

## SUPPLEMENTARY MATERIALS

to the article N.S. Yudin, A.V. Igoshin, G.A. Romashov, A.A. Martynov, D.M. Larkin  
 “Influence of breed and environment on leukocyte telomere length in cattle”

### Supplementary Material 1. The descriptive information for animals engaged in the study

Breed	Origin	Productive type	Animal ID	NCBI SRA ID	Age (years)	Sex	Health status	LTL	Age-adj. logLTL	Age-adj. LTL
Alatau	European	Dual	ALARUSF0000NSC22068	NA	9	Dam	Healthy	6,97248	0,86959	7,40617
Alatau	European	Dual	ALARUSF0000NSC22069	NA	11	Dam	Healthy	5,54975	0,78216	6,05571
Alatau	European	Dual	ALARUSF0000NSC22071	NA	8	Dam	Healthy	8,77334	0,96353	9,19452
Bestuzhev	European	Dual	BESRUSF0000NSC22072	NA	13	Dam	Healthy	10,0875	1,05336	11,30732
Bestuzhev	European	Dual	BESRUSF0000NSC22073	NA	13	Dam	Healthy	5,77142	0,81086	6,46932
Bestuzhev	European	Dual	BESRUSF0000NSC22074	NA	6	Dam	Healthy	8,85132	0,95569	9,02999
Bestuzhev	European	Dual	BESRUSF0000NSC22075	NA	12	Dam	Healthy	13,014	1,15814	14,39278
Bestuzhev	European	Dual	BESRUSF0000NSC22076	NA	10	Dam	Healthy	8,24832	0,94841	8,88003
Black Pied	European	Dairy	RBPRUSF0000NSC22135	NA	6	Dam	Healthy	8,17483	0,92116	8,33984
Black Pied	European	Dairy	RBPRUSF0000NSC22136	NA	9	Dam	Healthy	9,32436	0,99583	9,90434
Black Pied	European	Dairy	RBPRUSF0000NSC22137	NA	10	Dam	Healthy	13,695	1,16861	14,74385
Black Pied	European	Dairy	RBPRUSF0000NSC22138	NA	9	Dam	Healthy	6,99125	0,87076	7,42611
Black Pied	European	Dairy	RBPRUSF0000NSC22141	NA	8	Dam	Healthy	10,4228	1,03835	10,92317
Black Pied	European	Dairy	RBPRUSF0000NSC22143	NA	5	Dam	Healthy	16,9	1,23072	17,01075
Black Pied	European	Dairy	RBPRUSF0000NSC22144	NA	10	Dam	Healthy	11,5334	1,09401	12,4167
Black Pied	European	Dairy	RBPRUSF0000NSC22145	NA	6	Dam	Healthy	10,443	1,0275	10,6538
Buryat	Turano mongolian	Dual	BURRUSF0000NSC8G80	NA	5	Dam	Healthy	25,4396	1,40835	25,60632
Buryat	Turano mongolian	Dual	BURRUSF0000NSC19G82	NA	2	Dam	Healthy	12,308	1,0755	11,89863
Buryat	Turano mongolian	Dual	BURRUSF0000NSC21G73	NA	4	Dam	Healthy	16,6184	1,21758	16,50379
Buryat	Turano mongolian	Dual	BURRUSM0000NSC1G69	NA	2	Bull	Healthy	36,5915	1,54869	35,37446
Charolais	European	Beef	ERR10310244	ERR10310244	0,8	Dam	Unknown	4,20417	0,60198	3,99925
Charolais	European	Beef	ERR10310245	ERR10310245	6,9	Bull	Unknown	15,1607	1,19466	15,65513
Charolais	European	Beef	ERR10310246	ERR10310246	5,2	Dam	Unknown	4,24892	0,63228	4,28829
Charolais	European	Beef	SRR21864760	SRR21864760	0,83	Bull	Unknown	15,5708	1,17078	14,81784
Charolais	European	Beef	SRR21864761	SRR21864761	0,83	Bull	Unknown	10,8629	1,01442	10,3376
Charolais	European	Beef	SRR21864762	SRR21864762	0,83	Bull	Unknown	10,8175	1,0126	10,2944
Charolais	European	Beef	SRR21864763	SRR21864763	0,83	Bull	Unknown	9,35168	0,94936	8,89946
Charolais	European	Beef	SRR21864764	SRR21864764	0,83	Bull	Unknown	17,0444	1,21006	16,22018
Charolais	European	Beef	SRR21864765	SRR21864765	0,83	Bull	Unknown	19,4746	1,26794	18,53286
Charolais	European	Beef	SRR21864766	SRR21864766	0,83	Bull	Unknown	16,7059	1,20134	15,89805
Charolais	European	Beef	SRR21864767	SRR21864767	0,83	Bull	Unknown	11,0636	1,02237	10,5286
Charolais	European	Beef	SRR21864768	SRR21864768	0,83	Bull	Unknown	15,2791	1,16257	14,54025
Charolais	European	Beef	SRR21864769	SRR21864769	0,83	Bull	Unknown	7,98766	0,88089	7,6014
Charolais	European	Beef	SRR21864770	SRR21864770	0,83	Bull	Unknown	9,58042	0,95986	9,11714

Supplementary Material 1 (continued)

