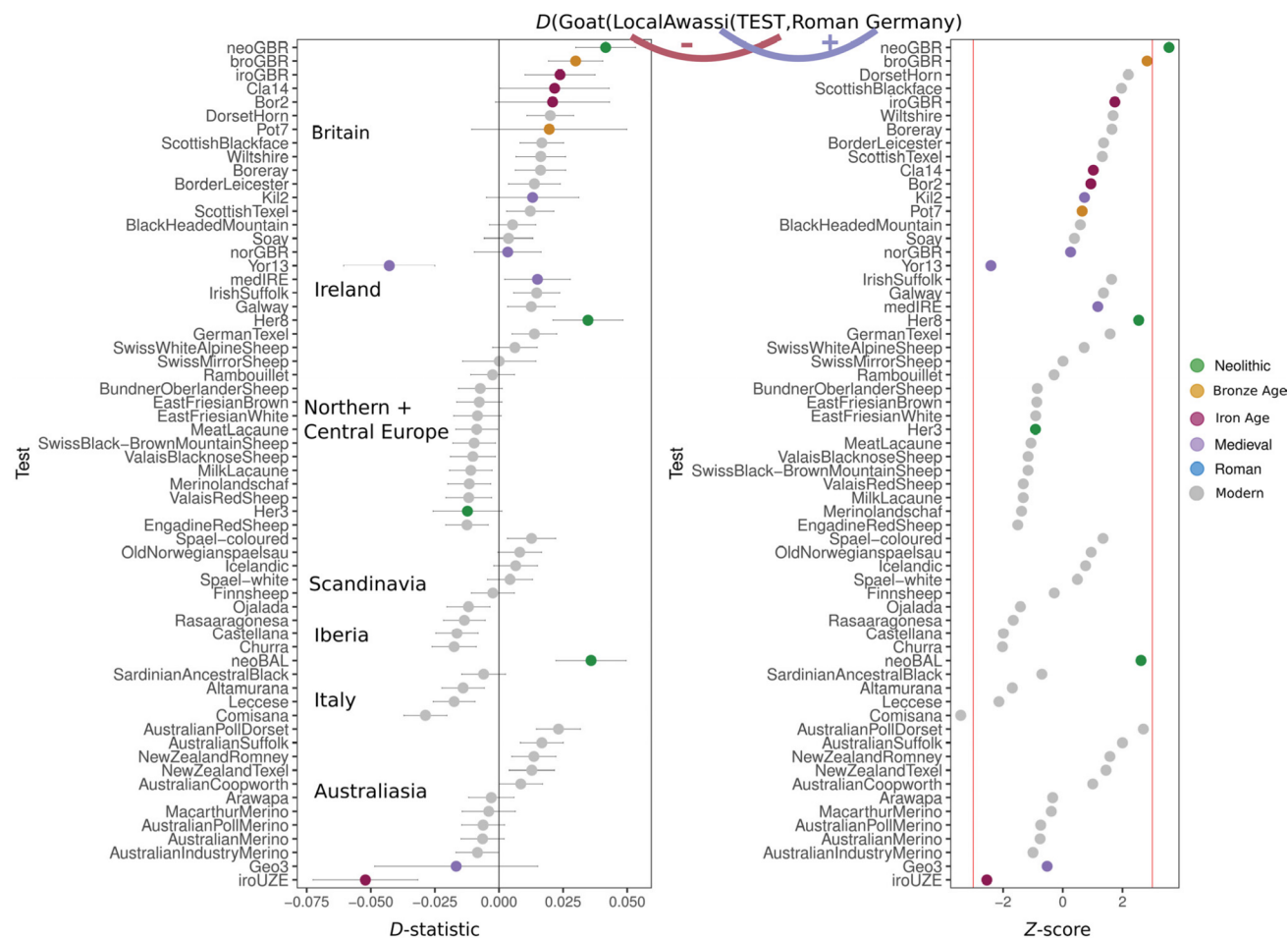
Appendix Figure 6. Chapter 6. *D-statistics to measure introgression from the Local Awasi, into European derived breeds and ancient samples in comparison to a Roman German population. Where possible ancient samples were combined into populations based upon temporal and geographical information. Abbreviations are as follows: neoBAL= Neolithic Balkans, broGBR= Bronze Age Cladh Hallan (GBR), iroGBR= Iron Age Danebury (GBR), medIRE= Medieval Dublin (IRE), norGBR= Medieval (Norse) Orkney (GBR), iroUZE= Iron Age Uzbekistan and romGER= Roman Germany. Colour denotes cultural period and geographic labels denote the country/region of the modern breeds. The ancient samples from Asia are included in these statistics as a reference point. Note: the Australian breeds are derived from European breeds, hence they have been included in the test*

Appendix Table 18. Chapter 6. Results of outgroup f₃-statistics results discussed in Chapter 5. Tests f₃(Neolithic Balkans; Population B; Population A) to calculate shared drift between A and B.