Breed	Origin	Productive type	Animal ID	NCBI SRA ID	Age (years)	Sex	Health status	LTL	Age-adj. logLTL	Age-adj. LTL
Charolais	European	Beef	SRR21864772	SRR21864772	0,83	Bull	Unknown	7,63096	0,86105	7,26195
Charolais	European	Beef	SRR21864783	SRR21864783	0,83	Bull	Unknown	15,4806	1,16826	14,732
Charolais	European	Beef	SRR21864784	SRR21864784	0,83	Bull	Unknown	10,7906	1,01152	10,2688
Hereford	European	Beef	HERRUSF000NSC34G001	SRR15840417	3,58	Dam	Healthy	23,1129	1,3584	22,82418
Hereford	European	Beef	HERRUSF000NSC36G027	SRR15840416	5,58	Dam	Healthy	22,7742	1,36367	23,10301
Hereford	European	Beef	HERRUSF000NSC39G186	SRR15840413	0,42	Dam	Healthy	65,1145	1,78976	61,62491
Hereford	European	Beef	HERRUSF000NSC40G001	SRR15840412	9,58	Dam	Healthy	19,8227	1,32676	21,22061
Hereford	European	Beef	HERRUSF000NSC42G175	SRR15840410	0,92	Dam	Healthy	46,8592	1,64979	44,64725
Hereford	European	Beef	HERRUSF000NSC45G061	SRR15840411	5,5	Dam	Healthy	29,9986	1,48286	30,39899
Hereford	European	Beef	HERRUSM00000NSC2012	NA	1	Bull	Healthy	14,1479	1,13016	13,49457
Hereford	European	Beef	HERRUSM00000NSC2013	NA	1	Bull	Healthy	10,7101	1,00926	10,21553
Hereford	European	Beef	HERRUSM00000NSC2014	NA	1	Bull	Healthy	8,58253	0,91308	8,1862
Hereford	European	Beef	HERRUSM00000NSC2015	NA	1	Bull	Healthy	22,8694	1,33872	21,81333
Hereford	European	Beef	HERRUSM00000NSC2016	NA	1	Bull	Healthy	8,84265	0,92605	8,43431
Hereford	European	Beef	HERRUSM00000NSC2017	NA	1	Bull	Healthy	11,4237	1,03727	10,89617
Hereford	European	Beef	HERRUSM00000NSC2018	NA	1	Bull	Healthy	9,23311	0,94482	8,80674
Hereford	European	Beef	HERRUSM00000NSC2019	NA	1	Bull	Healthy	13,398	1,10651	12,77931
Hereford	European	Beef	HERRUSM00000NSC2020	NA	1	Bull	Healthy	10,5033	1,00079	10,01828
Hereford	European	Beef	HERRUSM00000NSC2021	NA	1	Bull	Healthy	20,0953	1,28256	19,16734
Hereford	European	Beef	HERRUSM00000NSC2022	NA	1	Bull	Healthy	12,2452	1,06743	11,67974
Hereford	European	Beef	HERRUSM00000NSC2023	NA	1	Bull	Healthy	10,8985	1,01683	10,39523
Hereford	European	Beef	HERRUSM000NSC37G131	SRR15840409	1,16	Bull	Healthy	67,0039	1,8065	64,04749
Holstein	European	Dairy	SRR15373745	SRR15373745	2	Bull	Unknown	5,68812	0,74028	5,49893
Holstein	European	Dairy	SRR21864757	SRR21864757	0,83	Bull	Unknown	16,1671	1,18711	15,38531
Holstein	European	Dairy	SRR21864758	SRR21864758	0,83	Bull	Unknown	16,7557	1,20264	15,94544
Holstein	European	Dairy	SRR21864759	SRR21864759	0,83	Bull	Unknown	11,4431	1,03702	10,88975
Holstein	European	Dairy	SRR21864771	SRR21864771	0,83	Bull	Unknown	9,96294	0,97686	9,48116
Holstein	European	Dairy	SRR21864773	SRR21864773	0,83	Bull	Unknown	13,3866	1,10514	12,73926
Holstein	European	Dairy	SRR21864774	SRR21864774	0,83	Bull	Unknown	10,4012	0,99556	9,89823
Holstein	European	Dairy	SRR21864775	SRR21864775	0,83	Bull	Unknown	15,3811	1,16546	14,63732
Holstein	European	Dairy	SRR21864776	SRR21864776	0,83	Bull	Unknown	10,1222	0,98375	9,63272
Holstein	European	Dairy	SRR21864777	SRR21864777	0,83	Bull	Unknown	9,84019	0,97148	9,36435
Holstein	European	Dairy	SRR21864778	SRR21864778	0,83	Bull	Unknown	12,6404	1,08023	12,02915
Holstein	European	Dairy	SRR21864779	SRR21864779	0,83	Bull	Unknown	12,298	1,06831	11,7033
Holstein	European	Dairy	SRR21864780	SRR21864780	0,83	Bull	Unknown	12,1091	1,06159	11,52354

**Supplementary Material 1 (continued)**

Breed	Origin	Productive type	Animal ID	NCBI SRA ID	Age (years)	Sex	Health status	LTL	Age-adj. logLTL	Age-adj. LTL
Holstein	European	Dairy	SRR21864781	SRR21864781	0,83	Bull	Unknown	7,55252	0,85657	7,1873
Holstein	European	Dairy	SRR21864782	SRR21864782	0,83	Bull	Unknown	6,2973	0,77763	5,99278
Kalmyk (Rostov Oblast)	Turano mongolian	Beef	KALRUSF00000NSC2048	NA	9	Dam	Healthy	7,32355	0,89093	7,77908
Kalmyk (Rostov Oblast)	Turano mongolian	Beef	KALRUSF00000NSC2049	NA	9	Dam	Healthy	8,98991	0,97996	9,54909
Kalmyk (Rostov Oblast)	Turano mongolian	Beef	KALRUSF00000NSC2050	NA	9	Dam	Healthy	6,29468	0,82518	6,68621
Kalmyk (Rostov Oblast)	Turano mongolian	Beef	KALRUSF00000NSC2221	NA	13	Dam	Healthy	5,7904	0,81228	6,4906
Kalmyk (Rostov Oblast)	Turano mongolian	Beef	KALRUSF00000NSC2222	NA	9	Dam	Healthy	8,88321	0,97478	9,43575
Kalmyk (Rostov Oblast)	Turano mongolian	Beef	KALRUSF00000NSC2224	NA	11	Dam	Healthy	7,72759	0,92594	8,43209
Kalmyk (Rostov Oblast)	Turano mongolian	Beef	KALRUSF00000NSC2225	NA	5	Dam	Healthy	7,18294	0,85914	7,23001
Kalmyk (Rostov Oblast)	Turano mongolian	Beef	KALRUSF00000NSC2229	NA	6	Dam	Healthy	6,87163	0,84574	7,01034
Kalmyk (Rostov Oblast)	Turano mongolian	Beef	KALRUSF00000NSC2235	NA	15	Dam	Healthy	6,34452	0,86366	7,30566
Kalmyk (Rostov Oblast)	Turano mongolian	Beef	KALRUSF00000NSC2236	NA	6	Dam	Healthy	5,30555	0,73341	5,41265
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22040	NA	4,5	Dam	Healthy	9,20178	0,96379	9,19999
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22041	NA	4,5	Dam	Healthy	10,2767	1,01177	10,27471
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22042	NA	4,5	Dam	Healthy	9,42513	0,9742	9,4233
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22043	NA	4,5	Dam	Healthy	8,05904	0,9062	8,05748
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22044	NA	4,5	Dam	Healthy	8,40284	0,92434	8,40121
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22045	NA	4,5	Dam	Healthy	11,2109	1,04956	11,20872
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22046	NA	4,5	Dam	Healthy	9,1612	0,96187	9,15942
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22047	NA	4,5	Dam	Healthy	9,07931	0,95797	9,07755
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22048	NA	4,5	Dam	Healthy	8,93046	0,95079	8,92873
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22049	NA	4,5	Dam	Healthy	8,16753	0,91201	8,16594
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22050	NA	6,5	Dam	Healthy	6,35606	0,81479	6,52812
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22051	NA	6,5	Dam	Healthy	10,4292	1,02985	10,71153
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22052	NA	6,5	Dam	Healthy	8,10889	0,92056	8,32841
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22053	NA	6,5	Dam	Healthy	7,38273	0,87982	7,58259
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22054	NA	6,5	Dam	Healthy	9,85821	1,0054	10,12508
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22055	NA	6,5	Dam	Healthy	8,50793	0,94142	8,73825
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22056	NA	6,5	Dam	Healthy	9,34814	0,98233	9,6012
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22057	NA	6,5	Dam	Healthy	9,79271	1,0025	10,05781
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22058	NA	6,5	Dam	Healthy	8,19706	0,92526	8,41896
Kalmyk (Republic of Sakha)	Turano mongolian	Beef	KALRUSF00000NSC22059	NA	6,5	Dam	Healthy	6,8537	0,84753	7,03924
Kazakh Whiteheaded	European	Beef	KWHRUSF00000NSC22083	NA	4	Dam	Healthy	6,68426	0,82205	6,63816
Kazakh Whiteheaded	European	Beef	KWHRUSF00000NSC22084	NA	4	Dam	Healthy	7,28969	0,8597	7,23942
Kazakh Whiteheaded	European	Beef	KWHRUSF00000NSC22085	NA	4	Dam	Healthy	11,1848	1,04562	11,10766

Supplementary Material 1 (continued)

Breed	Origin	Productive type	Animal ID	NCBI SRA ID	Age (years)	Sex	Health status	LTL	Age-adj. logLTL	Age-adj. LTL
Kazakh Whiteheaded	European	Beef	KWHRUSF0000NSC22086	NA	6	Dam	Healthy	7,61262	0,89021	7,76629
Kazakh Whiteheaded	European	Beef	KWHRUSF0000NSC22087	NA	4	Dam	Healthy	6,80591	0,82988	6,75897
Kazakh Whiteheaded	European	Beef	KWHRUSF0000NSC43G177	SRR15840408	1,58	Dam	Healthy	84,2906	1,90863	81,02797
Kazakh Whiteheaded	European	Beef	KWHRUSM0000NSC35G115	SRR15840407	0,83	Bull	Healthy	66,1627	1,79909	62,96329
Kazakh Whiteheaded	European	Beef	KWHRUSM0000NSC38G165	SRR15840406	1,08	Bull	Healthy	59,5082	1,75451	56,82133
Kazakh Whiteheaded	European	Beef	KWHRUSM0000NSC41G096	SRR15840415	1	Bull	Healthy	11,4537	1,03841	10,92479
Kazakh Whiteheaded	European	Beef	KWHRUSM0000NSC44G185	SRR15840414	0,58	Bull	Healthy	11,2821	1,0294	10,70048
Kholmogory	European	Dairy	KHORUSM00000NSC2001	NA	2	Bull	Healthy	13,9994	1,13142	13,53378
Kholmogory	European	Dairy	KHORUSM00000NSC2002	NA	2	Bull	Healthy	16,7847	1,21022	16,22644
Kholmogory	European	Dairy	KHORUSM00000NSC2003	NA	2	Bull	Healthy	11,5901	1,0494	11,20461
Kholmogory	European	Dairy	KHORUSM00000NSC2004	NA	2	Bull	Healthy	31,5635	1,48449	30,5137
Kholmogory	European	Dairy	KHORUSM00000NSC2005	NA	2	Bull	Healthy	13,672	1,12114	13,21727
Kholmogory	European	Dairy	KHORUSM00000NSC2006	NA	2	Bull	Healthy	14,5293	1,14755	14,04605
Kholmogory	European	Dairy	KHORUSM00000NSC2036	NA	2	Bull	Healthy	12,6085	1,08597	12,18914
Kholmogory	European	Dairy	KHORUSM00000NSC2037	NA	2	Bull	Healthy	14,2293	1,13849	13,75603
Kholmogory	European	Dairy	KHORUSM00000NSC2038	NA	2	Bull	Healthy	13,6418	1,12018	13,18807
Kholmogory	European	Dairy	KHORUSM00000NSC2039	NA	2	Bull	Healthy	12	1,06449	11,60088
Kholmogory	European	Dairy	KHORUSM00000NSC2040	NA	2	Bull	Healthy	4,87568	0,67334	4,71351
Kholmogory	European	Dairy	KHORUSM00000NSC2041	NA	2	Bull	Healthy	8,88217	0,93383	8,58675
Kostroma	European	Dual	KOSRUSF0000NSC22092	NA	3	Dam	Healthy	13,5935	1,12448	13,31936
Kostroma	European	Dual	KOSRUSF0000NSC22093	NA	4	Dam	Healthy	11,1385	1,04382	11,06168
Kostroma	European	Dual	KOSRUSF0000NSC22094	NA	7	Dam	Healthy	7,76771	0,90481	8,03183
Kostroma	European	Dual	KOSRUSF0000NSC22095	NA	5	Dam	Healthy	14,9619	1,17782	15,05995
Kostroma	European	Dual	KOSRUSF0000NSC22096	NA	9	Dam	Healthy	8,87957	0,9746	9,43188
Kostroma	European	Dual	KOSRUSF0000NSC22097	NA	8	Dam	Healthy	8,00733	0,92385	8,39174
Kostroma	European	Dual	KOSRUSF0000NSC22098	NA	5	Dam	Healthy	9,35491	0,97388	9,41622
Kostroma	European	Dual	KOSRUSF0000NSC22099	NA	5	Dam	Healthy	7,2594	0,86374	7,30697
Kostroma	European	Dual	KOSRUSF0000NSC22100	NA	7	Dam	Healthy	7,69508	0,90073	7,95673
Kostroma	European	Dual	KOSRUSF0000NSC22101	NA	4	Dam	Healthy	7,19486	0,85402	7,14524
Kostroma	European	Dual	KOSRUSF0000NSC22102	NA	4	Dam	Healthy	8,42785	0,92271	8,36973
Kostroma	European	Dual	KOSRUSF0000NSC22103	NA	4	Dam	Healthy	12,2989	1,08686	12,21408
Red Steppe	European	Dairy	RSTRUSF0000NSC22110	NA	9	Dam	Healthy	10,5667	1,05015	11,22395
Red Steppe	European	Dairy	RSTRUSF0000NSC22113	NA	10	Dam	Healthy	6,45036	0,84163	6,94437
Red Steppe	European	Dairy	RSTRUSF0000NSC22114	NA	8	Dam	Healthy	4,99396	0,71881	5,2337