A	B	f3	stdrr	Z	SNP number
	Altamurana	0.019056	0.007526	2.532	6065
	Arawapa	0.021668	0.007858	2.757	6035
	AustralianCoopworth	0.027131	0.007737	3.506	6072
	AustralianIndustryMerino	0.019149	0.007511	2.549	6070
	AustralianMerino	0.019635	0.007469	2.629	6072
	AustralianPollDorset	0.029384	0.007908	3.715	6023
	AustralianPollMerino	0.02096	0.007473	2.805	6078
	AustralianSuffolk	0.029493	0.007726	3.817	6063
	BlackHeadedMountain	0.030846	0.007966	3.872	6039
	Bor2	0.074331	0.020576	3.613	1272
	BorderLeicester	0.024598	0.008296	2.965	5839
	Boreray	0.028465	0.00834	3.413	5792
	BundnerOberlanderSheep	0.025071	0.007738	3.24	6020
	Castellana	0.01775	0.007445	2.384	6075
	Churra	0.021083	0.007692	2.741	6062
	Cla14	0.092148	0.018314	5.031	1560
	Comisana	0.014119	0.007451	1.895	6065
	DorsetHorn	0.032844	0.008274	3.969	5939
	EastFriesianBrown	0.028876	0.007998	3.61	5931
	EastFriesianWhite	0.027396	0.007916	3.461	5812
	EngadineRedSheep	0.019853	0.007589	2.616	6046
	Finnsheep	0.030263	0.007697	3.932	6044
Bronze Age Britain	Galway	0.028133	0.007891	3.565	6013
	GermanTexel	0.030259	0.007768	3.895	6034
	Her3	0.031342	0.010685	2.933	3834
	Her8	0.016321	0.010898	1.498	3459
	Icelandic	0.035815	0.007801	4.591	5977
	IrishSuffolk	0.028591	0.008065	3.545	6009
	iroGBR	0.036822	0.011135	3.307	3495
	Kil2	0.039468	0.013828	2.854	2075
	Leccese	0.018225	0.007519	2.424	6072
	MacarthurMerino	0.016835	0.008629	1.951	5418
	MeatLacaune	0.020272	0.007506	2.701	6069
	medIRE	0.022044	0.009633	2.288	3737
	Merinolandschaf	0.024069	0.007697	3.127	6035
	MilkLacaune	0.017651	0.00754	2.341	6070
	neoGBR	0.048875	0.009689	5.044	4489
	NewZealandRomney	0.032714	0.008178	4	6039
	NewZealandTexel	0.028378	0.007756	3.659	6014
	norGBR	0.034464	0.010015	3.441	3924
	Ojalada	0.019817	0.00745	2.66	6074
	OldNorwegianspaelsau	0.03421	0.007896	4.333	6050
	Pot7	-0.006855	0.020186	-0.34	709
	Rambouillet	0.020245	0.007702	2.629	6069

	Rasaaragonesa	0.020324	0.007463	2.723	6088
	romGER	0.025292	0.008898	2.842	4525
	SardinianAncestralBlack	0.017672	0.007698	2.296	6032
	ScottishBlackface	0.032617	0.00794	4.108	6056
	ScottishTexel	0.032924	0.007855	4.191	6011
	Soay	0.032486	0.008201	3.961	5757
	Spael-coloured	0.03783	0.008209	4.608	5637
	Spael-white	0.034908	0.008011	4.357	6013
	SwissBlack-BrownMountainSheep	0.024774	0.007705	3.215	6034
	SwissMirrorSheep	0.02196	0.007582	2.896	6035
	SwissWhiteAlpineSheep	0.023355	0.00779	2.998	6038
	ValaisBlacknoseSheep	0.019644	0.007891	2.489	5934
	ValaisRedSheep	0.020422	0.007998	2.554	5925
	Wiltshire	0.03116	0.008286	3.761	5836