**Supplementary Material 1 (continued)**

Breed	Origin	Productive type	Animal ID	NCBI SRA ID	Age (years)	Sex	Health status	LTL	Age-adj. logLTL	Age-adj. LTL
Tagil	European	Dual	TGLRUSF0000NSC22115	NA	12	Dam	Healthy	6,89937	0,88254	7,63033
Tagil	European	Dual	TGLRUSF0000NSC22116	NA	12	Dam	Healthy	7,75921	0,93355	8,58126
Tagil	European	Dual	TGLRUSF0000NSC22117	NA	4,5	Dam	Healthy	7,68241	0,88541	7,68092
Tagil	European	Dual	TGLRUSF0000NSC22118	NA	5,5	Dam	Healthy	6,06659	0,7887	6,14756
Tagil	European	Dual	TGLRUSF0000NSC22119	NA	4,5	Dam	Healthy	7,98446	0,90216	7,98291
Tagil	European	Dual	TGLRUSF0000NSC22120	NA	3	Dam	Healthy	7,9744	0,89285	7,81358
Tagil	European	Dual	TGLRUSF0000NSC22121	NA	5	Dam	Healthy	7,32921	0,86789	7,37724
Tagil	European	Dual	TGLRUSF0000NSC22122	NA	5,5	Dam	Healthy	7,14082	0,85951	7,23613
Tagil	European	Dual	TGLRUSF0000NSC22123	NA	5	Dam	Healthy	6,93417	0,84383	6,97961
Tagil	European	Dual	TGLRUSF0000NSC22124	NA	3	Dam	Healthy	7,21258	0,84924	7,06712
Tagil	European	Dual	TGLRUSF0000NSC22125	NA	4	Dam	Healthy	7,1831	0,85331	7,13356
Tagil	European	Dual	TGLRUSF0000NSC22126	NA	4	Dam	Healthy	9,52278	0,97576	9,45711
Ukrainian Grey	European	Dual	UKGRUSF00000NSC2210	NA	5	Dam	Healthy	6,99799	0,84781	7,04385
Ukrainian Grey	European	Dual	UKGRUSF00000NSC2211	NA	8	Dam	Healthy	6,70709	0,8469	7,02908
Ukrainian Grey	European	Dual	UKGRUSF00000NSC2212	NA	12	Dam	Healthy	5,65813	0,79641	6,25758
Ukrainian Grey	European	Dual	UKGRUSF00000NSC2213	NA	13	Dam	Healthy	4,98632	0,74736	5,58929
Ukrainian Grey	European	Dual	UKGRUSF00000NSC2214	NA	6	Dam	Healthy	5,8913	0,77889	6,01022
Ukrainian Grey	European	Dual	UKGRUSF00000NSC2215	NA	7	Dam	Healthy	5,45755	0,75152	5,64312
Ukrainian Grey	European	Dual	UKGRUSF00000NSC2216	NA	5	Dam	Healthy	6,48264	0,81459	6,52512
Ukrainian Grey	European	Dual	UKGRUSF00000NSC2217	NA	10	Dam	Healthy	5,17298	0,74579	5,56916
Ukrainian Grey	European	Dual	UKGRUSF00000NSC2218	NA	10	Dam	Healthy	6,34281	0,83433	6,82858
Ukrainian Grey	European	Dual	UKGRUSF00000NSC2219	NA	6	Dam	Healthy	7,4435	0,88046	7,59375
Wagyu	Turano mongolian	Beef	WAGRUSFBR1900058384	NA	2	Dam	Healthy	7,11155	0,83727	6,87502
Wagyu	Turano mongolian	Beef	WAGRUSFBR1900058385	NA	2	Dam	Healthy	6,0818	0,76934	5,87952
Wagyu	Turano mongolian	Beef	WAGRUSFBR1900058386	NA	2	Dam	Healthy	5,30682	0,71014	5,13031
Wagyu	Turano mongolian	Beef	WAGRUSFBR1900058387	NA	2	Dam	Healthy	7,82843	0,87898	7,56806
Wagyu	Turano mongolian	Beef	WAGRUSFBR1900058388	NA	2	Bull	Healthy	7,04774	0,83336	6,81333
Wagyu	Turano mongolian	Beef	WAGRUSFBR1900058391	NA	2	Bull	Healthy	8,79857	0,92972	8,50593
Wagyu	Turano mongolian	Beef	WAGRUSFBR1900058394	NA	2	Dam	Healthy	7,50157	0,86046	7,25207
Wagyu	Turano mongolian	Beef	WAGRUSFBR1900058399	NA	2	Dam	Healthy	6,71772	0,81253	6,49429
Wagyu	Turano mongolian	Beef	WAGRUSMBR1900058351	NA	2	Bull	Healthy	6,46877	0,79613	6,25362
Wagyu	Turano mongolian	Beef	WAGRUSMBR1900058352	NA	2	Bull	Healthy	6,70402	0,81164	6,48104
Wagyu	Turano mongolian	Beef	WAGRUSMBR1900058356	NA	2	Bull	Healthy	5,10082	0,69295	4,93117
Wagyu	Turano mongolian	Beef	WAGRUSMBR1900058360	NA	2	Bull	Healthy	6,50723	0,79871	6,2908
Wagyu	Turano mongolian	Beef	WAGRUSMBR1900058367	NA	2	Bull	Healthy	7,58789	0,86543	7,33552

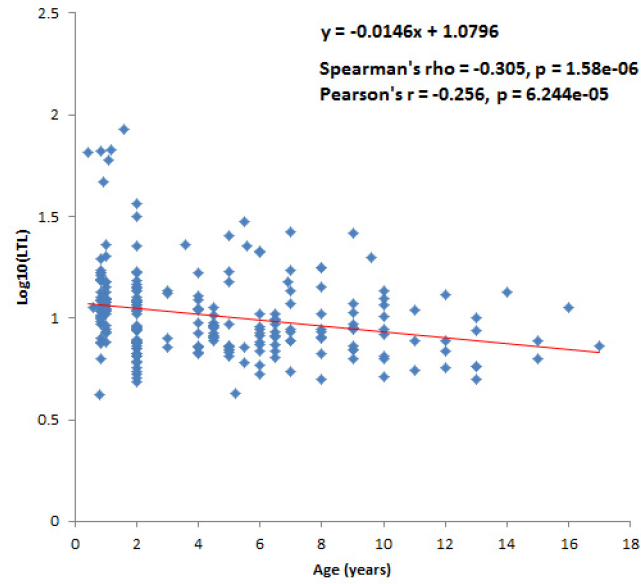
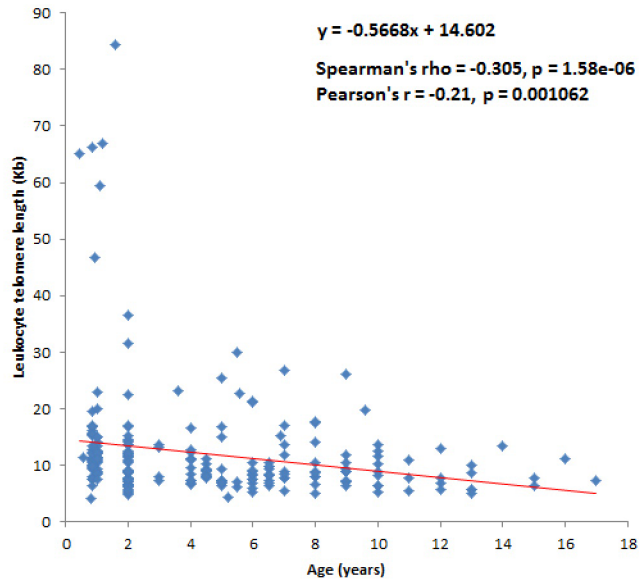
Supplementary Material 1 (continued)

Breed	Origin	Productive type	Animal ID	NCBI SRA ID	Age (years)	Sex	Health status	LTL	Age-adj. logLTL	Age-adj. LTL
Wagyu	Turano mongolian	Beef	WAGRUSMBR1900058371	NA	2	Bull	Healthy	6,67337	0,80965	6,45141
Wagyu	Turano mongolian	Beef	WAGRUSMBR1900058373	NA	2	Dam	Healthy	7,73582	0,87382	7,47853
Wagyu	Turano mongolian	Beef	WAGRUSMBR1900058375	NA	2	Bull	Healthy	6,4581	0,79541	6,2433
Wagyu	Turano mongolian	Beef	WAGRUSMBR1900058376	NA	2	Bull	Healthy	6,07902	0,76914	5,87683
Wagyu	Turano mongolian	Beef	WAGRUSMBR1900058380	NA	2	Bull	Healthy	5,42601	0,71979	5,24554
Wagyu	Turano mongolian	Beef	WAGRUSMBR1900058395	NA	2	Dam	Healthy	7,62673	0,86765	7,37306
Wagyu	Turano mongolian	Beef	WAGRUSMBR2000088832	NA	7	Bull	Healthy	8,85669	0,96179	9,15784
Yakut	Turano mongolian	Dual	YKTRUSF000NSC219A26	SRR12095786	11	Dam	Healthy	10,9267	1,07638	11,92286
Yakut	Turano mongolian	Dual	YKTRUSF000NSC221A41	SRR12095770	5	Dam	Healthy	6,7404	0,83152	6,78457
Yakut	Turano mongolian	Dual	YKTRUSF000NSC222A28	SRR12095784	10	Dam	Healthy	10,243	1,04248	11,02747
Yakut	Turano mongolian	Dual	YKTRUSF000NSC223A29	SRR12095783	8	Dam	Healthy	8,02184	0,92464	8,40694
Yakut	Turano mongolian	Dual	YKTRUSF000NSC224A42	SRR12095769	6	Dam	Healthy	8,40623	0,93328	8,57592
Yakut	Turano mongolian	Dual	YKTRUSF000NSC225A43	SRR12095768	8	Dam	Healthy	14,1815	1,17209	14,86231
Yakut	Turano mongolian	Dual	YKTRUSF000NSC226A30	SRR12095782	7	Dam	Healthy	8,52358	0,94514	8,8134
Yakut	Turano mongolian	Dual	YKTRUSF000NSC227A31	SRR12095781	14	Dam	Healthy	13,3483	1,18084	15,16507
Yakut	Turano mongolian	Dual	YKTRUSF000NSC230A32	SRR12095780	4	Dam	Healthy	10,9921	1,03808	10,91629
Yakut	Turano mongolian	Dual	YKTRUSF000NSC231A33	SRR12095779	16	Dam	Healthy	11,2067	1,11658	13,0792
Yakut	Turano mongolian	Dual	YKTRUSF000NSC233A34	SRR12095778	13	Dam	Healthy	8,70698	0,98944	9,75986
Yakut	Turano mongolian	Dual	YKTRUSF000NSC234A35	SRR12095777	10	Dam	Healthy	8,77008	0,97505	9,44175
Yakut	Turano mongolian	Dual	YKTRUSF000NSC235A44	SRR12095767	7	Dam	Healthy	13,5515	1,14651	14,01229
Yakut	Turano mongolian	Dual	YKTRUSF000NSC236A38	SRR12095773	8	Dam	Healthy	8,54285	0,95197	8,95297
Yakut	Turano mongolian	Dual	YKTRUSF000NSC237A36	SRR12095775	6	Dam	Healthy	9,10448	0,96793	9,28826
Yakut	Turano mongolian	Dual	YKTRUSF000NSC240A39	SRR12095772	17	Dam	Healthy	7,28665	0,93547	8,61933
Yakut	Turano mongolian	Dual	YKTRUSF000NSC242A37	SRR12095774	9	Dam	Healthy	8,78898	0,97014	9,33566
Yakut	Turano mongolian	Dual	YKTRUSF000NSC243A40	SRR12095771	15	Dam	Healthy	7,72406	0,94911	8,89419
Yakut	Turano mongolian	Dual	YKTRUSM000000SC2010	NA	2	Bull	Healthy	22,4694	1,3369	21,72207
Yakut	Turano mongolian	Dual	YKTRUSM000000NSC2007	NA	2	Bull	Healthy	15,1916	1,16691	14,68633
Yakut	Turano mongolian	Dual	YKTRUSM000000NSC2008	NA	2	Bull	Healthy	8,65501	0,92258	8,36715
Yakut	Turano mongolian	Dual	YKTRUSM000000NSC2009	NA	2	Bull	Healthy	7,31024	0,84924	7,0671
Yakut	Turano mongolian	Dual	YKTRUSM000000NSC2011	NA	2	Bull	Healthy	16,9746	1,21511	16,41002
Yakut	Turano mongolian	Dual	YKTRUSM000000NSC2042	NA	2	Bull	Healthy	10,7112	1,01515	10,35494
Yakut	Turano mongolian	Dual	YKTRUSM000000NSC2043	NA	2	Bull	Healthy	11,6179	1,05044	11,23149
Yakut	Turano mongolian	Dual	YKTRUSM000000NSC2044	NA	2	Bull	Healthy	11,3445	1,0401	10,96718
Yakut	Turano mongolian	Dual	YKTRUSM000000NSC2045	NA	2	Bull	Healthy	11,8901	1,0605	11,49464
Yakut	Turano mongolian	Dual	YKTRUSM000000NSC2046	NA	2	Bull	Healthy	12,0378	1,06586	11,63742