	Yor13	0.018174	0.012112	1.5	2335
Iron Britain	Altamurana	0.031094	0.009338	3.33	4149
	Arawapa	0.037371	0.009492	3.937	4132
	AustralianCoopworth	0.040584	0.00971	4.18	4148
	AustralianIndustryMerino	0.033163	0.009236	3.59	4148
	AustralianMerino	0.031636	0.009182	3.445	4154
	AustralianPollDorset	0.037643	0.009789	3.845	4115
	AustralianPollMerino	0.033597	0.009099	3.692	4155
	AustralianSuffolk	0.036544	0.009677	3.777	4150
	BlackHeadedMountain	0.038553	0.009675	3.985	4138
	Bor2	0.069121	0.022287	3.101	901
	BorderLeicester	0.046373	0.010484	4.423	4036
	Boreray	0.042786	0.010947	3.909	4012
	broGBR	0.036822	0.011135	3.307	3495
	BundnerOberlanderSheep	0.039424	0.009804	4.021	4128
	Castellana	0.03008	0.009295	3.236	4150
	Churra	0.030013	0.009342	3.213	4151
	Cla14	0.037623	0.019795	1.901	1082
	Comisana	0.029608	0.009432	3.139	4144
	DorsetHorn	0.041709	0.010635	3.922	4073
	EastFriesianBrown	0.041566	0.010178	4.084	4071
	EastFriesianWhite	0.040511	0.010014	4.045	4003
	EngadineRedSheep	0.034719	0.009378	3.702	4143
	Finnsheep	0.048356	0.009882	4.893	4140
	Galway	0.039795	0.009761	4.077	4128
	GermanTexel	0.044667	0.009719	4.596	4142
	Her3	0.032614	0.01267	2.574	2743
	Her8	0.006023	0.0131	0.46	2445
	Icelandic	0.047028	0.010015	4.696	4098
	IrishSuffolk	0.043613	0.010051	4.339	4108
	Kil2	0.063692	0.01733	3.675	1521
	Leccese	0.02983	0.009348	3.191	4149
	MacarthurMerino	0.036888	0.01085	3.4	3779

	MeatLacaune	0.030082	0.009126	3.296	4147
	medIRE	0.027533	0.012215	2.254	2678
	Merinolandschaf	0.03778	0.009633	3.922	4138
	MilkLacaune	0.027782	0.009262	3	4136
	neoGBR	0.040278	0.011502	3.502	3171
	NewZealandRomney	0.044768	0.009931	4.508	4136
	NewZealandTexel	0.039514	0.009668	4.087	4124
	norGBR	0.036727	0.013263	2.769	2830
	Ojalada	0.028734	0.00922	3.116	4155
	OldNorwegianspaelsau	0.050254	0.010075	4.988	4144
	Pot7	0.036695	0.026737	1.372	520
	Rambouillet	0.033798	0.00945	3.577	4150
	Rasaaragonesa	0.030219	0.009283	3.255	4160
	romGER	0.031251	0.011228	2.783	3190
	SardinianAncestralBlack	0.026857	0.009406	2.855	4124
	ScottishBlackface	0.041834	0.009907	4.223	4151
	ScottishTexel	0.043313	0.009934	4.36	4123
	Soay	0.043215	0.010493	4.118	3968
	Spael-coloured	0.052687	0.010657	4.944	3930
	Spael-white	0.050819	0.010197	4.984	4127
	SwissBlack-BrownMountainSheep	0.033947	0.009608	3.533	4132
	SwissMirrorSheep	0.034202	0.009494	3.602	4135
	SwissWhiteAlpineSheep	0.039308	0.009627	4.083	4144
	ValaisBlacknoseSheep	0.036867	0.009788	3.767	4073
	ValaisRedSheep	0.037531	0.010063	3.73	4068
	Wiltshire	0.038634	0.010173	3.798	3993