**Supplementary Material 1 (end)**

Breed	Origin	Productive type	Animal ID	NCBI SRA ID	Age (years)	Sex	Health status	LTL	Age-adj. logLTL	Age-adj. LTL
Yakut	Turano mongolian	Dual	YKTRUSM00000NSC2047	NA	2	Bull	Healthy	7,489	0,85973	7,23992
Yakut	Turano mongolian	Dual	YKTRUSM00000NSC2204	NA	2	Bull	Healthy	10,943	1,02445	10,57904
Yakut	Turano mongolian	Dual	YKTRUSM00000NSC2205	NA	2	Bull	Healthy	10,4072	1,00264	10,06106
Yakut	Turano mongolian	Dual	YKTRUSM00000NSC2206	NA	2	Bull	Healthy	8,67447	0,92355	8,38596
Yakut	Turano mongolian	Dual	YKTRUSM00000NSC2207	NA	2	Bull	Healthy	9,11963	0,94529	8,81631
Yakut	Turano mongolian	Dual	YKTRUSM00000NSC2208	NA	2	Bull	Healthy	9,1355	0,94604	8,83165
Yakut	Turano mongolian	Dual	YKTRUSM00000NSC2209	NA	2	Bull	Healthy	8,9028	0,93484	8,60669
Yakut	Turano mongolian	Dual	YKTRUSM0000NSC220A27	SRR12095785	3	Bull	Healthy	13,2599	1,11369	12,99249
Yakut	Turano mongolian	Dual	YKTRUSM0000NSC241A45	SRR12095766	8	Bull	Healthy	17,566	1,26504	18,40929
Yaroslavl	European	Dairy	YARRUSF000NSC23G246	SRR18297719	10	Dam	Healthy	12,4803	1,12827	13,43612
Yaroslavl	European	Dairy	YARRUSF000NSC24G250	SRR18297718	4	Dam	Healthy	12,8159	1,10474	12,72751
Yaroslavl	European	Dairy	YARRUSF000NSC25G252	SRR18297707	6	Dam	Healthy	21,4522	1,34015	21,88523
Yaroslavl	European	Dairy	YARRUSF000NSC26G255	SRR18297704	9	Dam	Healthy	26,0031	1,44123	27,6205
Yaroslavl	European	Dairy	YARRUSF000NSC27G256	SRR18297703	6	Dam	Healthy	21,0503	1,33194	21,47522
Yaroslavl	European	Dairy	YARRUSF000NSC28G257	SRR18297702	7	Dam	Healthy	11,7953	1,08623	12,19637
Yaroslavl	European	Dairy	YARRUSF000NSC29G259	SRR18297701	7	Dam	Healthy	17,1514	1,24882	17,7346
Yaroslavl	European	Dairy	YARRUSF000NSC30G258	SRR18297700	7	Dam	Healthy	26,6893	1,44086	27,59682
Yaroslavl	European	Dairy	YARRUSF000NSC31G253	SRR18297699	9	Dam	Healthy	11,7297	1,09549	12,45929
Yaroslavl	European	Dairy	YARRUSF000NSC32G254	SRR18297698	8	Dam	Healthy	17,6661	1,2675	18,51419
Yaroslavl	European	Dairy	YARRUSM00000NSC2024	SRR18297717	1	Bull	Healthy	8,39781	0,90363	8,01001
Yaroslavl	European	Dairy	YARRUSM00000NSC2025	SRR18297716	1	Bull	Healthy	11,4181	1,03706	10,89083
Yaroslavl	European	Dairy	YARRUSM00000NSC2026	SRR18297715	1	Bull	Healthy	12,4406	1,07431	11,86611
Yaroslavl	European	Dairy	YARRUSM00000NSC2027	SRR18297714	1	Bull	Healthy	12,2388	1,06721	11,67363
Yaroslavl	European	Dairy	YARRUSM00000NSC2028	SRR18297713	1	Bull	Healthy	11,9548	1,05701	11,40275
Yaroslavl	European	Dairy	YARRUSM00000NSC2029	SRR18297712	1	Bull	Healthy	11,4037	1,03651	10,8771
Yaroslavl	European	Dairy	YARRUSM00000NSC2030	SRR18297711	1	Bull	Healthy	7,57427	0,85881	7,2245
Yaroslavl	European	Dairy	YARRUSM00000NSC2031	SRR18297710	1	Bull	Healthy	12,4755	1,07553	11,8994
Yaroslavl	European	Dairy	YARRUSM00000NSC2032	SRR18297709	1	Bull	Healthy	11,9808	1,05795	11,42755
Yaroslavl	European	Dairy	YARRUSM00000NSC2033	SRR18297708	1	Bull	Healthy	11,05	1,02283	10,53973
Yaroslavl	European	Dairy	YARRUSM00000NSC2034	SRR18297706	1	Bull	Healthy	15,0364	1,15661	14,34204
Yaroslavl	European	Dairy	YARRUSM00000NSC2035	SRR18297705	1	Bull	Healthy	15,0148	1,15599	14,32144