	Yor13	0.027506	0.015266	1.802	1687
Medieval Ireland	Altamurana	0.0214	0.008142	2.628	4453
	Arawapa	0.021998	0.008586	2.562	4439
	AustralianCoopworth	0.029082	0.008313	3.498	4451
	AustralianIndustryMerino	0.018424	0.008292	2.222	4458
	AustralianMerino	0.017483	0.008201	2.132	4459
	AustralianPollDorset	0.026382	0.008593	3.07	4419
	AustralianPollMerino	0.017638	0.008186	2.155	4461
	AustralianSuffolk	0.030226	0.008494	3.559	4452
	BlackHeadedMountain	0.028277	0.008802	3.213	4446
	Bor2	0.038501	0.021693	1.775	993
	BorderLeicester	0.029522	0.008876	3.326	4329
	Boreray	0.024432	0.008905	2.744	4275
	broGBR	0.022044	0.009633	2.288	3737
	BundnerOberlanderSheep	0.020878	0.008187	2.55	4426
	Castellana	0.015311	0.008064	1.899	4455
	Churra	0.016705	0.008341	2.003	4453
	Cla14	0.027923	0.018252	1.53	1178
	Comisana	0.016608	0.008084	2.054	4446
	DorsetHorn	0.02828	0.008763	3.227	4368
	EastFriesianBrown	0.027052	0.008789	3.078	4385

	EastFriesianWhite	0.025006	0.008741	2.861	4301
	EngadineRedSheep	0.0213	0.008086	2.634	4449
	Finnsheep	0.026648	0.008575	3.108	4440
	Galway	0.029914	0.008606	3.476	4422
	GermanTexel	0.031915	0.008413	3.794	4433
	Her3	0.03199	0.012031	2.659	2925
	Her8	-0.000988	0.01216	-0.081	2655
	Icelandic	0.028864	0.008595	3.358	4397
	IrishSuffolk	0.035329	0.008758	4.034	4417
	iroGBR	0.027533	0.012215	2.254	2678
	Kil2	0.046128	0.01636	2.82	1603
	Leccese	0.016706	0.008145	2.051	4458
	MacarthurMerino	0.022417	0.009503	2.359	4056
	MeatLacaune	0.019999	0.008193	2.441	4447
	Merinolandschaf	0.022172	0.008313	2.667	4448
	MilkLacaune	0.021808	0.008374	2.604	4442
	neoGBR	0.015475	0.010609	1.459	3381
	NewZealandRomney	0.03567	0.008599	4.148	4441
	NewZealandTexel	0.028731	0.008575	3.35	4430
	norGBR	0.026035	0.011446	2.275	3013
	Ojalada	0.019726	0.008101	2.435	4456
	OldNorwegianspaelsau	0.031746	0.008504	3.733	4438
	Pot7	0.023732	0.0252	0.942	557
	Rambouillet	0.018317	0.008231	2.225	4453
	Rasaaragonesa	0.018072	0.008018	2.254	4466
	romGER	0.021328	0.01009	2.114	3463
	SardinianAncestralBlack	0.015527	0.008415	1.845	4424
	ScottishBlackface	0.0325	0.0085	3.824	4450
	ScottishTexel	0.031512	0.008439	3.734	4424
	Soay	0.02888	0.008923	3.237	4262
	Spael-coloured	0.028373	0.00891	3.184	4186
	Spael-white	0.025749	0.008507	3.027	4409
	SwissBlack-BrownMountainSheep	0.024636	0.008449	2.916	4425
	SwissMirrorSheep	0.02294	0.008316	2.759	4433
	SwissWhiteAlpineSheep	0.026732	0.008381	3.19	4434
	ValaisBlacknoseSheep	0.021138	0.008368	2.526	4378
	ValaisRedSheep	0.018119	0.008659	2.093	4369
	Wiltshire	0.024155	0.009002	2.683	4287
	Yor13	0.022094	0.015032	1.47	1806
Neolithic Britain	Altamurana	0.013201	0.007936	1.663	5149
	Arawapa	0.011896	0.008074	1.473	5129
	AustralianCoopworth	0.018348	0.00813	2.257	5144
	AustralianIndustryMerino	0.014974	0.007838	1.91	5150
	AustralianMerino	0.011744	0.007799	1.506	5151
	AustralianPollDorset	0.016834	0.008193	2.055	5115
	AustralianPollMerino	0.013541	0.007877	1.719	5153
	AustralianSuffolk	0.020074	0.008105	2.477	5146

BlackHeadedMountain	0.018171	0.008159	2.227	5122
Bor2	0.064883	0.020747	3.127	1164
BorderLeicester	0.020749	0.008756	2.37	5014
Boreray	0.020008	0.009052	2.21	4997
broGBR	0.048875	0.009689	5.044	4489
BundnerOberlanderSheep	0.013663	0.007998	1.708	5126
Castellana	0.010232	0.007832	1.306	5154
Churra	0.011665	0.008032	1.452	5153
Cla14	0.044562	0.017804	2.503	1397
Comisana	0.006097	0.007793	0.782	5142
DorsetHorn	0.022707	0.008864	2.562	5051
EastFriesianBrown	0.015399	0.008181	1.882	5059
EastFriesianWhite	0.012662	0.008178	1.548	4962
EngadineRedSheep	0.008868	0.007751	1.144	5135
Finnsheep	0.017222	0.008018	2.148	5143
Galway	0.020358	0.00813	2.504	5102
GermanTexel	0.019999	0.008113	2.465	5130
Her3	0.019519	0.011127	1.754	3453
Her8	0.015811	0.011994	1.318	3157
Icelandic	0.023792	0.008058	2.953	5098
IrishSuffolk	0.017277	0.008432	2.049	5112
iroGBR	0.040278	0.011502	3.502	3171
Kil2	0.025356	0.015319	1.655	1899
Leccese	0.008899	0.007803	1.141	5154
MacarthurMerino	0.014362	0.009195	1.562	4729
MeatLacaune	0.012874	0.007705	1.671	5151
medIRE	0.015475	0.010609	1.459	3381
Merinolandschaf	0.012516	0.007917	1.581	5143
MilkLacaune	0.009757	0.007786	1.253	5142
NewZealandRomney	0.022242	0.008458	2.63	5134
NewZealandTexel	0.019151	0.008416	2.276	5123
norGBR	0.018651	0.01104	1.689	3539
Ojalada	0.010661	0.007859	1.357	5147
OldNorwegianspaelsau	0.023066	0.008168	2.824	5134
Pot7	-0.008311	0.023244	-0.358	661
Rambouillet	0.009597	0.008034	1.195	5154
Rasaaragonesa	0.01249	0.007849	1.591	5162
romGER	0.007496	0.009158	0.819	4013
SardinianAncestralBlack	0.010478	0.008051	1.302	5129
ScottishBlackface	0.025008	0.008253	3.03	5147
ScottishTexel	0.021948	0.008363	2.624	5117
Soay	0.024786	0.00896	2.766	4967
Spael-coloured	0.023429	0.00843	2.779	4864
Spael-white	0.022223	0.008228	2.701	5106
SwissBlack-BrownMountainSheep	0.014036	0.007986	1.757	5116
SwissMirrorSheep	0.013121	0.008141	1.612	5126
SwissWhiteAlpineSheep	0.014267	0.007883	1.81	5128

	ValaisBlacknoseSheep	0.008226	0.008067	1.02	5050
	ValaisRedSheep	0.015085	0.008496	1.776	5053
	Wiltshire	0.018792	0.008646	2.173	4986
	Yor13	0.009734	0.013684	0.711	2121