**Supplementary Material 2.** Correlation between LTL (raw and log-transformed values) and age





**Supplementary Material 3.** The descriptive information on age-adjusted LTLs for breeds engaged in the study

Breed	Number of animals	Mean age-adj. LTL (Kb)	Median age-adj. LTL (Kb)
Alatau	3	7,55	7,41
Bestuzhev	5	10,02	9,03
Black Pied	8	11,43	10,79
Buryat	4	22,35	21,06
Charolais	17	11,35	10,34
Hereford	19	21,78	13,49
Holstein	15	10,79	10,89
Kalmyk (Rostov Oblast)	10	7,53	7,27
Kalmyk (Republic of Sakha)	20	8,95	9
Kazakh Whiteheaded	10	26,19	10,81
Kholmogory	12	13,56	13,2
Kostroma	12	9,81	8,9
Red Steppe	3	7,8	6,94
Tagil	12	7,59	7,5
Ukrainian Grey	10	6,41	6,39
Wagyu	20	6,68	6,49
Yakut	37	10,97	10,06
Yaroslavl	22	14,55	12,33

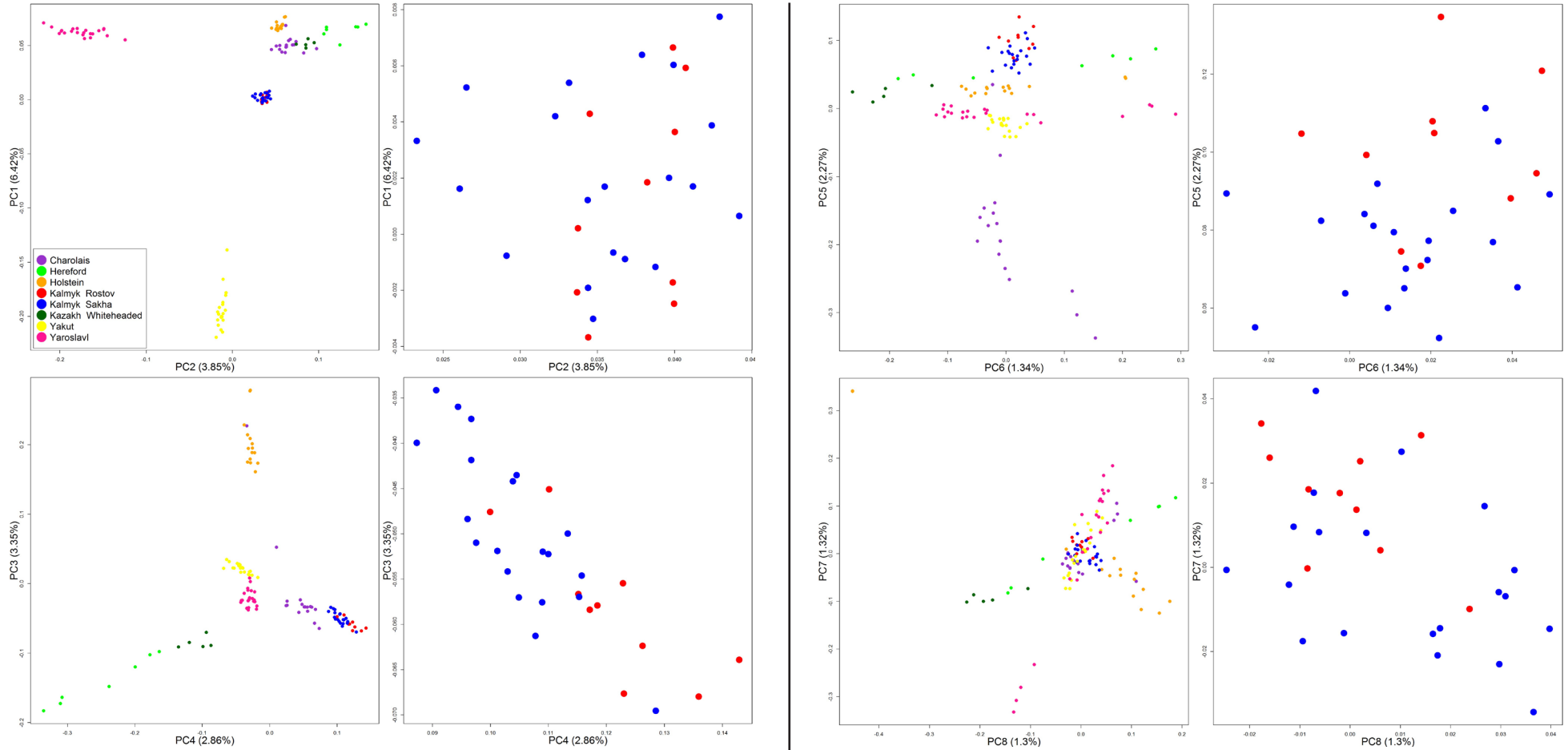
**Supplementary Material 4. The results of Tukey's HSD test**