Norse Britain	Altamurana	0.032462	0.008849	3.668	4665
	Arawapa	0.031774	0.008739	3.636	4635
	AustralianCoopworth	0.044277	0.008898	4.976	4656
	AustralianIndustryMerino	0.02999	0.008542	3.511	4656
	AustralianMerino	0.032918	0.00844	3.9	4662
	AustralianPollDorset	0.043926	0.008959	4.903	4624
	AustralianPollMerino	0.034471	0.008603	4.007	4667
	AustralianSuffolk	0.04419	0.008842	4.998	4663
	BlackHeadedMountain	0.03851	0.00897	4.293	4634
	Bor2	0.059055	0.021626	2.731	1022
	BorderLeicester	0.0335	0.009399	3.564	4508
	Boreray	0.040803	0.00968	4.215	4501
	broGBR	0.034464	0.010015	3.441	3924
	BundnerOberlanderSheep	0.032863	0.008822	3.725	4632
	Castellana	0.031008	0.008473	3.66	4659
	Churra	0.033104	0.008909	3.716	4657
	Cla14	0.060051	0.019986	3.005	1241
	Comisana	0.03115	0.008654	3.6	4656
	DorsetHorn	0.044613	0.0094	4.746	4575
	EastFriesianBrown	0.048412	0.009413	5.143	4586
	EastFriesianWhite	0.043596	0.009342	4.667	4506
	EngadineRedSheep	0.035361	0.008841	4	4654
	Finnsheep	0.051909	0.009067	5.725	4654
	Galway	0.040041	0.009163	4.37	4625
	GermanTexel	0.04525	0.008928	5.068	4633
	Her3	0.035082	0.01222	2.871	3057
	Her8	-0.002381	0.012301	-0.194	2742
	Icelandic	0.053903	0.009198	5.86	4605
	IrishSuffolk	0.042927	0.009157	4.688	4628
	iroGBR	0.036727	0.013263	2.769	2830
	Kil2	0.066963	0.016168	4.142	1667
	Leccese	0.032393	0.0088	3.681	4664
	MacarthurMerino	0.040023	0.010185	3.93	4239
	MeatLacaune	0.03706	0.008703	4.258	4663
	medIRE	0.026035	0.011446	2.275	3013
	Merinolandschaf	0.033545	0.008861	3.786	4651
	MilkLacaune	0.035398	0.008833	4.007	4652
	neoGBR	0.018651	0.01104	1.689	3539
	NewZealandRomney	0.04193	0.009079	4.618	4640
	NewZealandTexel	0.044849	0.009068	4.946	4634
	Ojalada	0.030675	0.008643	3.549	4664
	OldNorwegianspaelsau	0.051793	0.00906	5.717	4639
	Pot7	-0.003706	0.026195	-0.141	594

	Rambouillet	0.033437	0.008866	3.772	4656
	Rasaaragonesa	0.033275	0.008667	3.839	4671
	romGER	0.034104	0.011077	3.079	3608
	SardinianAncestralBlack	0.025036	0.00871	2.874	4630
	ScottishBlackface	0.042229	0.008897	4.746	4656
	ScottishTexel	0.044478	0.009211	4.829	4628
	Soay	0.047733	0.00943	5.062	4478
	Spael-coloured	0.058396	0.009398	6.213	4404
	Spael-white	0.051881	0.009037	5.741	4621
	SwissBlack-BrownMountainSheep	0.037101	0.008963	4.14	4644
	SwissMirrorSheep	0.037823	0.00909	4.161	4646
	SwissWhiteAlpineSheep	0.036829	0.008936	4.121	4640
	ValaisBlacknoseSheep	0.033863	0.009053	3.741	4569
	ValaisRedSheep	0.033413	0.009478	3.525	4576
	Wiltshire	0.039494	0.009568	4.128	4506
	Yor13	0.031619	0.015998	1.976	1889
Roman Germany	Altamurana	0.040103	0.008257	4.857	5504
	Arawapa	0.037675	0.008299	4.54	5479
	AustralianCoopworth	0.037807	0.008177	4.623	5492
	AustralianIndustryMerino	0.038996	0.008171	4.772	5511
	AustralianMerino	0.037229	0.008114	4.588	5518
	AustralianPollDorset	0.03941	0.008496	4.638	5452
	AustralianPollMerino	0.039085	0.008116	4.816	5518
	AustralianSuffolk	0.039773	0.008287	4.799	5499
	BlackHeadedMountain	0.039921	0.008414	4.745	5471
	Bor2	0.058208	0.02111	2.757	1163
	BorderLeicester	0.035576	0.008511	4.18	5308
	Boreray	0.036611	0.00903	4.055	5256
	broGBR	0.025292	0.008898	2.842	4525
	BundnerOberlanderSheep	0.042774	0.008319	5.142	5466
	Castellana	0.036021	0.008249	4.367	5511
	Churra	0.037289	0.008333	4.475	5509
	Cla14	0.044788	0.018744	2.389	1394
	Comisana	0.03729	0.008121	4.592	5511
	DorsetHorn	0.044884	0.009048	4.961	5397
	EastFriesianBrown	0.038359	0.008699	4.41	5388
	EastFriesianWhite	0.037408	0.008835	4.234	5284
	EngadineRedSheep	0.038396	0.008109	4.735	5513
	Finnsheep	0.03747	0.008171	4.585	5493
	Galway	0.035436	0.00827	4.285	5443
	GermanTexel	0.039578	0.008293	4.772	5469
	Her3	0.050411	0.011549	4.365	3534
	Her8	0.012335	0.012008	1.027	3175
	Icelandic	0.035443	0.008349	4.245	5407
	IrishSuffolk	0.039543	0.008284	4.774	5452
	iroGBR	0.031251	0.011228	2.783	3190
	Kil2	0.029008	0.014851	1.953	1910

	Leccese	0.039408	0.00814	4.842	5513
	MacarthurMerino	0.039304	0.009696	4.054	4978
	MeatLacaune	0.041202	0.008108	5.082	5507
	medIRE	0.021328	0.01009	2.114	3463
	Merinolandschaf	0.039037	0.008407	4.644	5504
	MilkLacaune	0.036246	0.00815	4.447	5495
	neoGBR	0.007496	0.009158	0.819	4013
	NewZealandRomney	0.03889	0.008328	4.67	5473
	NewZealandTexel	0.039471	0.008501	4.643	5457
	norGBR	0.034104	0.011077	3.079	3608
	Ojalada	0.037447	0.008138	4.602	5515
	OldNorwegianspaelsau	0.04106	0.008245	4.98	5493
	Pot7	0.025818	0.02342	1.102	668
	Rambouillet	0.036558	0.00811	4.508	5511
	Rasaaragonesa	0.03591	0.008025	4.475	5523
	SardinianAncestralBlack	0.03607	0.008379	4.305	5477
	ScottishBlackface	0.039632	0.00823	4.816	5490
	ScottishTexel	0.040923	0.008362	4.894	5449
	Soay	0.032979	0.008535	3.864	5216
	Spael-coloured	0.040558	0.008623	4.704	5116
	Spael-white	0.035579	0.008284	4.295	5439
	SwissBlack-BrownMountainSheep	0.041649	0.008361	4.981	5480
	SwissMirrorSheep	0.036766	0.008236	4.464	5471
	SwissWhiteAlpineSheep	0.036183	0.008251	4.385	5475
	ValaisBlacknoseSheep	0.034831	0.008195	4.25	5391
	ValaisRedSheep	0.033949	0.008564	3.964	5368
	Wiltshire	0.038658	0.008723	4.432	5268
	Yor13	0.03455	0.013608	2.539	2157