Breed №1	Breed №2	t value	Pr(> t )	Breed №1	Breed №2	t value	Pr(> t )
Bestuzhev	Alatau	0,925	0,9999	Kazakh Whiteheade	Holstein	2,417	0,5324
Black Pied	Alatau	1,508	0,9819	Kazakh Whiteheade	Kalmyk	4,458	<0.01
Black Pied	Bestuzhev	0,6	1	Kholmogory	Alatau	2,151	0,7265
Buryat	Alatau	3,41	0,0568	Kholmogory	Bestuzhev	1,349	0,9941
Buryat	Bestuzhev	2,835	0,2509	Kholmogory	Black Pied	0,878	1
Buryat	Black Pied	2,623	0,3808	Kholmogory	Buryat	-2,007	0,8197
Charolais	Alatau	1,489	0,984	Kholmogory	Charolais	1,259	0,9973
Charolais	Bestuzhev	0,544	1	Kholmogory	Hereford	-2,168	0,7153
Charolais	Black Pied	-0,091	1	Kholmogory	Holstein	1,269	0,997
Charolais	Buryat	-2,946	0,1966	Kholmogory	Kalmyk	2,965	0,1863
Hereford	Alatau	3,514	0,0417	Kholmogory	Kazakh Whiteheaded	-1,192	0,9986
Hereford	Bestuzhev	2,926	0,2063	Kostroma	Alatau	0,978	0,9999
Hereford	Black Pied	2,787	0,2772	Kostroma	Bestuzhev	-0,065	1
Hereford	Buryat	-0,69	1	Kostroma	Black Pied	-0,827	1
Hereford	Charolais	3,844	0,0137	Kostroma	Buryat	-3,474	0,0477
Holstein	Alatau	1,439	0,9886	Kostroma	Charolais	-0,825	1
Holstein	Bestuzhev	0,503	1	Kostroma	Hereford	-4,176	<0.01
Holstein	Black Pied	-0,121	1	Kostroma	Holstein	-0,752	1
Holstein	Buryat	-2,913	0,2111	Kostroma	Kalmyk	0,986	0,9999
Holstein	Charolais	-0,045	1	Kostroma	Kazakh Whiteheaded	-3,096	0,1361
Holstein	Hereford	-3,73	0,0207	Kostroma	Kholmogory	-1,815	0,9099
Kalmyk	Alatau	0,495	1	Red Steppe	Alatau	-0,011	1
Kalmyk	Bestuzhev	-0,753	1	Red Steppe	Bestuzhev	-0,937	0,9999
Kalmyk	Black Pied	-1,805	0,9136	Red Steppe	Black Pied	-1,523	0,9801
Kalmyk	Buryat	-4,369	<0.01	Red Steppe	Buryat	-3,43	0,0525
Kalmyk	Charolais	-1,948	0,8514	Red Steppe	Charolais	-1,507	0,9819
Kalmyk	Hereford	-6,084	<0.01	Red Steppe	Hereford	-3,538	0,0376
Kalmyk	Holstein	-1,791	0,9187	Red Steppe	Holstein	-1,457	0,9871
Kazakh Whiteheade	Alatau	2,936	0,2004	Red Steppe	Kalmyk	-0,511	1
Kazakh Whiteheade	Bestuzhev	2,253	0,6558	Red Steppe	Kazakh Whiteheaded	-2,959	0,1914
Kazakh Whiteheade	Black Pied	1,972	0,8391	Red Steppe	Kholmogory	-2,168	0,7162
Kazakh Whiteheade	Buryat	-1,125	0,9993	Red Steppe	Kostroma	-0,994	0,9998
Kazakh Whiteheade	Charolais	2,465	0,4949	Tagil	Alatau	0,056	1
Kazakh Whiteheade	Hereford	-0,715	1	Tagil	Bestuzhev	-1,158	0,999

Supplementary Material 4 (end)

Breed №1	Breed №2	t value	Pr(> t )	Breed №1	Breed №2	t value	Pr(> t )
Tagil	Black Pied	-2,139	0,7374	Wagyu	Red Steppe	-0,36	1
Tagil	Buryat	-4,512	<0.01	Wagyu	Tagil	-0,723	1
Tagil	Charolais	-2,292	0,6267	Wagyu	Ukrainian Grey	0,389	1
Tagil	Hereford	-5,719	<0.01	Yakut	Alatau	1,588	0,9706
Tagil	Holstein	-2,156	0,7249	Yakut	Bestuzhev	0,59	1
Tagil	Kalmyk	-0,774	1	Yakut	Black Pied	-0,139	1
Tagil	Kazakh Whiteheaded	-4,478	<0.01	Yakut	Buryat	-3,127	0,1242
Tagil	Kholmogory	-3,16	0,1154	Yakut	Charolais	-0,043	1
Tagil	Kostroma	-1,48	0,985	Yakut	Hereford	-4,375	<0.01
Tagil	Red Steppe	0,07	1	Yakut	Holstein	0,007	1
Ukrainian Grey	Alatau	-0,609	1	Yakut	Kalmyk	2,489	0,4785
Ukrainian Grey	Bestuzhev	-1,95	0,8496	Yakut	Kazakh Whiteheaded	-2,742	0,3047
Ukrainian Grey	Black Pied	-3,002	0,1716	Yakut	Kholmogory	-1,409	0,9909
Ukrainian Grey	Buryat	-5,062	<0.01	Yakut	Kostroma	0,918	0,9999
Ukrainian Grey	Charolais	-3,143	0,1197	Yakut	Red Steppe	1,604	0,968
Ukrainian Grey	Hereford	-6,345	<0.01	Yakut	Tagil	2,632	0,3763
Ukrainian Grey	Holstein	-2,988	0,1785	Yakut	Ukrainian Grey	3,706	0,0222
Ukrainian Grey	Kalmyk	-1,913	0,8682	Yakut	Wagyu	4,105	<0.01
Ukrainian Grey	Kazakh Whiteheaded	-5,127	<0.01	Yaroslavl	Alatau	2,598	0,3998
Ukrainian Grey	Kholmogory	-3,952	<0.01	Yaroslavl	Bestuzhev	1,838	0,9011
Ukrainian Grey	Kostroma	-2,392	0,5502	Yaroslavl	Black Pied	1,437	0,9888
Ukrainian Grey	Red Steppe	-0,595	1	Yaroslavl	Buryat	-1,854	0,8948
Ukrainian Grey	Tagil	-1,008	0,9998	Yaroslavl	Charolais	1,991	0,8281
Wagyu	Alatau	-0,374	1	Yaroslavl	Hereford	-2,005	0,8196
Wagyu	Bestuzhev	-1,696	0,9479	Yaroslavl	Holstein	1,942	0,8546
Wagyu	Black Pied	-2,858	0,2402	Yaroslavl	Kalmyk	4,466	<0.01
Wagyu	Buryat	-5,248	<0.01	Yaroslavl	Kazakh Whiteheaded	-0,912	1
Wagyu	Charolais	-3,65	0,0277	Yaroslavl	Kholmogory	0,488	1
Wagyu	Hereford	-7,83	<0.01	Yaroslavl	Kostroma	2,666	0,3531
Wagyu	Holstein	-3,443	0,0526	Yaroslavl	Red Steppe	2,618	0,3845
Wagyu	Kalmyk	-1,724	0,9401	Yaroslavl	Tagil	4,286	<0.01
Wagyu	Kazakh Whiteheaded	-5,727	<0.01	Yaroslavl	Ukrainian Grey	5,112	<0.01
Wagyu	Kholmogory	-4,523	<0.01	Yaroslavl	Wagyu	6,024	<0.01
Wagyu	Kostroma	-2,304	0,6189	Yaroslavl	Yakut	2,44	0,515

Supplementary Material 5. Principal component analysis of eight cattle populations including two populations of the Kalmyk cattle breed



The left columns show all breeds while the right column shows only the Kalmyk cattle individuals.



**Supplementary Material 6.** fastSTRUCTURE analysis of eight cattle populations including two populations of the Kalmyk cattle breed. K = 2–8 are shown

